PROFILING THE IMPACT OF MISOPHONIA USING THE ICF CLASSIFICATION SYSTEM

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SEPTEMBER - 2023

CERTIFICATE

This is to certify that this dissertation entitled **"Profiling the Impact of Misophonia Using the ICF Classification System"** is the bonafide work submitted in part fulfilment for the degree of Master of Science (Audiology) of the student with Registration Number **P01II21S0048**. This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other university for the award of any other Diploma or Degree.

Mysuru

September 2023

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DECLARATION

This is to certify that this Master's Dissertation entitled **"Profiling the Impact of Misophonia Using the ICF Classification System"** is the result of my study under the guidance of Dr. Prashanth Prabhu P (Guide), Assistant Professor in Audiology, Department of Audiology, All India Institute of Speech and Hearing, Mysuru, and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

Mysuru **Registration No: P01II21S0048**

September 2023

Dedicated to my dearest and adorable family,

Ammachi, Achayi and Aravind,

and to my wonderful and steadfast friends,

Preeti Chech, Sands, Heinzy, and Sam,

Moreover, to **all the people living every day with misophonia.**

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I can do all this through him, who gives me strength.

Philippians 4:13 NIV

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ABSTRACT

Misophonia is characterised by an abnormal extreme reaction to specific sound stimuli known as triggers. The reactions can be emotional, behavioural or physiological. In response to triggers, a person with misophonia might express irritation, anger or disgust by being verbally or physically aggressive. This ultimately impacts their quality of life. The present study aimed to determine the impact of misophonia on everyday life using the International Classification of Functioning, Disability and Health (ICF) as a classification system. The study sample included 51 individuals with misophonia. The data was collected using two open-ended questions, the Problem Question (PQ) and the Life Effects Question (LEQ). The responses were linked to categories within ICF using a simple content analysis approach. Of 294 responses obtained, 222 were related to PQ, and 72 were associated with LEQ. Activity Limitations and Participation Restrictions were predominant in misophonic individuals, followed by Impairments of Body Function. There is a significant relationship between gender and the ICF domains. The study alludes to the multifaceted characteristics of the effect of misophonia on persons affected. It demonstrates the advantages of using open-ended questions in studying this impact.

Keywords: activity limitations, body function, environmental factors, gender, ICF, misophonia, open-ended questions, participation restrictions.

Abbreviations: ICF = International Classification of Functioning, Disability and Health; LEQ = Life Effects Question; PQ = Problem Question.

CHAPTER 1

INTRODUCTION

Misophonia is a disorder characterised by an abnormally strong adverse reaction to specific sound stimuli. These specific sound stimuli are known as triggers. The reaction to these triggers can be emotional or physiological. Misophonia has been gaining acceptance in recent years. It was formally recognised as a separate disorder, Selective Sound Sensitivity Syndrome, in the late 1990s (Danesh & Aazh, 2020). The word 'misophonia' was coined in the year 2002 from the combining Greek roots 'miso', meaning hate, and 'phonia', meaning sound (Jastreboff & Jastreboff, 2014).

Schröder et al. (2013) provided a diagnostic criterion for misophonia. Swedo et al. (2022) developed a consensus definition for misophonia. It states that:

> Misophonia is a disorder of decreased tolerance to specific sounds or stimuli associated with such sounds. These stimuli, known as "triggers," are experienced as unpleasant or distressing and tend to evoke strong negative emotional, physiological, and behavioural responses that are not seen in most other people. (p.10)

Studies on the frequency of misophonia are limited. Wu et al. (2014) found that the prevalence of misophonia was 19.9 % in 483 US undergraduates. The prevalence of misophonia in UK undergraduates was 49.1 % (Naylor et al., 2021). The prevalence of misophonia was 23.28 % among 170 graduate students at Mysore University (Aryal & Prabhu, 2022). In another study, misophonia was present in about 15.85 % of 328 Indian undergraduates (Patel et al., 2022). Tada et al. (2022) reported the prevalence in Japan to be

54 %. The Turkish population's prevalence of misophonia was estimated to be 12.8% of 541 residents (Kılıç et al., 2021).

Reports on the frequency of misophonia in clinical groups are present in the literature. Yektatalab et al. (2022) reported that 23.8 % of 390 Iranian undergraduates were misophonic. Of the 23.8% (93), 39.8% (37) had OCD, 8.6% (8) had anxiety, and 9.7% (9) had depression. Kenar et al. (2022) studied the prevalence of misophonia in the multiple sclerosis population. They reported a higher prevalence in the multiple sclerosis group compared to controls. There was also a higher frequency of severe depression and anxiety in patients with multiple sclerosis and misophonia.

Misophonia can occur in isolation or along with other psychiatric disorders, such as mood disorders, obsessive-compulsive personality disorder (OCPD) and attention deficit hyperactivity disorder (ADHD) (Schröder et al., 2013). It can also occur alongside other decreased sound tolerance disorders, such as tinnitus, hyperacusis and phonophobia (Jastreboff & Jastreboff, 2014).

According to Jastreboff and Jastreboff (2014), the sound can also be related to a previous negative experience. Individuals with misophonia express their irritation, anger and disgust in response to the triggering sound aggressively. This can be verbal or physical. Misophonic individuals understand that their response is excessive and tend to avoid social situations (Schröder et al., 2013). Their response inadvertently affects their relationships with family, friends and colleagues. The impact of misophonia extends to all situations of life and, thus, harms the quality of life.

1.1 Need for the Study

An individual's reactions to misophonic triggers can interfere with daily life (Jastreboff & Jastreboff, 2014). It leads to significant distress and mental health issues. Functional impairment caused by misophonia can be mild to severe. It affects the occupational and academic roles of the individual. They also have difficulty with attention and the performance of tasks (Schröder et al., 2013). The social life of misophonic individuals is affected by adverse reactions to triggers, leading them to have poor social relationships and isolation from social events (Schröder et al., 2013).

The International Classification of Functioning, Disability, and Health (ICF) is a multidimensional classification of health and health-related domains (World Health Organization., 2001). The major domains of the classification include Body Structure(s), Body Function, Activity Limitation, Participation Restriction, Environmental Factors, and Personal Factors, which allow for an understanding of human functioning and disability for the development of clinical, research, policy and other public health uses (Üstün et al., 2003).

Literature on the efficacy of this classification in describing the overall impact of different auditory disorders is available. Classifying hearing loss through ICF leads to most ICF categories under the Activity and Participation division, followed by the division of the Environmental Factors (Granberg, Möller, et al., 2014). For single-sided deafness, Functional Impairment had the most ICF categories, followed by Activity and Participation and Environmental Factors (Durisala et al., 2017). Manchaiah, Nisha, et al. (2022) report that Activity and Participation are the most affected ICF categories for tinnitus.

The literature review also indicates that research needs to be performed on classifying the impact of misophonia using the ICF classification system. Thus, the current study aims to use the ICF system to highlight the daily barriers and life effects experienced by individuals with misophonia. Specifically, the study will focus on the full effects of misophonia on Body Function, Activity and Participation, and Environmental and Personal Factors.

1.2 Aim of the Study

The current study aims to profile the impact of misophonia experienced by individuals in their everyday life.

1.3 Objectives of the Study

- To record the consequences and life effects of misophonia using the ICF classification, particularly for the domains: Body Function, Body Structures, Activities, Participation, Contextual Factors, Environmental Factors, and Personal Factors.
- To know which domain among Body Structure(s), Body Function, Activity Limitation and Participation Restriction, Environmental Factors, and Personal Factors of ICF classification is most impactful in everyday life for individuals with misophonia.
- To evaluate if there are any gender differences for the ICF categories.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Definition of Misophonia

Misophonia has been recognised and defined by different fields of science, including audiology, psychology/psychiatry and neuroscience, in the past decade. However, scientists disagree on whether this condition belongs to auditory, psychiatric/psychologic, or neurological disorders.

