NÖRO PSİKİYATRİ ARŞİVİ
ARCHIVES OF NEUROPSYCHIATRY

RESEARCH ARTICLE

Arch Neuropsychiatry 2024;61:248–254
https://doi.org/10.29399/npa.28630

Sex-Specific Correlations Between Misophonia Symptoms and ADHD, OCD, and Autism-Related Traits in Adolescent Outpatients

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ABSTRACT

Introduction: Misophonia, not yet classified within diagnostic manuals, triggers strong emotional, physiological, and behavioural reactions to specific sounds. This study examines its correlations with attention deficient/hyperactivity disorder (ADHD) traits, obsessive-compulsive traits, and autism-related traits in adolescent outpatients with non-psychotic disorders. We hypothesize a positive association between misophonic symptoms and these psychological traits.

Methods: This study was conducted at a Turkish psychiatric centre from January to July 2023 in adolescents aged 12–18. Parents completed the Autism Spectrum Quotient-Adolescent (AQ-Adolescent), and Conner's ADHD Parent Rating Scale-48 (CPRS-48), while the adolescent filled out the Misophonic Symptom Checklist (MCL) and Maudsley Obsessive-Compulsive Inventory (MOCI). Using non-parametric statistical tests, the research found associations between the scales, with a total sample size of 348.

Results: Females had higher scores on MCL. There is a negative correlation between AQ-Adolescent and MCL, positive correlations between MCL-MOCI and MCL-CPRS-48. In gender specific correlation analysis found that AQ-Adolescent and MCL were negatively correlated, MCL and MOCI were positively correlated in males. MCL, CPRS-48 and MOCI were positively correlated in females. In regression AQ-Adolescent, MOCI and CPRS-48 significantly predicted the levels of MCL.

Conclusions: Our study unveils a link between ADHD, obsessive-compulsive symptoms, autistic traits, and misophonic symptoms in adolescent psychiatric outpatients, highlighting sex differences.

Keywords: ADHD, adolescent, autistic traits, misophonia, obsessive-compulsive

Cite this article as: Herdi O, Yıldırım F. Sex-Specific Correlations Between Misophonia Symptoms and ADHD, OCD, and Autism-Related Traits in Adolescent Outpatients. Arch Neuropsychiatry 2024; 61:248–254.

INTRODUCTION

Misophonia, while not formally recognized as a definitive diagnosis within the International Classification of Diseases (ICD) and the Diagnostic and Statistical Manual of Mental Disorders (DSM), is characterized by pronounced negative emotional (anger, disgust, distress), physiological (increased heartbeat, piloerection) and aggressive (shouting, yelling or giving harm to the source of the misophonic sound, in a word trigger) or aversive (moving away from the source of the trigger or not being present at a place where a trigger could emerge) behavioural responses to certain auditory stimuli (1,2). Predominantly, these triggering sounds are generated by other individuals and encompass activities such as lip smacking, chewing, coughing, and respiration. Intriguingly, certain visual stimuli related to these sounds, such as the movement of lips, can also provoke misophonic reactions. While mild aversions to specific sounds, such as gum chewing or slurping, are prevalent among the general population, the experience of misophonia transcends mere discomfort. It can result in significant social impairments across domestic, academic, and professional environments. Furthermore, the condition may precipitate challenges in interpersonal relationships (3–5). From a clinical perspective, neuropsychiatry professionals have postulated that misophonia might be categorized as a neuropsychiatric disorder. In contrast, audiological experts have suggested its inclusion under the umbrella of decreased sound tolerance syndrome, concurrently with hyperacusis and phonophobia (1,6).

Highlights

- **Misophonia is positively correlated with ADHD.**
- **Misophonia is positively correlated with obsessive-compulsive traits.**
- **Misophonia is inversely correlated with autistic traits.**
- **There are sex differences on these relationships.**

The prevalence of misophonia remains inadequately characterized, though findings from a myriad of studies suggest a range between 6% and 50% (7–11). The extensive variability observed in these prevalence rates can be attributed to disparities in study samples and the utilization of distinct scales or diagnostic criteria in assessing misophonia. Preliminary research posits the typical onset of misophonia around ages of 12 to 13 (12) and suggests potential hereditary factors (13).

