RESEARCH ARTICLE

Tinnitus related handicap in daily living among Pakistani population: A multicenter study

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Abstract

Objective: To determine the impact of tinnitus-related handicap on daily living of tinnitus sufferers and factors associated with tinnitus severity.

Methods: The cross-sectional study was conducted from November 2016 to April 2017at Al-Nafees Medical College Hospital, Islamabad, Capital Development Authority Hospital, Islamabad, Lahore General Hospital, Lahore, Bahawal Victoria Hospital, Bahawalpur; and Wassay Ear Nose Throat Clinic, Muzaffarabad, Pakistan. Tinnitus patients of either gender aged 15-75 years were included. Detailed history was taken and examination was conducted. Data was collected using the Tinnitus Handicap Inventory, and was analysed using SPSS 21.

Results: Of the 152 patients, 87(57.20%) were males. The overall mean age was 44.10±16.06 years. Tinnitus was severe in 53(34.87%), while catastrophic severity was noted in 26(17.10%). Cases with hearing loss and male gender suffered significantly more in daily life activities ($p<0.05$). Severity of tinnitus handicap was associated with the type of tinnitus sound ($p<0.05$).

Conclusion: Gender, hearing loss and type of tinnitus sound were found to be associated with the severity of the condition.

Keywords: Daily living, Quality of life, Tinnitus, Tinnitus handicap inventory. (JPMA 71: 90; 2021)

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Introduction

Tinnitus, a phantom auditory sensation, is derived from Latin verb "tinnire" meaning 'to ring'.[1] It is a symptom of some underlying disorder and can be subjective or objective. Subjective tinnitus is commonly referred to as hissing, buzzing, whistling, humming, crickets, blowing wind, running water or with complex tonal characteristics. Its intensity varies from imperceptible to very annoying level affecting the quality of life of the sufferers. The elderly affected by tinnitus suffer concentration difficulty, frustration, despair and may have abnormal behaviour, having significant impact on economy which can also result in huge personal financial losses up to the tune of $30,000 per annum.[2]

The prevalence of troublesome tinnitus increases with age, being 10-15% among the adult population,[1] with a higher prevalence (7.05%) in Europeans and the lowest prevalence (1%) in Asians.[3] However, in India a prevalence of 7% has been reported.[4] The pathophysiological mechanisms of tinnitus are still not well-defined.[4] Though traditionally considered to be of ontological origin, it is now considered to have a neuronal origin.[5] A number of risk factors are implicated, including reduced hearing, ototoxic medications, head injury, anxiety and depression.[6]

Tinnitus is an area requiring further research. With no standardised test for diagnosis or presence of tinnitus, some subjective tests, like tinnitus pitch and loudness matching, are used for evaluation in addition to a detailed history and establishing the hearing status. Researchers and clinicians have developed subjective tests with a self-administered questionnaire to measure the impact of tinnitus.[5] Tinnitus handicap inventory (THI) is a common tool used to screen for tinnitus disability / severity and planning management, especially counselling.[7] With limited treatment options, including counselling and cognitive behavioural therapy, the development of new innovations in treatment targeting the brain are being considered.[5]

Further research has been recommended by different authors, including categorisation of individual tinnitus sensation and emotional and functional issues that are associated with tinnitus.[8] The current study was planned to determine the impact of tinnitus on daily living of tinnitus sufferers, and factors associated with the severity of tinnitus handicap.

Patients and Methods

The cross-sectional study was conducted from November 2016 to April 2017 at Al-Nafees Medical College Hospital,

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Islamabad, Capital Development Authority (CDA) Hospital, Islamabad, Lahore General Hospital, Lahore, Bahawal Victoria Hospital, Bahawalpur; and Wassay Ear Nose Throat (ENT) Clinic, Muzaffarabad, Pakistan.

After approval from the advanced studies and research committee, Isra Institute of Rehabilitation Sciences, Isra University Islamabad, the sample size was calculated using Raosoft online calculator[9] with 95% confidence level and around 8% margin of error, taking population size as 20,[3,10] and 50% response distribution. The sample was rasied using non-probability convenience sampling technique.

Those included were tinnitus patients of either gender aged 15-75 years. Patients with inflammatory and obstructive lesions of the ear and vertigo and those who could not understand the questions because of language barrier and low intellectual abilities were excluded.

Data was collected using the THI English version[7] related to handicap in their daily life because of tinnitus. THI measures subjective severity of the tinnitus handicap using the 25-item tinnitus handicap inventory scale.[11] For each item on the inventory, the participant responds with "yes" (4 points), "sometimes (2 points) or "no" (0 point). These responses are summed up, with the total score ranging 0-100 points. Depending on the total score, the handicap caused by tinnitus was categorised as slight, mild, moderate, severe and catastrophic.

Data was analysed using SPSS 21. Qualitative data, like gender, was presented as frequencies and percentages, while age of presentation was expressed as mean±standard deviation (SD). Chi-square test was used to find the associations between categorical variables. $p<0.05$ was considered statistically significant.

