THE MEDIATING ROLE OF DISTRESS TOLERANCE IN THE RELATIONSHIP BETWEEN MISOPHONIA AND ANXIETY SENSITIVITY

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THE MEDIATING ROLE OF DISTRESS TOLERANCE IN THE RELATIONSHIP BETWEEN MISOPHONIA AND ANXIETY SENSITIVITY

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ABSTRACT

THE MEDIATING ROLE OF DISTRESS TOLERANCE IN THE RELATIONSHIP BETWEEN ANXIETY SENSITIVITY AND MISOPHONIA

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The current study was conducted to examine the relationship between misophonia and anxiety sensitivity and to explore the mediating role of distress tolerance in this relationship. Another aim of the present investigation was to find out the prevalence of misophonia in the non-clinical population in Turkey. The study was conducted with 400 participants (214 females and 186 males) aged between 20 and 65 (*M*=36.41; *SD*=11.87). To perform the study, participants completed the "Socio-Demographic Information Form", "Risk-Screening Questionnaire for Alcohol and Drug Use (BAPİRT)", "Misophonia Questionnaire (MQ)", "Anxiety Sensitivity Index-3 (ASI-3)", and "Distress Tolerance Scale (DTS)". The findings of the study revealed that distress tolerance partially mediated the relationship between misophonia and anxiety sensitivity. Also, the prevalence rate of misophonia was found as 21.3% in this study. According to the findings of correlation analyses, misophonia was positively correlated with all subtypes of anxiety sensitivity; and all subtypes of anxiety sensitivity were negatively correlated with DTS-total score, tolerance, and self-efficacy of distress tolerance. Also, misophonia and DTS-total score, tolerance, regulation, and self-efficacy of distress tolerance are negatively correlated. However, there was no significant correlation observed between misophonia severity and regulation of distress tolerance. Regulation of distress tolerance was negatively correlated with ASI-3-Total scores, physical concerns, and cognitive concerns, but regulation of distress tolerance and social concerns of AS was not correlated significantly. Physical and cognitive concerns of anxiety sensitivity positively predicted, and self-efficacy of distress tolerance negatively predicted the total scores of MQ, misophonia symptoms, emotions, and behaviors of misophonia, and misophonia symptom severity. Moreover, people who experienced cognitive concerns are more likely to present misophonia and develop emotions and behaviors when they confront a trigger sound and have more severe misophonia symptoms. Future studies should control for the education level of

participants, examine the functioning of individuals in detail, conduct longitudinal studies to reveal the cause-and-effect relationship and use more comprehensive measures for data collection such as interviews and observations.

Keywords: Misophonia, anxiety sensitivity, distress tolerance, trigger sounds, prevalence

ÖZ

MİZOFONİ VE KAYGI DUYARLILIĞI ARASINDAKİ İLİŞKİDE SIKINTIYA KATLANMANIN ARACI ROLÜ

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Bu çalışma, mizofoni ve kaygı duyarlılığı arasındaki ilişkiyi incelemek ve bu ilişkide sıkıntı toleransının aracı rolünü araştırmak için yapılmıştır. Bu araştırmanın bir diğer amacı, Türkiye'deki klinik olmayan popülasyonda mizofoninin yaygınlığını bulmaktır. Araştırma, yaşları 20 ile 65 arasında değişen (*Ort.*=36.41 ve *S*=11.87) 400 katılımcı (214 kadın ve 186 erkek) ile yürütülmüştür. Araştırmayı gerçekleştirmek için katılımcılar "Sosyodemografik Bilgi Formu", "Bağımlılık Profil İndeksi Risk Tarama Ölçeği (BAPİRT)", "Mizofoni Ölçeği (MÖ)", "Anksiyete Duyarlığı İndeksi-3 (ADİ-3)" ve "Sıkıntıya Dayanma Ölçeği (SDÖ)"ni doldurmuşlardır. Araştırmanın bulguları, sıkıntı toleransının mizofoni ve kaygı duyarlılığı arasındaki ilişkiye kısmen aracılık ettiğini ortaya koymuştur. Ayrıca, bu çalışmada mizofoninin yaygınlığı %21.3 olarak bulunmuştur. Korelasyon analizlerinin bulgularına göre mizofoni, anksiyete duyarlılığının tüm alt tipleri ile pozitif yönde; kaygı duyarlılığının tüm alt türleri, SDÖ-toplam puanı, tolerans ve öz-yeterlik alt ölçekleri ile negatif ilişkiliydi. Ayrıca, mizofoni ve SDÖ-toplam puanı, tolerans, düzenleme ve öz-yeterlik ile negatif ilişkilidir. Ancak, mizofoni şiddeti ile SDÖ'nün düzenlenme alt ölçeği arasında anlamlı bir ilişki gözlenmedi. SDÖ'nün düzenlenme alt ölçeği, ASI-3-Toplam puanları, fiziksel kaygılar ve bilişsel kaygılar ile negatif yönde ilişkili olduğu, ancak düzenlenme ve sosyal kaygılar arasında anlamlı bir ilişki olmadığı görülmüştür. Kaygı duyarlılığının fiziksel ve bilişsel kaygıları MÖ toplam puanlarını, mizofoni belirtilerini, duyguları ve mizofoni davranışlarını ve mizofoni semptom şiddetini olumlu bir şekilde yordamıştır fakat sıkıntıya dayanmanın öz-yeterliği bunları olumsuz yönde yordamıştır. Bunlara ek olarak, bilişsel kaygılar yaşayan kişilerin, tetikleyici bir sesle karşılaştıklarında duygu ve davranışlar geliştirmeleri, mizofoni geliştirmeye daha yatkın olmaları, daha şiddetli mizofoni semptomlarına sahip olmaları olasıdır. Gelecekteki araştırmalarda, katılımcıların eğitim düzeyinin kontrol edilmesi, bireylerin işlevselliğinin ayrıntılı olarak incelemesi, neden-sonuç ilişkisini ortaya çıkarmak için boylamsal çalışmaların

yapması ve veri toplama için görüşme ve gözlem gibi daha kapsamlı ölçümler kullanması önerilmektedir.

Anahtar Kelimeler: Mizofoni, kaygı duyarlılığı, sıkıntıya katlanma, tetikleyici sesler, yaygınlık

DEDICATION

To my family…

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABREVIATIONS

ADHD : Attention Deficit Hyperactivity Disorder

A-Miso-S : Amsterdam-Misophonia-Scale

AS : Anxiety Sensitivity

ASI-3 : Anxiety Sensitivity Index-3

BAPIRT : Risk-Screening Questionnaire for Alcohol and Drug Use

CBT : Cognitive Behavioral Therapy

DBT : Dialectical Behavioral Therapy

DSM : Diagnostical and Statistical Manual of Mental Disorders

DT : Distress Tolerance

DTS : Distress Tolerance Scale

ICD : International Classification of Diseases and Related Health Problems

MDD : Major Depressive Disorder

MQ : Misophonia Questionnaire

OCPD : Obsessive-Compulsive Personality Disorder

OCD : Obsessive-Compulsive Disorder

PTSD : Post-Traumatic Stress Disorder

SPSS : Statistical Package for the Social Sciences

CHAPTER 1

INTRODUCTION

Misophonia is a currently focused construct that refers to hypersensitivity to certain sounds in which these sounds cause a strong negative and aversive emotional reaction and arousal (Edelstein, Brang, Rouw, & Ramachandran, 2013; Schröder, Vulink, & Denys, 2013). Even if misophonia interferes with the daily lives of individuals, there are not many studies published on this subject. Also, few studies examined the prevalence of misophonia in the literature and there is no study examining the prevalence of misophonia in Turkey to date(Naylor, Caimino, Scutt, Hoare, & Baguley, 2021; Öz, 2015; Wu, Lewin, Murphy, & Storch, 2014; Zhou, Wu, & Storch, 2017). It was observed that elevated levels of anxiety sensitivity and lower distress tolerance levels are related with the increase in the severity of misophonia symptoms. However, there is no previous study examining how distress tolerance is affected and mediated in the relationship between misophonia and anxiety sensitivity.

This chapter intends to provide descriptions about misophonia, anxiety sensitivity, and distress tolerance. The current study aims to investigate the relationship between misophonia and anxiety sensitivity and the mediating role of distress tolerance

in this relationship. Furthermore, another purpose of the present study is to ascertain the prevalence rate of misophonia in the nonclinical population Turkey.

1.1. The Misophonia Term

The term misophonia is the combination of miso which means hate in Greek, and phonia which stands for sound refers to "hatred of sound" (P. Jastreboff, & M. Jastreboff, 2001, 2014). Individuals who have misophonia react abnormally and negatively towards repetitive or certain patterns of sounds which named as trigger sounds such as eating sounds (smacking lips, chewing, slurping), nasal sounds (breathing, sniffing, snoring), and other kinds of sounds (typing, clock ticking, finger tapping, pen clicking, footsteps) (Edelstein et al., 2013; Schröder et al., 2013). Sometimes visual stimuli such as shaking legs, seeing someone else eating, and/or playing with hair can also trigger people with misophonia (Schröder et al., 2013). When people with misophonia hear these trigger sounds or see the visual triggers, they experience disturbing emotions and reactions including irritability and disgust which then turn into greater responses like anger, rage, and hate to ones who produce the sound (Edelstein et al., 2013). As a result of distress, and extreme feelings and responses to trigger sounds; these individuals can develop avoidance strategies and can experience problems in concentration; thus, their functioning in school, working settings, family and interpersonal contexts could be impaired (Kumar et al., 2014; Porcaro, Alavi, Gollery, & Danesh, 2019).

Misophonia was first mentioned by P. Jastreboff and M. Jastreboff (2001) in a short audiology report and they defined it as aversion or dislike of specific sounds that generate unfavorable emotional reactions. Before the term misophonia entered the literature, Marsha Johnson was referring to misophonia as Selective Sound Sensitivity

Syndrome (Johnson, 1997, as cited in Meltzer & Herzfeld, 2014). Since misophonia comes from the audiology literature, it is categorized under the decreased sound tolerance with hyperacusis and phonophobia; and these phenomena have always been confused with each other. In misophonia, the one experiences discomfort and responds negatively to aversive sounds which are repetitive and has specific patterns depending on the setting; whereas in hyperacusis, the individual reacts abnormally to sound in all contexts because of its intensity and spectrum. Also, when a person is faced with trigger sounds, the emotion experienced in phonophobia is fear but, the emotions experienced in misophonia disgust and irritation (P. Jastreboff & M. Jastreboff, 2001, 2015). After P. Jastreboff and M. Jastreboff (2001) had introduced the term misophonia, it has started to gain an important place in the field of psychology, especially since 2013 with the studies of Edelstein et al. (2013) and, Schröder et al. (2013).