Despite the ongoing debates between audiological and neuropsychiatric disciplines, burgeoning evidence highlights potential associations between psychological traits or manifestations and misophonia. Obsessive-compulsive disorders, agoraphobia, tic disorders, mood disorders, panic

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Received: 26.09.2023, **Accepted:** 06.12.2023, **Available Online Date:** 09.08.2024

disorder, attention deficit hyperactivity disorder, hypochondriasis, body dysmorphic disorder, eating disorder, trichotillomania, skin picking, and autism spectrum disorders have been reported to have significant associations with misophonic symptoms (1,14–21). A study by Çolak et al. (22) delineated a positive correlation between aggression, trait anxiety, obsessions, neuroticism, somatic sensation amplification, and the severity of misophonic symptoms in patients with non-psychotic psychiatric disorders. Rinaldi et al. found that adolescents with misophonia exhibited elevated levels of obsessive-compulsive traits when juxtaposed with their non-misophonic counterparts. Additionally, individuals with misophonia tend to experience heightened levels of depression and anxiety compared to those who do not have the condition.

In the present study, we focused on three specific psychological traits: Attention deficient/hyperactivity disorder (ADHD) traits, obsessive-compulsive traits, and autism-spectrum traits. Our selection was predicated on three primary considerations: a) extant literature suggesting potential associations with misophonia, b) psychiatric conditions that exhibit higher prevalence among adolescent outpatients, and c) psychological traits whose associations with misophonia remain inadequately elucidated.

Obsessive-compulsive disorder (OCD) has been postulated to have a potential association with misophonia, primarily due to symptomatology overlaps, such as the recurrent preoccupation with triggers (analogous to obsessions) and subsequent avoidance behaviours (akin to compulsions) (23,24). While there are distinct differences in the symptomatology of misophonia and OCD, underlying relationship between these two conditions is plausible. Numerous studies have identified the co-presentation of OCD and misophonia in both adult and paediatric populations (21,23,25). Furthermore, there has been a report indicating a comorbidity between misophonia and Tourette Syndrome, a condition wherein OCD is notably prevalent, particularly in paediatric cases (26).

A connection between ADHD and sensory sensitivities is well-established (27,28), with misophonia often considered a form of sensory sensitivity by various researchers (29,30). In one particular study, approximately 5% of adult participants with misophonia were found to also have ADHD (31). Conversely, another research retrospectively examined the medical records of misophonic adults and contrasted them with those of individuals without misophonia. In this research, while rates of depression and anxiety disorders were elevated in childhood, the prevalence of ADHD did not appear to be significantly heightened among adults with misophonia (32). These debatable data indicate that relationships between ADHD and misophonia need to be investigated. Moreover, the relationship between subclusters of symptoms of ADHD –hyperactivity, attention deficits, and impulsivity– and misophonia does not have a place in current literature.

Autism spectrum disorder (ASD) is also frequently associated with sensory sensitivities. The DSM-V characterizes over-responsiveness to auditory stimuli as a feature of autism (33). However, the auditory sensitivities linked to autism predominantly pertain to sounds that are loud, high-pitched, or unexpected, which are not characteristic of misophonia (1,34). While several case reports and studies aimed to explore the relationship between autism and misophonia, findings remain conflicting (21,35). Jager et al. found no significant association between autism and misophonia (31), whereas Claiborn et al. observed a marginally increased prevalence of autism among individuals with misophonia (36). Importantly, from a neurobiological perspective, the involvement of the insular cortex and the salience network in both conditions suggests a potential interconnection (37,38).