Marsha Johnson, AuD, first reported on increased sensitivity to specific sound stimuli among members of online support groups for hyperacusis in the late 1990s. She coined Selective Sound Sensitivity Syndrome (4S) (Danesh & Aazh, 2020). The term *misophonia* was introduced in 2002 by Margaret Jasterboff, PhD and Pawel Jasterboff, PhD, who combined the Greek words *miso* (meaning *hate*) and *phonia* (meaning *voice, sound*) (Jastreboff & Jastreboff, 2014).

Misophonia has been described as an abnormally intense response to a sound with a particular pattern and meaning to a specific subject. It depends on the environment and may be associated with a previous negative experience (Jastreboff & Jastreboff, 2014, 2015). Møller (2011) considered misophonia a phantom sensation similar to tinnitus and defined it as a “dislike of certain specific sounds”. Schröder et al. (2013) investigated 42 patients with misophonia and reported that misophonia symptoms could not be classified under the disorders utilising DSM-IV-TR and ICD-10. Therefore, the authors suggested that misophonia must be considered a separate psychiatric disorder. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) (American Psychiatric

Association, 2013), and the International Statistical Classification of Diseases and Related Health Problems, Eleventh Revision (World Health Organization, 2022), neither include an official diagnosis for misophonia. Brout et al. (2018) stated that misophonia was a complicated neurophysiological and behavioural disease distinguished by heightened physiological responsiveness and high emotional reactivity from sensitivity to particular auditory stimuli.

A standard or foundational description is necessary for comprehending the disorder and developing effectual treatment for individuals affected. Swedo et al. (2022) executed a study involving an expert committee from June 2020 through January 2021 to meet this demand. The authors agreed on a definition of misophonia. According to this study, misophonia presents as reduced tolerance to specific sounds. The stimuli, also known as triggers, are distressing or discomforting and tend to elicit intense negative emotional, physiological and behavioural reactions uncommon in other individuals.

2.2 Prevalence of Misophonia

Research on the prevalence of misophonia has been growing in the past few years. Misophonia can occur with other psychiatric disorders such as obsessive-compulsive disorder (OCD), depression, anxiety disorders, attention deficit hyperactivity disorder (ADHD) and other mood disorders. The prevalence of misophonia was studied initially alongside its comorbid conditions.

Schröder et al. (2013) described the clinical profile of 42 Dutch patients with misophonia. The patients were assessed using a standard psychiatric interview. Their general and psychiatric history was obtained. They were evaluated with the Structured Clinical

Interview for DSM-IV Axis II Personality Disorders (SCID-II), the Hamilton Depression Rating Scale (HAM-D), the Hamilton Anxiety Rating Scale (HAM-A) and the Symptom Checklist (SCL-90). To measure the severity of misophonia, the Amsterdam Misophonia Scale (A-MISO-S) was used, which was obtained by modifying the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS). The psychiatric comorbidities for persons with misophonia in this sample were 52.4 % with obsessive-compulsive personality disorder, 7.1 % with mood disorders, 4.8 % with ADHD, 4.8 % with Tourette Syndrome, 4.8 % with trichotillomania, 2.4 % with skin picking, 2.4 % with obsessive-compulsive disorder, 2.4 % with panic disorders and 2.4 % with hypochondria.

Studies on prevalence have been conducted on the student population and the general population of various countries. A cross-sectional study was conducted by Naylor et al. (2021) on the medical student population in the UK using A-MISO-S. Misophonia was reported in 49.1 % of the 336 students in the study sample.

Kılıç et al., 2021 reported on the frequency of misophonia in 541 individuals out of 300 homes in Ankara, Turkey. The researchers used a semi-structured interview designed for their study. From their research, the prevalence of misophonia is understood to be 12.8%, which is 69 individuals out of 541 individuals interviewed. However, the authors also note that 78.9% of the sample population, 427 individuals, reported at least one misophonic sound to be distressing.

Jakubovski et al. (2022) performed a population survey among households in Germany. They utilised the Misophonia Questionnaire (MQ) and Amsterdam Misophonia Questionnaire (AMISOS-R) to determine misophonia symptoms. Two estimates of the

prevalence of symptoms were performed; the primary estimate was per MQ, and the secondary estimate was as per AMISOS-R. Among 126 individuals, 5.0 % of the sample were determined to have clinically significant misophonic symptoms, according to the primary estimate, MQ. The AMISOS-R rating estimated that 5.9 % of the sample suffered from misophonia.

In 2023, a study was conducted on the general population of the UK using a multidimensional psychometric tool, the Selective Sound Sensitivity Syndrome Scale (S-Five), the Misophonia Questionnaire (MQ), the Amsterdam Misophonia Scale (A-MISO-S), Public Health Questionnaire – 9 (PHQ-9), the Generalized Anxiety Disorder – 7 questionnaire (GAD-7) and a diagnostic interview. The authors estimated the frequency of misophonia in the general population of the UK to be 18.4 % (Vitoratou et al., 2023).

Wu et al. (2014) studied 483 undergraduate students from Florida, USA, through the online administration of questionnaires. The questionnaires utilised were the Misophonia Questionnaire (MQ), the ASQ, the Sheehan Disability Scale (SDS), the Obsessive-Compulsive Inventory-Revised (OCD-R), Depression Anxiety Stress Scale – 21 (DASS-21) and the Rage Outbursts and Anger Rating Scale (ROARS). The authors stated that approximately 20 % of the study population exhibited significant misophonic symptoms.

Aryal and Prabhu (2022) performed a cross-sectional study of 172 students from Mysore University in Karnataka, India. The authors employed the Amsterdam Misophonia Questionnaire (A-MISO-S) and the Misophonia Assessment Questionnaire (MAQ), which were administered through an online survey. The study participants included 172 students

between 18 and 30 years old. 48.27 % of the participants reported experiencing misophonia, and 23.28 % reported clinically significant misophonic symptoms.

Patel et al. (2022) conducted a preliminary online survey on undergraduate students across India. The measures utilised were the Amsterdam Misophonia Questionnaire (A-MISO-S) and the Misophonia Questionnaire (MQ). It included 328 students, of which approximately 15.85 % had misophonia of moderate to severe degree.

2.3 Misophonia Triggers and Reactions

Triggers are perceived as unpleasant and stressful. They tend to elicit a powerful adverse emotional, physiological and behavioural reaction, which is inappropriate and disproportionate.

Most triggers reported include sounds produced by another individual, specifically those produced by the human body. The precise pattern or meaning of the trigger to the person elicits reactions rather than the intensity of the specific sounds or stimuli. In describing a case example, Bernstein et al. (2013) report that the sounds of slurping, swallowing and chewing triggered the subject. The degree to which the subject reacted to the trigger differed between housemates, family members and strangers. Hadjipavlou et al. (2008) described two cases of misophonia. In the first case, the triggers included the sounds of people licking their lips, eating and speaking, and in the second case, the triggers included the sounds of eating, speaking and people picking their nails. Kumar et al. (2014) studied the profile of symptoms and triggers in the misophonic population and reported that 93.0 % described eating sounds as triggers. In a study describing familial misophonia, the most common trigger sounds were related to the mouth (chewing food, brushing teeth, whistling,

and popping lips), the nose (snoring, blowing the nose and breathing) or fingers (typing, clicking a pen). Half the participants in the study also claimed that the sounds caused a more robust reaction when produced by persons closely related to them than strangers (Sanchez & Silva, 2018).

