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THE EFFECT OF TINNITUS ON THE QUALITY OF LIFE OF THE SUFFERERS

ABSTRACT

Background: Tinnitus is a prevalent condition characterized by the perception of sound in the absence of an external source. The impact of tinnitus on individuals can vary significantly, with some experiencing only mild discomfort while others are greatly affected on a day-to-day basis. Some people may find their symptoms relatively manageable, while others may struggle with the physical, emotional, and psychological implications of the condition. This wide range of experiences highlights the need to examine the association between tinnitus and the quality of life of sufferers in greater detail so that appropriate management can be given according to its severity. The study is aimed to investigate the effect of tinnitus on the quality of life of the sufferers.

Method: Cross sectional study of patients suffering from tinnitus.

Result: There were a total of 50 patients, 38 females and 12 males. The mean age of 39.4 (SD 18.56). 34 patients had tinnitus in both ears and 16 patients had tinnitus in one ear only. The mean Tinnitus Handicap Inventory (THI) score was 40.79 (SD 7.80). Majority of the patients (42%) had moderate degree of severity in their tinnitus. Patients had higher scores in the functional and emotional domain 59.75% and 59.84% respectively.

Conclusion: The study contributes valuable insights into the various day to day activities where tinnitus has a negative impact causing a poorer quality of life.

Keywords: Key words: Quality of life in tinnitus, Tinnitus, Tinnitus Handicap Index

INTRODUCTION

Tinnitus is the perception of sound in the absence of an external source, often described as ringing, buzzing, or humming in the ears. It can be a chronic condition that significantly impacts a person's quality of life. It is a highly prevalent disorder, and ~10–15% of the adult population suffers from chronic, subjective tinnitus.^{1,2} The heterogeneous disorder is experienced differently in every individual: some only experience little discomfort, while others feel a great impact on cognitive abilities and emotional aspects.³ The presence of tinnitus can lead to failure in reasoning and concentration both in the social and domestic environments, causing people to be irritable, anxious, distressed, depressed, and

insomniac.

The Tinnitus Handicap Inventory (THI) is a widely used questionnaire designed to assess the impact of tinnitus on quality of life of an individual and to monitor changes over time.

MATERIALS AND METHODS

We conducted a descriptive cross-sectional study in a tertiary care hospital in Kathmandu, Nepal from February 2021 to March 2022 after acquiring approval from an ethical review board. Adult patients who presented to the otorhinolaryngology clinics with ongoing tinnitus as their primary complaint were included in the study. Individuals with tinnitus for less than three

months, obvious disease in the ears, severe mental health conditions, cognitive impairment and serious medical conditions that could significantly impact quality of life outcomes, independent of tinnitus were excluded. Written informed consent was obtained from the patients after which the demographic information, medical history, and relevant details about tinnitus, such as onset, duration, and subjective characteristics were recorded. A thorough clinical examination was done. A pure-tone audiometry to measure hearing thresholds at various frequencies was done by a trained audiologist. Each participant had the Tinnitus Handicap Inventory (THI) questionnaire read to them, and their response was noted.

The THI has 25 questions and each response is scored the following values: yes (4 points), sometimes (2 points) and no (0 points). The maximum sum achieved is 100 points, and, depending on the result, can show the degree of severity of tinnitus associated with the individual's quality of life.⁴

THI scores were graded as following:⁵

- 0-16: Very mild. Tinnitus is perceived only in silence and is easily masked.
- 18-36: Mild. It can occasionally interfere with sleep but not with daily activities.
- 38-56: Moderate. Tinnitus is perceived even in the presence of environmental sound. Interference with sleep and relaxing activities is not infrequent.
- 58-76: Severe. Tinnitus is continuously perceived and hardly masked by external noise. It alters the sleep cycle and can interfere with the subject's daily activities.
- 78-100: Catastrophic-All side effects caused by tinnitus are present at a very severe level. The subject requires medical assistance very frequently, including neuropsychiatric help.