In the present study, given the ambiguity surrounding the psychological basis of misophonia and the pressing need for comprehensive examination, our objective was to explore the association between levels of misophonic symptoms and various trait psychological variables. Specifically, we assessed attention-deficit and hyperactivity symptoms, obsessive-compulsive traits, and autism-related traits among adolescent outpatients presenting with non-psychotic psychiatric disorders. Our hypothesis is that there is a positive correlation between levels of misophonic symptoms and the levels of ADHD symptoms, obsessive-compulsive symptoms, and autism-spectrum traits.

METHODS

Participants

This study was conducted at a private psychiatric centre in Türkiye from January to July 2023. The objective was to recruit a sufficient number of outpatients who met the inclusion criteria as determined by the pre-calculated sample size. Eligible participants were patients aged between 12 to 18 years. Exclusion criteria encompassed diagnoses of psychotic disorder, bipolar disorder, intellectual disability, autism spectrum disorder, and alcohol or drug related disorders. Additionally, due to the requirement for parents (either mother, father, or legal guardian) to complete two of scales employed in this study, patients with illiterate parents were also excluded. Total sample size was calculated by g-power program (H1 rho^2=0.05, alfa error prob=0.05, power=0.95 with three predictor). The calculated sample size was 335. Informed consent was duly obtained from both the patients and their respective guardians. The ethical approval was obtained from Antalya Bilim University Social and Human Sciences Ethical Committee (Approval No: 2022/18, Approval Date: 22.04.2022).

A total of 348 patients participated in the study, with females constituting 56% of the sample. The mean age of the participants was 14.34±1.56 years. Detailed sociodemographic characteristics are presented in Table 1.

In our sample, medication using distribution was unmedicated (21.8%, n=76), only tricyclic antidepressants (TCA) (0.6%, n=2), TCA+ antipsychotic (Ap)(0.9%, n=3), only Ap (4.3%, n=15), only Noradrenaline reuptake inhibitors (NRI) (2.6%, n=9), only Serotonin and noradrenalin reuptake inhibitors (SNRI) (1.4%, n=5), SNRI+Ap (0.6%, n=2), Selective serotonin reuptake inhibitors (SSRI) (44.3%, n=154), SSRI+Ap (3.2%, n=11), only Methylphenidate (MPh) (15.2%, n=53), MPh+NRI (0.6%, n=2), MPh+Ap (2.3%, n=8), MPh+TCA (0.6%, n=2), SSRI+MPh (0.3%, n=1), Mirtazapine (0.9%, n=3), and SSRI+Mood regulators (0.6%, n=2).

Procedure

Following a psychiatric evaluation conducted by a child and adolescent psychiatrist (one of the authors) and upon obtaining informed consent from both the patient and their parent, the researchers completed a sociodemographic data form. The Autism Spectrum Quotient-Adolescent (AQ-Adolescent) and Conner's ADHD Parent Rating Scale-48 (CPRS-48) were administered to the parent. Concurrently, the Misophonic Symptom Checklist (MCL) and the Maudsley Obsessive-Compulsive Inventory (MOCI) were presented to the patient. Eligible patients completed the study measures in a singular session, which coincided with their psychiatric assessments and treatments. This study received approval from the local ethics committee.

Measures

Sociodemographic data form: The form, designed by the research team, was employed to gather pertinent information on the patients, including their age, sex, psychiatric diagnosis, and ongoing treatment. Additionally, data related to the parents such as age, occupational status, educational

