



Assessment of severity of tinnitus in patients with and without Hearing Loss Using the Tinnitus Functional Index (TFI)

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ABSTRACT

Aim and Objectives: To compare the severity of Tinnitus in patients with and without hearing loss using Tinnitus Functional Index. **Methodology:** Study method: Prospective study. **Study centre:** Saveetha Medical College And Hospital, Thandalam. **Study population:** Patients with complaints of Tinnitus attending the ENT OPD. **Study duration:** 6 months - from January 2022 to June 2022. **Sample size:** 50. To address the chief complaints of the patients with complaints of tinnitus, a questionnaire was reviewed, and tested. The severity of tinnitus was evaluated using the Tinnitus Functional Index questionnaire. **Results:** The study outcome was tabulated and analysed. Statistical techniques were used to verify the accuracy of results. Out of 50 tinnitus patients, Mild annoyance (7), Moderate annoyance (31) and Severe annoyance (12) were the results obtained. **Conclusion:** On calculating the severity of tinnitus using Tinnitus Functional Index for sample size of 50 patients moderate severity patients were high compared to mild and severe annoyance patients.

INTRODUCTION:

A definition of tinnitus is the sense of sound when there is no external auditory stimuli¹. According to², 2-7% of tinnitus sufferers seek medical advice and intervention for their severe chronic tinnitus and its associated symptoms that severely interfere with everyday life. It is generally agreed that the associated symptoms, such as tinnitus-related stress, anxiety, depression, and insomnia, have an impact on how severe tinnitus is perceived, in addition to the bothersome sound itself^{3,4}. Tinnitus is caused by diverse pathologies and is commonly associated with sensorineural hearing loss^{2,5}. Evidence shows that cochlear damage can be present in tinnitus patients with normal hearing thresholds before gross behavioural threshold reductions can be measured⁶. Tinnitus surveys are regarded as a crucial instrument for determining the degree of tinnitus and results of interventions.

Tinnitus is a symptom of an underlying ailment rather than a distinct disease. It is the sense of sound when there is no actual external sound present. Tinnitus is an annoying condition that can

have an impact on health in the form of insomnia, attention problems, anxiety, and even depression. Almost everyone at one time experiences tinnitus. With an estimated prevalence of 10-15% in adults, subjective chronic tinnitus is a distressing ailment that affects a large portion of the general population. Up until age 70, bothersome tinnitus is more common. Men and women both have a similar prevalence. Though it is challenging to assess prevalence in children, data from existing research indicate that tinnitus experience is widespread, with rates comparable to those in adults. Children, on the other hand, tend to be less inclined to be upset by the perception. The Tinnitus Functional Index (TFI) developed by⁶ provides a reliable and valid measurement of the multiple domains of tinnitus severity and intervention outcomes. The TFI's thorough coverage of numerous significant tinnitus complaints and ability to measure how responsive patients are to treatment-related change are its two most significant benefits⁷.

METHODOLOGY:

This is a Prospective study done in the department of ENT at Saveetha Medical College, Thandalam. IEC approval and patient consent were obtained prior to the study. Study population were patients with Tinnitus during January 2022 to June 2022 in the age group 6 months and above. A total of 50 participants with Tinnitus were included in the study. The study sample consists of both male and female students from various parts of the city which represents different work/home environment with respect to sound level and culture/practice.

The questionnaire was distributed to 50 patients who came with the problem of tinnitus to ENT Department of Saveetha Medical College. Responses were recorded and analysed. Patients might complete the Tinnitus Functional Index questionnaire on their own or with assistance. The severity of tinnitus was measured using Tinnitus Functional Index whether the patient is of mild, moderate, or severe annoyance. The Tinnitus Functional Index questionnaire consists of 25 questions. Each question consists of score scale from 0-10. "0" being completely interfering with the day-to-day activities and "10" not interfering with the activities. According to the patients answering the question the severity is calculated using the Tinnitus Functional Index.

TINNITUS FUNCTIONAL INDEX:

The TFI comprised 25 questions⁸ in total, with eight subscales 10 addressing the following topics: tinnitus intrusiveness, the perception of control, cognitive interference, sleep disturbance, auditory concerns related to tinnitus present, relaxation issues, quality of life, and emotional distress.

Total score was calculated as the sum of all valid responses (maximum possible score = 250 if participant were to rate all 25 TFI items at maximum value of 10), divided by the number of questions for which participant provided valid responses (respondent's mean item score for all items having valid answers), multiplied by 10 (respondent's overall TFI score within 0-100 range), and finally divided by the number of questions for which participant provided valid responses. According to the total score, the severity of tinnitus was divided into three categories:

- Mild annoyance, total score less than 25, little or no intervention required.
- Moderate annoyance, total score between 25 and 50, possible need for professional intervention.
- Severe annoyance, total score greater than 50, tinnitus severe enough to qualify for more aggressive intervention.