The questionnaire is grouped into three subscales. The functional sub-scale comprises eleven questions (1, 2, 4, 7, 9, 12, 13, 15, 18, 20 and 24) and evaluates the role limitations in the areas of mental, social/occupational, and physical functioning. Examples of functional limitations include difficulties with concentration, work performance, social interactions, and physical activities. There are nine questions (3, 6, 10,

14, 16, 17, 21, 22 and 25) for the emotional subscale, including a wide range of emotional responses for tinnitus, such as anger, frustration, irritability and depression. And finally, there are five questions for the catastrophic subscale (5, 8, 11, 19 and 23) to survey the most severe reactions resulting from tinnitus, such as despair, loss of control, inability to face problems, inability to escape the tinnitus, and fear of having a serious illness.⁴

Analysis was done with the Statistical Package for the Social Sciences (SPSS) version 25. The relationship between THI score, age of the patient, duration of tinnitus and severity of hearing loss was assessed using Pearson Correlation Test. The level of significance was set at $<.05$.

RESULTS

A total of 50 patients, consisting of 38 females and 12 males were included in this study. The mean age of the patients was 39.4 years (SD 18.56) and ranged from 21 to 81 years. The mean duration of tinnitus was 10 months (range 3-48 months) and 76% of the patients had tinnitus for less than a year. Pure tone audiometry average of 500, 1000, 2000, 4000 Hz frequency mean hearing loss in right ear was 30.88 (SD 14.12) and left ear was 30.06 (SD 15.26). 34 patients had tinnitus in one year while 16 patients had tinnitus in both the ears. The mean THI score of the patients was 40.79 (SD 7.80). Five patients had very mild tinnitus, 14 patients had mild tinnitus, 21 patients had moderate tinnitus, 8 patients had severe tinnitus while 2 patients fell in the catastrophic severity group (Figure-1).

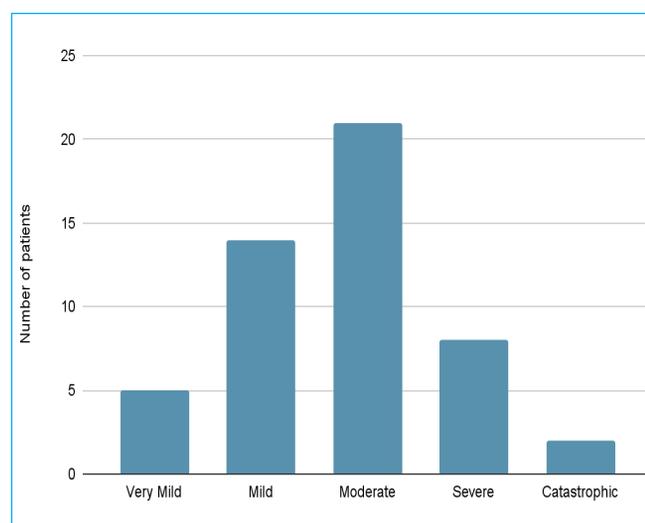


Figure-1: Tinnitus Handicap Index score among the patients.

Further analysis of the THI scores in the three subscale—functional, emotional, and

catastrophic showed higher scores in the functional and emotional impact of tinnitus on the patients.

Table 1- Score of the three different subscales of THI (Tinnitus Handicap Inventory)

Sub Scale	Minimum score	Maximum score	Mean score	Standard deviation	Mean percentage score.
Functional	12	36	21.56	5.60	59.75%
Emotional	6	26	15.56	6.73	59.84%
Catastrophic	0	16	5.36	3.30	26.8%

Correlation between THI score, age of the patients, duration of tinnitus and severity of hearing loss was calculated using the Pearson correlation coefficient. There was no correlation between THI scores, the severity of hearing loss and age of the patient and duration of tinnitus at a significance level of 0.05.

Table 2: The correlation between THI scores with age of the patient, duration of tinnitus, and severity of hearing loss.

