Unraveling the pivotal role of autistic traits in misophonia: A preliminary investigation of the interrelationship between misophonia and sensory sensitivity

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SUMMARY

Objective: A burgeoning body of evidence suggests a higher prevalence of autistic traits among individuals with misophonia. This study aimed to examine the comorbid psychiatric diagnoses and autistic traits along with associations between sensory profiles and internalizing symptoms in a clinical sample of adolescents with misophonia, while also comparing them to a control group.

Method: Female adolescents with misophonia (n = 22) and controls (n = 22) aged 14-18 years participated in this study. Psychiatric evaluations were conducted with semi-structured interviews. The diagnosis of misophonia was established both clinically and through the use of the Amsterdam Misophonia Scale Revised. Autistic traits were assessed by the Youth Self Report. The Revised Children's Anxiety and Depression Scale-Child Version and the Adolescent/Adult Sensory Profile were administered.

Results: The misophonia group exhibited a high prevalence of psychiatric diagnoses, particularly obsessive-compulsive disorder (OCD) and anxiety disorders. Adolescents with misophonia had a significantly higher level of internalizing symptoms, autistic traits, and sensory sensitivities ($p<0.001$, $r=0.58$; $p<0.01$, $d=1.02$; and $p<0.001$, $r=0.58$, respectively). Autistic traits had a mediating role in the relationship between misophonia and sensory sensitivity.

Discussion: These findings suggest that evaluating autistic traits may offer valuable insights into understanding and managing misophonia in female adolescents, opening up avenues for the development of targeted interventions aimed at mitigating the impact of misophonia-related sensory sensitivity outcomes.

Key Words: Misophonia, autistic traits, sensory sensitivity, female adolescent

INTRODUCTION

Misophonia, defined as "decreased sound tolerance" (1), is characterized by intense emotional reactions like anger, anxiety, or disgust to and avoidance behavior from special sounds such as oral sounds (e.g., chewing, slurping, sipping and smacking), nasal sounds (e.g., heavy breathing and sniffling) and some other sounds (e.g., pen clicking, clock ticking, finger tapping (2,3). Although it has been stated that misophonia should be considered as a psychiatric disorder (4), it has not been defined in diagnostic classification systems such as DSM-5 (Diagnostic Manuel of Mental Disorders-5 and ICD-10 (International Classification of Disease-10) (5,6).

Although misophonia has unique clinical characteristics with an underlying neurophysiological mechanism, it has a particularly strong association with psychiatric disorders (7). It has been reported that approximately half of the individuals with misophonia has accompanying anxiety disorder (8), obsessive-compulsive disorder (OCD) (4,9–11) and major depressive disorder (MDD) (7,12,13).

The relationship between misophonia and autism

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spectrum disorder (ASD) like traits has recently been addressed in a few studies (14,15). Elevated autistic traits have been reported in both children and adults with misophonia (15). Similarly, a recent study has reported a positive correlation between the severity of misophonia and autistic traits (14), while contradictory results were identified that ASD traits had no significant relation to the severity of the misophonia symptoms (16).

Lately, another focus on the psychiatric research field of misophonia is the possible association with general sensory sensitivities, and an obvious finding is that children with misophonia showed greater sensory hypersensitivity not only in the auditory domain but also more widely across multiple senses (12,15). In this regard, the profound association between ASD and misophonia has prompted researchers to explore the possibility of misophonia as a sensory manifestation of ASD. However, the sensory sensitivity commonly observed in ASD (touch and smell) usually diverges from the sensory profile identified in individuals with misophonia (sound) (15). Therefore, the precise nature of the association between elevated ASD characteristics and increased sensory sensitivity in individuals with misophonia have not yet been conclusively established.

Although there has been a recent rise in interest regarding misophonia, few studies have focused on concurrent psychiatric symptoms and sensory profile in adolescent aged group (10,15). As such, the current study aims to focus on the gap by investigating the co-occurrence of internalizing symptoms (anxiety, OCD and depressive symptoms), sensory profiles and autistic traits among adolescents with misophonia in a comparison with a control group without misophonia. The first aim of this study was to determine the accompanying psychiatric disorders. The second aim was to investigate specific psychological profiles associated with misophonia, including autistic-like traits, sensory profiles, and internalizing symptoms. The third aim was to clarify the pivotal role of autistic traits in the relationship between misophonia and sensory sensitivity.