Misophonia can seriously and adversely affect individuals' daily activities, social life, and interpersonal relationships. In order not to be exposed to the trigger sounds, individuals may not attend to certain environments, leave the setting, and argue or fight with the person who made the trigger sound. Recent research illustrated which sounds cause more discomfort in individuals and negative reactions towards others who produce trigger sounds. It is stated that individuals who have misophonia are different from each other in terms of the severity, sensitivity, and nature of their misophonic complaints (Rouw & Erfanian, 2018). Yet, there are common sounds that bother them most and cause them to react abnormally. The research by Edelstein et al. (2013) suggested that the most bothersome sounds reported by 11 individuals with misophonia were related to eating sounds, pen clicking, finger tapping, footsteps, typing, and whistling. Also, these individuals stated that they had feelings of anger, rage, and hate

towards the people making these sounds (Edelstein et al., 2013). In accordance with Edelstein et al. (2013)'s findings, other research supported that the most disturbing sounds are eating sounds and repetitive tapping (Wu et al., 2014). In addition, one study demonstrated how different levels of misophonia sensitivity influenced the learning of 72 college students in the presence of chewing sounds. This research showed that when exposing to gum chewing sound in reading phase, students who have higher misophonia sensitivity performed worse on comprehension test than students have lower misophonia sensitivity. Also, when they were not exposed to gum chewing sounds, they had a better performance (Seaborne & Fiorella, 2018). Considering these results, a person with misophonia may experience a trigger sounds in all areas of his or her life and therefore, either his functionality may decrease, or his career and social life may be affected adversely as he experiences negative emotions towards people producing these sounds. Although people reported their discomfort and distress about the trigger sounds, and decline in their functionality was observed, the diagnostic criteria are not present for misophonia in DSM V (Diagnostic and Statistical Manual of Mental Disorders) and ICD (International Classification of Diseases and Related Health Problems) (American Psychiatric Association, 2013; Schröder et al., 2013; World Health Organization, 2004). However, Schröder et al. (2013) proposed diagnostic criteria in their paper, and they suggested that the misophonia should be under the diagnostic criteria of Obsessive-Compulsive and Related Disorders (OCD) since they share some characteristics such as being obsessive and avoidance. The misophonia's proposed diagnostic criteria include 6 items which are:

1) The existence or expectation of a certain sound generated by humans (such as breathing and eating sounds) cause an aversive and impulsive

physical response that starts with discomfort or disgust and suddenly turns into anger.

2) This anger leads to a self-control loss with uncommon but severely aggressive outbursts.

3) The individual acknowledges that disgust or anger is extreme, unreasonable, or disproportionate to the conditions or the inducing stressor.

4) The person tends to use avoidance strategies to misophonic condition, or if she/he does not use avoidance strategies, he tries to withstand the misophonic sound he encounters with a strong feeling of anger, discomfort, and disgust.

5) The person's disgust, anger, or avoidance leads to marked distress or has a significant impact on the person's daily life.

6) The individual's disgust, avoidance, and irritability are not defined better by any other diseases such as Post-traumatic stress disorder or Obsessive-compulsive disorder.

The recent replication and extension of Wu and her colleagues' (2014) research conducted by Zhou, Wu, & Storch (2017) with 415 Chinese college students illustrated that nearly 20% of their participants specified that they were "often" or "always" sensitive to specific sounds. However, 6% of the participants stated the misophonic symptoms cause significant interference. The results of a study by Wu et al. (2014) indicated that approximately a quarter of 483 college students who studied at the University of South Florida reported that they were feeling sensitive to certain sounds

"often" or "always". Their findings demonstrated that about 20% of the participants had clinically significant symptoms of misophonia which indicates a substantial interference in their daily life and functioning. In addition, the two studies are consistent with each other so that they both find impairments in the social and occupational lives of participants who have greater sensitivity to misophonic sounds. In a study conducted with 543 people in Ankara aged 15 and over, which measures the prevalence of misophonia in the population, the prevalence rate of misophonia was found as 7.7% (Öz, 2015). Another self-report investigation about the prevalence of misophonia which is conducted with 336 medical students studying at the University of Nottingham proposed that 49.1% of the participants had clinically significant misophonia symptoms. The study's results denoted that, 37% of the participants experienced mild symptoms of misophonia, 12% experienced moderate symptoms, and 0.3% experienced severe symptoms with respect to Amsterdam Misophonia Scale (A-Miso-S) (Naylor et al., 2021). According to the outcome of these studies, it can be inferred that misophonia can also be seen in non-clinical populations, and it can lead to problems in an individual's functioning.

Misophonia has been related with the numerous mental disorders' symptoms involving anxiety disorders and depression (Wu et al., 2014; Zhou et al., 2017) however, the association was mostly observed with OCD and other obsessive-compulsive-related disorders (Edelstein et al., 2013; Hadjipavlou, Baer, Lau, & Howard, 2008; Neal & Cavanna, 2013; Schröder et al., 2013; Webber & Storch, 2015; Wu et al., 2014; Zhou et al., 2017). According to the results of Schröder and his colleagues' (2013) study, observed comorbid disorders were 52.4% obsessive-compulsive personality disorder (OCPD), 7.1% mood disorders, 4.8% trichotillomania,

4.8% attention-deficit hyperactivity disorder (ADHD), 4.8% Tourette syndrome, 2.4% panic disorder, 2.4% hypochondriasis, 2.4% OCD, and 2.4% skin picking 1. In addition, the study which measured the comorbidity of misophonia and conducted by Rouw et al. (2018) found that 13% of the participants had anxiety disorders, 13% had depressive disorders, 12% had post-traumatic stress disorder (PTSD), 12% had ADHD, 8% had eating disorders, and 6% had selective mutism. In addition, it was explored that the most frequently observed comorbidities were 15.38% PTSD, 11.53% OCD, 9.61% Major Depressive Disorder (MDD), and 9.61% anorexia nervosa (Erfanian, Kartsonaki, & Keshavarz, 2019). Also, case studies of misophonia indicated comorbidity with Tourette syndrome (Neal & Cavanna, 2013), and OCD-related behaviors (Hadjipavlou et al., 2008).

1.2. Anxiety Sensitivity

Anxiety sensitivity was first defined by Reiss and McNally in 1985 under the fear expectancy model, and it means fear of anxiety. In their fear expectancy theory, it was stated that there are three essential fears which are negative evaluation fear, death/injury fear, and anxiety sensitivity which affect the severity and precipitation of several fears and conditions of anxiety (Reiss, 1991). In other words, anxiety sensitivity is the fear of perceptions and sensations related to anxiety (McNally, 2002). So, if a person who has high anxiety sensitivity feel anxious in the face of a stressor, there is a high probability that he/she worries, and the anxiety he experiences will lead to a harmful outcome such as a losing his mind or heart attack (Reiss, 1991; Reiss & McNally, 1985). Therefore, individuals with high anxiety sensitivity are more motivated to avoid situations and engage in safety behaviors that may trigger anxiety symptoms (McNally, 1989). When individuals with greater levels of anxiety sensitivity experience

an anxiety-related situation, they immediately become alarmed, and this inflames their anxiety (Reiss & McNally, 1985). So, this creates an additional anxiety and thus a vicious circle evolves where daily life stressors generate anxiety, and this anxiety propagates additional anxiety (Reiss, 1991; Reiss & McNally, 1985).

It has been proposed in the literature that having higher levels of anxiety sensitivity anticipates the occurrence of anxiety disorders (Cox, Endler, & Swinson, 1991; McNally & Lorenz, 1987; Schmidt, Lerew, & Jackson, 1997; Schmidt, Lerew, & Jackson, 1999; Schmidt, Mitchell, & Richey, 2008; Taylor, Koch, & McNally, 1992). In a study, it was explored that individuals who have higher anxiety sensitivity levels were five times more likely to develop an anxiety disorder as compared to individuals who have lower anxiety sensitivity (Maller & Reiss, 1992). In addition, in 5-week follow-up research, it was proposed that during a stressful period, people with a low level of anxiety sensitivity have a lower risk of experiencing panic attacks than people with a greater level of anxiety sensitivity (Schmidt et al., 1997).

1.2.1. Relationship between Anxiety Sensitivity and Misophonia

While anger is the predominant misophonic response, the anxiety caused by anger as a result of trigger sounds affects behavioral responses such as safety behaviors and avoidance. These behavioral reactions may result in functional problems in individuals' daily life, occupation, and interpersonal relationships which leads to diminished life quality and thus, additional anxiety (Potgieter et al., 2019). Therefore, it can be said that anxiety plays a crucial role in the development and predisposition of misophonia. According to findings of prospective research conducted with people who did not have any psychological disorders it was suggested that having anxiety sensitivity predicts future emergence of anxiety disorders, sudden panic attacks, panic disorder,

and anxiety symptoms (Maller & Reiss, 1992; Ehlers, 1995; Schmidt et al., 1997; Schmidt, Zvolensky, & Maner, 2006).

Most of the studies on misophonia have investigated whether there is another psychiatric disease comorbid with or causes misophonia (Dozier, 2015; Edelstein et al., 2013; Erfanian et al., 2019; Hadjipavlou et al., 2008; Jager, de Koning, Bost, Denys, & Vulink, 2020; Schröder et al., 2013; Schröder, Vulink, van Loon, & Denys, 2017; Webber et al., 2015). Since several research found comorbidity and relationship between misophonia and anxiety disorders and OCD, anxiety sensitivity was considered to be a contributing factor that also plays a significant role in anxiety disorders and OCD. In other words, anxiety sensitivity is one of the vulnerability factors that contribute to the development of anxiety disorders and obsessive-compulsive disorders.

Since anxiety sensitivity also underlies Obsessive-Compulsive and Anxiety Disorders, few articles have addressed the relationship between anxiety sensitivity and misophonia (Cusack, Cash, & Vrana, 2018; Frank, Roszyk, Hurley, Drejaj, & McKay, 2020; McKay, Kim, Mancusi, Storch, & Spankovich, 2018). According to the research results of Cusack et al. (2018), a moderately significant relationship was found between the severity of misophonia and anxiety sensitivity. In another study, it was determined that individuals with misophonia have higher anxiety sensitivity than individuals without misophonia (Frank et al., 2020). When individuals with and without symptoms of misophonia were compared, they found that participants with misophonia symptoms had significantly higher scores on the anxiety sensitivity subscale measuring physical worries (McKay et al., 2018). Taken these together, it can be considered that anxiety sensitivity is a vulnerability factor that increases the likelihood of the occurrence and the development of misophonia.

1.3. Distress Tolerance

Distress tolerance (DT) is first described by Simons and Gaher (2005) as the capability to experience and endure negative psychological situations and events. Although cognitive or physical processes can cause distress, distress occurs when there is an emotional situation often featured by a tendency to act to relieve the emotional experience. Distress tolerance is interpreted as a meta-emotion frame that comprises of an individual's expectations and appraisals of experiencing negative emotional conditions with regard to 1) tolerability and repulsiveness, 2) appraisal and acceptance, 3) inclination to take attention and ruin functioning and 4) emotion regulation.

Most research about distress tolerance claims that distress tolerance contains individual differences in the degree to which people can tolerate a particular degree and type of their discomfort and danger (Otto, Reilly-Harrington, & Taylor, 1999; Simons & Gaher, 2005). Thus, it is a structure that includes cognitive, behavioral, and affective functions. Individuals who have lower levels of DT are more responsive to stressful and distressing situations. Also, those people lack the ability to cope with distress (Zvolensky, Bernstein, & Vujanovic, 2011; Zvolensky, Vujanovic, Bernstein, & Leyro, 2010). Therefore, people who have lower distress tolerance will try to avoid negative feelings and emotions and could use coping strategies to fix their emotional states quickly. On the other hand, those who have greater levels of distress tolerance can react more flexibly and functional to distress and distressing situations.

1.3.1. Relationship between Distress Tolerance and Misophonia

Distress tolerance has been recently addressed in studies to explore the mechanisms underlying misophonia and in case studies addressing the treatment of misophonia. According to the results of a research, individuals with misophonia attained

significantly lower distress tolerance scores than individuals without misophonia (Frank et al., 2020). In addition, in case studies examining misophonia, the clients' ability to tolerate distress was strengthened by administering Dialectical Behavioral Therapy and Mindfulness Therapies, and consequently, it was observed that the clients' misophonia symptoms regressed, and it was recommended to work on distress tolerance (Kamody & Del Conte, 2017; Schneider & Arch, 2015).