Statistical Analysis:

Data analysis was performed using SPSS Statistics.

RESULTS:

50 participants were included in the present study. Out of 50 tinnitus patients, 14% Mild annoyance (7), 62% Moderate annoyance (31) and 24% Severe annoyance (12).

Demographic information of tinnitus patients:

Table 1: AGE

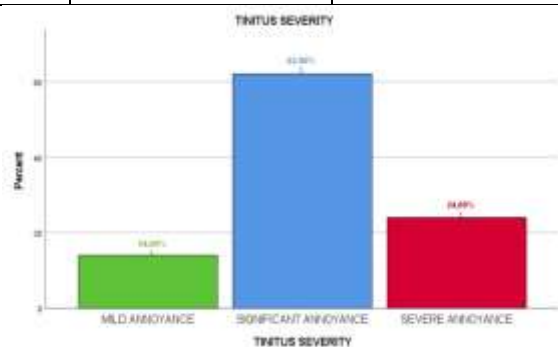
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6M - 25 YEARS	4	8.0	8.0	8.0
	26-50 YEARS	39	78.0	78.0	86.0
	51 YEARS AND ABOVE	7	14.0	14.0	100.0
	Total	50	100.0	100.0	

Table 2: SEX

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	25	50.0	50.0	50.0
	FEMALE	25	50.0	50.0	100.0
	Total	50	100.0	100.0	

Table 3: TINNITUS SEVERITY

		Frequency	Percent	Valid Percent	Cumulative Percent
	MILD ANNOYANCE	7	14.0	14.0	14.0
	SIGNIFICANT ANNOYANCE	31	62.0	62.0	76.0
	SEVERE ANNOYANCE	12	24.0	24.0	100.0
	Total	50	100.0	100.0	

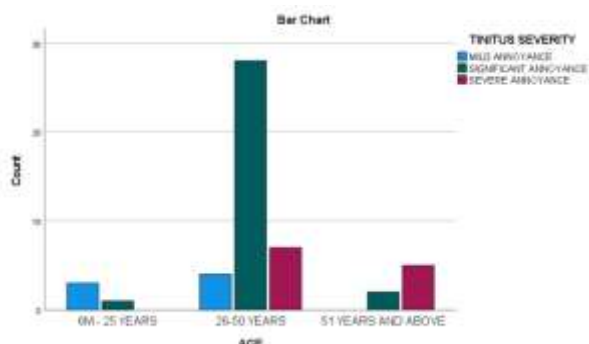


On cross tabulation between the age and tinnitus severity

Table 4: AGE * TINNITUS SEVERITY Cross tabulation

		TINNITUS SEVERITY			Total
		MILD ANNOYANCE	SIGNIFICANT ANNOYANCE	SEVERE ANNOYANCE	
AGE	6M - 25 YEAR	3	1	0	4
	26-50 YEARS	4	28	7	39
	51 YEARS AND ABOVE	0	2	5	7

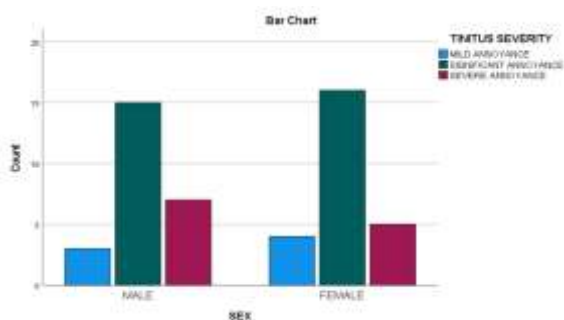
	ABOVE				
	Total	7	31	12	50



On cross tabulation between sex and tinnitus severity

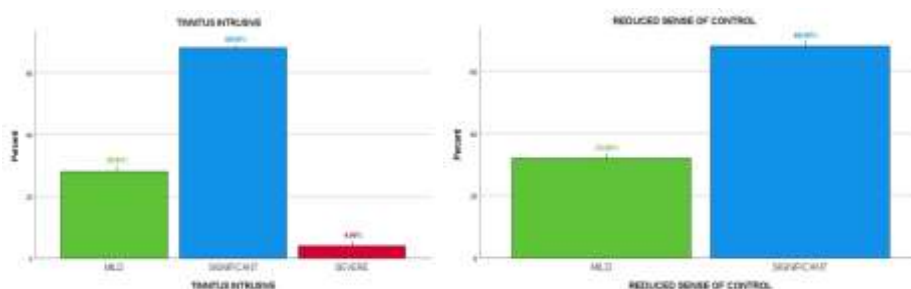
Table 5: SEX * TINNITUS SEVERITY Crosstabulation

		MILD ANNOYANCE	TINNITUS SEVERITY SIGNIFICANT ANNOYANCE	SEVERE ANNOYANCE	Total
SEX	MALE	3	15	7	25
	FEMALE	4	16	5	25
Total		7	31	12	50



Subscales :

Tinnitus intrusiveness, the perception of control, cognitive interference, sleep disturbance, auditory concerns related to tinnitus present, relaxation issues, quality of life, and emotional distress.



