RESEARCH ARTICLE

Psychopathological symptoms as a common Risk Factor for Tinnitus distress and magnitude: A cross-sectional study

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Abstract

Objective: To examine the association of tinnitus distress, tinnitus magnitude and psychopathological symptoms among patients with ear-related problems.

Methods: The cross-sectional study was conducted from December 1, 2020, to June 30, 2021, at the Hearing and Balance Clinic, Rawalpindi, Pakistan, in collaboration with the National Institute of Psychology, Quaid-i-Azam University, Islamabad, Pakistan, and comprised adult tinnitus patients of either gender. All patients underwent ear examination and audiological evaluations for tinnitus matching. Psychological assessment was done using the Tinnitus Magnitude Index, the Tinnitus Reaction Questionnaire and the Symptoms Check List-90. Data was analysed using SPSS 21.

Results: Of the 159 subjects, 97(61%) were male and 62(39%) were females. The overall mean age was 47.94±17.47 years. Patients showed statistically significant tendency to develop psychopathological symptoms, including somatisation, phobic anxiety, depression and paranoid ideation ($p<0.05$). Additionally, significant gender differences were also observed ($p<0.05$).

Conclusion: There was a high prevalence of tinnitus distress along with psychopathological symptoms among tinnitus patients.

Keywords: Tinnitus, Psychopathology, Gender, Cross-sectional study. (JPMA 72: 2034; 2022)

DOI: https://doi.org/10.47391/JPMA.4644

Introduction

Tinnitus is considered a symptom that is often described as a subjective perception of sound (ringing, humming, roaring etc.) that is not related to any external sound stimulus.[1] This condition is considered one of the very first indicators of auditory system abnormalities among patients with ear-related problems.[2,3]

Among three-fourth of the patients experiencing tinnitus, the precise cause is yet unknown and is, thus, explained as idiopathic.[4] In some people it has been found that tinnitus might have been caused by exposure to loud noises which might indicate early signs of cochlear damage.[5] Majority of the patients with known causes of tinnitus are either due to cochlear and retrocochlear damage that includes viral infections, ear trauma, presbycusis, noise-induced hearing loss or lymphatic disorder, and are mostly incurable.[6,7]

A few studies have mentioned that tinnitus symptoms can also be present among individuals who have no hearing abnormalities.[7,8] The most common symptoms related to tinnitus reported in Pakistan and internationally are commonly related in the form of decreased speech discrimination, lack of concentration, phobic anxieties and somatisation, together triggering tinnitus-related distress.[9,10]

Emotions related to persistently living and managing with tinnitus, are termed tinnitus distress.[11] Tinnitus distress is explained as a multidimensional phenomenon that can be associated with problems, such as difficulties with concentration, insomnia, or negative thinking which can amplify it in vicious cycles.[12] Furthermore, patients experiencing tinnitus-related distress tend to report anger, hopelessness, exhaustion, hostility and, in some cases, even suicidal thoughts.[13] Considering the comprehensive array of difficulties tinnitus patients might face along with a number of diversifying comorbidities, like tinnitus sensitivities (magnitude/loudness) and levels of distress, tinnitus is considered a heterogeneous condition.[14]

Studies have revealed a close link between tinnitus and comorbid psychological disorders, indicating that tinnitus may cause certain distresses leading towards deterioration in psychological wellbeing and thus creating hindrances in the daily life satisfaction of the affected individuals.[15,16] The prevalence of tinnitus distress and psychopathological symptoms have been overlooked in the past, and incurable nature of tinnitus further suggests the need to study the psychopathological symptoms and level of tinnitus distress among patients. The current study was planned to examine the association of tinnitus distress, tinnitus magnitude and psychopathological symptoms among patients with ear-

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related problems, and to see if gender had any association with tinnitus distress.

Subjects and Methods

The cross-sectional study was conducted from December 1, 2020, to June 30, 2021, at the Hearing and Balance Clinic, Rawalpindi, Pakistan, in collaboration with the National Institute of Psychology (NIP), Quaid-i-Azam University (QAU), Islamabad, Pakistan. After approval from the NIP ethics review board, the sample size was calculated using Epitool with 95% confidence interval (CI).[17] The sample was raised using non-probability sampling technique. Those included were adult patients of either gender having tinnitus symptoms for >6 months, and not having any prior history of psychological/ psychiatric treatment. Those having side-effects of certain medications were excluded.

After the informed consent subjects underwent ear examination and audiological evaluations. Tinnitus matching was performed using AD528 Diagnostic Audiometer in a sound-treated room. Psychological assessment was performed using the Tinnitus Magnitude Index (TMI), the Tinnitus Reaction Questionnaire (TRQ) and the Symptoms Check List-90 (SCL-90). TMI measures the subjective magnitude of tinnitus having internal reliability of α=0.86, TRQ measures tinnitus-related distress and has internal reliability of α=0.96, and SCL-90 measures nine symptoms of psychopathology, such as anxiety, depression, paranoid ideation, somatisation, anger hostility, psychoticism, obsessive compulsive, interpersonal sensitivity and phobic anxiety. The Cronbach alpha coefficients of all the subscales range from α=0.71 to α=0.87].[18-20]

Data was analysed using SPSS 21. Frequencies and percentages were calculated for categorical variables. Correlation analysis was performed to analyse the relationship between tinnitus magnitude, distress and psychopathological symptoms. Gender differences were computed using independent sample t-test. P<0.05 was considered statistically significant.