1.3.2. Relationship between Distress Tolerance and Anxiety Sensitivity

Studies investigating the association between distress tolerance and anxiety sensitivity and anxiety-related constructs have just begun to emerge in the literature. As noted earlier in this chapter, having a low distress tolerance reduces one's capacity to endure and cope with negative psychological conditions and circumstances (Simons & Gaher, 2005). Therefore, individuals with low distress tolerance levels are thought to be more likely to experience problems related to anxiety since they perceive that their sensations and perceptions about anxiety symptoms are unbearable and uncontrollable (Keough, Riccardi, Timpano, Mitchell, & Schmidt, 2010). Also, according to Marsha Linehan's (1993) biosocial theory, difficulty in withstanding negative feelings can aggravate the evaluation of negative emotions in a way that those with lower levels of distress tolerance are more responsive to negative emotions. Inflated evaluations of negative feelings, such as anxiety, can aggrandize the negative emotions. Individuals with amplified negative feelings and emotions which is resulting from low distress tolerance can respond overly to the outcomes of perceptions and sensations related to anxiety.

Although there is an obvious relationship between anxiety and distress tolerance theoretically, the studies examining this association are very few in number. A study

conducted by Marshall and her colleagues (2008) revealed that low levels of distress tolerance were found in daily-smoking individuals who had a panic history. Also, it was observed that low distress tolerance is related to comorbid agoraphobia in those with panic disorder (Telch, Jacquin, Smits, & Powers, 2003). In addition, experimental research explored the negative relationship between anxiety sensitivity and distress tolerance so that individuals who scored high on anxiety sensitivity reported lower distress tolerance (Anestis, Selby, Fink, & Joiner, 2007; Bernstein, Zvolensky, Vujanovic, & Moos, 2009; Keough et al., 2010; Timpano, Buckner, Richey, Murphy, & Schmidt, 2009; Zvolensky et al., 2009). A study conducted by Keough et al. (2010) found the relationship between anxiety sensitivity and distress tolerance such that as one's AS increases, his/her DT diminishes. Taken all these together, it can be said distress tolerance is both related with anxiety sensitivity and anxiety, and it plays a role in the emergence of them.

1.4. Aims and Hypotheses

Although misophonia affects and interferes individuals' daily life, relationships, and occupation; there are not many studies on this subject and most of the previous research consists of case studies, the characteristics of misophonia, its relationship with other psychiatric diseases, its psychophysiology, treatment, and neurological structure of the misophonia. Also, there are very few studies on this subject in Turkey, and these consist of case studies apart from a study measuring the prevalence of misophonia in Ankara (A. Altınöz, Ünal, & Ş. Altınöz, 2018; Gençer, Karadere, Okumuş, & Hocaoğlu, 2018; Hocaoglu, 2018; Öz, 2015; Tunç & Başbuğ, 2017). In addition, no previous study has examined how distress tolerance affects and plays a mediating role in the relationship between misophonia and anxiety sensitivity. Furthermore, in the literature,

few studies examine the prevalence of misophonia and also, in Turkey there was one study assessed the prevalence. However, this study was limited in a way that it only measures the prevalence rate of misophonia in Ankara. Therefore, the purpose of the current research is to investigate the prevalence of misophonia in the non-clinical population in Turkey; and also, to explore the relationship between misophonia, anxiety sensitivity, and distress tolerance; and the mediator role of the distress tolerance in the relationship between misophonia and anxiety sensitivity.

In line with the results of previous studies, it was hypothesized that;

(1) The prevalence of clinically significant misophonia symptoms will be around 6-20% since the research using MQ found prevalence rate of misophonia between 6% and 20% (Wu et al., 2014; Zhou et al., 2017).

(2) There will be a significant positive relationship between misophonia and anxiety sensitivity.

(3) There will be a negative significant relationship between misophonia and distress tolerance.

(4) There will be a negative significant relationship between anxiety sensitivity and distress tolerance.

(5) Distress tolerance will mediate the relationship between misophonia and anxiety sensitivity.

Consistent with the current study's hypotheses, the proposed mediation model is demonstrated in Figure 1.1.

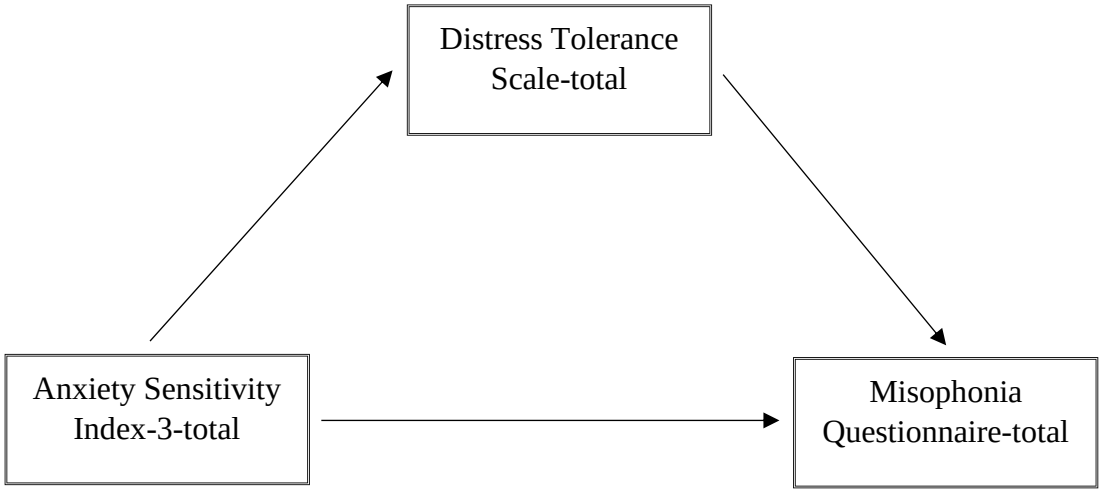

Figure 1.1 The mediation model of the study

CHAPTER 2

METHOD

2.1. Participants

610 individuals participated in this study. Participants were recruited from convenience sampling. The inclusion criteria for this research were: i) to be between the ages of 18 and 65 for eliminating any impairments resulting from age; ii) not having hearing problems because it can influence the misophonia symptoms; iii) not using any antidepressants or anxiolytics for the last two weeks since these drugs can affect the symptom severity of misophonia (McGuire, Wu, & Storch, 2015); iv) not having head trauma or psychotic disorders as it can be difficult to distinguish the symptoms of individuals with head trauma and psychotic disorders; and v) not experiencing substance or alcohol dependence because they decrease the severity of misophonia symptoms (Edelstein et al., 2013). Thus, 210 of the 610 participants were excluded from the research since 3 of them did not accept the informed consent, 22 of them had hearing loss, 6 of them were older than 65 years, 36 of them was taking antidepressants or anxiolytics, 3 of them had a psychotic disorder, 123 of them had a high risk on substance or alcohol use, and 17 of them dropped out the test. After excluding these

participants, 400 participants between the ages of 20 and 65 have remained, and the study was conducted with them.

Among these 400 participants, 214 (53.5%) of them were female and 186 (46.5%) of them were male. While the age range of the participants was 20-65, the mean age was 36.41 (SD=11.87). 235 (58.8%) of participants had associate/bachelor's degrees, 38 (9.5%) of them had master's degrees, 34 (8.5%) of them continuing their master's degree, 50 (12.5%) of them were high school graduates, 22 (5,5%) of them continuing their associate/bachelor's degrees, 6 (1,5%) of them continuing their PhD., 6 (1.5%) of them had a PhD., 6 of them (1.5%) were secondary school graduates, 2 of them (.5%) were primary school graduates, and 1 (.3%) of them continuing high school education. Detailed demographic information is presented in Table 2.1.

None of the participants had a hearing impairment/loss or disease. There were 26 (6.5%) people who have a psychiatric diagnosis and 374 (93.5%) who do not. There are 12 (3.0%) people who use a psychiatric or medical drug and 388 (97.0%) who do not. None of the participants stated using any antidepressant or fear/anxiety medication until 2 weeks ago.

Table 2.1

Demographic Characteristics of Participants

Variable	Groups	n	%
Gender	Female	214	53.5
	Male	186	46.5
Education level	Primary school graduate	2	.5
	Secondary school graduate	6	1.5
	Continuing high school	1	.3
	High school graduate	50	12.5
	Continuing Associate/Bachelor	22	5.5
	Associate/Bachelor's degree	235	58.8
	Continuing Master's degree	34	8.5

	Master's degree	38	9.5
	Continuing PhD	6	1.5
	PhD graduate	6	1.5
Hearing impairment/loss or disease	Yes	-	-
	No	400	100
Psychiatric diagnosis	Yes	26	6.5
	No	374	93.5
Psychiatric or medical drugs currently used	Yes	12	3.0
	No	388	97.0
Using any antidepressants or anti-anxiety relievers until 2 weeks ago	Yes	-	-
	No	400	100
Total		400	100
Variable	Min-Max	$\bar{x}$	SD
Age	20-65	36.41	11.87

2.2 Materials

2.2.1. Socio-Demographic Information Form

Socio-Demographic Information Form involves questions about age, sex, education level, psychiatric history (diagnosis), impairments related to hearing, use of psychiatric or medical drugs, and any antidepressant or anti-anxiety medication used for the last two weeks.

2.2.2. Risk-Screening Questionnaire for Alcohol and Drug Use (BAPİRT)

Risk-Screening Questionnaire for Alcohol and Drug Use was developed by Ögel and his colleagues (2017) to measure the risk level of alcohol and substance users for adults. BAPİRT is a self-report measure that consists of two scales which are alcohol and substance. Both scales have 6 questions with a 3-point Likert scale ranging from 0 to 2. For the alcohol scale, if the total score of the answers given to the questions is equal to or higher than 3, the individual is evaluated within the scope of high risk. For the substance scale, if the total score of the answers to the first 6 questions is equal to higher than 4, the substance use level of the person is considered as high risk. Also, on the substance scale,

if the answer to the last question (Have you ever used a substance intravenously in your life?) is “sometimes” or “very frequently”, the substance use level of the individual is directly considered as high risk. The reason for using BAPIRT in this study was to eliminate the participants who pose a risk in terms of alcohol and substance dependence since substance or alcohol decrease the severity of misophonia symptoms (Edelstein et al., 2013). BAPİRT was developed from the Bağımlılık Profil İndeksi (Ögel, Koç, & Görücü, 2017). For the internal reliability, the Cronbach's alpha for the coefficient of the BAPİRT-alcohol scale is 0.70 and 0.88 for the BAPİRT-drug scale.

2.2.3. Misophonia Questionnaire (MQ)

The Misophonia Questionnaire (MQ) was developed by Wu et al. (2014) to assess the individuals’ misophonia symptoms, emotions and behaviors when exposed to misophonic trigger sounds, and misophonic sound sensitivity. This self-report assessment consists of three sections that measure the existence of misophonia symptoms, behaviors, and emotions as a result of symptoms, and severity of sound sensitivity. The first section that measures misophonia symptoms, named as Misophonia Symptom Scale, contains 7 statements (e.g., “I am sensitive to the sound of people eating”) on a scale from 0 to 4 (0: Not all true, 1: Rarely true, 2: Sometimes true, 3: Often true, 4: Always true). The second part which behaviors and emotions are assessed, named as Misophonia Emotions and Behaviors Scale, include 10 questions (e.g., “ Once you are aware of the sound(s), because of the sound(s), how often do you leave the environment to a place where the sound(s) cannot be heard anymore?”) on a scale from 0 to 4 (0: Never, 1: Rarely, 2: Sometimes, 3: Often, 4: Always). The last section of the MQ named as Misophonia Severity Scale measures the overall sound sensitivity on a scale from 1 (minimal) to 15 (very severe) (Wu, Lewin, Murphy & Storch, 2014). Scores obtained from the first two parts of the MQ

are summed up to generate the Total Score that can range between 0 and 68. For the last section of the MQ (Misophonia Severity Scale), individuals who get scores of 7 and above indicate clinically significant misophonia symptoms. The Cronbach's alphas for the internal consistency of the scale's original form were 0.86 for the Misophonia Symptom Scale, 0.86 for the Misophonia Emotions and Behaviors Scale, and 0.89 for the total score.