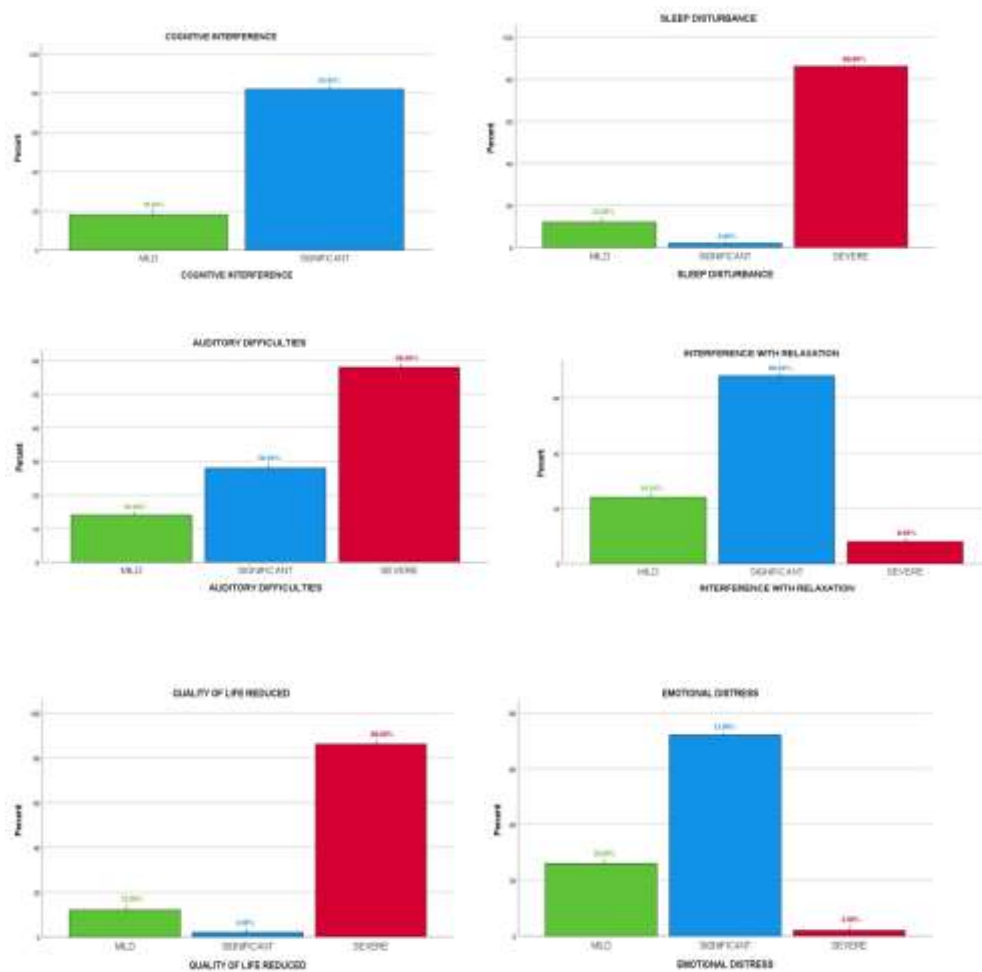


Table 6: TINNITUS INTRUSIVE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MILD	14	28.0	28.0	28.0
	SIGNIFICANT	34	68.0	68.0	96.0
	SEVERE	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

Table 7: REDUCED SENSE OF CONTROL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MILD	16	32.0	32.0	32.0
	SIGNIFICANT	34	68.0	68.0	100.0
	Total	50	100.0	100.0	

Table 8: COGNITIVE INTERFERENCE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MILD	9	18.0	18.0	18.0
	SIGNIFICANT	41	82.0	82.0	100.0
	Total	50	100.0	100.0	

Table 9: SLEEP DISTURBANCE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MILD	6	12.0	12.0	12.0
	SIGNIFICANT	1	2.0	2.0	14.0
	SEVERE	43	86.0	86.0	100.0
	Total	50	100.0	100.0	