Results

Of the 159 subjects, 97(61%) were male and 62(39%) were females. The overall mean age was 47.94±17.47 years. Majority of the patients had their tinnitus matched at frequency of 4000Hz, 7000Hz and 8000Hz, and 4(3%) experienced slight, 10(6%) mild, 27(17%) moderate, 58(37%) severe and 60(38%) patients experienced catastrophic tinnitus distress (Table-1).

In terms of psychopathological symptoms, 16(10.1%) patients had mild, 81(50.9%) moderate, 51(32.1%) severe and 11(6.9%) very severe anxiety. Also, 10(6.3%) had mild, 27(17.0%) moderate, 96(60.4) severe and 26(16.4) very

Table-1: Demographic characteristics (N=159).

Categories		f (%)
Gender	Male	97(61)
	Female	62(39)
Tinnitus Complaint	Unilateral	102(64)
	Bilateral	57(36)
Tinnitus Matching	1500Hz	11(7)
	2000Hz	10(6)
	3000Hz	21(13)
	4000Hz	30(19)
	6000Hz	26(16)
	7000Hz	29(18)
	8000Hz	32(20)
Tinnitus Distress	Slight	4(3)
	Mild	10(6)
	Moderate	27(17)
	Severe	58(37)
	Catastrophic	60(38)

Table-2: Psychopathological symptoms (N=159).

Psychopathological Symptoms		f (%)
Anxiety	Mild	16(10.1)
	Moderate	81(50.9)
	Severe	51(32.1)
	Very Severe	11(6.9)
Depression	Mild	10(6.3)
	Moderate	27(17.0)
	Severe	96(60.4)
	Very Severe	26(16.4)
Anger Hostility	Mild	101(63.5)
	Moderate	28(17.6)
	Severe	12(7.5)
	Very Severe	18(11.3)
Interpersonal Sensitivity	Mild	21(13.2)
	Moderate	82(51.6)
	Severe	45(28.3)
	Very Severe	11(6.9)
Obsessive Compulsive	Mild	2(1.3)
	Moderate	29(18.2)
	Severe	83(52.2)
	Very Severe	45(28.3)
Paranoid Ideation	Mild	53(33.3)
	Moderate	33(20.8)
	Severe	49(30.8)
	Very Severe	24((15.1)
Phobic Anxiety	Mild	17(10.7)
	Moderate	63(39.6)
	Severe	69(43.4)
	Very Severe	10(6.3)
Psychoticism	Mild	12(7.5)
	Moderate	55(34.6)
	Severe	80(50.3)
	Very Severe	12(7.5)
Somatisation	Mild	10(6.3)
	Moderate	18(11.3)
	Severe	61(38.4)
	Very Severe	70(44)

Table-3: Correlation matrix related to tinnitus magnitude, tinnitus distress and psychopathological symptoms (N=159).

Variables	M	S.D	α	1	2	3	4	5	6	7	8	9	10	11
1.Tinnitus Mag	21.99	2.48	0.82	1	.50**	.33**	.47**	.25**	.20*	.41**	.20*	.28**	.32**	.28**
2.TinnitusDistress	75.38	12.38	0.93		1	.76**	.80**	.54**	.56**	.68**	.50**	.59**	.76**	.68**
3.Anxiety	26.33	5.97	0.85			1	.89**	.59**	.66**	.80**	.72**	.75**	.87**	.87**
4.Depression	32.14	7.18	0.88				1	.49**	.65**	.79**	.64**	.71**	.80**	.83**
5.Anger Hostility	10.54	3.96	0.76					1	.80**	.38**	.76**	.65**	.69**	.67**
6.Intp.Sensitivity	18.10	5.47	0.85						1	.41**	.82**	.77**	.79**	.74**
7.Obs.Com	28.64	5.70	0.86							1	.45**	.47**	.66**	.69**
8.PARA.IDE	12.02	3.75	0.77								1	.78**	.74**	.67**
9.PHOB	15.08	4.33	0.82									1	.79**	.72**
10.PSYCH	25.06	4.68	0.72										1	.80**
11.Somatis	29.99	5.81	0.84											1

M: Mean, SD: Standard deviation, α: Alpha, Tinnitus Mag: Tinnitus magnitude, Intp. Sensitivity: Interpersonal sensitivity, Obs.Com: Obsessive Compulsive, PARA.IDE: Paranoid ideation, PHOB: Phobic anxiety, PSYCH: Psychoticism, Somatis: Somatisation.

Table-4: Mean differences on tinnitus magnitude, tinnitus distress and psychopathological symptoms in male and female patients (N=159).