Based on the aforementioned aims, we hypothesized that (I) adolescents with misophonia would exhibit higher rates of comorbid psychiatric disorders, particularly obsessive-compulsive disorder and anxiety, compared to controls; (II) individuals with misophonia would demonstrate significantly elevated levels of autistic traits, internalizing symptoms, and sensory sensitivities; and (III) autistic traits would mediate the relationship between misophonia and sensory sensitivity. By addressing these hypotheses, the current study seeks to contribute to the growing body of literature by providing a more comprehensive understanding of the psychiatric and sensory characteristics of adolescents with misophonia. In doing so, the findings may inform future diagnostic considerations and intervention strategies, and underscore the importance of recognizing misophonia as a distinct clinical profile, especially in adolescent female populations.

METHODS

Participants and procedure

This study was conducted at Sami Ulus Training and Research Hospital, department of child and adolescent psychiatry in Türkiye from July to December 2021. The sample consisted of 14-18-year-old adolescent females, newly diagnosed with misophonia (n=22; mean age= 15.36 years, SD=1.32), and age-matched controls (n=22; mean age= 15.95 years, SD=0.84) without misophonia.

The misophonia group comprised clinical cases who applied to the child and adolescent psychiatry outpatient clinic and were newly diagnosed with misophonia by a board-certified child and adolescent psychiatrist. Participants were recruited consecutively over a defined period using purposive sampling, ensuring that all individuals who met the inclusion criteria and consented to participate were included in the study.

The control group was selected from among the patients who applied to the pediatric outpatient clinics for minor acute illnesses such as common cold and coughs without having any psychiatric disorders. The healthy control group was matched for sex to control for potential sex-related differences and ensure homogeneity in sex distribution across groups.

Inclusion criteria for both groups were: being female, aged between 14 and 18 years, and having sufficient cognitive and language abilities to complete the assessments. For the misophonia group, a new diagnosis of misophonia confirmed by a child and adolescent psychiatrist was required. Exclusion criteria for both groups included the presence of any neurological or chronic medical conditions, uncorrected visual or hearing impairments, and any current or past psychiatric disorders in the control group.

The research protocol was approved by the Ethics Committee of Sami Ulus Hospital (Ethics approval reference number: E-21/06-195). Written informed consent was obtained from all participants and their parents.

First of all, sociodemographic characteristics of the participants were evaluated with a form prepared by the researchers. Next, psychiatric assessments were conducted by certificated child and adolescent psychiatrists who are certified in the application of Schedule for Affective Disorders Schizophrenia for Affective Disorders and Schizophrenia for School-Age Children Present and Lifetime Version (K-SADS-PL). The diagnosis of misophonia was established through clinical assessment by a child and adolescent psychiatrist, supported by scores on the Amsterdam Misophonia Scale Revised (AMISOS-R), which was used as a categorical measure to confirm the presence of misophonia. This combined approach ensured that case identification was based on both a structured clinical assessment and the use of the AMISOS-R as a standardized diagnostic instrument. Finally, the following questionnaires were administered respectively for the evaluation of anxiety, depressive symptoms and autistic traits: Revised Children's Anxiety and Depression Scale Child Version (RCADS-CV), Youth Self Report (YSR), and Adolescent/Adult Sensory Profile (AASP). Eligible participants completed the study measures during a single session, which was conducted concurrently with their psychiatric assessments.

Measures

Sociodemographic characteristics of the groups were examined using a semi-structured interview form, including age, disease history and family characteristics. The Hollingshead-Redlich Scale (HRS) was used to determine socioeconomic status (SES), divided into three categories: low (HRS ≤22), medium (HRS 23-44), and high (HRS ≥ 45) levels of SES (17).

K-SADS-PL-DSM-5, a semi-structured interview, is widely used for diagnosing child psychiatric disorders evaluating psychiatric symptoms and ending with diagnostic supplements (18). The K-SADS-PL-DSM-5 Turkish version has been found to be valid and reliable (19).