Results

Of the 152 partients, 87(57.20%) were males and 65(42.80%) females. The overall mean age was 44.10±16.06 years. Hearing loss was found in 106(69.70%) cases (Table 1) and 45(29.6%) of the subjects were housewives (Figure).

Table-1: Demographic Data (n=152).

Demographic Variable	n (%)	Valid Percent	Cumulative Percent
Gender			
Male	87 (57.2)	57.2	57.2
Female	65 (42.8)	42.8	100.0
Age Group (years)			
15-20	11 (7.2)	7.2	7.2
21-30	19 (12.5)	12.5	19.7
31-40	43 (28.3)	28.3	48.0
41-50	28 (18.4)	18.4	66.4
51-60	23 (15.1)	15.1	81.6
61-70	21 (13.8)	13.8	95.4
>70	7 (4.6)	4.6	100.0
Area			
Islamabad	59 (38.8)	38.8	38.8
Rawalpindi	24 (15.8)	15.8	54.6
Lahore	29 (19.1)	19.1	73.7
Bahawalpur	20 (13.2)	13.2	86.8
Kashmir	20 (13.2)	13.2	100.0
Education			
Uneducated	27 (17.8)	17.8	17.8
Primary	18 (11.8)	11.8	29.6
Matric	35 (23.0)	23.0	52.6
Intermediate	29 (19.1)	19.1	71.7
Under graduate	18 (11.8)	11.8	83.6
Post graduate	25 (16.4)	16.4	100.0
Co-morbids/ Psychological disorders			
Yes	26 (17.1)	17.1	17.1
No	126 (82.9)	82.9	100.0
Ear, Nose and Throat (ENT) Surgery			
Yes	8 (5.3)	5.3	5.3
No	144 (94.7)	94.7	100.0
Hearing			
Normal Hearing	46 (30.3)	30.3	30.3
Hearing loss	106 (69.7)	69.7	100.0

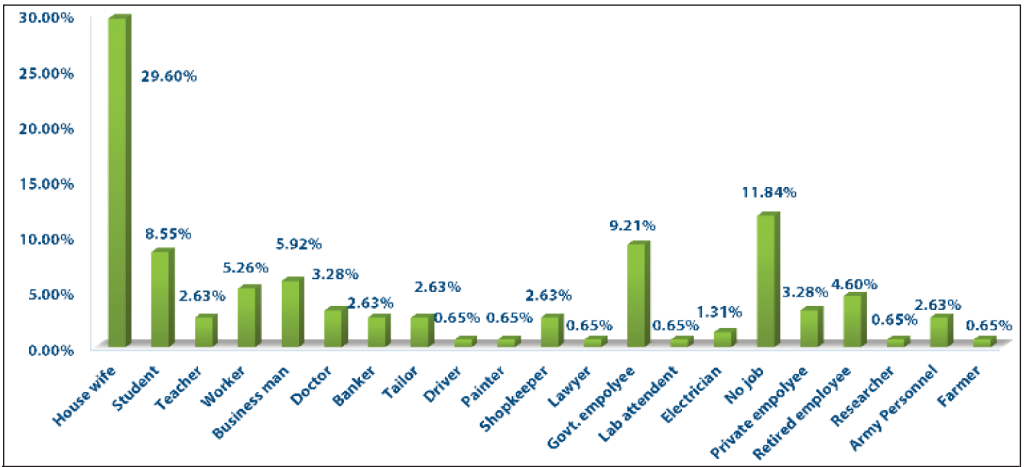

Figure: Occupation of the study population (n=152).

Severity was higher in males compared to females ($p=0.04$). Association between age and tinnitus handicap score was significant ($p=0.007$). Significant associations of tinnitus were also noted with hearing loss, and tinnitus sound, while it was non-significant with the duration and site of tinnitus (Table 2). More patients perceived tonal tinnitus than non-tonal tinnitus, but the association was non-significant ($p=0.08$).

Table-2: Age, Gender and Tinnitus Characteristics * Tinnitus Severity and Chi Square. Cross Tabulation (n=152).