Merve Deniz Sakarya and Eda Çakmak (2021) adapted the MQ in Turkish. There are four sections on the Turkish adaptation of the scale which are Misophonia Symptom Scale that consists of 7 questions, Misophonia Emotions and Behaviors Scale-Avoiding and Internalization which includes 6 questions, Misophonia Emotions and Behaviors Scale-Aggression and Externalization that contains 4 questions, and Misophonia Severity Scale in the Turkish adaptation of the scale. The Cronbach's alpha of internal consistency was .89 for the Misophonia Scale. For internal consistency, the Cronbach's alpha for the Misophonia Symptoms Scale was .79, Misophonia Emotions and Behaviors Scale–Avoidance and Internalization was .85, Misophonia Emotions and Behaviors Scale–Aggression and Externalization was .83. The Pearson correlation coefficient was found as .78 for the test-retest reliability. Since the Turkish adaptation of the Misophonia Questionnaire was conducted this year, it has not been published yet, and there is no other study using the Turkish adaptation of MQ, in this study, it was handled in 3 sections, as in the original version of the Misophonia Questionnaire. By doing so, this path has been chosen to follow a certain consistency with the results of previous studies.

Also, the current study's Cronbach's Alpha reliability coefficient for Misophonia Questionnaire-total was .934; for the Symptom sub-scale was .867; for the Emotions and Behaviors sub-scale was calculated as .927.

2.2.4. Anxiety Sensitivity Index-3 (ASI-3)

Anxiety Sensitivity Index-3 was developed by Taylor et al. (2007) to assess fear of anxiety-related symptoms, perceptions, and sensations. ASI-3 is a self-report questionnaire that consists of 18 questions on a 5-point Likert scale ranging from 0-4 (0: Very little, 1: A little, 2: Some, 3: Much, 4: Very much). It involves 3 subscales which are Physical Concerns that includes 8 questions, cognitive concerns that consists of 4 questions, and social concerns that contains 4 questions. The total score of ASI-3 can be between 0-72. Attaining higher scores on this scale indicates an increasing severity on the level of anxiety sensitivity.

The Turkish adaptation of the ASI-3 is performed by Mantar (2008). The Cronbach's alpha of internal consistency was .93 and test-retest reliability was .64 for the Turkish version of the scale. In addition, this study's Cronbach's Alpha reliability coefficient for Anxiety Sensitivity Index-3 -total was .936; for the Physical Concerns sub-scale was .886; for the Cognitive Concerns sub-scale was .87; for the Social Concerns sub-scale was found as .842.

2.2.5. Distress Tolerance Scale (DTS)

The Distress Tolerance Scale was developed by Simons and Gaher (2005) to measure individual differences in the capability to endure and experience distress. DTS is a self-report measure that contains 15 items rated on a 5-point Likert scale (5: Strongly disagree, 4: Mildly disagree, 3: Agree and disagree equally, 2: Mildly agree, 1: Strongly agree). The scores that can be attained from the test are between 0 and 75. Getting higher scores on the DTS demonstrates higher distress tolerance. DTS includes 4 subscales

which are Tolerance that includes 3 questions, Appraisal that contains 6 questions, Absorption that consists of 3 questions, and Regulation which includes 3 questions.

The Turkish adaptation of the DTS is conducted by Sargın and his colleagues (2012). In the Turkish adaptation of this scale, there were 3 sub-scales which are Tolerance, Regulation, and Self-efficacy. The Cronbach's alpha coefficients for the whole scale were .89. The Cronbach's alpha for the Tolerance sub-scale was .90, .80 for the Regulation sub-scale, .64 for the Self-efficacy sub-scale. In addition, test-retest reliability was found statistically significant ($p<.01$). Furthermore, the present study's Cronbach's Alpha reliability coefficient for Distress Tolerance Scale-total was .904; for the Tolerance sub-scale was .899; for the Regulation sub-scale was .838; for the Self-efficacy sub-scale was calculated as .592.

2.3. Procedure

Data were collected after the approval of the Bahçeşehir University Scientific Research and Publication Ethics Committee (reference number: E-20021704-604.01.02-9015). The data collection process was done online via Google Forms which is a secure online survey program. Participants were recruited by convenience sampling from non-clinical individuals aged between 18 and 65 years. The survey link was sent to social media groups. Firstly, participants who entered the online survey read the informed consent (see Appendix A) about the research and learned that whenever they feel discomfort about the study, they have a right to give up without specifying any reason. Before starting the survey, all participants must have accepted electronically that they have read the informed consent and have been approved to participate. After each participant read the informed consent and agreed to participate in the research, they proceeded to fill out the Socio-Demographic Information Form. Afterward, demographic

information form and other surveys (see Appendices- all scales were applied in the same order as shown in the Appendices) were implemented via Google Forms. It took about 10-15 minutes to complete the entire survey. Participants' responses coded anonymously with numbers.

2.4. Data Analysis

The analysis of the data was carried out with the IBM Statistical Package for the Social Sciences (SPSS) 25 program. In the analysis of descriptive data, mean, standard deviation, percentage and frequency values were calculated. The normality of the data was examined with skewness and kurtosis values. When the kurtosis and skewness values are between +1.5 and –1.5, it is considered to be a normal distribution (Tabachnick & Fidell, 2013). The Cronbach's Alpha reliability analysis results were given for the scores of the scales. In this study, it was determined that the data were normally distributed, and parametric tests were preferred. The prevalence of Misophonia symptoms was examined by grouping the Misophonia Questionnaire Severity sub-scale scores. Independent Groups t-test and One-Way ANOVA were used for differences of the scales by gender, education levels and misophonia severity. In cases where the variances were not homogeneous, the t test was used. Tukey test was used for post hoc of ANOVA. In the education level, high school and below education levels, associate and undergraduate education levels, and finally graduate education levels were combined under one group to balance the sample sizes between groups. Pearson correlation analyses were used to determine the relationships between the scales, and multiple linear regression (stepwise) analysis was used to determine the predictive effect. In the mediation analysis, linear regression analyzes were applied for Baron and Kenny's (1986) mediation model.

Baron and Kenny's (1986) mediated regression technique was applied to examine the suggested mediation relationship between the main variables. This technique requires the following four steps to establish a mediating relationship between the main variables. In the first step, the independent variable should significantly predict the dependent variable. In the second step, the independent variable should significantly predict the mediating variable. When the independent variable is controlled in the third step, the mediating variable should significantly predict the dependent variable. Finally, if these three steps are met, the predictive power of the independent variable in the third step should be less than that in the first step to establish a mediating relationship. This decrease in the predictive power of the dependent variable of the independent variable from the first to the third step indicates partial mediation. On the other hand, if the independent variable completely loses its significance on the dependent variable in the third step, this result shows a full mediation. Finally, the Sobel test results are examined in order to decide on the partial or full mediation effect.

CHAPTER 3

RESULTS

3.1. Descriptive Statistics

This section contains descriptive data. Minimum-maximum values, skewness-kurtosis values, mean and standard deviation values for the scales used in the research were given.

Table 3.1

Descriptive Statistics for the Risk Screening Questionnaire for Alcohol and Drug Use

Scales		n	Min	Max	$\bar{x}$	sd
BAPIRT-Alcohol		400	.00	2.00	.52	.70
BAPIRT-Drug		9	1.00	3.00	1.67	.87
Intravenous Drug Use	Never	400			100	
	Sometimes	-			-	
	Very frequently	-			-	

In Table 3.1, minimum-maximum values, mean and standard deviation values for the Risk-Screening Questionnaire for Alcohol and Drug Use are given. “Have you ever used a substance intravenously in your life?” item distributions are given according to the answers given. For the Alcohol subscale of the Risk-Screening Questionnaire, the range was calculated as 0-2, with Mean=.52 and Standard Deviation=.70.

In the Drug sub-scale of the Risk-Screening Questionnaire, 9 participants used drugs in the last 1 year. For drug users, the range of scores obtained from the scale was calculated as 1-3, with mean=1.67 and standard deviation= .87. According to "Have you ever used a substance intravenously in your life?" item, it is seen that none of the participants have used drugs intravenously.

Table 3.2

Descriptive Statistics for MQ, ASI-3, and DTS

Scales	n	Min	Max	$\bar{x}$	sd	Skewness	Kurtosis
MQ-Total	400	0.00	67.00	26.53	15.00	.302	-.583
MQ-Symptom	400	0.00	28.00	12.76	6.94	.208	-.702
MQ-Emotions and Behaviors	400	0.00	40.00	13.77	9.44	.514	-.322
MQ-Severity	400	0.00	15.00	3.86	3.48	1.017	.679
ASI-Total	400	0.00	72.00	20.56	14.70	.795	.155
ASI-Physical Concerns	400	0.00	24.00	7.54	5.92	.734	-.141
ASI-Cognitive Concerns	400	0.00	28.00	7.46	5.72	.964	.395
ASI- Social Concerns	400	0.00	20.00	5.56	4.74	.717	-.288
DTS-Total	400	19.00	75.00	53.93	12.75	-.535	-.449
DTS-Tolerance	400	9.00	45.00	32.97	8.67	-.556	-.492
DTS-Regulation	400	3.00	15.00	9.69	3.50	-.142	-1.013
DTS-Self Efficacy	400	4.00	15.00	11.27	2.87	-.388	-.779

MQ: Misophonia Questionnaire; ASI: Anxiety Sensitivity Index-3; DTS: Distress Tolerance Scale

In Table 3.2, minimum-maximum values, skewness-kurtosis values, mean and standard deviation values for MQ, ASI-3 and DTS scores are given. It can be observed that MQ, ASI-3 and DTS total and subscale scores were seen normally distributed.

Table 3.3

Prevalence of Misophonia Symptoms

Variable	Scores	n	%
MQ-Severity	0-6	315	78.8
	7 and above	85	21.3
	Total	400	100.0

MQ: Misophonia Questionnaire

In Table 3.3, the prevalence of Misophonia symptoms was examined by grouping the MQ-Severity sub-scale scores.

3.2. Findings on the Analysis of MQ, ASI-3 and DTS Scores According to Demographic Information

In this section, the results of the analyses of the MQ, ASI-3 and DTS scores according to demographic information are given.

Table 3.4

Independent Groups t-test Results for the Analysis of MQ, ASI-3, and DTS Scores by Gender

Scales	Groups	n	$\bar{x}$	sd	t	df	p
MQ-Total	Female	214	29.05	14.47	3.662	398	.000**
	Male	186	23.62	15.11			
MQ-Symptom	Female	214	14.13	6.64	4.329	398	.000**
	Male	186	11.18	6.97			
MQ-EB	Female	214	14.92	9.29	2.633	398	.009**
	Male	186	12.45	9.47			
MQ-Severity	Female	214	3.93	3.34	.472 [a]	378.529	.637
	Male	186	3.77	3.64			
ASI-Total	Female	214	22.70	14.68	3.152	398	.002**
	Male	186	18.10	14.37			
ASI-3-PC	Female	214	8.24	6.03	2.555	398	.011*
	Male	186	6.74	5.71			
ASI-3-CC	Female	214	8.36	5.83	3.420	398	.001**
	Male	186	6.42	5.42			
ASI-3- SC	Female	214	6.09	4.69	2.440	398	.015*
	Male	186	4.94	4.73			
DTS-Total	Female	214	53.21	12.12	-1.208	398	.228
	Male	186	54.75	13.42			
DTS-Tolerance	Female	214	32.64	8.23	-.810	398	.419
	Male	186	33.34	9.16			

DTS-Regulation	Female	214	9.58	3.43	-.661	398	.509
	Male	186	9.81	3.59			
DTS-Self Efficacy	Female	214	10.99	2.90	-2.117	398	.035*
	Male	186	11.60	2.81			

**p<.05; **p<.01;* [a] Equal variances not assumed; MQ: Misophonia Questionnaire; MQ-EB: Misophonia Questionnaire Emotions and Behaviors; ASI-3: Anxiety Sensitivity Index-3; ASI-PC: Anxiety Sensitivity Index-3 Physical Concerns; ASI-3-CC: Anxiety Sensitivity Index-3 Cognitive Concerns; ASI-3-SC: Anxiety Sensitivity Index-3 Social Concerns; DTS: Distress Tolerance Scale

Table 3.4 shows the independent groups t-test results for the comparison of MQ, ASI-3 and DTS scores according to gender.