Correlation	Pearson Correlation Coefficient (R)	P value
Age of the patients	-0.170	.237
Duration of tinnitus.	0.017	.906
Severity of hearing loss	0.055	.704

DISCUSSION

In our study we observed that there is a higher prevalence of tinnitus in females 38 (76%) compared to 12 (24%) males. This observation aligns with previous studies that have reported a higher number of female tinnitus sufferers.^{6,7,8,9} One possible link between tinnitus and females is hormonal changes. Levels of oestrogen and progesterone can affect the auditory system and potentially contribute to tinnitus. In a cohort study by Chen et al., they have provided evidence that hormone replacement therapy decreased the risk of tinnitus in menopausal women in a long-term and nationwide population-based survey.¹⁰

The average age of the subjects in this study was 39.4 years old. Average age of the patients less

than 50 years old have been reported by some authors however the majority of the studies shows patients older than 50 years.^{11,12,13}

The mean duration of tinnitus was 10 months (range 3-48 months). 76% of the patients had tinnitus for less than a year and all the patients studied had tinnitus for less than 5 years. These findings are in agreement with the studies presented by different authors which reported the time since onset of tinnitus as less than five years.^{12,15}

Our study showed that the mean THI score was 40.79 (SD 7.80). Twenty one patients (42%) of the patients had a moderate degree of perceived handicap caused by tinnitus. In a study by Ukaegbe et al. the mean THI score was 36.6 ± 19.7 and in a study by Lacerda et al. the mean THI was 37.8%, both showing a moderate degree of perceived handicap in majority of the patients.^{6,12} Though tinnitus can have range of effects, majority of the patients were found to have moderate degree of severity.

Two patients (4%) had very high THI scores to be in the catastrophic group. These patients had lost their hope, were desperate and could no longer cope with tinnitus. This group of patients were recommended to seek neuropsychiatric assistance.

In this study, the mean functional and emotional scores were 21.56 (59.75.27%) and 15.56 (59.84%) respectively. The mean catastrophic score in this study was 3.30 (26.8%).

This shows a similar degree of handicap in the functional and emotional subscale. Functional limitations included difficulties with concentration, work performance, social interactions, physical activities and sleeping. Handicap in the emotional

subscale included patients disturbed by anxiety, depression and irritability. A higher score in the functional subscale was seen in the study by Lacerda et al. However some other authors have shown greater handicap in the emotional subscale.^{6,12}

This study found no correlation between the THI scores, age of the patient, severity of hearing loss and duration of tinnitus. This implies that these factors may not influence the perceived handicap caused by tinnitus. However other authors have shown that age independently was a significant predictor of tinnitus. Reisinger et al. showed that the odds of reporting tinnitus is higher in older people. Tinnitus in older age was likely due to the presence of age related changes in the cochlea and the brain.¹⁶ Lacerda et al. they found a significant correlation between the THI score and the length of time since onset.¹² Exposure to tinnitus for a longer duration could further aggravate the condition causing increase THI scores. In a study by Mahafza et al. a comparison of the severity of tinnitus in patients with and without hearing loss was done which showed statistically significant association between hearing status and the severity of tinnitus. Damaged hair cells within the inner are unable to pass along proper electrical impulses, but they can also send out abnormal impulses leading to tinnitus.¹⁷ Our study included a relatively small sample size of 50 patients. A larger sample size could improve the generalizability of the findings and provide more robust statistical analysis. The study relied on patients who presented to otorhinolaryngology clinics with tinnitus as their primary complaint. This may introduce selection bias, as individuals seeking medical attention for tinnitus may have different characteristics or severity levels compared to the general population of tinnitus sufferers.

CONCLUSION

Patients may perceive different degrees of handicap ranging from a very mild to a catastrophic form. This study shows a moderate degree of perceived handicap caused by tinnitus in the majority (42%) of the patients. Greater score of 59.75% and 59.83% is seen in functional and emotional subscale respectively.

Competing interests: None.

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