Specific voices and spoken sounds have been reported as triggers. Colucci (2015) reported a case whose triggers included the spoken /s/, /t/, /ch/, and /sh/ sounds. Zhou et al. (2017) reported consonants and vowels among triggers affecting the population of Chinese university students they studied. Webber et al. (2014) describe a case that reported certain songs and high-pitched voices to be triggering. Other trigger sounds include repetitive clicking and tapping.

2.4 International Classification of Functioning, Disability and Health

2.4.1 History of the ICF

The attempts to classify disease systematically date back to the 18th century. François Bossier de Sauvages de Lacroix developed a system of 10 distinct disease classes, which included 2400 diseases. The WHO assumed the "International Statistical Classification of Diseases or ICD" in 1949 (Hirsch et al., 2016; Jetté et al., 2010). It allowed for the recording of the incidence of the disease and its outcome singularly about its mortality. However, the existence of health conditions that do not solely result in death but disability requires a model that focuses on the individual and their interaction with their environment, in addition to mortality.

In the mid-1970s, the World Health Organisation developed a system to assist in assessing disability caused by disease. It focused on three dimensions that broadly

correspond to impairment of function at the level of the organ, leading to disability, which in turn led to limited societal interaction. This system, the International Classification of Impairments and Handicaps (ICIDH), was published in 1980 (Thuriaux, 1995).

The ICIDH has been criticised for over-medicalization and for emphasising that the critical determinant of disability is the limitations of people's abilities, with insufficient attention given to the role of an unaccommodating environment in creating disability. It underwent seven revisions and testing, leading to the fifty-fourth World Health Assembly officially advocating the International Classification of Functioning, Disability and Health and the acronym ICF in May 2001 (Australian Institute of Health and Welfare, 2002; Bickenbach et al., 1999; Imrie, 2004).

2.4.2 Overview of the ICF

ICF provides a global and standardised language and framework for describing health and health-related conditions. It defines elements of health and well-being related to health, such as education and employment. ICF defines functioning as including all body functions, activities and participation. It utilises the term disability for impairments, activity limitations or participation restrictions. It also indexes environmental factors that interact with functioning and disability. As a framework, it assesses health and disability in individual and population contexts. (World Health Organization., 2001).

ICF is a member of the global classifications the World Health Organisation (WHO) created for use in various areas of health. It is a multipurpose classification system that supports numerous disciplines and sectors. As a classification system, ICF has a hierarchical structure that divides information into different levels. The two broad domains at the top of

the hierarchy are Functioning and Disability, and Contextual Factors. These domains are divided into categories, providing comprehensive and systematic information classification. It classifies information across multiple domains, including Body Functions, Body Structures, Activities, Participation, Environmental Factors, and Personal Factors (World Health Organization., 2001). The ICF views a person's level of functioning as the result of a complex interaction between Personal Factors, Environmental Factors and health conditions.

It is based on the biopsychosocial model. The ICF was developed to address the limitations of traditional models of health and disability in representing the multidimensional nature of human functioning and disability.

It is a person-centred approach that recognises and facilitates a holistic assessment of one’s functional abilities and assists in constructing individualised interventions and other supportive services. ICF also supports research and evidence-based practice as it provides a standard framework and a shared language, enabling interdisciplinary research and facilitating the comparison of findings among studies. It has practical utility for policy development and implementation in health care as it allows policymakers to identify barriers and guides the inception of policies and strategies to aid in removing the identified barriers. ICF is also used in health information systems and statistics to classify and code data related to functioning and disability. It can be utilised for education and training programs for professionals from different disciplines. It is also valuable in assessing an individual’s qualification for disability benefits and other social benefits (World Health Organization., 2001).

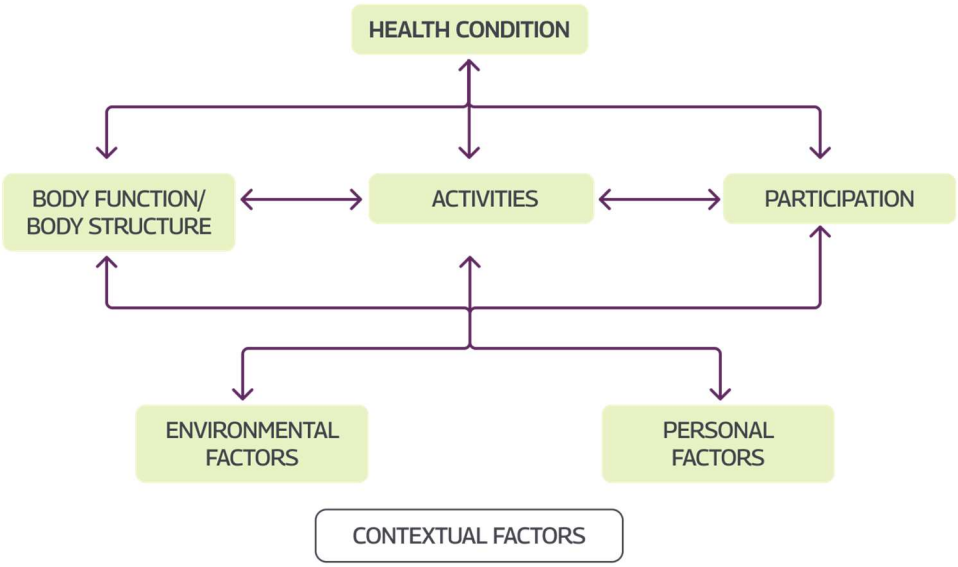
2.5 Conceptual Model of ICF

ICF is based on the biopsychosocial model, which integrates the medical and social models of disability. The medical model perceives disability as a person's characteristic directly resulting from disease, trauma or other health conditions. It assumes that disability requires medical care provided as individualised treatment by a professional and stipulates correcting the problem with the individual. The social model of disability perceives disability as a socially actualised issue, not a characteristic of the individual. Thus, it necessitates a political and social response as the disability stems from disobliging physical surroundings caused by attitudes and different elements of the social context. Both models are partially valid but inadequate independently, so the biopsychosocial model integrates their advantages to provide a versatile perception of the different health perspectives: biological, individual and social (World Health Organization., 2001).

Within this model, ICF defines functioning and disability as the results of interactions between health conditions and contextual factors. Contextual factors include external Environmental Factors and internal Personal Factors. Environmental factors include the physical, social and attitudinal environment that a person lives in. This ranges from climate and terrain to social attitudes and laws. Understanding how people interact with their environment is essential to explain their functioning and disability adequately. Personal Factors include age, gender, coping strategies, education, past and current experience, social background and other factors that can affect a person's experience with a disability (World Health Organization., 2001).

Figure 2.1

Model of Disability by ICF (World Health Organization., 2001)



The figure shows how ICF classifies human functioning at three levels: functioning at the level of an individual body or body part, functioning at the level of an entire person and functioning of an entire person within a social context. Therefore, disability is a dysfunction at one or more levels and can be classified under Impairments, Activity Limitations and Participation Restrictions. Impairments are difficulties related to bodily function or structure, like a substantial deviation or loss. Activity concerns the execution of a task or an action. Participation entails how an individual engages in a life situation. Activity Limitations specify challenges in performing activities. Participation Restrictions characterise the constraints encountered during engagement in daily life experiences. The

physical, social, and attitudinal context in which individuals reside and interact daily comprises Environmental Factors (World Health Organization., 2001).

2.6 ICF Core Sets

The ICF classification system is quite exhaustive and complex for daily practice. To simplify the use of the ICF for clinicians and other professionals, the WHO created tools based on the ICF, such as the ICF Checklist and the WHO Disability Assessment Schedule II (WHO-DAS II). The WHO-DAS II and ICF Checklist may have limitations in specialist settings due to their generic nature. This apparent need for specialised clinical settings was the main impetus for WHO and the ICF Research Branch to design the exacting scientific procedure yielding the Comprehensive and Brief ICF Core Sets.