AMISOS-R is a self-reporting instrument that measures the presence and severity of symptoms experienced in response to particular auditory stimuli (4). The AMISOS-R was determined to be a valid and reliable instrument for evaluating misophonia in a Turkish adolescent sample, exhibiting a Cronbach's α of .92 and a test-retest reliability score of .89 (20). Following an initial inquiry regarding which sounds participants are sensitive to and the emotional responses these sounds elicit, a 10-item rating scale is administered. Each item is scored on a scale from 0 to 4, yielding a maximum possible total score of 40. Based on the total score, the severity of misophonia is categorized into four levels: normal and subclinical misophonia, mild misophonia, moderate to severe misophonia, and severe to extreme misophonia (20).

RCADS-CV was developed to screen for anxiety disorders, depression, and obsessive-compulsive symptoms in children and adolescents. This self-report questionnaire consists of forty-seven items and six subscales (generalized anxiety disorder, separation anxiety disorder, panic disorder, obsessive-compulsive disorder, social anxiety disorder, and major depressive disorder), and two comprehensive subscales (Total Internalizing and Total Anxiety) (21). Elevated scores correlate with heightened levels of symptoms. The validity and reliability of the Turkish version were conducted, inter-scale reliability was strong/excellent with a Cronbach's α of .95 and subscale coefficients ranging from .75 to .86, indicating strong internal consistency (22).

YSR, a self-report questionnaire, is designed to obtain 11-18 years olds' self-ratings of psychiatric problems (23). The YSR includes 112 emotional and behavioral problems based on the preceding 6 months. High scores indicate high levels of problems. A Turkish adaptation study was found to be valid and reliable (for total score, test-retest reliability= .82 and Cronbach's alpha=.89) (24). This checklist, similar to the Child Behavior Check List, is also used to define autistic traits (AT)-sum of the Withdrawn/Depressed, Social Problems, and Thought Problems subscales T-scores-, scoring above 195 is considered as a positive AT profile (25). This threshold was established and validated in prior research employing the ASEBA framework, demonstrating its efficacy in identifying clinically significant autistic-like behaviors (26).

AASP queries and evaluates adolescents' and adults' sensory processing abilities in their daily lives based on Dunn's sensory processing model. The responses are evaluated in four quadrants: low registration, sensory sensitivity, sensory avoiding, and sensory seeking (27). The Turkish version of the AASP questionnaire showed high internal consistency and test–retest reliability (r=.0.66–0.82 and r=0.67–0.82, respectively) (28).

Statistical Analysis

A priori analysis was conducted using G*Power 3.1 to determine the minimum sample size required to detect a large effect size (Cohen's d = 0.8) with a power of 0.80 and an alpha level of 0.05 for between-group comparisons (independent samples t-tests) (29). The analysis indicated that a total sample size of 42 participants (21 per group) would be sufficient to detect statistically significant differences (30,31).

IBM SPSS (Statistical Program for Social Sciences) 22.0 was used for statistical analyses of the sociodemographic and clinical characteristics of the groups. Prior to the analyses, the Shapiro-Wilk test was used to determine the normality of the data distribution. Group comparisons for continuous variables were conducted using the Independent samples t-test for the normally distributed variables, while the Mann-Whitney U test was used for non-normal distributions. For categorical comparisons, Fisher's exact test was performed. Spearman correlations were used to determine the relationships between scale scores. To determine the mediating effect of the autistic traits, multiple regression analyses were conducted to examine the relationship between misophonia (predictor) and sensory sensitivity scores (outcome) in the whole sample. All statistical tests were two-tailed with a threshold for significance of α =.05.

RESULTS

Sociodemographic and clinical characteristics of the groups

Both groups were found to be similar in terms of age, parental age, education level, and family characteristics (p> .05) (see Table 1).

Among the controls, one of the siblings had ADHD, and in the misophonia group, two parents had anxiety, two parents had OCD diagnoses, and one sibling had anxiety (Table 1). Thirteen (59%) out of 22 females with misophonia had psychiatric disorders, while the female participants in the control group did not receive any psychiatric diagnosis, although three of them had subthreshold anxiety disorders. Among the misophonia group, three participants (13.6%) had pure anxiety disorders, while an equivalent number of female participants (13.6%) had pure OCD. Additionally, four of them (18.1%) presented with comorbid diagnoses of OCD and anxiety, and two (9%) had a comorbidity of anxiety and depression. Furthermore, one female participant (4.5%) had an eating disorder.

