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Awareness and experience of tinnitus among young adults in the state of Karnataka, India - An online survey

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ABSTRACT

Background: The causes and the auditory/non auditory effect of tinnitus on quality of life were studied extensively. Tinnitus can affect an individual at any point of time and has multiple causes. Limited studies have investigated the awareness of tinnitus and the experience of tinnitus among healthy young adults.
Materials and Methods: The current survey investigated the awareness and experience of 'tinnitus' among healthy young adults in the state of Karnataka, India through an online survey. Healthy young adults aged 18 to 40 years from different parts of the state of Karnataka were targeted and a total of 304 individuals voluntarily participated in the online survey.
Results: Responses showed that about 55% of participants have heard the term "tinnitus" and only 36.18% were aware of tinnitus. When the term 'tinnitus' was defined, more than 54% of participants responded that they have experienced tinnitus at least once in their lifetime. Majority of the participants reported prolonged use of personal listening devices at loud and moderate volumes. 13.81% of participants believed that tinnitus can have a devastating effect on the quality of life and only few (29.62%) were aware that tinnitus could be treated. Unhealthy listening habits are potential risk factors for developing hearing loss and tinnitus among young adults.
Conclusion: The survey highlights the need for creating awareness about seeking timely management and developing healthy listening habits among young adults to prevent the adverse effects of tinnitus. This needs to be implemented through future preventive campaigns, educational, and social media awareness programs.

1. Introduction

The term "tinnitus" is defined as a ringing sensation perceived by an individual within the ear or head without the presence of any external stimulation.[1–3] Tinnitus can be classified as continuous/intermittent and subjective or objective,[4] presented unilaterally or bilaterally; can be pulsatile or non-pulsatile, intermittent or constant.[5] The major causative factors associated with tinnitus are medication, surgery, ear-related diseases/disorders, head and neck injuries and/or noise exposure.[6–12] The presence of tinnitus can have an adverse effect in the day-to-day life of the individual irrespective of age and gender and can occur anytime across the life span.

Majority of the researchers have focused on exploring the occurrence and consequences of tinnitus in individuals with hearing loss, age-related hearing loss, and noise exposure.[13] One of the common cause for tinnitus is continuous or sudden noise exposure.[13] Literature reveals that younger adults exposed to leisure noise at loud volumes are at high risk for developing ear damage and consequently tinnitus. Leisure noise exposure at loud volumes is one of the key

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factors for damaging the outer hair cells14 which in turn causes hearing loss and tinnitus. Studies state that the prevalence of noise induced tinnitus ranged from 3% to15% among younger adults.[14,15] Another study reported that majority of their young participants had experienced tinnitus after exposure to loud leisure noise and were unaware of the potential risks of loud noise exposure.[16] However, the experience of tinnitus after noise exposure was found to be a motivating factor for the use of hearing protection devices among young adults.[16] The characteristics of transient and chronic tinnitus after leisure noise exposure among young adults have been studied in the literature.[7,17,18] The results showed that the young adults experienced transient tinnitus frequently after leisure noise exposure and some of the participants developed chronic tinnitus. Young adults were found to be unaware of the existence of tinnitus and most of the participants did not know about the causes or effects of tinnitus. Also, few of the participants had the experience of tinnitus and others knew someone who suffered from tinnitus.[18]

The causes and the auditory/non auditory effect of tinnitus on human health were studied extensively. However, limited studies have investigated the awareness of tinnitus and the experience of tinnitus among young adults and there is a dearth in literature that have investigated the same in India. Hence, the current survey focuses on understanding the awareness of tinnitus and its experience among young individuals in the state of Karnataka, in the southern part of India. The current study would help the health care professionals to focus on creating awareness and developing hearing health promotion programs targeting the young adults who are at the potential risks of developing hearing related problems and promote healthy listening habits. The survey would also help the participants to develop a self-awareness about the potential impacts of noise exposures or loud music exposures and potential impact on hearing and to design healthy listening habits to prevent hearing loss and hearing damage and steps to be taken for effective management of tinnitus and other hearing conditions.