ICF Core Sets are specifically crafted, condensed collections of ICF categories across the whole classification for describing functioning and disability. A three-phase, multi-method scientific procedure is used to create ICF Core Sets. Empirical multicenter research, a comprehensive literature examination, a qualitative investigation, and an expert poll are the four preliminary studies that go into the procedure. The outcomes of the initial investigations act as the foundation for a systematic consensus-building process at an international conference where participating experts choose which ICF categories will be present in the Comprehensive and Brief ICF Core Sets. The first ICF Core Set may need modification for specific applications and deployment in particular contexts (Selb et al., 2015).

2.7 Application of ICF in Auditory and Vestibular Disorders

ICF has been incorporated into audiology and vestibular research for measuring outcomes and understanding the quality of life and functional impact of different disorders on the population.

Ramkumar and Rangasayee (2010) investigated the effects of tinnitus on body function and activity limitation/participation restriction. The study comprised twenty-one normal-hearing individuals between the ages of 18 and 60. These participants experienced continuous tinnitus for at least three months. An intake questionnaire and Tinnitus Handicap Questionnaire (THI) were administered. Each question within THI was mapped by assigning an ICF code. The authors reported that the test reliability and internal consistency of the THI+ICF questionnaire were good. Compared to activity limitation/participation restriction, body function was more impaired. The authors concluded that from an ICF perspective, tinnitus does not significantly affect activity limitation/participation restriction. In addition, the psychoacoustic characteristics of tinnitus had little to no effect on activity participation/participation restriction.

Another study exploring the problem and life effects endured by persons with tinnitus was conducted in the UK. The study recruited volunteers 18 years and above who had experienced tinnitus for at least three months. A demographic questionnaire, the Tinnitus Functional Index, the Insomnia Severity Index and the Generalized Anxiety Disorder were administered to the participants. The participants were also asked the Problem Question (PQ) and Life Effects Question (LEQ). All the responses obtained were linked to ICF and analysed. The authors reported that most problems provided by the participants were

classified under body function, with activity limitations and participation restrictions in succession. Limited answers were associated with environmental and personal factors (Manchaiah et al., 2018).

Manchaiah et al. (2022) examined the effects of tinnitus among the US population. Three hundred forty-four persons with tinnitus responded to questionnaires and open-ended questions (PQ and LEQ). Their answers were mapped to the ICF categories. The most salient consequence of tinnitus was activity limitations and participation restrictions. Recreation and leisure (d920), conversation (d350), communicating with – receiving - spoken messages (d310), listening (d115), and remunerative employment (d850) were the most often reported responses to activity limitations and participation restrictions. This was followed by body function, within which the commonly stated categories were emotional functions (b152), attention functions (b140), and sleep functions (b134).

Durisala et al. (2017) studied the issues and life effects faced by individuals with unilateral hearing loss using the ICF classification. A total of 26 participants were asked to answer the Problem Questionnaire (PQ) and Life Effects Questionnaire (LEQ). ICF codes were assigned to the reported answers and classified. The authors commented that patients generally responded more to PQ than LEQ. More responses were categorised under functional impairment compared to activity limitations, participation restriction, or environmental factors.

Hearing loss and vertigo research were conducted to develop ICF Core Sets. The first version of the ICF Core Sets for hearing loss was in response to the need for a single audiology questionnaire that would cover the broad perspective embodied by the ICF and

for an agreement on the best tool to evaluate the impact of hearing impairment on the lives of adults with hearing impairment and the outcomes of treatment. It commenced with a systematic review to find variables focused on people with hearing loss and to find and reclassify the ideas in measurement tools using the ICF as a guide. The results of this review were published in a scientific paper. The outcome measuring instruments identified through the review were linked to the ICF classification. Two hundred and eighty-five categories were recognised. Listening, hearing functions, auditory perceptions, emotions, and the physical environment were frequent. Categories related to communication, social and attitudinal environment were less frequent. Following this, a qualitative study focused on determining essential aspects of functioning and contextual factors from the patient's perspective. This study was conducted in the Netherlands and South Africa. The authors accounted for the cultural variations within South Africa through personal interviews. One hundred forty-three categories were determined, of which the highest number were part of Activities and Participation, succeeded by Environmental factors. A global survey among hearing health professionals determined 209 distinct ICF categories for hearing loss. The most common categories within Activities and Participation were related to communication, and Environmental Factors were related to the physical environment.

Finally, 117 categories were selected for inclusion in the Comprehensive ICF Core for hearing loss, and 27 categories were assigned to the Brief ICF Core for hearing loss (Danermark et al., 2013; Granberg, Dahlström, et al., 2014; Granberg, Möller, et al., 2014; Granberg, Pronk, et al., 2014).

The ICF Core Sets project on vertigo was initiated by the lack of standardised terminology in vestibular research for the classification and definition of vertigo, the scarcity

of information on disease burden and health care costs, and the lack of agreement on measures and variables that are essential for the patient. Like developing the ICF Core Set for Hearing Loss, 100 second-level categories were identified for the ICF Core Set for Vertigo and 29 second-level for the Brief Core Set (Grill et al., 2012).

CHAPTER 3

METHODS

3.1 Research Design and Participants

The study used a survey design. The data was collected through a qualitative survey research method. Individuals with misophonia who reported experiencing a strong adverse reaction to specific sound stimuli were included in the study.

The diagnostic criteria given by Schröder et al. (2013) were also utilised. It describes that individuals with misophonia react immediately and impulsively to the presence or expectation of the trigger. The adverse aversive reaction starts with irritation or disgust, turning into anger. They feel a loss of self-control and can be aggressive in their outbursts. The person understands that their feelings are excessive. They avoid situations that can cause these reactions or endure them with intense negative emotions. The emotional responses cause them distress and interfere with their daily lives. The authors note that these reactions cannot be attributed to another underlying disorder, such as OCD or PTSD.

A-MISO-R (Amsterdam Misophonia Scale – Revised) was applied to ascertain the misophonia presence and severity. Fifty-one individuals diagnosed with misophonia aged 18-30 with an average age of 23.25 participated. There were 13 males (25.5 %) and 38 females (74.5 %) among the fifty-one individuals.

3.1.1 Inclusion Criteria and Exclusion Criteria

Individuals who completed the 12^{th} standard and were proficient in English only were included in the study.

The study did not include individuals with tinnitus, hyperacusis, migraine and reduced hearing sensitivity.

3.2 Procedure

The study procedure was explained to the participants, who gave informed consent. The participants' demographic details, including age and gender, were collected. The informed consent and demographic details were obtained through the online form. The study was conducted in two stages.

3.2.1 Phase 1: Obtaining responses to the online survey form

The online survey form included the following sections:

- The first section explained the context of the study, misophonia and its characteristics, and the outline of the survey form.
- The following section obtained the demographic details, including age and gender and the informed consent. The contact details of the participants were also obtained. This section also included questions about whether the person has tinnitus, hyperacusis, migraine and reduced hearing sensitivity. The Tinnitus Handicap Inventory, Khalfa Hyperacusis Questionnaire and Generalized Anxiety Disorder Scale (GAD-7) were employed to identify individuals having tinnitus, hyperacusis and any psychological problems, respectively. Low questionnaire scores indicated that the person did not suffer from any conditions. If a person had any of the mentioned conditions, they were excluded from the study.
- The next section consisted of the Amsterdam Misophonia Scale – Revised (AMISOS-R). It is the revised version of the Amsterdam Misophonia Scale, given by Schröder et al. (2013). It includes checklists for specific misophonic sounds and the emotions related to the sounds. The information from the checklist is not included in the rating. For the rating, ten questions focusing on the severity

are utilised. The rating scale is from 0 to 4, which can result in a total score between 0 to 40. The scores can be rated as follows: 0–10: typical to subclinical misophonia; 11–20: mild misophonia; 21–30: moderate–severe misophonia; 31–40: severe to extreme misophonia.