MQ-total scores ($t_{(398)}$= 3.662; p<.01), Symptom ($t_{(398)}$= 4.329; p<.01) and Emotions and Behaviors ($t_{(398)}$= 2.633; p<.01) sub-scales scores were found to differ statistically significant according to the gender variable. It was seen that the Severity sub-scale scores did not differ statistically significant according to the gender variable (p>.05). Females had higher scores than males on MQ-total, Symptom, Emotions and Behaviors sub-scales.

ASI-3 -total scores ($t_{(398)}$= 3.152; p<.01), Physical Concerns ($t_{(398)}$= 2.555; p<.05), Cognitive Concerns ($t_{(398)}$= 3.420; p<.01) and Social Concerns ($t_{(398)}$= 2.440; p<.05) sub-scale scores were found to differ statistically significant according to the gender variable. Compared to males, females got higher scores from ASI-3 -total scores, Physical Concerns, Cognitive Concerns and Social Concerns sub-scales.

DTS –Self Efficacy subscale scores ($t_{(398)}$= -2.117; p<.05) were found to differ statistically significant according to the gender variable. Males had higher scores than females on Self-efficacy sub-scale. It was seen that DTS total scores, Tolerance and Regulation sub-dimension scores did not differ statistically significant according to the gender (p>.05).

Table 3.5

One-Way ANOVA Results of MQ, ASI-3, and DTS Scores According to Education Level

Scales	Groups	n	$\bar{x}$	sd	F	df	p	Post-hoc
MQ-Total	1.High school and below	59	21.17	14.21	4.514	2 399	.012*	1<2 1<3
	2.Associate/Undergraduate	257	27.35	15.22				
	3. Graduate	84	27.77	14.22				
MQ-Symptom	1.High school and below	59	10.39	6.35	4.167	2 399	.016*	1<2 1<3
	2.Associate/Undergraduate	257	13.07	6.91				
	3. Graduate	84	13.44	7.20				
MQ-EB	1.High school and below	59	10.78	9.15	3.516	2 399	.031*	1<2
	2.Associate/Undergraduate	257	14.27	9.76				
	3. Graduate	84	14.33	8.31				
MQ-Severity	1.High school and below	59	2.66	3.29	5.980	2 399	.003**	1<2 1<3
	2.Associate/Undergraduate	257	3.86	3.45				
	3. Graduate	84	4.68	3.49				
ASI-3-Total	1.High school and below	59	18.58	14.07	1.703	2 399	.183	
	2.Associate/Undergraduate	257	21.57	15.21				
	3. Graduate	84	18.87	13.34				
ASI-3-PC	1.High school and below	59	7.76	6.18	1.470	2 399	.231	
	2.Associate/Undergraduate	257	7.81	5.99				
	3. Graduate	84	6.56	5.46				
ASI-3-CC	1.High school and below	59	6.37	5.34	1.397	2 399	.248	
	2.Associate/Undergraduate	257	7.74	5.90				
	3. Graduate	84	7.36	5.37				
ASI-3-SC	1.High school and below	59	4.44	4.36	3.546	2 399	.030*	-
	2.Associate/Undergraduate	257	6.01	4.83				
	3. Graduate	84	4.95	4.58				
DTS-Total	1.High school and below	59	52.86	13.14	1.799	2 399	.167	
	2.Associate/Undergraduate	257	53.42	12.64				
	3. Graduate	84	56.24	12.67				
DTS-Tolerance	1.High school and below	59	32.41	9.69	1.731	2 399	.178	
	2.Associate/Undergraduate	257	32.59	8.47				
	3. Graduate	84	34.52	8.42				
DTS-Regulation	1.High school and below	59	9.41	3.53	.974	2 399	.378	
	2.Associate/Undergraduate	257	9.60	3.61				
	3. Graduate	84	10.14	3.13				
DTS-Self Efficacy	1.High school and below	59	11.05	2.58	.665	2 399	.515	
	2.Associate/Undergraduate	257	11.23	2.91				
	3. Graduate	84	11.57	2.95				

**p<.05; **p<.01;* MQ: Misophonia Questionnaire; MQ-EB: Misophonia Questionnaire Emotions and Behaviors; ASI-3: Anxiety Sensitivity Index-3; ASI-PC: Anxiety Sensitivity Index-3 Physical Concerns; ASI-3-CC: Anxiety Sensitivity Index-3 Cognitive Concerns; ASI-3-SC: Anxiety Sensitivity Index-3 Social Concerns; DTS: Distress Tolerance Scale

One-Way ANOVA results for the comparison of MQ, ASI-3 and DTS scores according to education level are given in Table 3.5.

MQ-total scores ($F_{(2,399)}$=8,197, p<.05), Symptom ($F_{(2,399)}$=8,197, p<.05), Emotions and Behaviors ($F_{(2,399)}$=8,197, p<.05) and Severity ($F_{(2,399)}$=8,197, p<.01) sub-scale scores were found to differ statistically significant according to the education level variable. Those with high school or below education level got lower scores in MQ-total scores, Symptom and Severity sub-scales compared to those with associate/undergraduate and graduate education levels. Those with high school and below education level got lower scores on MQ-Emotions and Behaviors sub-dimensions compared to those with associate/undergraduate education.

It was observed that the ASI-3 Social Concerns sub-scale scores differed statistically significant according to the education level ($F_{(2,399)}$=3.546, p<.05). However, the post hoc analysis showed that the difference between the groups was not significant (p>.05). It was determined that ASI-3-total scores, Physical Concerns and Cognitive Concerns sub-scale scores, DTS total scores, Tolerance, Regulation and Self-efficacy sub-scale scores did not differ statistically significant according to the education level (p>.05).

Table 3.6

Independent Groups t-Test Results for MQ, ASI-3, and DTS Scores for the Examination of Misophonia Severity

Scales	Groups	n	$\bar{x}$	sd	t	df	p
MQ-Total	0-6	315	22.76	13.25	-11.032	398	.000**
	7 and above	85	40.48	12.74			
MQ-Symptom	0-6	315	11.30	6.34	-8.795	398	.000**
	7 and above	85	18.14	6.44			
MQ-EB	0-6	315	11.46	8.22	-10.685	398	.000**
	7 and above	85	22.34	8.75			
ASI-Total	0-6	315	18.47	13.80	-5.676	398	.000**
	7 and above	85	28.29	15.42			
ASI-PC	0-6	315	6.79	5.56	-5.014	398	.000**
	7 and above	85	10.32	6.41			
ASI-3-CC	0-6	315	6.68	5.43	-5.440	398	.000**
	7 and above	85	10.35	5.85			

ASI-3- SC	0-6	315	5.00	4.42	-4.170 [a]	116.955	.000**
	7 and above	85	7.62	5.33			
DTS-Total	0-6	315	54.69	12.98	2.312	398	.021**
	7 and above	85	51.11	11.49			
DTS-Tolerance	0-6	315	33.57	8.74	2.675	398	.008**
	7 and above	85	30.75	8.05			
DTS-Regulation	0-6	315	9.66	3.56	-.264	398	.792
	7 and above	85	9.78	3.31			
DTS-Self Efficacy	0-6	315	11.46	2.85	2.538	398	.012**
	7 and above	85	10.58	2.87			

**p<.05; **p<.01;* MQ: Misophonia Questionnaire; MQ-EB: Misophonia Questionnaire Emotions and Behaviors; ASI-3: Anxiety Sensitivity Index-3; ASI-PC: Anxiety Sensitivity Index-3 Physical Concerns; ASI-3-CC: Anxiety Sensitivity Index-3 Cognitive Concerns; ASI-3-SC: Anxiety Sensitivity Index-3 Social Concerns; DTS: Distress Tolerance Scale

Table 3.6 indicates the independent groups t-test results for the comparison of MQ, ASI-3 and DTS scores according to misophonia severity.

MQ-total scores ($t_{(398)}$= -11.032; p<.01), Symptom ($t_{(398)}$= -8.795; p<.01) and Emotions and Behaviors ($t_{(398)}$= -10.685; p< .01) sub-scales scores were found to differ statistically significant according to the misophonia severity. Those with misophonia severity scores of 7 and above got higher scores on MQ-total, Symptom, Emotions and Behaviors sub-dimensions than those with 0-6 scores.

ASI-3 -total scores ($t_{(398)}$= -5.676; p<.01), Physical Concerns ($t_{(398)}$= -5.014; p<.05), Cognitive Concerns ($t_{(398)}$= -5.440; p<.01) and Social Concerns ($t_{(116.955)}$= -4.170; p<.05) sub-scale scores were found to differ statistically significant according to the misophonia severity. Those with misophonia severity scores of 7 and above got higher scores in ASI-3-total scores, Physical Concerns, Cognitive Concerns and Social Concerns sub-scales than those with 0-6 scores.

DTS-total scores ($t_{(398)}$= 2.312; p<.05), Tolerance ($t_{(398)}$= 2.675; p<.01) and Self-efficacy ($t_{(398)}$= 2.538; p<.05) sub-scale scores were found to differ statistically significant according to the misophonia severity. Those with misophonia severity scores of 7 and above got lower scores in DTS total scores, Tolerance and Self-efficacy sub-scales than

those with 0-6 scores. Also, DTS's Regulation sub-scale scores did not differ statistically significant according to the misophonia severity (p>.05).

3.3. Findings on the Relationship between MQ, ASI-3 and DTS Scores and Age

In this section, the results of Pearson correlation analysis for examining the relationships between the MQ, ASI-3 and DTS scores and the age are given.

Table 3.7

Pearson Correlation Analysis Results to Examine the Relationship Between MQ, ASI-3, and DTS Scores

Scales	1	2	3	4	5	6	7	8	9	10	11	12
1.MQ-T	1											
2.MQ-Symptom	.884**	1										
3.MQ-EB	.939**	.668**	1									
4.MQ-Severity	.633**	.520**	.623**	1								
5.ASI-3-T	.547**	.452**	.536**	.338**	1							
6.ASI-3-PC	.487**	.416**	.467**	.301**	.904**	1						
7.ASI-3-CC	.533**	.437**	.525**	.317**	.916**	.740**	1					
8.ASI-3- SC	.445**	.356**	.445**	.291**	.865**	.662**	.710**	1				
9.DTS-Total	-.309**	-.232**	-.321**	-.189**	-.403**	-.370**	-.370**	-.343**	1			
10.DTS-T	-.275**	-.191**	-.297**	-.189**	-.410**	-.352**	-.372**	-.382**	.957**	1		
11.DTS-R	-.191**	-.178**	-.172**	-.070	-.174**	-.217**	-.168**	-.068	.640**	.444**	1	
12.DTS-SE	-.311**	-.237**	-.320**	-.185**	-.341**	-.316**	-.312**	-.285**	.771**	.689**	.283**	1

**p<.05; **p<.01;* MQ-T: Misophonia Questionnaire-Total; MQ-EB: Misophonia Questionnaire Emotions and Behaviors; ASI-3-T: Anxiety Sensitivity Index-3-Total; ASI-PC: Anxiety Sensitivity Index-3 Physical Concerns; ASI-3-CC: Anxiety Sensitivity Index-3 Cognitive Concerns; ASI-3-SC: Anxiety Sensitivity Index-3 Social Concerns; DTS-T: Distress Tolerance Scale-Tolerance; DTS-R: Distress Tolerance Scale-Regulation; DTS-SE: Distress Tolerance Scale-Self Efficacy

In Table 3.7, the results of Pearson correlation analysis for examining the relationships between MQ, ASI-3 and DTS scores and the age are given.