2. Materials and Methods

2.1. Ethics committee approval

The Institutional Ethics Committee approval (FMIEC/CCM/606/2020). was taken before the commencement of the study.

2.2. Questionnaire

The questionnaire for the survey was framed under the domains of 1) Biographic details 2) Awareness and experience of tinnitus 3) Auditory behaviours 4) Effect of tinnitus and 5) Attitude towards tinnitus. The questionnaire for the survey was framed in English language and was validated by five qualified professionals from the field of Speech and Hearing and the questionnaire was modified by incorporating the suggestions. The final questionnaire for the survey consisted of 30 self-administered open-ended and closed-ended questions and targeted healthy young adults.

2.3. Participants

A total of 304 healthy young adults between 18 and 40 years from different parts of the state of Karnataka, India participated in the survey. The survey included participants who were not under any medications which are known to cause ototoxicity, who were diagnosed with hearing loss prior, or who have not undergone any head, neck, and ear related surgeries and/or injuries, and who were not from the field of Audiology were included in the study and participants were randomly chosen from general public across Karnataka.

2.4. Methodology

An observational qualitative descriptive study design was adopted for the survey. The questionnaire for the survey was circulated online as Google forms through various social groups and E-mails. The participation in the survey was completely voluntary and the consent for participation was taken online wherein the participant must opt the option for voluntary participation option and only then the survey would be proceeded. The participants were requested to attempt all the questions and provide genuine answers.

2.5. Data analysis

The responses from all the participants were subjectively analysed for the individual completion of questionnaire and completion of answers. The incomplete responses were discarded from the analysis. The obtained data were processed and analysed using SPSS version 20. Descriptive statistics was used and the responses were determined in terms of mean, standard deviation, frequency counts and percentage scores.

3. Results

3.1. Awareness and Experience of Tinnitus

The results showed that out of the 304 participants, 55% (169 participants) have heard the term “tinnitus” and the remaining 45% (135 participants) have not heard the term tinnitus before. Out of these 169 participants who have heard the term “tinnitus, 65.06% (110 participants) were aware of what tinnitus is and how it feels like and remaining 34.94% (59 participants) were completely unaware of the same. Despite of being aware or unaware about tinnitus, when the condition of tinnitus was defined in the following section of the survey, more than 54% (164 participants) of the total 304 participants reported that they have experienced tinnitus at least once in their life time.

Table 1: Depicts the type, loudness, duration and occurrence of tinnitus across the participants

Type of tinnitus	Loudness of tinnitus	Duration of tinnitus	Occurrence of tinnitus
Ringing sound – 91 participants (55.48%)	Soft – 95 participants (57.92%)	< 3sec – 70 participants (42.68%)	Rare – 119 participants (72.56%)
Hissing sound – 12 participants (7.34%)	Moderate – 62 participants (37.80%)	3 seconds to 1 minute - 76 participants (46.34%)	Occasional – 31 participants (18.90%)
Pulsating sound – 10 participants (6.09%)	Loud – 2 participants (1.24%)	1 min - 2 min – 6 participants (3.65%)	Frequent – 2 participants (1.21%)
Not Sure – 51 participants (31.09%)	Not Sure – 5 participants (3.04%)	> 2 min – 1 participant (0.63%)	Very frequent – 6 participants (3.65%)
		Not Sure – 11 participants (6.70%)	Not Sure – 6 participants (3.68%)

However, the type, loudness, duration and frequency of tinnitus varied among the participants (Table 1).

3.2. Auditory behaviours

3.2.1. Hearing loss

Out of the 304 participants, 10 participants (3.28%) reported of hearing loss along with difficulty in understanding speech, vertigo and aural fullness. Among these 10 participants, 6 participants were reported to have tinnitus, majorly of ringing type (4 participants) within a range of moderate (3 participants) and soft (3 participants) loudness levels. Overall, 15 participants (4.93%) reported that they had previous history of ear infections and discharge with most of them having persisting hearing loss and occasional tinnitus.