Internalizing symptoms, sensory profiles, and autistic traits of the groups

Female participants with misophonia had significantly higher scores of depression, anxiety, and obsessive-compulsive symptoms and higher sensory processing profile scores in all four quadrants of AASP compared with controls (Table 2). The misophonia group scored significantly higher, especially in the domains of sensory sensitivity and sensory avoiding (p<.001 and p= .001, respectively).

Table 1. Sociodemographic characteristics of groups

Sociodemographic Variables	Misophonia (n=22) Mean (SD)/ Mdn (IQR)/n (%)	Control (n=22) Mean (SD)/ Mdn (IQR)/n (%)	*p*
Participants age (years) [a]	15 (14-17)	16 (15-17)	0.138
Mothers age (years) [b]	44.25 (5.43)	47.05 (5.93)	0.475
Fathers age (years) [b]	47 (4.55)	50.91 (5.83)	0.234
Mothers education level [c], n (%)			
Less than high school	6 (27.3)	2 (9.1)	
High school	8 (36.4)	7 (31.8)	0.196
College degree or higher	8 (36.4)	13 (59.1)	
Fathers education level [c], n (%)			
Less than high school	3 (16.7)	1 (4.5)	
High school	8 (23.3)	4 (18.2)	0.225
College degree or higher	11 (50)	17 (77.3)	
Family type [c], n (%)			
Nuclear family	21 (95.5)	22 (100)	
Extended family	1 (4.5)	0 (0)	1
SES [c], n (%)			
Low	4 (18.2)	3 (13.6)	
Medium	11 (50)	6 (27.3)	0.217
High	7 (31.8)	13 (59.1)	
Family history of psychiatric disorders [c], n (%)			
None	17 (77.3)	21 (95.5)	
Either parents	4 (18.2)	0	0.009
Siblings	1 (4.5)	1 (4.5)	

Note: Means are shown with standard deviations in parentheses; and medians are shown with inter-quartile range in parantheses. SD: Standard Deviation; Mdn: Median; IQR: Inter-quartile range; SES: socioeconomic status [a] *Mann-Whitney U Test,* [b] *Independent Samples T-Test,* [c] *Fisher Exact Test*

Comparing the autistic traits between the two groups, after the assumption of normality was confirmed, Student's t test was performed. Female participants in the misophonia group had significantly higher AT scores than controls on the YSR mean (SD)=185.72 (15.96) vs 170.00 (14.76); t (42) =-3.39, p=.002; Cohen's d = 1.02]. From the categorical perspective, more misophonia than control participants had a positive AT profile (12 [54.5%] vs 2 [9.1%]; Fisher's exact test, p=.003).

Associations between internalizing symptoms, autistic traits, and sensory profiles

Based on the our main hypothesis, the associations between total anxiety and total internalizing scores (total anxiety & depression), autistic trait scores, and sensory profile scale scores were investigated. Moderate-to-strong statistically significant correlations were detected between anxiety scores, depressive symptoms, autistic traits and sensory sensivity scores in the whole sample (Table 3).

Mediation analysis for the relationship between misophonia and sensory sensitivity

A One-way ANCOVA was conducted to determine the impact of psychiatric diagnoses on the association between misophonia and sensory sensitivity. Statistically significant effects of the misophonia on sensory sensitivity were found even after controlling for the diagnosis of OCD [F(1, 41)= 18.43,