Table 10: AUDITORY DIFFICULTIES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MILD	7	14.0	14.0	14.0
	SIGNIFICANT	14	28.0	28.0	42.0
	SEVERE	29	58.0	58.0	100.0
	Total	50	100.0	100.0	

Table 11: INTERFERENCE WITH RELAXATION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MILD	12	24.0	24.0	24.0
	SIGNIFICANT	34	68.0	68.0	92.0
	SEVERE	4	8.0	8.0	100.0
	Total	50	100.0	100.0	

Table 12: QUALITY OF LIFE REDUCED

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MILD	6	12.0	12.0	12.0
	SIGNIFICANT	1	2.0	2.0	14.0
	SEVERE	43	86.0	86.0	100.0
	Total	50	100.0	100.0	

Table 13: EMOTIONAL DISTRESS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MILD	13	26.0	26.0	26.0
	SIGNIFICANT	36	72.0	72.0	98.0
	SEVERE	1	2.0	2.0	100.0
	Total	50	100.0	100.0	

DISCUSSION:

Currently, the TFI is acknowledged as a useful instrument for determining the subjective impact and severity of tinnitus as well as evaluating changes brought on by treatment. Thoughtful consideration should be given to the fact that the TFI is a patient-reported subjective indicator of tinnitus severity. There is evidence that it differs from tinnitus severity assessed using other techniques, like psychoacoustic measurements, and numerous additional research have found that

THI scores did not significantly correspond with tinnitus loudness measurements⁹. The TFI questionnaire was used in this study, and statistical analysis of the level of annoyance revealed that a much higher percentage of participants were SIGNIFICANTLY annoyed.

Tinnitus patients frequently and frequently complain of sleep disturbance. Recent research has demonstrated that there is a decreased tolerance and higher discomfort with the tinnitus when sleeplessness and are present. This is also true with our study, nearly **86 percent** of people have responded that sleep disturbance is severely associated with tinnitus. Patients also have experienced auditory difficulties which nearly accounts for the maximum number of responses submitted by the patients. The quality of life also reduced in patients with tinnitus. Patients are not able to participate in their day to day activities. People get distracted easily and not able to adapt with tinnitus. Other all subscales provide us the interference in patients life.

On comparing the result with Parent article¹⁰, tinnitus severity results of both the study were different. In the normal hearing group, the level of tinnitus annoyance was reported as mild by 17 participants, significant by 14 participants and severe by only 3. The result of the parent article shows a majority of patients were with mild annoyance. This study shows Out of 50 tinnitus patients, 14% Mild annoyance (7), 62% Moderate annoyance (31) and 24% Severe annoyance (12). A majority of people responded were under moderate annoyance.

On comparing the subscales of both articles, the results obtained from the patients are following. The Parent article shows Significant reduction of Tinnitus intrusiveness, Significant loss of perception of control, Mild cognitive interference, Significant sleep disturbance, Mild auditory disturbances and difficulties, Mild relaxation issues, Mild disturbances in quality of life, and Mild emotional distress. While this study shows a subscale result of Significant reduction of Tinnitus intrusiveness, Significant loss of perception of control, Significant cognitive interference, Severe sleep disturbance, Severe auditory disturbances and difficulties, significant relaxation issues, Severe disturbances in quality of life, and Significant emotional distress. Results obtained and calculated in this study are mentioned above.

The thorough study of the TFI subscales offers therapists guidance on how to address and treat tinnitus as a symptom in people with normal hearing as well as those with sensorineural hearing loss. Several languages have currently been translated into the TFI. To determine tinnitus severity in terms of multiple dimensions in the cultural context, it would be interesting to undertake a crosscultural study utilising various language versions of the TFI. This could lead to a better knowledge of tinnitus and how it affects patients with varied hearing statuses in various socioeconomic settings, which could then result in more targeted and successful intervention methods with more defined tactics to use in counselling and rehabilitation.

CONCLUSION:

Patients with normal hearing thresholds perceived their tinnitus as being SIGNIFICANTLY worse using the Tinnitus Functional Index. In addition, the subscales of the Tinnitus Functional Index showed that tinnitus patients' Significant reduction of Tinnitus intrusiveness, Significant loss of perception of control, Significant cognitive interference, Severe sleep disturbance, Severe auditory disturbances and difficulties, significant relaxation issues, Severe disturbances in quality of life, and Significant emotional distress. Further research on the TFI in a clinical population in various nations would be helpful for a thorough diagnostic and intervention evaluation as it serves as a key assessment tool for the global tinnitus community. To better tinnitus management and audiological rehabilitation, it would be necessary to conduct an inquiry into the intensity of tinnitus and establish the precise traits of tinnitus perception.

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