- The final section consisted of two open-ended questions: the Problem Question (PQ) and the Life Effects Question (LEQ). These questions were obtained from previous studies on hearing loss (Durisala et al., 2017) and tinnitus (Manchaiah et al., 2018; Manchaiah, Nisha, et al., 2022; Ramkumar & Rangasayee, 2010).
    1. Problem Question: 'Make a list of difficulties you have due to your sound issues. Write down as many as you can think of.'
    2. Life Effects Question: 'Make a list of your sound issue's effects on your life. Write down as many as you can think of.'

The participants were instructed to elaborate as much as possible on their difficulties and their effects on their daily lives. The answers obtained from the online form were compiled for analysis. Any further enquiries regarding the answers given by the participants were conducted through telephonic conversations.

3.2.2 Phase 2: ICF Coding

An analysis method known as the seven-step linking procedure (Hsieh & Shannon, 2005) was used to code the answers obtained to the ICF framework. The seven-step linking procedure was developed on qualitative content analysis. This analysis method was described by Granberg, Möller, et al. (2014) in a previous study that classified hearing loss using the ICF framework. The seven-step linking procedure includes the following steps:

- Meaningful unit identification

- Defining the significant concept(s)
- Underlying meaning interpretation
- Determining the linking unit(s)
- Appropriate ICF category derivation
- Documenting the linking rule applied
- Verifying the representativeness of the ICF categories chosen.

The analysis began with identifying words that can be considered meaningful units. These words were counted and analysed to determine meaningful patterns and concepts. These concepts are interpreted to obtain the underlying meaning. From the underlying meaning, the linking unit is determined. This unit is used across multiple responses with similar concepts and patterns. The unit is then coded according to the domains under the ICF framework. The linking rules provided by Cieza et al. (2002, 2005) were used to determine the appropriate codes. Other studies have used this procedure to link similarly (Durisala et al., 2017; Granberg, Möller, et al., 2014; Manchaiah et al., 2018; Manchaiah, Nisha, et al., 2022).

The answers to the two questions were provided to two coders who were asked to code for all the responses independently. The codes were obtained from ICF (World Health Organization, 2001). These included codes under the following domains: Body Structure(s), Body Function, Activity Limitation, Participation Restriction, Environmental Factors, and Personal Factors. If there was a difference in opinion between the coders, a third coder was consulted and a final decision about the code was made. This improved the reliability of the coding process.

3.3 Statistical Analysis

The statistical analysis used IBM SPSS 20.0 and GraphPad Prism 9 software. Descriptive statistics for means and standard deviation (SD) were obtained. The total number of answers to the PQ and LEQ questions were obtained. A normality check was performed using Shapiro-Wilk's test. Based on the normality test results, the Wilcoxon Signed-Rank test was conducted to check for the significant difference between the number of responses. Mann – Whitney U Test was utilised to determine if there was a significant difference between genders. The effect size was calculated using the formula ($Z/\sqrt{N}$) whenever significant. Spearman's rho correlation coefficient was tested to determine the relationship between the problems mentioned in the PQ and LEQ questions with AMISO-R.

CHAPTER 4

RESULTS

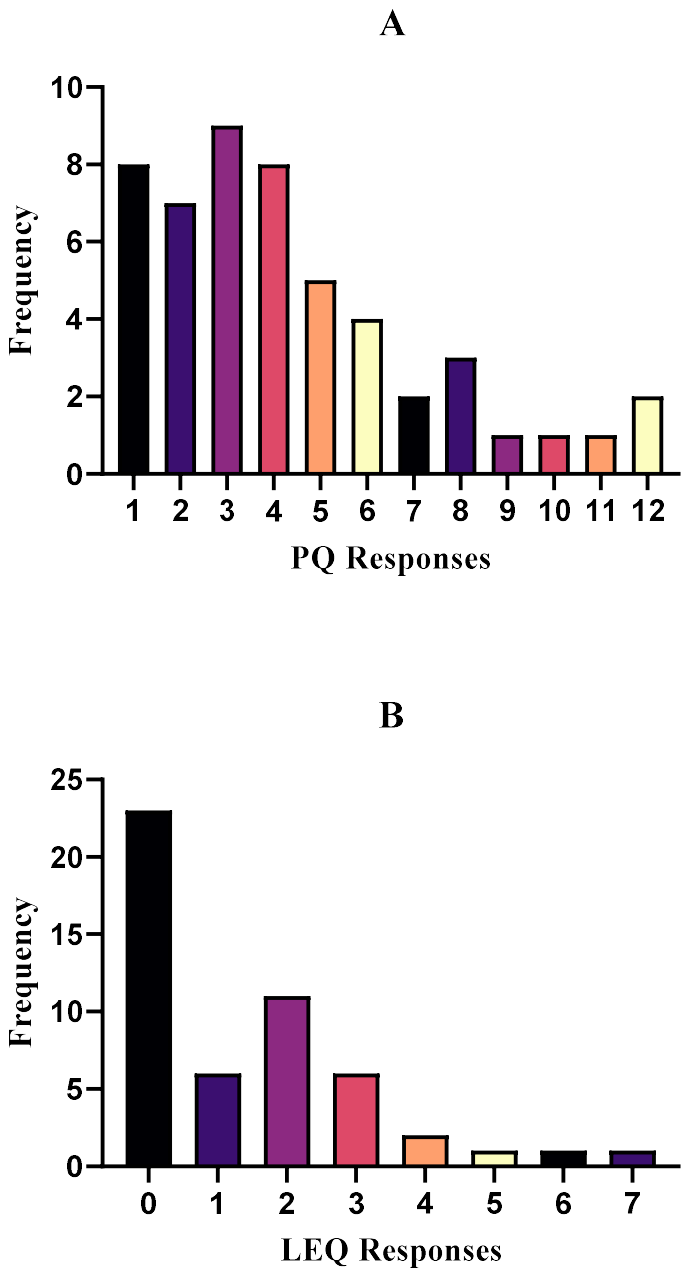
The present investigation aimed to utilise the ICF classification system to profile the problems and life effects affecting persons with misophonia. Fifty-one individuals with misophonia were asked two open-ended questions through an online form or a phone call. Their responses were drafted and linked to ICF codes by the coders. Descriptive and inferential statistics were completed using SPSS (version 20.0). To determine whether the data were distributed normally or not, Shapiro-Wilk's Test of Normality was performed. The data of this study is not distributed normally ($p < 0.05$). Therefore, for inferential statistics, non-parametric tests were administered. The results of the study are detailed below.

4.1 Estimation of Problems and Life Effects of Misophonia

The two open-ended questions obtained 294 responses (PQ: 222, LEQ: 72). The meaningful responses ranged from 1 to 12 for PQ and from 0 to 7 for LEQ. Participants provided 1 to 4 responses for PQ and 0 to 3 responses for LEQ, as illustrated in Figure 4.1. The average response per participant was 4.35 and 1.41 for PQ and LEQ, respectively.

Figure 4.1

The Number of Responses Reported in PQ (A) and LEQ (B)



Significant differences were noted in the total number of answers between the two questions. There was also a significant difference between the two questions for the domains,

Body Function, Activity Limitation and Participation Restriction and Personal Factors. No significant difference was detected among the two questions for the domain of Environmental Factors, as seen in Table 4.1.

The highest mean scores for both questions were for Activity Limitations and Participation Restrictions (PQ Mean = 1.75, LEQ Mean = 0.75).