Table 2. Comparisons of scale scores across the groups

	Misophonia (n=22)	Control (n=22)		
	Mdn (IQR)	Mdn (IQR)	Z/U	*p*
RCADS-CV				
GAD	55 (47.5-62.5)	49 (41-57)	-2.07/154	0.038*
SAD	57 (46.5-67.5)	48 (39-57)	-2.00/157	0.045*
PD	72 (63-81)	46.5 (36-57)	-3.26/103.5	0.001**
OCD	64 (57-71)	50.5 (41.5-59.5)	-3.18/106.5	0.001**
SP	54 (44.5-63.5)	44.5 (35.5-53.5)	-2.31/143.5	0.021*
MDD	73 (61.5-84.5)	41.5 (30-53)	-4.22/62.5	<0.001***
Total Anxiety	65 (55.5-74.5)	47 (39-55)	-3.33/100	0.001**
Total Internalizing	66 (55.5-76.5)	45 (36.5-53.5)	-3.86/77.5	<0.001***
AASP				
Low registration	33 (28-38)	29 (23-35)	-1.89/161.5	0.058
Sensory seeking	42 (38.5-45.5)	44.5 (40.5-48.5)	-1.77 /166.5	0.075
Sensory sensitivity	47 (42.5-51.5)	35 (30.5-39.5)	-3.85/78	<0.001***
Sensory avoiding	44.5 (40.5-48.5)	36.5 (32.5-40.5)	-3.33/100	0.001**

Note: Medians are shown with inter-quartile range in parantheses.
Mdn: Median; IQR: Inter-quartile range; RCADS-CV: Revised children s anxiety and depression scale-child version; GAD: Generalized anxiety disorder; SAD: Separation anxiety disorder; PD: Panic disorder; OCD: Obsessive-compulsive disorder; SP: Social phobia; MDD: Major depressive disorder; AASP: Adolescent/adult sensory profile *Mann-Whitney U Test* *p<0.05, **p<0.01, ***p<0.001

Table 3. Correlation anaylses of scale scores

	RCADS-CV Internalizing	YSR-AT	AASP Low registration	AASP Sensory seeking	AASP Sensory sensitivity	AASP Sensory avoiding
RCADS-CV Anxiety	0.974***	0.609***	0.502**	-0.022	0.632***	0.673***
RCADS-CV Internalizing		0.646***	0.523***	-0.031	0.654***	0.685***
YSR-AT			0.479**	-0.048	0.581***	0.610***
AASP/Low registration				0.207	0.551***	0.372*
AASP/Sensory seeking					-0.136	-0.212
AASP/Sensory sensitivity						0.786***

RCADS-CV: Revised childrens anxiety and depression scale child version; YSR: Youth Self Report; AT: Autistic trait; AASP: Adolescent/adult sensory profile
Spearman Correlation Test *p<0.05, **p<0.01, ***p<0.001

p<.001)], anxiety [F(1, 41)= 15.50, p<.001)], and depression [F(1, 41)= 25.67, p<.001)]. To further determine the interrelationship between misophonia, autistic traits and sensory sensitivity regression analysis was carried out. A model was developed based on the hypothesis that autistic traits could mediate the relationship between misophonia and sensory sensitivity. Finally, the significant correlations of both YSR-AT score (autistic traits) and group with AASP/Sensory Sensivitiy score (r =0.58, p < .001, and r = 0.61, p < .001, respectively) suggested the eventual presence of a partial mediating effect of autistic trait score on the relationship between group and sensory sensitivity score. The mediation analysis showed a significant indirect effect of group on sensory sensitivity score through autistic traits, β= 0.39 (95% bootstrapped); group showed β=0.54, p < .001 for YSR-AT score (Figure 1).

DISCUSSION

In this study, comorbid psychiatric disorders, autistic traits, sensory profiles, and internalizing symptoms in female adolescents with misophonia were investigated and compared with age-matched controls. Additionally, the interrelationships between autistic traits, sensory sensitivities, and misophonia were identified along with the direct and indirect effects. Since a greater prevalence of misophonia has been reported in females (32), and the vast majority of cases with misophonia presented in the previous studies (12,13) are female gender, our sample consisted entirely of female adolecents. It is also possible that gender-related discrepancies in seeking professional help may skew reported prevalence rates (33). In other words, misophonia itself may not exhibit gender-related patterns, potentially implicating sampling bias. Nevertheless, because our sample includes clinical data, it is important to examine the psychiatric correlates in females with misophonia. Nevertheless, it is important to note that our research findings. Naturally, these results are ultimately applicable to the female adolescent clinical group.