Table 1. Sociodemographic variables and clinical variables

	%(n)	Mean ± SD
Sex		
Female	56(195)	
Male	44(153)	
Age		14.34±1.56
Diagnosis		
Anxiety disorders	21.9(76)	
Intermittent explosive Disorder	1.5(5)	
Conduct disorder	0.9(3)	
ADHD	22.7(79)	
Depression	21.5(75)	
Conversion disorder	0.7(2)	
OCDS	8.6(30)	
School refusal	1.7(6)	
Tic disorder	1.7(6)	
PTDS	0.7(2)	
Grief reaction	0.9(3)	
DMDD	1.1(4)	
Consultation	16.4(57)	
Educational status of mother		
Illiterate	2.6(9)	
Primary school	25.9(90)	
High school	36.2(126)	
University or above	35.3(123)	
Mother's Age		43.23±5.17
Occupational status of mother		
Unemployed	42.7(141)	
Free lance	30(99)	
Corporate	27.3(90)	
Educational status of father		
Illiterate	2.6(9)	
Primary school	24.6(84)	
High school	36.8(126)	
University or above	123(36)	
Father's age		47.50±5.72
Occupational status of father		
Unemployed	3.6(12)	
Freelance	66.1(222)	
Corporate	30.4(102)	
Blood relation between mother and father		
Yes	10(33)	
No	90(297)	
Family history of mental disorder		
Yes	24.1(78)	
No	75.9(246)	
Delivery method		
Caesarean	63.6(204)	
Normal	36.4(117)	
Hospitalization after delivery		
Yes	16.2(36)	
No	83.8(186)	

ADHD: attention-deficit/hyperactivity disorder; DMDD: disruptive mood dysregulation disorder; OCDS: obsessive-compulsive disorder spectrum; PTSD: post-traumatic stress disorder.

background, family history of psychiatric diagnosis, hospitalization after delivery, and mode of delivery were also collected.

Autism Spectrum Quotient-Adolescent (AQ-Adolescent): The AQ was originally devised to screen for autistic traits or broad autism phenotype in adults possessing typical intellectual capacities. While the foundational construct of the adolescent version aligns with that of the AQ, it has adapted to facilitate completion by parents (39). The AQ-adolescent encompasses 50 items and five subdimensions: communication, social skills, imagination, attention to detail, and attention switching. The scale employs a 4-point Likert scale. However, during scoring, both "strongly agree" and "somewhat agree" responses are assigned a score of one, while "strongly disagree" and "somewhat disagree" are scored as zero. Consequently, the maximum achievable score on the scale is 50 points. The Turkish validity and reliability study was conducted by Çetinoğlu et al (40).

Conner's ADHD Parent Rating Scale-48 (CPRS-48): The initial version of the CPRS comprised 94 items and was designed for parents to assess their children's attention deficit, hyperactivity, and associated symptoms (41). Later, in 1978, Goyette et al. streamlined this into a 48-item version (42). This version defines five subscales: conduct problems, learning problems,

psychosomatic, impulsive-hyperactive, and anxiety. The scale utilizes a 4-point Likert system. The Turkish adaptation encompassing both validity and reliability evaluations, was carried out by Kaner et al (43).

Misophonic symptom checklist (MCL): MCL is a 4-point Likert type scale developed by Öz and Kiliç (7). The checklist assesses both types and severity of misophonic symptoms and includes 50 different sounds. The total score will be between 0 and 150; with higher scores indicating more severe misophonic symptoms.

Maudsley Obsessive-Compulsive Inventory (MOCI): MOCI was developed by Hodgson and Rachman and is designed to measure subset of obsessive-compulsive symptoms (44). Maudsley obsessive-compulsive inventory comprises 30 yes/no items grouped into four subscales and higher scores indicate more serious obsessive-compulsive traits. The Turkish version of the inventory has been shown to have adequate validity and reliability in a study conducted by Erol and Savasir (45).

Statistical Analysis

Descriptive statistics were utilized to characterize sociodemographic and clinical variables, as well as the scores derived from the scales. In light of the non-normal distribution of the scale scores, as determined by the Kolmogorov-Smirnov tests, non-parametric statistical tests were employed. Specifically, the Mann-Whitney U test was implemented to contrast MCL scores between two groups, while Spearman's correlation was used to investigate associations between the ages of the adolescent, mother, and father, and the scores of the respective scales. Due to the impact of sex on MCL scores, correlation analyses of MCL and the other scales were conducted for each sex separately. Subsequent to these analyses, multivariate linear regression, using the enter method, was employed to gauge the predictive capacities of the MOCI, CPRS-48, and AQ-Adolescent on MCL scores. All statistical procedures were executed using IBM Statistical Package for Social Sciences (SPSS) program version 22.0. A p-value of <0.05 was deemed indicative of statistical significance.