Table 4.1

Number of Responses in Each ICF Domain for PQ and LEQ

Category	PQ Mean (SD)	LEQ Mean (SD)	Wilcoxon (Z)	Sig.(*p*)	Effect Size ($r = Z/\sqrt{N}$)
All responses	4.35 (2.925)	1.41 (1.699)	- 5.635	0.000	- 0.78
Impairment of Body Function	1.47 (0.880)	0.35 (0.522)	- 5.528	0.000	- 0.77
Activity Limitations and Participation Restrictions	1.75 (1.798)	0.75 (0.997)	- 3.593	0.000	- 0.50
Environmental Factors	0.45 (0.901)	0.39 (1.185)	- 0.600	0.549	
Personal Factors	0.33 (0.653)	0.08 (0.337)	- 2.446	0.014	- 0.34

Note. SD = Standard Deviation.

Significant differences were observed between the genders for the domains, Activity Limitations and Participation Restrictions, and Environmental Factors. No significant differences were seen for Impairment of Body Function and Personal Factors, as tabulated in Table 4.2.

Table 4.2

Effect of Gender on Each ICF Domain

Category	Mean (SD)	Z	Sig. *(p)*	Effect Size ($r = Z/\sqrt{N}$)
Impairment of Body Function	1.82 (1.178)	- 0.764	0.445	
Activity Limitations and Participation Restrictions	2.49 (2.327)	- 2.391	0.170	- 0.33
Environmental Factors	0.84 (1.515)	- 2.349	0.019	- 0.32
Personal Factors	0.41 (0.753)	- 0.555	0.579	

Note. SD = Standard Deviation.

Spearman's Rank correlation between AMISO-R scores and the LEQ responses revealed a weak relationship with Environmental Factors. There was a meaningful moderate positive relationship between the responses from both open-ended questions and the AMISO-R scores for all categories and Environmental Factors alone. No significant

correlation was observed for Impairment of Body Functions, Activity Limitation and Participation Restrictions, or Personal Factors. These results are depicted in Table 4.3.

Table 4.3

Correlation between AMISO-R Scores and PQ and LEQ for Each Domain

Category		Correlation Coefficient (r)	Sig. (*p*)
All Categories	PQ	0.413	0.003
	LEQ	0.020	0.890
	Total	0.332	0.017
Impairment of Body Function	PQ	0.230	0.871
	LEQ	- 0.217	0.126
	Total	- 0.087	0.544
Activity Limitations and Participation Restrictions	PQ	0.499	0.000
	LEQ	0.185	0.194
	Total	0.483	0.000
Environmental Factors	PQ	0.217	0.126
	LEQ	0.292	0.038
	Total	0.335	0.016
Personal Factors	PQ	0.062	0.666
	LEQ	- 0.032	0.826
	Total	0.064	0.653

4.2 Activity Limitations and Participation Restrictions

Activities and Participation were predominantly affected, with 131 answers, as depicted in Table 4.4. Ninety-three responses to PQ and 38 responses to LEQ were recorded. The most influenced category was “Focusing attention” (d160), with 25 responses. This was succeeded by “Higher education” (d830), “Conversation” (d350) and “Socializing” (d9205).

Table 4.4

Frequency Counts of Responses under Activity Limitations and Participation Restrictions

Function	ICF Codes	PQ (= 93)	LEQ (= 38)	Total (= 131)
Focusing attention	d160	22	3	25
Higher education	d830	11	10	21
Conversation	d350	16	1	17
Socialising	d9205	5	6	11
Focusing attention on the environment	d1601	8	1	9
Thinking	d163	8	0	8
Carrying out daily routine	d230	3	5	8
Listening	d115	5	1	6

Regulating behaviours within interactions	d7202	4	2	6
Reading	d166	3	1	4
Focusing attention on the person	d1600	3	0	3
Basic interpersonal interactions	d710	1	1	2
Shopping	d6200	2	0	2
Handling stress	d2401	1	1	2
Conversing with many people	d3504	0	1	1
Using communication devices and techniques	d360	0	1	1
Using transportation	d470	1	0	1
Looking after one's health	d570	0	1	1
Informal relationships with friends	d7500	0	1	1
Informal relationships with peers	d7504	0	1	1

Child-parent relationships	d7601	0	1	1

4.3 Body Function

The second most affected domain was Body Functions, with 94 responses in total. Seventy-six responses were from PQ, and 18 responses were from LEQ. The most commonly affected category was “Appropriateness of emotion” (b1520), followed by “Range of emotion” (b1522) and “Sleep functions” (b134). The categories affected by Impairment of Body Function are tabulated below in Table 4.5.

Table 4.5

Frequency Counts of Responses under Impairment of Body Function

Function	ICF Codes	PQ (= 76)	LEQ (= 18)	Total (= 94)
Appropriateness of emotion	b1520	38	6	44
Range of emotion	b1522	17	3	20
Sleep functions	b134	8	7	15
Maintenance of sleep	b1342	3	0	3
Pain in head and neck	b28010	1	1	2
Emotional functions	b152	1	0	1

Amount of sleep	b1340	1	0	1
Onset of sleep	b1341	1	0	1
Quality of sleep	b1343	1	0	1
Temperament and personality functions	b126	1	0	1
Extraversion	b1260	1	0	1
Agreeableness	b1261	1	0	1
Psychic stability	b1263	1	0	1
Energy level	b1300	1	0	1
Memory functions	b144	0	1	1

4.4 Environmental Factors and Personal Factors

The least affected domain, with 43 responses, was Environmental Factors, as shown in Table 4.6. It consisted of 23 responses from PQ and 20 responses from LEQ. The commonly encountered category was “Friends” (e320), with 11 responses. This category was followed by “Immediate family” (e310), “Acquaintances, peers, colleagues, neighbours and community members” (e325), “Individual attitudes of friends” (e420) and “Individual attitudes of acquaintances, peers, colleagues, neighbours and community members” (e425).

Table 4.6

Frequency Count of Responses under Environmental Factors

Function	ICF Codes	PQ (= 23)	LEQ (= 20)	Total (= 43)
Friends	e320	7	4	11
Immediate family	e310	5	1	6
Acquaintances, peers, colleagues, neighbours and community members	e325	2	3	5
Individual attitudes of friends	e420	3	2	5
Individual attitudes of acquaintances, peers, colleagues, neighbours and community members	e425	1	4	5
Strangers	e345	1	2	3
Individual attitudes of immediate family members	e410	2	1	3
Individual attitudes of strangers	e445	0	3	3
Health professionals	e355	1	0	1
Architecture and construction services, systems and policies	e515	1	0	1

The most common personal factor was Avoidance, with 13 responses (10 in PQ and 3 in LEQ). The other personal factors reported included Coping Strategies and Habits. The personal factors are tabulated below in Table 4.7.