	Male Tinnitus Patients (n=97)		Female Tinnitus Patients (n=62)		t(df)	P-Value	95% CI		Cohen's d
Variables	M	SD	M	SD			LL	UL	
TMI-1	6.96	0.97	7.45	0.84	-3.39(142.67)	0.01	-.78	-.21	0.54
TMI-2	7.04	0.96	7.68	0.85	-4.40(141.53)	0.00	-.92	-.35	0.71
TMI-3	7.49	1.03	7.63	0.93	-.85(140.03)	0.40	-6.34	-3.49	-
Tinnitus Distress	72.58	13.16	79.42	9.50	-3.80(154.60)	0.00	-10.40	-3.29	0.60
Anxiety	24.51	6.54	29.19	3.36	-5.22(157)	0.00	-6.46	-2.91	0.90
Depression	30.44	8.25	35.98	3.04	-5.07(157)	0.00	-7.70	-3.38	0.89
Anger Hostility	9.95	3.76	11.47	4.11	-2.35(121.54)	0.02	-2.80	-.24	0.39
Interpersonal Sensitivity	16.97	5.59	19.19	5.22	-2.55(136.60)	0.01	-3.95	-.50	0.41
Obsessive Compulsive	26.92	6.34	31.32	2.96	-5.12(157)	0.00	-6.10	-2.71	0.89
Paranoid Ideation	11.20	3.93	13.34	3.01	-3.66(157)	0.00	-3.30	-.99	0.61
Phobic Anxiety	13.60	4.10	17.39	3.62	-6.10(141.59)	0.00	-5.02	-2.56	0.98
Psychoticism	23.98	5.20	26.66	2.88	-3.71(157)	0.00	-4.11	-1.25	0.64
Somatization	28.42	6.26	32.45	3.95	-4.52(157)	0.00	-5.79	-2.27	0.77

M: Mean, SD: Standard deviation, CI: Confidence interval, LL: Lower limit, UL: Upper limit, TMI-1: Strong or loud tinnitus, TMI-2: Consciously aware of tinnitus, TMI-3: Severity of tinnitus.

severe depressive symptoms. Besides, 101(63.5%) had mild, 28(17.6%) moderate, 12 (7.5%) severe and 18 (11.3) very severe anger hostility symptoms, while very severe symptoms of interpersonal sensitivity 11(6.9%), obsessive compulsive 45(28.3%), paranoid ideation 24(15.1%), psychoticism 12(7.5%) and somatisation 70(44%) were noted (Table-2).

Patients showed statistically significant tendency to develop psychopathological symptoms, including somatisation, phobic anxiety, depression and paranoid ideation ($p<0.05$) (Table-3).

There were significant gender differences as females scored more on all psychopathological symptoms, including anxiety, depression, interpersonal sensitivity, anger hostility, obsessive compulsive, paranoid ideation and somatisation, compared to the male patients ($p<0.05$). Differences in symptom severity signified that female patients had a tendency to develop more psychopathological symptoms than the male patients ($p<0.05$). Though the prevalence of tinnitus was more in male patients, the severity was less than that of female patients (Table-4).

Discussion

Findings demonstrated that tinnitus magnitude, tinnitus distress and psychopathological symptoms were positively associated, thus confirming that tinnitus magnitude and tinnitus-related distress are both linked with the development of psychopathological symptoms, such as anxiety, depression, paranoid ideation, somatisation, anger hostility, psychoticism, obsessive compulsive, interpersonal sensitivity and phobic anxiety. The current findings are consistent with literature.[21]

It was found in the present study that tinnitus mostly matched at 4000Hz, 7000Hz and 8000Hz frequencies. Prior studies have highlighted that usually high frequency tinnitus matching is indicative of exposure to some loud noises in the past, thus signifying the hearing health precautions.[22] Also

tinnitus distress mostly reported by the patients was at catastrophic (38%) and severe (37%) levels, signifying the need of psychological counselling and rehabilitation. The most noted psychopathological symptom was somatisation (44%), obsessive compulsive (28%) and depression (16.4%). These findings are in line with literature.[23,24]

Significant gender-related differences among tinnitus patients for the existence of tinnitus magnitude, tinnitus distress and psychopathological symptoms were found, showing that female patients were more inclined towards reporting strong or loud tinnitus, conscious awareness of tinnitus, tinnitus-related distress and overall psychopathological symptoms. Prior studies have mentioned that generally female patients are prone to state more of their emotional and psychological problems, and, therefore, seek more attention and help for their physiological and psychological problems in certain instances.[25,26] However, no significant differences were found regarding severity of tinnitus as both gender reported nearly similar severity.

The cross-sectional design of the current study is a limitation, as in order to examine the duration and other confounding reasons contributing towards the development of tinnitus distress and psychological ailments, a longitudinal study is more appropriate.

Conclusion

High prevalence of tinnitus distress along with the existence of psychopathological symptoms among patients suffering from tinnitus indicated that there is a vital need for appropriate psychological interventions along with physiological treatment.

Disclaimer: The text is based on an academic thesis.

Conflict of Interest: None.

Source of Funding: None.

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