There is a significant correlation of MQ total scores with Symptom (r=.884; p<.01), Emotions and Behaviors (r=.939; p<.01) and Severity (r=.633; p<.01) sub-scale scores; ASI-3 total scores (r=.547; p<.01), Physical Concerns (r=.487; p<.01), Cognitive Concerns (r=.533; p<.01), Social Concerns (r=.445; p<.01) sub-scale scores; DTS-total scores (r=-.309; p<.01), Tolerance (r=-.275; p<.01), Regulation (r=-.191; p<.01) and Self-efficacy (r=-.311; p<.01) sub-scale scores. So, participants scored greater on MQ have more symptoms and symptom severity, and develop emotions and behaviors caused by trigger sounds; experience more physical, social, and cognitive concerns related to AS; have a lower DT, diminished ability to tolerate distress, and lower capacity to cope with distress.

There is a significant correlation of Symptom sub-scale scores with Emotions and Behaviors (r=.668; p<.01) and Severity (r=.520; p<.01) sub-scale scores; ASI-3 total scores (r=.452; p<.01), Physical Concerns (r=.416; p<.01), Cognitive Concerns (r=.437; p<.01), Social Concerns (r=.356; p<.01) sub-scale scores; DTS total scores (r=-.232; p<.01), Tolerance (r=-.191; p<.01), Regulation (r=-.178; p<.01) and Self-efficacy (r=-.237; p<.01) sub-scale scores. These results indicate that individuals with higher scores of MQ-Symptom experience more emotions and behaviors, and have more severe symptoms of misophonia; engage in more physical, social, and cognitive concerns of AS; and lower ability to withstand distress.

There is a significant correlation of Emotions and Behaviors with Severity sub-scale scores (r=.623; p<.01), ASI-3 total scores (r=.536; p<.01), Physical Concerns

(r=.467; p<.01), Cognitive Concerns (r=.525; p<.01), Social Concerns (r=.445; p<.01) sub-scale scores; DTS-total scores (r=-.321; p<.01), Tolerance (r=-.297; p<.01), Regulation (r=-.172; p<.01) and Self-efficacy (r=-.320; p<.01) sub-scale scores. Thus, it is observed that those who experience more emotions and behaviors when hear trigger sounds have greater severity of misophonia; and more likely to sensitive to anxiety-related components which are physical, cognitive, and social concerns; and diminished capacity to endure distress.

There is a significant correlation between Severity sub-scale scores and ASI-3 total scores (r=.338; p<.01), Physical Concerns (r=.301; p<.01), Cognitive Concerns (r=.317; p<.01), Social Concerns (r=.291; p<.01) sub-scale scores; DTS-total scores (r=-.189; p<.01), Tolerance (r=-.189; p<.01) and Self-efficacy (r=-.185; p<.01) sub-scale scores. In other words, people who experience more severe misophonic symptoms engage in more physical, cognitive, and social concerns of AS; and lower levels of DT.

The significant correlation was found between ASI-3 total scores and Physical Concerns (r=.904; p<.01), Cognitive Concerns (r=.916; p<.01), Social Concerns (r=.865; p<.01) sub-scale scores; DTS-total scores (r=-.403; p<.01), Tolerance (r=-.410; p<.01), Regulation (r=-.174; p<.01) and Self-efficacy (r=-.341; p<.01) sub-scale scores. Therefore, participants who got greater scores on AS engage in physical, cognitive, and social concerns of AS more; and have a lower ability to cope with emotional distress.

There is a significant correlation of Physical Concerns sub-scale scores with Cognitive Concerns (r=.740; p<.01), Social Concerns (r=.662; p<.01) sub-scale scores; DTS-total scores (r=-.370; p<.01), Tolerance (r=-.352; p<.01), Regulation (r=-.217; p<.01) and Self-efficacy (r=-.316; p<.01) sub-scale scores. So, those who reported higher

physical concerns experience more cognitive and social concerns of AS; and scored lower on distress tolerance.

There is a significant correlation of Cognitive Concerns sub-scale scores with Social Concerns ($r=.710$; $p<.01$) sub-scale scores; DTS-total scores ($r=-.370$; $p<.01$), Tolerance ($r=-.372$; $p<.01$), Regulation ($r=-.168$; $p<.01$) and Self-efficacy ($r=-.312$; $p<.01$) sub-scale scores. As a result, individuals with greater score of cognitive concerns engage in more social concerns; and lower levels of tolerating distress.

There is a significant correlation between Social Concerns sub-scale scores with DTS-total scores ($r=-.343$; $p<.01$), Tolerance ($r=-.382$; $p<.01$) and Self-efficacy ($r=-.285$; $p<.01$) sub-scale scores. Also, there is a significant correlation of DTS-total scores with Tolerance ($r=.95$; $p<.01$), Regulation ($r=.660$; $p<.01$) and Self-efficacy ($r=.771$; $p<.01$) sub-scale scores. In other words, individuals who have more social concerns tolerate distress less.

There is a significant correlation between Tolerance sub-scale scores and Regulation ($r=.444$; $p<.01$) and Self-efficacy ($r=.689$; $p<.01$) sub-scale scores. In addition, there is a significant correlation between Regulation sub-scale scores and Self-efficacy ($r=.283$; $p<.01$) sub-scale scores.

There is no significant correlation between DTS's Regulation sub-scale and MQ-Severity and ASI-3-Social Concerns sub-scales. Also, there is no significant correlation between age and MQ-Severity, ASI-3-total scores, Physical Concerns, Social Concerns sub-scales, DTS-Regulation sub-scale ($p>.05$).

3.4. Findings on the Regression of MQ Scores by ASI-3 and DTS Scores

In this section, the results of the analysis of the findings regarding the regression of MQ scores by ASI-3 and DTS scores are given.

Table 3.8

Multiple Linear Regression Analysis Results on the Prediction of MQ, ASI-3, and DTS Scores

Dependent Variable	Independent Variable	B	Standard Error $_B$	Beta	t	p
MQ-Total	ASI-3-CC	.935	.163	.357	5.745	.000**
	DTS-SE	-.751	.230	-.144	-3.263	.001**
	ASI-3-PC	.449	.157	.177	2.853	.005**
R= .567 R^2= .321 Sd:3/396 F: 62.385 p<.001**						

**p<.05; **p<.01;* MQ: Misophonia Questionnaire*;* ASI-3-CC: Anxiety Sensitivity Index-3-Cognitive Concerns; ASI-3-PC: Anxiety Sensitivity Index-3-Physical Concerns DTS-SE: Distress Tolerance Scale-Self Efficacy

In Table 3.8, multiple linear regression (stepwise) analysis was designed to predict MQ-total scores by ASI-3 and DTS scores.

ASI-3-Physical Concerns, Cognitive Concerns, Social Concerns, DTS-Tolerance, Regulation and Self-efficacy sub-scales were included in the analysis as independent variables. The established model is statistically significant ($F(3, 396)=62.385$, $p<.01$). The model explains 32.1% of the MQ-total score variance. Respectively, ASI-3-Cognitive Concerns ($\beta =.357$, $t =5.745$, $p<.01$), DTS-Self Efficacy ($\beta =-.144$, $t =-3.263$, $p<.01$) and ASI-3-Physical Concerns ($\beta =.177$, $t =2.853$, $p<.01$) sub-scale scores predicted the MQ-total scores significantly. It was seen that the ASI-3-Social Concerns, DTS-Tolerance and Regulation scores did not statistically significantly predict the MQ-total scores and they were excluded from the model ($p>.05$).

Table 3.9

Multiple Linear Regression Analysis Results on the Prediction of MQ-Symptom Sub-scale Scores by ASI-3 and DTS Scores

Dependent Variable	Independent Variable	B	Standard Error $_B$	Beta	t	p
MQ-Symptom	ASI-CC	.327	.081	.269	4.037	.000**
	ASI-PC	.220	.078	.187	2.806	.005**
	DTS-SE	-.226	.114	-.093	-1.980	.048*
R= .466 R^2= .218 Sd:3/396 F: 36.693 p<.001**						

**p<.05; **p<.01;* MQ: Misophonia Questionnaire; MQ: Misophonia Questionnaire*;* ASI-3-CC: Anxiety Sensitivity Index-3-Cognitive Concerns; ASI-3-PC: Anxiety Sensitivity Index-3-Physical Concerns; DTS-SE: Distress Tolerance Scale-Self Efficacy

In Table 3.9, multiple linear regression (stepwise) analysis was designed to predict MQ-Symptom sub-scale scores by ASI-3 and DTS scores.

ASI-3-Physical Concerns, Cognitive Concerns, Social Concerns, DTS-Tolerance, Regulation and Self-efficacy sub-scales were included in the analysis as independent variables. The established model is statistically significant ($F(3, 396)=36.693$, $p<.01$). The model explains 21.8% of the MQ-Symptom sub-scale scores variance. In order, ASI-3-Cognitive Concerns ($\beta =.269$, $t =4.037$, $p<.01$), Physical Concerns ($\beta =.187$, $t =2.806$, $p<.01$) and DTS-Self Efficacy ($\beta =-.093$, $t =-1.980$, $p<.05$) sub-scale scores were found to predict MQ-Symptom sub-scale scores statistically significantly. It was determined that the ASI-3-Social Concerns, DTS-Tolerance and Regulation sub-scale scores did not statistically significantly predict the MQ-Symptom sub-scale scores and they were excluded from the model ($p>.05$).

Table 3.10

Multiple Linear Regression Analysis Results on the Prediction of MQ-Emotions and Behaviors Sub-scale Scores by ASI-3 and DTS Scores

Dependent Variable	Independent Variable	B	Standard Error $_B$	Beta	t	p
MQ-Emotions and Behaviors	ASI-3-CC	.609	.103	.369	5.901	.000**
	DTS-SE	-.524	.146	-.159	-3.598	.000**
	ASI-3-PC	.230	.100	.144	2.302	.022*
R= .558 R^2= .312 Sd:3/396 F: 59.835 p<.001**						

**p<.05; **p<.01;* MQ: Misophonia Questionnaire; ASI-3-CC: Anxiety Sensitivity Index-3-Cognitive Concerns; ASI-3-PC: Anxiety Sensitivity Index-3-Physical Concerns; DTS-SE: Distress Tolerance Scale-Self Efficacy

In Table 3.10, multiple linear regression (stepwise) analysis was designed to predict MQ-Emotions and Behaviors sub-scale scores by ASI-3 and DTS scores.

ASI-3-Physical Concerns, Cognitive Concerns, Social Concerns, DTS-Tolerance, Regulation and Self-efficacy sub-scales were included in the analysis as independent variables. The established model is statistically significant ($F(3, 396)=59.835$, $p<.01$). The model explains 31.2% of the MQ-Emotions and Behaviors sub-scale score variance. Respectively, ASI-3-Cognitive Concerns ($\beta =.369$, $t =5.901$, $p<.01$), DTS-Self Efficacy ($\beta =-.159$, $t =-3.598$, $p<.01$) and ASI-3-Physical Concerns ($\beta =.144$, $t =2.302$, $p<.05$) sub-scale scores predicted the Emotions and Behaviors sub-scale scores statistically significantly. It was determined that the ASI-3-Social Concerns, DTS-Regulation and Tolerance sub-scale scores did not significantly predict the Emotions and Behaviors sub-scale scores, and they were excluded from the model ($p>.05$).