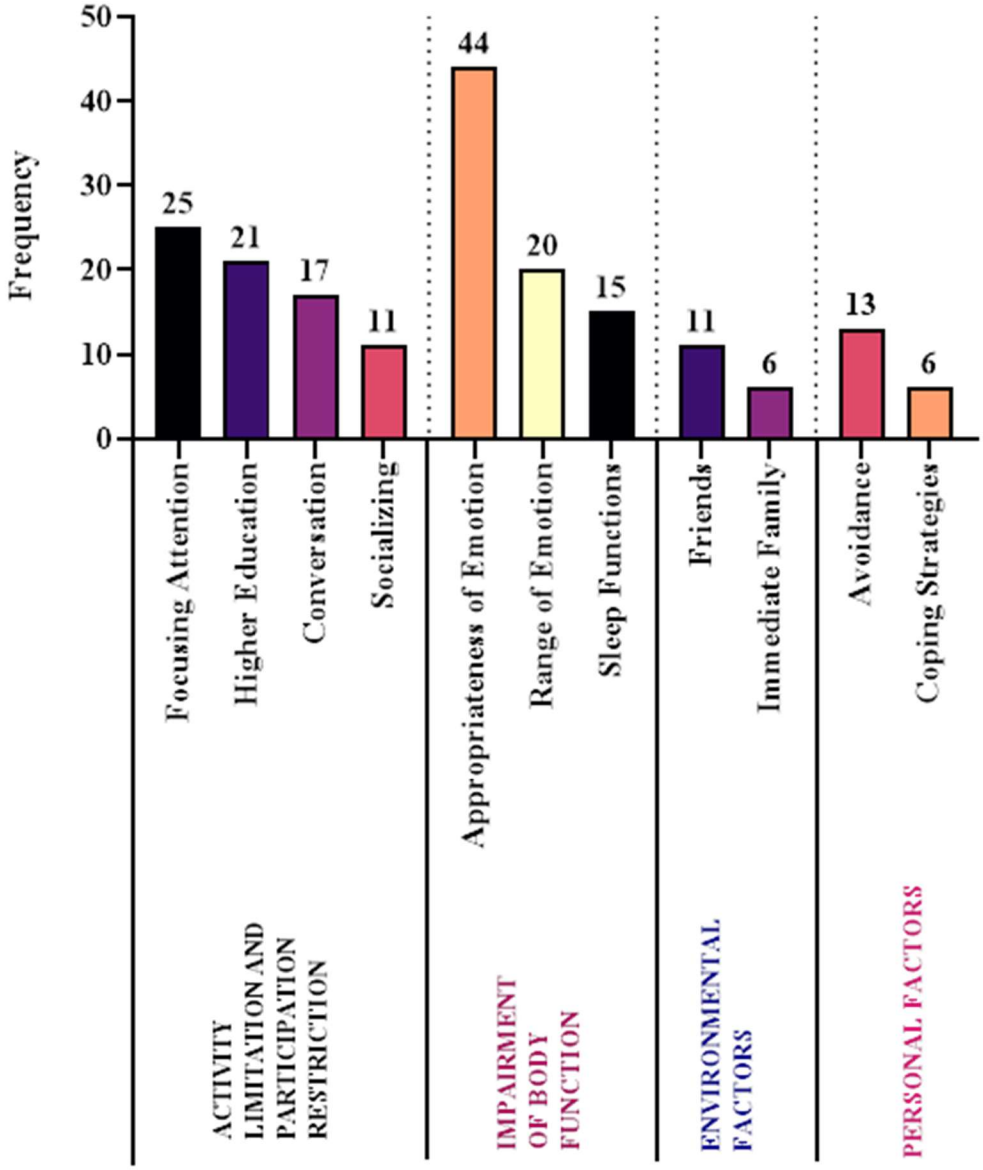
Table 4.7

Frequency Count of Responses under Personal Factors

Functions	PQ (= 16)	LEQ (= 4)	Total (= 20)
Avoidance	10	3	13
Coping Strategies	5	1	6
Habits	1	0	1

Figure 4.2

Bar Graph Depicting the Most Impacted Categories for All Domains



CHAPTER 5

DISCUSSION

This study used open-ended questions to investigate the problems and life effects impacting 51 adults. The answers to the open-ended questions were mapped and coded utilising the ICF classification system. The questions obtained a total of 294 responses from the participants. Most individuals provided 1 to 4 meaningful answers to both questions. The responses indicate that misophonia is multi-dimensional. Using open-ended questions to obtain information on misophonia's effects has been very beneficial.

Activities and Participation were most impacted by misophonia, followed by Body Functions, Environmental Factors and Personal Factors. There are no studies that utilised the ICF framework to explore misophonia. However, some studies have used the ICF framework to ascertain the problem and life effects caused by tinnitus in the existing literature. Tinnitus and hyperacusis occur alongside misophonia. Sztuka et al. (2010) reported that 10 % of his study sample of 44 individuals with tinnitus had misophonia. In a study examining 149 patients consulting a tinnitus and hyperacusis clinic, misophonics were 57 % of the sample, and of these individuals, 28.9 % had only misophonia and no hyperacusis. Having established the association between misophonia, tinnitus, and hyperacusis, it becomes crucial to understand the outcomes of tinnitus studies conducted within the ICF framework. Manchaiah et al. (2022) reported that for tinnitus, Activity Limitations and Participation Restrictions were the predominant consequences, succeeded by Impairments in Body Functions and limited effect due to Contextual Factors. A similar study conducted by Manchaiah et al. (2018) among the population of the UK revealed contradictory results. In

this study, Impairment in Body Functions was the most dominant effect, succeeded by Activity Limitations and Participation Restrictions. Contextual Factors caused a marginal impact.

5.1 Functioning and Disability

The category with the most responses under Activity Limitation and Participation Restrictions, at 25 responses, was "Focusing attention" (d160). "Focusing attention" was the category most affected, with 25 responses. In the present study, participants reported that in the presence of the trigger stimuli, they focused their attention on the trigger, and it was difficult to divert their attention away from it. Studies have investigated the attentional abilities of misophonics. Edelstein et al. (2013) reported similar experiences with misophonics in their research. Nine out of eleven participants said the trigger impeded their attentional abilities. They reported being hyper-focused and unable to ignore the trigger sounds. They also reported difficulty paying attention at a movie or class when a person is producing the trigger. A study evaluating selective attention said that misophonics could have impaired selective attention when subjected to sounds eliciting misophonic reactions (Silva & Sanchez, 2019). Frank et al. 2020 also reported similar findings for individuals with misophonia asked to attend to visual stimuli during and after hearing aversive stimuli.

The second most affected was "Higher education" (d830). Most participants in the present study were undergraduate or graduate students who expressed that misophonia affected their academic functioning. Multiple studies have used university students as their study sample when investigating misophonia. Wu et al. (2014) investigated impairment associated with misophonic symptoms in 484 undergraduate students and revealed moderate

or higher levels of functional impairment were observed at 14.9 % for work and school-related functioning. A similar study by Zhou et al. (2017) showed that 25.7 % of 415 Chinese undergraduate students revealed moderate or higher work or school functioning impairment.

The third and fourth most affected categories were "Conversion" (d350) and "Socialization" (d9205). The present study participants said engaging in conversions with aversive sounds present was challenging. They also admitted that it was difficult to participate and enjoy different social situations fully. Studies on impaired social functioning among misophonics are available. Moderate or higher levels of impairment in social functioning were observed in 6.4 % of the study sample when investigating undergraduate students (Wu et al., 2014). Zhou et al. (2017) stated that 11.0 % of 415 participants reported impaired social functioning. In a case report, Bernstein et al. (2013) said that the client expressed significant social impairment, including an inability to enjoy social meals and avoidance of social events.

The domain affected second most was Body Function. The category most affected within the domain was "Appropriateness of emotion" (b1520), succeeded by "Range of emotion" (b1522) and "Sleep functions" (b134), as illustrated in Figure 4.2.

Nearly all the participants in the present study reported experiencing negative emotions when hearing the triggering sounds. They expressed anger, disgust, annoyance and irritation. Some said they wanted to react verbally or physically to the person making the aversive sound. They understood that their reaction was disproportionate and exaggerated but expressed feeling helpless and agitated due to the presence of the aversive sound. Similar reports of impaired emotional functioning are available in the existing literature. Edelstein

et al. (2013) reported that misophonics stated a range of negative feelings, including anger or rage, intense anxiety, panic, and extreme irritation. Schröder et al. (2013) indicated that exposure to aversive stimuli led to an immediate physical reaction among their study sample of 42 patients. It started as irritation or disgust for 59.5 % and 40.5% of the sample, respectively, that instantaneously became anger. 12 of 42 patients reported getting verbally aggressive. Seven patients admitted to physical aggression directed towards objects. Five patients admitted to being physically aggressive with their partner at the time.