Initially, it was observed that approximately half of adolescent females with misophonia also presented with either comorbid anxiety, OCD, or both. According to our research findings, approximately one-third of them had OCD, and one-fifth had an anxiety disorder, which is consistent with recent studies (34,35). Based on the substantial comorbidity between misophonia and these disorders (4,8–10), previous announcements have suggested that individuals who exhibit misophonia as a major complaint should be assessed for other psychiatric

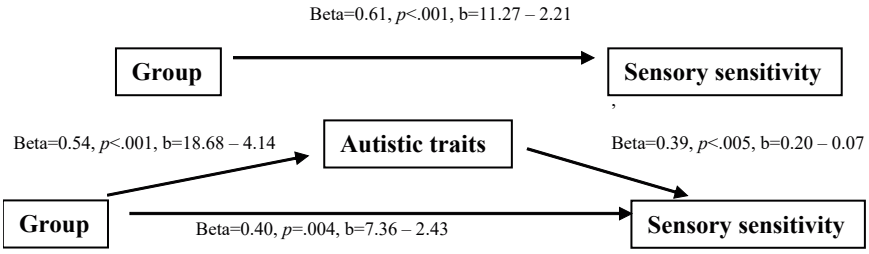

Figure 1. Mediation analysis results

disorders, specifially OCD and anxiety disorder (36). Additionally, it is well established that misophonia shares phenomenological similarities with OCD and anxiety disorders (4,9,13). However, misophonia falls short of meeting the complete diagnostic criteria for any of these specific disorders (37), and vice versa, these diagnoses do not fully encompass all of the symptoms of misophonia (4). Consequently, this finding could support the arguments that misophonia should be considered as a distinct diagnosis with its own unique clinical characteristics (7,38).

Recent research investigations have demonstrated that individuals with misophonia exhibit heightened levels of autistic traits (15), and a strong positive association has been observed between the severity of misophonia symptoms and the presence of these autistic traits (14). As expected, higher YSR-AT scores indicating increased autistic traits in the misophonia group than controls supported these findings. This observation is also consistent with previous research showing that individuals with misophonia often present with elevated levels of autistic traits, including sensory sensitivities, rigid thinking patterns, and difficulties with social communication (16,39). Such studies have highlighted overlapping features between misophonia and ASD, suggesting shared underlying neurodevelopmental mechanisms. These parallels reinforce the notion that autistic traits may play a significant role in the clinical profile of individuals with misophonia. On the other hand, there is also evidence suggesting no significant association between the ASD and misophonia. For instance, a study examining children and adolescents found that ASD symptoms were not elevated in children with misophonia, and no correlation between misophonia symptoms and ASD traits was observed. In fact, ASD symptoms were significantly lower in children with misophonia compared to those with anxiety disorders (34). Similarly, research focusing on adolescent outpatients reported an inverse correlation between misophonia and autistic traits, indicating that higher levels of misophonia symptoms were associated with lower levels of autistic traits (40). These findings highlight the complexity of the relationship between misophonia and autistic traits, indicating that while some individuals may exhibit overlapping features, misophonia does not universally co-occur with ASD.

According to the current results, female adolescents with misophonia also demonstrated greater sensory sensitivity using AASP, consistent with the prior investigations (2). The strong correlations observed between misophonia and general sensitivities suggest a potential link between selective sound sensitivities and increased prevalence of other forms of sensory hypersensitivity (12). Another related issue is whether misophonia is different from sensory over-responsivity (SOR), which is a clinical condition seen in childhood and is associated with ASD, and also is a part of the diagnostic criteria for ASD in the latest DSM (5). SOR is characterized by intense distress (e.g., irritability or anger outbursts) by sensory stimulation, such as a particular auditory stimuli (e.g., sirens) (41). Since the trigger stimuli associated with SOR are not the same as those associated with misophonia (e.g., chewing, breathing), it can be argued that SOR and misophonia are a discrete entity (42). Additionally, misophonia and ASD should not be regarded as synonymous, although in this study, it was observed that approximately half of the adolescents with misophonia exhibited characteristics resembling those found in ASD.

Studies have indicated significant relationships between all four quadrants of the sensory profile (28). Here, we found that females with misophonia had significantly higher sensory sensitivity, sensory avoiding, and low registration scores. Regarding the current correlations between sensory profiles of all participants, we found moderate-to-large positive relationships, except for the sensory seeking domain. The lack of significant differences can be interpreted as suggesting that sensory seeking is not consistently stable and uniform, particularly during later developmental stages that correspond to the age range of the group included in our study (43).