Table 3.11

Multiple Linear Regression Analysis Results on the Prediction of MQ-Severity Sub-scale Scores by ASI-3 and DTS Scores

Dependent Variable	Independent Variable	B	Standard Error $_B$	Beta	t	p
MQ-Severity	ASI-3-CC	.127	.043	.208	2.955	.003**
	ASI-3-PC	.086	.041	.147	2.087	.038*
R= .332 R^2= .110 Sd:2/397 F: 24.589 p<.001**						

**p<.05; **p<.01;* MQ: Misophonia Questionnaire; ASI-CC: Anxiety Sensitivity Index-3-Cognitive Concerns; ASI-PC: Anxiety Sensitivity Index-3-Physical Concerns DTS: Distress Tolerance Scale

In Table 3.11., multiple linear regression (stepwise) analysis was designed to predict MQ-Severity sub-scale scores by ASI-3 and DTS scores.

ASI-3-Physical Concerns, Cognitive Concerns, Social Concerns, DTS-Tolerance, Regulation and Self-efficacy sub-scales were included in the analysis as independent variables. The established model is statistically significant (F(2, 397)=24.589, p<.01). The model explains 11% of the MQ-Severity sub-scale score variance. ASI-3-Cognitive Concerns (β =.208, t =2.955, p<.01) and Physical Concerns (β =.147, t =2.087, p<.05) sub-scales predicted Severity sub-scale scores statistically significantly. It was seen that the ASI-3-Social Concerns, DTS-Tolerance, Regulation and Self-efficacy sub-scale scores did not statistically significantly predict the Severity sub-scale scores and they were excluded from the model (p>.05).

3.5. Mediation Analysis

Mediation analysis was performed to determine whether DTS total scores mediated the relationship between MQ and ASI-3 total scores.

Table 3.12

Mediator Regression Analysis Findings on the Mediator Role of DTS Total Scores in the Relationship between MQ and ASI-3 Total Scores

Dependent Variable	Independent Variable	B	Standard Error $_B$	Beta	t	p
MQ-Total (Step 1)	ASI-3-Total	.558	.043	.547	13.032	.000**
R= .547 R^2= .299 Sd:1/398		F: 169.978	p<.001**			
DTS-Total (Step 2)	ASI-3-Total	-.350	.040	-.403	-8.796	.000**
R= .403 R^2= .163 Sd:1/398		F: 77.362	p<.001**			
MQ-Total (Step 3)	ASI-3-Total	.514	.047	.504	11.052	.000**
	DTS-Total	-.125	.054	-.106	-2.326	.021*
R= .555 R^2= .309 Sd:2/397		F: 88.559	p<.001**			

**p<.05; **p<.01;* MQ: Misophonia Questionnaire; ASI: Anxiety Sensitivity Index-3; DTS: Distress Tolerance Scale

In Table 3.12, mediator regression analysis findings regarding the mediating role of DTS-total scores in the relationship between MQ and ASI-3 total scores are given. In the model, the dependent variable was MQ-total, the mediating variable was DTS-total, and the independent variable was ASI-3-total.

In the first step, ASI-3-total significantly predicted MQ-total scores (β = .547, t= 13,032, p <.01; F(1, 398)=169.978, p<.01). ASI-3-total explains 29.9% variance of MQ-total scores. In the second step, ASI-3-total significantly predicted DTS-total scores (β =-.403, t=-8.796, p<.01; F(1, 398)=77.362, p<.01). ASI-3-total explains 16.3% variance of DTS-total scores.

In the last step of the mediating regression analysis, there should be a relationship between the mediating variable and the dependent variable, and the predictive power of the independent variable in the first step of the dependent variable should decrease or be

insignificant at this step. Accordingly, when ASI-3-total was controlled, DTS-total significantly predicted MQ-total scores (β =-.106, t=-2.326, p<.05). ASI-3-total also significantly predicted MQ-total scores (β =.504, t=11.052, p<.01; F(2, 397)=88.559, p<.01). The measured model explains the 30.9% variance of MQ-total scores.

From the first stage to the third stage, the decrease in the strength of the relationship between the ASI-3-total and the MQ-total supports the partial mediation. The Sobel test revealed that the strength of the relationship between ASI-3-total and MQ-total decreased significantly (z = 2.24, p <.05). Accordingly, DTS-total partially mediates the relationship between MQ and ASI-3 total scores. Figure 3.2 shows the diagram of the mediation analysis.

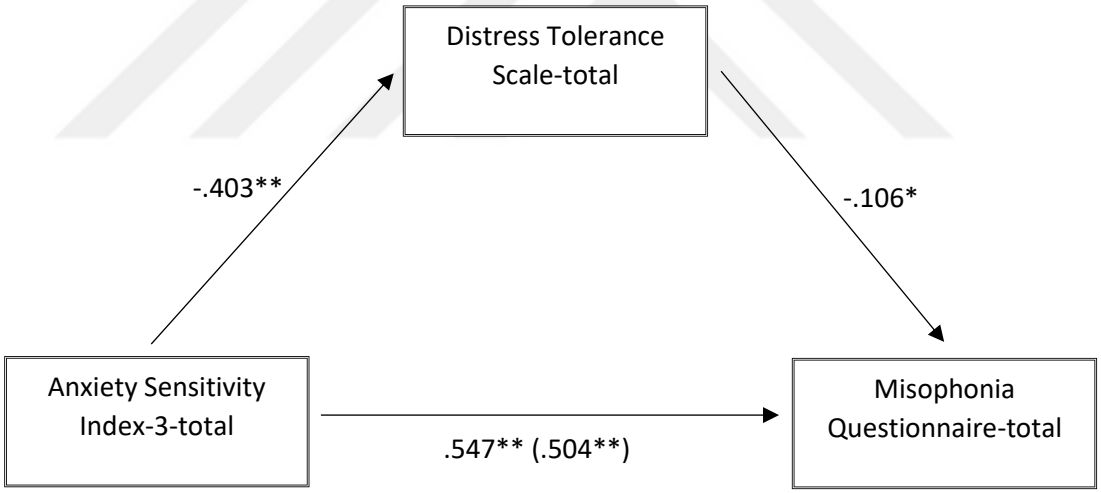

Figure 3.2 Diagram on the partial mediation role of DTS-total scores on the relationship between MQ and ASI-3 total scores

*Notes: *p<.05 **p<.01*

CHAPTER 4

DISCUSSION

The current study aimed to investigate the relationships between misophonia, anxiety sensitivity, and distress tolerance. In addition, the moderating role of distress tolerance in the relationship between misophonia and anxiety sensitivity was explored. Moreover, another aim of this study is to determine the prevalence rate of misophonia in Turkey.

In this section, the results of the study will be discussed in line with the previous research. Furthermore, strengths, limitations, and clinical implications of the study will be specified, and suggestions for future research will be stated.

4.1. Findings Related to Demographic Information

In the current study, gender, age, level of education, misophonia severity were reviewed and assessed since they could have influence and describe the main variables.

Considering gender differences in misophonia, anxiety sensitivity, and distress tolerance, some statistically significant differences were found. The findings of this study suggested that there is a significant difference between females and males on misophonia total score, misophonia symptoms, emotions and behaviors developed when

exposed to trigger sounds. So, females got greater scores on MQ, had more misophonia symptoms, and expressed more emotions and behaviors to trigger sounds as compared to males. This result is incompatible with other studies which revealed that gender differences are not significantly differed in misophonia symptoms and misophonic emotions and behaviors, and total score of misophonia (Wu et al., 2014; Zhou et al., 2017).

Besides, the results demonstrated that the severity of misophonia symptoms was not significantly differed between males and females. Although, it was suggested that females with misophonia experience greater disturbance and impairments due to misophonic symptoms than males with misophonia (Erfanian et al., 2019; Rouw & Erfanian, 2018; Siepsiak, Sobczak, Bohaterewicz, Cichocki, & Dragan, 2020); the current study's results were consistent with some previous studies. With respect to existing research, it was stated that no statistically significant relationship was detected between gender differences and impairments in functions due to misophonia symptoms (Quek et al., 2018; Wu et al., 2014). In addition, there was a significant difference in anxiety sensitivity between gender. According to the present study's results, it can be said that females experience more anxiety-related symptoms and sensations than males. Nonetheless, some part of the results in this study are consistent with previous studies which asserted females got greater scores than males only on the physical concerns; but in social and cognitive concerns, gender differences were not found (Stewart, Taylor, & Baker, 1997; Watt, Gallagher, Couture, Wells, & MacLean, 2020). Also, other studies did not observe significant differences between males and females in anxiety sensitivity (Ayvaşık, 2000; Cox et al., 1991). Moreover, there was a statistically significant difference between males and females on the subjective appraisal of distress. In other

words, the results indicated that males' capacity to coping with distress is more sufficient. On the other side, males and females did not differ significantly in their distress tolerance (DTS-Total), perceived ability to tolerate emotional distress, regulation efforts to alleviate distress. These results are partially in line with the literature which reported that males scored significantly higher on distress tolerance levels than women (Leyro, Zvolensky, & Bernstein, 2010; McHugh et al., 2014; Simons & Gaher, 2005).

In terms of education level, there was a statistically significant difference in MQ-Total score, misophonia symptoms, and severity of misophonia. It was found that participants with high school or below education level got lower scores in Misophonia Questionnaire-total scores, experience misophonia symptoms less, and had a less misophonia severity compared to those with associate/undergraduate and graduate education levels. Also, behaviors and emotions when exposed to trigger sounds significantly differed on the level of education. Participants with high school and below education level developed fewer behaviors and emotions when confronting with a trigger sound than participants with associate/undergraduate education. These results are compatible with a study that determined that individuals got higher scores on misophonia increased as their education level increased (Öz, 2015). On the other hand, there was no statistically significant difference detected between education levels on ASI-3-total scores, physical, social, and cognitive concerns of anxiety sensitivity; DTS-total scores, tolerance, regulation, and self-efficacy of distress. To the best of our knowledge, previous studies did not investigate the differences between education levels on anxiety sensitivity and distress tolerance.

Regarding misophonia severity, statistically significant differences were observed. Participants with clinically significant misophonia symptoms (scores of 7 and

above) got higher scores on Misophonia Questionnaire-total, had more misophonia symptoms, and developed more emotions and behaviors when they face trigger sounds than participants without clinically significant misophonia symptoms (scores 0-6). These findings are in line with the previous research results (Wu et al., 2014). Furthermore, there were a significant difference in ASI-3-Total scores, physical, cognitive, and social concerns of anxiety sensitivity in terms of misophonia severity. Results showed that participants who have clinically significant misophonia symptoms experienced more anxiety-related symptoms and sensations than participants who do not have clinically significant misophonia symptoms. This finding is consistent with a study which posited that individuals with misophonia had higher levels of anxiety sensitivity as compared to participants without misophonia (Frank et al., 2020). Moreover, DTS-Total scores, tolerance, and self-efficacy differed significantly on the misophonia severity scores. Those with clinically significant misophonia symptoms could tolerate distress less, could have lower capacity to cope with distress, and when faced with negative emotions, those individuals could get more distracted, and function less as compared to those without clinically significant misophonia symptoms. These results are in accordance with a study which suggested that individuals with clinically significant misophonia symptoms had less distress tolerance than individuals who do not have clinically significant misophonia symptoms (Frank et al., 2020). However, there was no significant difference was observed between those with and without clinically significant misophonia symptoms on the regulation of distress tolerance.