RESULTS

The distribution of scale scores was assessed using the Kolmogorov-Smirnov test. None of the scales conformed to a normal distribution, warranting the use of non-parametric statistical analyses. The medians for the AQ-Adolescent, CPRS-48, MCL, and MOCI were 22 (range: 9–31), 41 (range: 8–96), 41 (range 2–124), and 17 (range: 4–33), respectively.

The Relationship Between Sociodemographic-Clinical Variables and MCL

Exploring associations between sociodemographic variables and MCL scores, significant positive correlations were found both the mother's age (r=0.215, p<0.001) and the father's age (r=0.138, p=0.015). No significant correlation was observed between the adolescent's age and MCL scores (r=0.026, p=0.629). Female participants exhibited significantly higher MCL scores compared to males (Z=-3.377, p<0.001). There was no significant association between the MCL scores and the blood relationship between the parents (Z=-1.489, p=0.137). Participants with a family history of mental disorders had significantly higher MCL scores than those without such a history (Z=-2.466, p=-0.014). The method of delivery did not have a significant impact on the MCL scores (Z=-1.693, p=0.091). Notably, participants who did not require hospitalization post-delivery exhibited significantly higher MCL scores compared to those who did (Z=-2.616, p=0.009).

The Correlational Analysis Between Scales

The correlation analyses of AQ-Adolescent, MCL, MOCI and CPRS-48 are presented in Table 2. While MCL was positively correlated with MOCI (r=0.357, p<0.001) and CPRS-48 (r=0.313, p<0.001), negatively with AQ-Adolescent (r=-0.123, p=0.021). Sex-stratified correlation analyses are presented in Table 3.

The Regression Model for Predicting MCL Scores

Finally, enter method multivariate linear regression analyses conducted was with MOCI, CPRS-48 and AQ-Adolescent to predict MCL. Analysis conducted to see if the date met the assumption of collinearity indicated that multicollinearity was not a concern (MOCI, Tolerance=0.95, VIF=1.053;

Table 2. Correlation analyses of AQ-adolescent, MOCI, MCL and CPRS-48

	AQ-adolescent	MOCI	MCL	CPRS-48
AQ-adolescent	-			
MOCI	-0.102	-		
MCL	-0.123*	0.357**	-	
CPRS-48	0.303**	0.218**	0.313**	-

AQ-adolescent: autism spectrum quotient-adolescent; CPRS-48: Conner's ADHD parents rating scale-48; MCL: misophonia symptom questionnaire; MOCI: Maudsley obsessive-compulsive inventory. * <0.05, ** <0.01

Table 3. Sex-stratified correlation analyses of AQ-adolescent, MOCI, MCL and CPRS-48

	AQ-adolescent	MOCI	MCL	CPRS-48
Males				
AQ-adolescent	-			
MOCI	-0.104	-		
MCL	-0.232**	0.191*	-	
CPRS-48	0.249**	0.235**	0.093	-
Females				
AQ-adolescent	-			
MOCI	-0.072	-		
MCL	0.008	0.425**	-	
CPRS-48	0.354**	0.180*	0.485**	-

AQ-adolescent: autism spectrum quotient-adolescent; CPRS-48: Conner's ADHD parents rating scale-48; MCL: misophonia symptom questionnaire; MOCI: Maudsley obsessive-compulsive inventory. * <0.05, ** <0.01

Table 4. Multiple regression analyses for MCL

	B	SE	Beta	p
MOCI	1.158	0.188	0.297	<0.001
AQ-adolescent	-0.999	0.273	-0.180	<0.001
CPRS-48	0.515	0.077	0.335	<0.001

AQ-adolescent: autism spectrum quotient-adolescent; CPRS-48: Conner's ADHD parents rating scale-48; MCL: misophonia symptom questionnaire; MOCI: Maudsley obsessive-compulsive inventory. * <0.05, ** <0.01

CPRS-48, Tolerance=0.88, VIF=1.137; AQ-Adolescent, Tolerance=0.91, 1.097). In the model, these variables significantly predicted MCL scores and explained 23.7% of the variance (Adjusted R^2=0.237, F=36.892, p<0.001). The analysis shows that all variables maintain their significance in the mode (Table 4).