Variable	Tinnitus handicap inventory (THI) Category					Total	*p* value	r-alue
	Slight (0-16) n (%)	Mild (18-36) n (%)	Moderate (38-56) n (%)	Severe (58-76) n (%)	Catastrophic (78-100) n (%)	n (%)		
Participants (Frequency/ Percentage	10(6.5)	25(16.4)	38(25)	53(34.87)	26(17.1)			
Gender								
Male	8(9.2)	12(13.8)	19(21.8)	37(42.)	11(12.7)	87(100.)	0.04	9.59
Female	2(3.1)	13(20.0)	19(29.2)	16(24.6)	15(23.1)	65(100)		
Age (Years)								
< 20	3(27.3)	5(45.5)	0(0.0)	3(27.3)	0(0.0)	11(100)	0.007	22.27
21 to 40	4(6.3)	13(20.6)	13(20.6)	19(30.2)	14(22.2)	63(100)		
41 to 60	3(6.0)	5(10.0)	16(32.0)	19(38)	7(14)	50(100)		
Above 60	0(0.0)	2(7.1)	9(32.1)	12(42.9)	5(17.9)	28(100)		
Hearing Status								
Normal	8(17.4)	13(28.3)	11(23.9)	9(19.6)	5(10.9)	46(100.0)	0.001	23.27
Loss	2(1.9)	12(11.3)	27(25.5)	44(41.5)	21(19.8%)	106(100)		
Type of tinnitus sounds								
Insect	4(19.0)	6(28.6)	5(23.8)	6(28.6)	0(0.0)	21(100)	0.03	32.62
Whistling	1(1.6)	11(17.7)	17(27.4)	19(30.6)	14(22.6)	62(100)		
Machine	4(13.3)	1(3.3)	10(33.3)	10(33.3)	5(16.7)	30(100)		
Ocean roar	1(10)	3(30.0)	3(30)	2(20)	1(10)	10(100)		
Wind blow	0(0.0)	4(14.8)	3(11.1)	15(55.6)	5(18.5)	27(100)		
Others	0(0.0)	0(0.0)	0(0.0)	1(50.0)	1(50.0)	2(100)		
No. of tinnitus sounds								
Tonal	5(5.4)	13(14.0)	19(20.4)	35(37.6)	21(22.6)	93(100)	0.08	8.14
Non tonal	5(8.5)	12(20.3)	19(32.2)	18(30.5)	5(8.5)	59(100)		
Duration of tinnitus								
< 1 month	5(17.9)	9(32.1)	5(17.9)	6(21.4)	3(10.7)	28(100)	0.06	19.94
1month to 1 year	2(3.0)	11(16.7)	17(25.8)	22(33.3)	14(21.2)	66(100)		
1 to < 5	2(4.5)	3(6.8)	12(27.3)	21(47.7)	6(13.6)	44(100)		
>5 years	1(7.1)	2(14.3)	4(28.6)	4(28.6)	3(21.4)	14(100.0)		
Site of tinnitus								
Right ear	5(8.8)	10(17.5)	16(28.1)	16(28.1)	10(17)	57(100)	0.59	10.21
Left ear	4(8.7)	5(10.9)	11(23.9)	19(41.3)	7(15.2)	46(100.0)		
Both ears	1(2.2)	9(19.6)	9(19.6)	18(39.1)	9(19.6)	46(100)		
In Head	0(0.0)	1(33.3)	2(66.7)	0(0.0)	0(0.0)	3(100)		

Discussion

A wide range of tinnitus handicap was noted, extending from a handicap score of 0-16 (slight) in 6.58% to 78-100 (catastrophic) in 17.10%, with 51.9% cases having severe to profound tinnitus handicap affecting daily life. Similar wide-ranging results have been reported earlier.[7,12,13]

The current study found that most patients (34.87%) had grade 4 severe degree of tinnitus handicap. This was in line with a Saudi study,[14] but in contrast with another study.[7] The possible reason of higher percentage of grade 4 tinnitus handicap in the current study may be that most participants were suffering from hearing loss, which is another additional handicap that affects the quality of life.

Some studies have shown higher prevalence in female patients,[4] while others have suggested higher prevalence in male participants.[14] The possible reason of higher prevalence in men may be that they are bread-earners exposed to occupational noise more than women. The same was the case in the current study. Another study[15] reported that females were significantly more affected by tinnitus stress, while still others[7,12,16] reported a statistically non-significant association with gender.

As regards age, studies[12,16] did not find a significant association with THI score. In contrast, a study reported that tinnitus increased with age.[3] The current study also found significant association (p=0.007) between age and tinnitus handicap scores.

Literature[4,14] has also reported significant association of tinnitus distress and duration of tinnitus, but in the current study the association was not statistically significant.

In the current study, whistling was the commonest tinnitus

sound, and there was significant association of tinnitus severity with the type of sound, with the whistling sound having the maximum severity. In contrast, a study reported high frequency of buzzing sound at 38%, followed by hissing sound (32%) and whistling and combination of sounds at 28% each.[4] The significant association of whistling with THI noted in our study could be due to the fact that whistling is a high-pitch sound which is a source of annoyance compared to low-pitch sounds.

Different studies also found that cases with more than one tinnitus sounds had more catastrophic effect than a single sound.[4,7,8] The current study did not find any statistically significant difference in this regard.

Tinnitus cases feel depressed, unhappy, tense, irritable, annoyed, distressed and frustrated[4] and it affects quality of life as well as occupational performance.[12,17]

A study[7] noted no significant difference in THI score with unilateral or bilateral tinnitus,[7] as was the case in the current study.

There was significant association between tinnitus and patients with hearing loss in the current study which is in line with literature.[15,18,19] In contrast, other studies[7,16] did not note any difference in THI score for cases with or without hearing loss.

A study suggested that tinnitus is sub-auditory perception which increases in silent ambient environment.[20] We may suppose that having less work and remaining longer time at home where auditory attention may possibly be more relevant for increasing the annoyance of such a perception.

Being a self-funded project, the study could collect data only from two cities, and also did not correlate THI with different degrees of hearing loss.

Conclusion

Gender, hearing loss and type of tinnitus sound were significantly associated with the severity of tinnitus.

Disclaimer: The text is based on an M.Phil. thesis.

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