Many participants reported that falling asleep or maintaining sleep in the presence of aversive sounds was challenging. The effect of misophonia on sleep has yet to be extensively studied. Bishop, (2023) examined the relationship between misophonia and depression. The author reported a significant relationship between misophonia symptoms and impaired sleep functions. Neal and Cavanna (2013) described a patient with Tourette syndrome and misophonia reporting childhood sleep problems.

5.2 Contextual Factors

The domain of Environmental Factors was the least affected. The most affected category was "Friends" (e320), with 11 responses. It was followed by "Immediate family" (e310), "Acquaintances, peers, colleagues, neighbours and community members" (e325), "Individual attitudes of friends" (e420) and "Individual attitudes of acquaintances, peers, colleagues, neighbours and community members" (e425), as tabulated in Table 4.6. In the present study, participants gave accounts of friends teasing them about their trigger by producing it despite being told that it is aversive to them. Participants also mentioned losing their temper towards their immediate family members and friends, leading to their

relationships being affected by their misophonic symptoms. Some participants reported avoiding certain acquaintances and peers as they produced the aversive sound, and they internalised their negative emotions towards the person making it. Case reports with similar experiences are available in the existing literature. A case report on two young misophonics reported negative feelings towards family members, friends, peers, teachers and strangers. One patient stated significant irritation and distress caused by family members and friends compared to strangers. The second patient reported outbursts towards family members, leading to having meals in separate rooms and avoiding conversations with their parents. They also said that suppressing their irritation and distress towards teachers and peers (McGuire et al., 2015).

Avoidance was the most frequently reported personal factor, with 13 responses, as illustrated in Figure 4.2. Participants reported actively avoiding places, persons and situations that caused the occurrence of their triggers. This avoidance strategy affected their ability to participate in everyday life events fully. It also affected their interpersonal relationships, especially with friends and immediate family members. The available literature reports on the use of avoidance to cope with misophonia. Schröder et al. (2013) reported avoidance of situations with the aversive sounds by all 42 patients in their study. Wu et al. (2014) stated that individuals with misophonia adopted avoidance as maladaptive behaviour after the triggers elicited negative emotions. Edelstein et al. (2013) stated that misophonic individuals used avoidance of situations with aversive sounds as a coping strategy.

5.3 Relation to Gender and AMISOS-R Scores

Significant differences were noted between genders for Activity Limitations and Participation Restrictions, and Environmental Factors. In the studies exploring tinnitus using the ICF framework, the comparison between the genders for the responses across the different ICF domains was not interpreted (Manchaiah et al., 2018, 2022). However, Manchaiah et al. (2018) determined the relationship between gender and all the responses for PQ and LEQ and reported a weak relationship. Literature on gender and its effect on misophonia is variable. Studies have reported no effect across genders on the severity of misophonic symptoms (Quek et al., 2018; Wu et al., 2014). Aryal and Prabhu (2022) reported no gender effect on the prevalence of misophonia among university students in India. Other studies have reported a higher prevalence in women than men (Erfanian et al., 2019; Siepsiak et al., 2020). The effect of gender across different domains of ICF for misophonia requires further study.

The present study determined a weak positive relationship between AMISO-R scores and LEQ responses for Environmental Factors. A moderate positive relationship existed between the AMISO-R scores and the total number of answers for all categories and Environmental Factors alone. No studies exist that support or contradict the relationship between AMISO-R scoring and the domains of ICF. However, the current study did indicate that as the AMISO-R score increased, the responses to the PQ and LEQ questions increased. The responses were more significant for PQ than LEQ. Thus, future studies can assess the magnitude to which the severity of misophonic symptoms affects everyday life.

CHAPTER 6

SUMMARY AND CONCLUSIONS

The current study investigated the impact of misophonia on everyday life using two open-ended questions (PQ and LEQ). The number of answers for PQ was 222 and 72 for LEQ, totalling 294. There is a significant difference between the responses obtained for both questions. The responses were mapped to ICF codes and analysed.

Activities and Participation were most affected, followed by Body Functions and Environmental Factors. Personal Factors had the lowest number of responses. The most frequently affected categories under Activities and Participation are "Focusing attention" (d160), "Higher Education" (d830), "Conversation" (d350) and "Socialising" (d9205). The most frequently occurring impairments in Body Functions were "Appropriateness of emotion" (d1520), "Range of emotion" (d1522) and "Sleep function" (b134). The most common categories under Environmental Factors included "Friends" (e320), "Immediate family" (e310), "Acquaintances, peers, colleagues, neighbours and community members" (e325), "Individual attitudes of friends" (e420) and "Individual attitudes of acquaintances, peers, colleagues, neighbours and community members" (e425). Avoidance was the most frequent response under Personal Factors.

Significant differences between genders were observed for Activity Limitations and Participation Restrictions, and Environmental Factors. Gender differences across different domains require further study.

The results indicate using open-ended questions alongside other measures to optimise examining the broad and heterogeneous effects of misophonia. The results also

indicate that future assessment and treatment protocols for misophonia can benefit from using a multidimensional framework as a guide.

6.1 Implications of the Study

The result of the present study indicates the multifaceted consequences of misophonia. It also showcases the benefits of unstructured questions. Open-ended questions can add to the efficacy of assessment by allowing individuals with misophonia to provide additional information on their personal experience with the disorder. The information obtained through open-ended questions can be helpful in addition to the information obtained from the structured questionnaires and other measures. Manchaiah, Andersson, et al. (2022) studied the efficacy of open-ended questionnaires in assessing the effects of tinnitus and how it relates to patient-reported outcome measures (PROMs). They reported that open-ended questionnaires identify elements not explored with patient-reported outcome measures. The authors also stated that PROMs correlate more with PQ than LEQ, suggesting that PROMs are more targeted towards the problems experienced by patients with tinnitus.

The study also reveals that misophonia affects different domains of a person's life. The biopsychosocial approach of ICF demonstrated that misophonia affects all domains in various capacities. Therefore, assessment protocol for misophonia should involve measures that focus on all domains of the patient's experience with the disorder. Assessment focusing on the limitations to daily activities and everyday routine, along with the usually investigated biomedical aspects of an auditory disorder, can provide more insight into the patient's needs. A comprehensive assessment also assists in the efficient planning of treatment for misophonia. The affected domains and the extent of impact varies among individuals, and

hence, a multidimensional approach to treatment planning can allow for personalisation. Identifying contextual factors can also provide insight into potential barriers that can disrupt management. Other authors have also stated similar insights (Gagné et al., 2009; Meyer et al., 2016).

6.2 Strengths and Limitations

A simple qualitative content analysis approach was employed to link the concepts obtained from the responses to the ICF categories. The study also utilised open-ended questions that allowed for a thorough comprehension of the impact of misophonia (Manchaiah, Andersson, et al., 2022). The open-ended questions were administered through an online form that allowed for elaborate and more thought-out answers from the participants, thus avoiding the restrictions common to a structured format. Using open-ended questions and classification through ICF, the current study's approach is reliable (Durisala et al., 2017; Manchaiah et al., 2018; Manchaiah, Nisha, et al., 2022) and allows many responses.

However, the study's sample size is low, limiting the results' generalisation. The age range explored in the study also limits the application of the results to different age groups. Future studies can increase the sample size as well as the age range. The study examined the relationship between PQ and LEQ responses, AMISO-R scores, and gender. Future studies can include correlations and comparisons to other demographic variables and audiological parameters.

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