DISCUSSION

In this study, the association between misophonic symptoms and trait psychological variables, including ADHD, obsessive-compulsive and autism related traits, was investigated. While ADHD and obsessive-compulsive traits were positively correlated with misophonic symptoms, autism related traits were negatively. Additionally, sex, the ages of mother and father, family history of mental disorders, and not requiring hospitalization after post-delivery had an impact on MCL scores. In the regression model, MOCI, CPRS-48, AQ-Adolescent significantly predicted the misophonic symptoms, and all variables maintained their significance in the full model.

In the present study, female participants manifested elevated levels of misophonic symptoms. The literature offers varied perspectives on the association between misophonia and sex. Nonetheless, results predominantly leaning towards female dominance have been recurrently reported (1,9,36). The implications of sex in relation to misophonia will be elaborated upon in subsequent sections of this discussion.

There was a discernible positive correlation between the ages of both parents and the severity of misophonic symptoms in their offspring. This emergent finding insinuates a potential neuropsychiatric underpinning to misophonia. While it might seem speculative to infer so, it is noteworthy that elevated parental age has been previously associated with conditions like autism spectrum disorder, schizophrenia, ADHD, bipolar disorder, and cognitive deficits (46). Contrastingly, this age associated predisposition is not evidenced in audiological disorders according to our knowledge.

Furthermore, participants with a familial history of mental disorders displayed heightened misophonic symptoms. The established knowledge posits an augmented risk for various mental disorders contingent upon family history. Analogously, this principle holds for a myriad of organic disorders, encompassing conditions like cancer, Alzheimer's disease, diabetes mellitus, and hypertension. However, deriving concrete interpretations from this observed association remains challenging. More targeted research endeavours are essential to draw more conclusive inferences. The same issues are valid for not having hospitalization post-delivery and higher levels of misophonic symptoms.

Contrary to our hypothesis, our findings indicated a negative correlation between the levels of autistic traits and misophonia symptoms. Intriguingly, this significant correlation diminished when exclusively focused on female-specific correlation analyses. A few case reports have identified the coexistence of autism and misophonia (21,35). Yet, a study by Jager et al. did not elucidate a distinct association between the two conditions (31). Given the absence of a control group in their study, one cannot conclusively deduce that autistic traits are not more prevalent among misophonic individuals. Conversely, Cliaborn et al. reported a slightly elevated prevalence of autism in misophonics compared to the general population (36).

Drawing from neurobiological evidence, Williams et al. underscored potential shared neural substrates between autism and misophonia (38). Specifically, previous research has documented heightened anterior insular cortex activity (37) and salience network responses (47) in misophonic individuals following exposure to triggering stimuli. These neural structures and networks, particularly the insular cortex and the salience network, have been implicated in the pathophysiology of autism (38). Rinaldi et al. also observed amplified autism-related traits in misophonic adults and children (29).

However, our findings suggest a divergent relationship. More intriguingly, this inverse correlation between autistic and misophonic traits became non-significant when analysing the female participants specifically. A fundamental distinction to note is that reactions in autism are not predominantly specific sounds but tend to be aversive or aggressive responses to loud, high-pitched, or sudden noises (34). Misophonia, on the other hand, manifests as emotional, autonomic, and behavioural reactions to specific sounds, often determined by individual sensitivities and the sound source. Williams et al. broached the subject of this relationship by classifying misophonia under the broader spectrum of reduced sound tolerance. Our data, however, may imply that misophonia diverges from this overarching categorization, potentially signifying its distinct neuropsychiatric classification.