Mediation analysis revealed that autistic symptoms acted as a mediator in the relationship between misophonia and sensory sensitivity. This evidence holds potential implications for interventions as it unveils an underlying mechanism that indirectly influences the outcomes associated with misopho-

nia. As such, it may be beneficial to target sensory sensitivities to evaluate autistic traits before implementing psychiatric interventions. However, due to the small size and cross-sectional nature of the current study, conducting mediation analysis is rendered questionable at best. Therefore, it is evident that these factors should also be considered when interpreting the mediation results, especially in this context.

The emerging evidence on the association between SOR in ASD has spurred theoretical speculation, with one model proposing that ASD contributes to SOR (44). More recently, sensory sensitivity has become part of the diagnostic criteria for ASD (5). In line with these suggestions, our mediation analysis demonstrates the mediator role of autistic traits between misophonia and sensory sensitivity. In light of our findings, defining ASD-related traits may constitute a valuable alternative research emphasis within the realm of misophonia.

This study offers several unique contributions to the existing literature on misophonia. Unlike most previous studies, which have primarily focused on adult populations or lacked well-defined diagnostic procedures, the current research specifically targeted clinically diagnosed female adolescents, using both clinical evaluation and psychiatric scales. By incorporating a control group matched for age and sex, this study also enabled a more rigorous comparison of psychiatric comorbidities, sensory profiles, and autistic traits. Furthermore, the inclusion of mediation analysis allowed for an exploration of the underlying mechanisms linking misophonia, sensory sensitivity, and autistic traits—an area that remains understudied. These methodological strengths underscore the value of this study in advancing the understanding of misophonia as a distinct clinical entity with unique neurodevelopmental features, particularly in female adolescents.

There exist several limitations that are considered as such. First, the cross-sectional design did not allow for causal relationships to be established between misophonia and psychiatric comorbidities. Therefore, it is difficult to ascertain whether misophonia is a risk factor for the development of psychiatric comorbidities or whether the presence of comorbid psychiatric conditions exacerbates misophonia symptoms. Second, the study relied on self-reported measures of psychiatric symptoms and sensory profiles, which may be subject to response bias and social desirability effects. Additionally, because the severity of misophonia was not assessed, it was not possible to examine the relationship between psychiatric symptoms and misophonia severity. Most notably, the relatively small sample size restricts the statistical power and may limit the robustness of the observed relationships. Additionally, the sample consisted exclusively of female adolescents, which may reduce the generalizability of the findings to male populations or to broader clinical and community samples.

Given the preliminary nature of the present study, future research should aim to replicate and expand upon these findings in larger, more diverse samples, including both female and male participants, to enhance generalizability. Longitudinal designs would be particularly valuable for examining the temporal dynamics and potential causal relationships between misophonia, autistic traits, and sensory sensitivities. Additionally, the inclusion of objective assessments of misophonia severity and multi-informant reporting (e.g., parent or clinician ratings) could help reduce self-report bias and strengthen the validity of observed associations. Neurobiological or neuroimaging studies may also contribute to clarifying the shared and distinct mechanisms underlying misophonia and related neurodevelopmental conditions such as ASD. Moreover, experimental studies exploring targeted interventions that address sensory processing difficulties and autistic traits may provide further insight into effective treatment approaches tailored to individuals with misophonia.

In conclusion, the present study identified several noteworthy findings concerning female adolescents with misophonia. Notably, a substantial proportion of participants exhibited comorbid psychiatric disorders, particularly obsessive-compulsive disorder and anxiety, aligning with prior research. Furthermore, individuals with misophonia demonstrated significantly higher levels of autistic traits and sensory sensitivities relative to age-matched controls. Lastly, the current findings indicated that autistic traits may function as an intermediary fac-

tor linking misophonia to sensory sensitivity, suggesting a potentially shared neurodevelopmental mechanism. Collectively, these results offer a more refined understanding of the clinical profile of misophonia and lend support to its conceptualization as a distinct diagnostic entity, rather than a mere manifestation of other conditions such as OCD or ASD. These findings have important implications for both clinical practice and future research because they shed light on the potential mechanisms underlying misophonia and open up avenues for developing targeted interventions that address autistic traits to mitigate the impact of misophonia-related sensory sensitivity.

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