The prevalence rate of misophonia was found as 21.3% for the current study. Among the 400 participants, 85 participants reported “moderate” to “very severe” clinically significant misophonia symptoms (scored 7 or above) that are interfering with

their daily life. This finding is consistent with the study that found approximately 20% prevalence of clinically significant misophonia symptoms which indicates a substantial interference in individuals' functioning (Wu et al., 2014).

4.2. Findings Related to Analyses of Correlation

According to the findings of correlation analyses, misophonia was positively correlated with all subtypes of anxiety sensitivity. Specifically, people who got higher scores on misophonia symptoms, emotions, and behaviors, and misophonia severity are more sensitive to anxiety and experience more physical, social, and cognitive concerns related to anxiety sensitivity. These findings complement with the previous research which found a moderate significant relationship between anxiety sensitivity and misophonia severity (Cusack et al., 2018). Moreover, misophonia and DTS-total score, tolerance, regulation, and self-efficacy of distress tolerance are negatively correlated. Considering this relationship, those with greater scores on misophonia symptoms, and misophonia emotions and behaviors have a lower distress tolerance, diminished ability to tolerate distress, and lower capacity to cope with distress. Although, misophonia severity was negatively correlated with DTS-total score, tolerance, and self-efficacy; there was no significant correlation found between misophonia severity and regulation of distress tolerance.

Also, the results of the study indicated that all subtypes of anxiety sensitivity were negatively correlated with DTS-total score, tolerance, and self-efficacy of distress tolerance. That means participants who obtained higher scores on physical, cognitive, and social concerns of anxiety sensitivity tolerate distress less and have a lower ability to cope with emotional distress. These findings are compatible with the results of existing research which stated a negative relationship between anxiety sensitivity and distress

tolerance in a way that people who reported greater anxiety sensitivity levels scored lower on distress tolerance (Anestis et al., 2007; Bernstein et al., 2009; Keough et al., 2010; Timpano et al., 2009; Zvolensky et al., 2009). Even though regulation of distress tolerance was negatively correlated with ASI-3-Total scores, physical concerns, and cognitive concerns, there was no significant correlation between regulation of distress tolerance and social concerns of anxiety sensitivity.

4.3. Findings Related to Regression Analyses

In this study, multiple linear regression analyses were performed to explore whether misophonia can be predicted based on anxiety sensitivity and distress tolerance. In other words, it was meant to be determined how much of the variation in misophonia can be explained by anxiety sensitivity and distress tolerance as a whole, as well as each independent variables' relative contribution when explaining the variance. It was hypothesized that anxiety sensitivity will positively, and distress tolerance will negatively predict the misophonia.

Results demonstrated that 32.1% of the variance in MQ-total scores can be accounted for by the cognitive concerns and physical concerns of anxiety sensitivity, and self-efficacy of distress tolerance predictors as a whole. Considering the predictors' individual contributions, the findings show that physical and cognitive concerns of anxiety sensitivity positively predicted, and self-efficacy of distress tolerance negatively predicted the total scores of MQ. Moreover, results also indicated that individuals who engaged in cognitive concerns are more likely to present misophonia. These suggest that experiencing cognitive and physical concerns of anxiety sensitivity and having low levels of capacity to overcome distress contribute to misophonia. According to the existing

research, physical concerns of anxiety sensitivity predicted the misophonia (McKay et al., 2018).

Findings also revealed that, 21.8% of the variance in misophonia symptoms can be explained by the cognitive concerns and physical concerns of anxiety sensitivity, and self-efficacy of distress tolerance predictors collectively. Regarding the relative contributions of the predictors, the results represented that cognitive and physical concerns of anxiety sensitivity positively predicted, and self-efficacy of distress tolerance negatively predicted the symptoms of misophonia. Furthermore, results showed that people who experienced cognitive concerns are more likely to have misophonia symptoms. Taking these into account, individuals who engage in cognitive and physical concerns of anxiety sensitivity and have lower capacity to withstand distress are more likely to develop misophonia symptoms. As McKay et al. (2018) proposed that physical concerns of anxiety sensitivity contributed the misophonia symptoms.

In addition, this study's results indicated that 31.2% of the variance in misophonia emotions and behaviors can be accounted for by the cognitive concerns and physical concerns of anxiety sensitivity, and self-efficacy of distress tolerance predictors as a whole. When looking the predictors' individual contributions, the findings demonstrated that physical and cognitive concerns of anxiety sensitivity positively predicted, and self-efficacy of distress tolerance negatively predicted the emotions and behaviors of misophonia. Also, those who engaged in cognitive concerns are more likely to develop emotions and behaviors when they confront a trigger sound. These results proposed that, people who experience cognitive and physical concerns of anxiety sensitivity and have low capacity to cope with distress are more likely to elicit emotions and behaviors to trigger sounds.

Moreover, results also suggested that 11% of the variance in misophonia severity can be explained by the cognitive concerns and physical concerns of anxiety sensitivity collectively. Considering the relative contributions of the predictors, the results revealed that cognitive concerns and physical concerns of anxiety sensitivity positively predicted the severity of misophonia. Additionally, results showed that individuals who engaged in cognitive concerns are likely to have more severe misophonia symptoms. These findings indicated that experiencing cognitive and physical concerns of anxiety sensitivity contribute to severity of misophonia symptoms. In their study, Cusack et al. (2018) found that cognitive concerns of anxiety sensitivity predicted individuals' misophonia severity.

4.4. Findings Related to Mediation Analyses

The current study was conducted to investigate the effect of anxiety sensitivity and distress tolerance on misophonia and to understand whether distress tolerance is a mediating variable. It was hypothesized that anxiety sensitivity will positively predict misophonia. Also, it was predicted that distress tolerance has a mediator role in the relationship between misophonia and anxiety sensitivity in a way that distress tolerance will decrease the relationship between misophonia and anxiety sensitivity. Thus, a regression analysis was performed to examine these hypotheses.

According to the current study's findings, anxiety sensitivity had a significant direct effect on distress tolerance. This finding posits that people who are sensitive to and fear anxiety related perceptions and sensations are less likely to have a capability to experience and tolerate distressing emotions, situations and contexts. This result is compatible with Anestis and his colleagues' (2007) findings which stated that individuals with increased anxiety sensitivity levels are less capable to cope with negative emotions and distress.

In addition, distress tolerance had a direct effect on misophonia. This result shows some evidence that individuals who do not have the capacity to withstand and experience negative psychological situations and events are more likely to experience misophonia, disturbed by trigger sounds and develop negative reactions and emotions when they encounter trigger sounds of misophonia.

According to the mediation analysis of the present study, distress tolerance significantly mediated the relationship between misophonia and anxiety sensitivity. Since the strength of the relationship between anxiety sensitivity and misophonia decreased significantly but not fully, distress tolerance partially mediated the relationship between misophonia and anxiety sensitivity. These results also indicates that anxiety sensitivity had a significant indirect effect on misophonia through distress tolerance. This finding suggests that individuals who fear sensations and perceptions associated with anxiety and believes anxiety-related symptoms can have detrimental consequences do not have the sufficient ability to manage and experience distressing factors and situations which in turn lead them to experience misophonia and react abnormally and negatively towards trigger sounds for instance eating sounds, nasal and throat sounds, repetitive tapping, rustling, environmental sounds and specific consonants or vowels; experience disturbing emotions and reactions when they hear trigger sounds; and have impairments in their daily lives due to sensitivity of misophonic sounds. This is the first study exploring the mediator role of the distress tolerance in the relationship between misophonia and anxiety sensitivity.

4.5. Limitations

The present study involves some limitations. Firstly, the data were obtained only from self-report measures in an online setting that could cause biases. For example, participants may have given socially acceptable answers to questions, may not have

enough insight to evaluate themselves and, after answering some of the questions, their concentration may be lost, and their attention may be reduced (Krosnick, 2018). Secondly, more than half of the participants had an associate/bachelor's degree which can affect the generalizability of the study. In addition, this study's data collection process coincided with the period of the Covid-19 pandemic. Therefore, individuals' anxiety sensitivity may have increased, and distress tolerance may have diminished during the Covid-19 pandemic. As a result, this situation leads to a discrepancy between the current study's findings and the results of existing research. Moreover, the present study is cross-sectional in which participants were assessed in a single time frame which did not provide a causal relationship among the variables. Furthermore, as distress tolerance mediated the relationship between misophonia and anxiety sensitivity partially, other variables could be mediator in this relationship.

To eliminate these limitations, future research should collect data in multiple forms such as interviews and observation and conduct experimental studies. Also, future studies should control for the education level of participants. In addition, conducting replication studies can be helpful to observe whether the similar results can be obtained at different time points. Since misophonia have an impact on individuals' functioning in daily life, future studies can examine the functioning of individuals in detail so that Amsterdam Misophonia Scale (A-Miso-S) would be administered to participants. Furthermore, future studies should conduct longitudinal studies which assess individuals in different time points by this way they can reveal the cause-and-effect relationship. Additionally, future research should examine the other possible mediators in the relationship between misophonia and anxiety sensitivity.

4.6. Contributions and Clinical Implications of the Study

To the best of our knowledge, the present study is the first to examine the mediating role of distress tolerance in the relationship between anxiety sensitivity and misophonia. This study suggested that distress tolerance partially mediated the relationship between misophonia and anxiety sensitivity. Also, since anxiety sensitivity and distress tolerance play a role in anxiety symptomology and the present study found the relationship between misophonia and them, misophonia can be classified in DSM under the Anxiety Disorders section. The current study contributed to the literature also by providing the prevalence rate of clinically significant misophonia in the non-clinical population which was 21.3%. So, symptoms of misophonia present quite common in non-clinical individuals. Therefore, it can be suggested that misophonia can take part in the Diagnostic and Statistical Manual of Mental Disorders as a new disorder.

The present study indicated the effects of anxiety sensitivity and distress tolerance on misophonia. Thus, when working with individuals who have misophonia, therapists could take into consideration anxiety sensitivity and distress tolerance factors while identifying and choosing intervention approaches for misophonia. For instance, therapy approaches that focus on reducing anxiety sensitivity and enhancing distress tolerance can be beneficial when working with people who have misophonia. In the current study, it was observed that experiencing cognitive and physical components of anxiety sensitivity contributes to the development and exacerbation of misophonia. Also, lower self-efficacy of distress tolerance predicted the occurrence of misophonia symptoms, and emotions and behaviors to trigger sounds. Therefore, cognitive restructuring, exposure, relaxation, and mindfulness techniques can be useful in therapy when treating individuals with misophonia. In addition, since low self-efficacy of distress tolerance refers to an

individual's evaluation of his/her own coping capacity as inadequate; cognitive restructuring in CBT, and teaching distress tolerance and emotion regulation skills in DBT could be helpful with those who have misophonia. So, individuals with misophonia can benefit from Cognitive Behavioral Therapy (CBT), Dialectical Behavioral Therapy (DBT) and Mindfulness Therapies in psychotherapy.

4.7. Conclusion

The current study is the first to examine the mediator role of distress tolerance in the relationship between misophonia and anxiety sensitivity. Also, this is the first study investigating the prevalence rate of misophonia in Turkey. In addition, distress tolerance mediated the relationship between misophonia and anxiety sensitivity. These findings contribute to understanding the underlying mechanisms of misophonia. Therefore, clinicians should pay attention to levels of anxiety sensitivity and distress tolerance of individuals who refer to clinics with misophonic complaints and they should use treatment interventions focusing on AS and DT. In addition, since the prevalence rate of misophonia was quite high in the nonclinical sample, the AS and DT are also the components of anxiety disorders, and several symptoms of misophonia are similar to mental disorders, misophonia would be classified as a mental disorder in DSM.

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APPENDIX