In our research, ADHD trait levels showed a positive correlation with misophonia symptoms across the entire sample. Yet, intriguingly, this significant positive association between the two conditions disappeared in gender-specific analyses focusing on males. Previous studies have attempted to elucidate the comorbidity between ADHD and misophonia. Jager et al. found that 5% of their 575 adult misophonic participants had co-morbid ADHD (31). In contrast, another study reported a higher rate of 12%(5). Notably, a recent study indicated that ADHD did not significantly impact children in the misophonia group (32).

When considering sex differences, ADHD is typically more prevalent in males during childhood and adolescence, with notable clinical differences observed between the sexes. Specifically, inattention tends to be more predominant in females, whereas hyperactivity and impulsivity are more commonly seen in males. Furthermore, tactile defensiveness, characterized by heightened sensitivity to touch, is more prevalent in females. It's possible that this sensory sensitivity could shed light on our findings. Nevertheless, these novel results necessitate further investigation through more targeted research.

Our study identified a positive correlation between obsessive-compulsive and misophonic symptoms. Interestingly, sex did not significantly impact this relationship as it did in the associations between ADHD-misophonia and autism traits-misophonia. Several researchers propose that misophonia should be conceptualized within the spectrum of OCD-related disorders. They suggest that if misophonia were to be included

in diagnostic manuals such as the DSM or ICD, it should be categorized under OCD-related conditions (1,23,30,48). According to this perspective, the act of ruminating on triggers represents the obsessive component, while aversive behaviours function as the compulsive part. Conformably, just as not exhibiting compulsion in OCD can lead to heightened anxiety and autonomic symptoms, exposure to a trigger in misophonia without an escape can evoke similar responses. Nevertheless, we along with some other researchers (49), challenge this conceptualization. The symptomatology of misophonia exhibits distinct differences from that of OCD-related disorders. Notably: 1) misophonics do not always ruminate on potential trigger, 2) predominant emotion is not anxiety, it is disgust, and 3) aversive or aggressive behaviours are not observed in every misophonics; some individuals may endure a trigger without exhibiting notable reactions, and there's no repetitive manifestation of compulsive behaviour. However, the correlation between obsessive-compulsive and misophonic symptoms has been consistently observed (1,12,18,22,23,50). The foundational cause of this relationship remains an area of ongoing investigation.

Our study faces several limitations. The findings may not be generalizable to all adolescent psychiatric patients due to their confinement to a single private centre and the exclusion of specific disorders, such as psychotic disorders and autism spectrum disorder. While we examined several trait features, other aspects like state features, trait anxiety, and personality were not assessed, leaving a gap in our understanding of misophonia. The reliance on self-report scales introduces potential biases, and we did not account for the known comorbidities of anxiety and OCD-related disorders. Medications that participants might be on, such as methylphenidate, antidepressants, and antipsychotics, could influence symptom levels. AQ-Adolescent and CPRS-48 were filled by parents. There may be a risk of that some parents could be willing to present their child's clinical manifestations exaggerated or extenuated. Finally, the cross-sectional design of our study does not allow us to draw conclusions about causality.

Our study pioneers the exploration of associations between ADHD symptoms, obsessive-compulsive tendencies, autistic traits, and misophonic symptoms among adolescent psychiatric outpatients. While gender was not our primary focus, its notable influence on these relationships holds significance. These insights could enrich our understanding of misophonia as a distinct clinical phenomenon. Further research is essential to delve deeper into these relationships.

Ethics Committee Approval: The ethical approval was obtained from Antalya Bilim University Social and Human Sciences Ethical Committee (Approval No: 2022/18, Approval Date: 22.04.2022).

Informed Consent: Informed consent was duly obtained from both the patients and their respective guardians.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept- OH, FY; Design- OH, FY; Supervision- OH; Resource- (-); Materials- (-); Data Collection and/or Processing- OH, FY; Analysis and/or Interpretation- OH; Literature Search- OH; Writing- OH, FY; Critical Reviews- OH.

Conflict of Interest: The authors declared that there is no conflict of interest.

Financial Disclosure: There is no funding for this research.

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