3.2.2. Loud noise exposure

Results revealed that 57 participants (18.75%) had exposure to loud sounds and 11 (19.29%) of them had noise exposure from work places with varying durations ranging from 2 hours to 10 hours per day. Among the 57 participants with loud noise exposure, 31 participants (54.38%) reported of experiencing tinnitus of variable types, with most of them reporting tinnitus as a ringing sound (17 participants; 54.83%), followed by hissing sound (3 participants; 9.69%) and pulsating sound (2 participants; 6.45%). The loudness levels of the tinnitus across these participants were reported to be of moderate level (19 participants; 61.30%) majorly, soft level (9 participants; 29.03%), and loud level (1 participant; 3.22%). Few of the participants who had noise exposure and experience of tinnitus were not sure about the type (9 participants; 29.03%) and the loudness (2 participants; 6.45%) of the tinnitus.

3.2.3. Recreational noise exposure

Several participants (114 participants; 37.82%) reported of the habit of attending loud music concerts and in that 55.65% (63 participants) of them have experienced tinnitus. Among these 63 participants, 31 participants (48.43%) have reported of occasional tinnitus. Further, 11 participants (17.18%) reported that they have experienced frequent episodes of tinnitus. Majority of these individuals have reported of ringing type of tinnitus (34 participants; 54.68%) and remaining participants reported of pulsating (14.06%; 9 participants) and hissing (25%;16 participants) types of tinnitus. It was also reported that, 4 of the participants were not able to determine the type of the tinnitus that they perceived. Moderate level of tinnitus was reported by most of the participants who have the habit of attending loud music concerts/DJs (48.43%; 31 participants) and others reported of soft level of tinnitus (48.43%;31 participants). Only 1 participant had reported of loud level of the tinnitus.

3.2.4. Personal listening devices (PLDs) usage

The results showed that 60.85% (185 participants) of the participants were users of PLDs or earphones/headphones at loud volumes. The duration of daily usage of the PLDs or earphones/headphones varied among the individuals. 12.74% (24 participants) of participants were having a usage of <1 hour, 37.25% (69 participants) for a duration of 1-3 hours, 17.64% (33 participants) for 3-5 hours, 9.8% (18 participants) for 5-8 hours and 2.94% (5 participants) having a duration of >8 hours per day. Out of these 185 participants, 102 participants (55.13%) have experienced tinnitus of varying types - majorly ringing type (55 participants, 53.93%), pulsating type (9 participants, 8.82%), hissing type (9 participants, 8.82%) at moderate (45 participants, 44.12%), soft (54 participants, 52.94%) and loud (1 participant, 0.98%) levels. Few of the participants were indecisive about the type (29 participants, 28.43%) and loudness (2 participants, 1.96%) of tinnitus. Combined use of Personal Listening Devices (PLDs) along with recreational noise exposure at loud volumes have also been reported among 32.93% (54 participants) of participants with tinnitus.

3.2.5. Ototoxic medication and history of surgery

Responses were collected from the participants regarding their medical history. Out of the 164 participants who reported tinnitus experience, 3 participants were under long term ototoxic medication for various purposes. About 6.90% (21 participants) of the total participants reported

the history of medication / surgeries for ear/nose and/or throat related issues. Out of which 57.14% (12 participants) have experienced tinnitus and 42.85% (9 participants) have experienced tinnitus post treatment.

3.3. Effect of tinnitus

A minor number (4.26%; 13 participants) of participants have reported that their tinnitus has worsen over the years. Among the participants who have experienced tinnitus, 13.81% (21 participants) of them considered that tinnitus has a devastating effect on the quality of life. The psychosocial behaviors reported were, presence of stress, fatigue, annoyance, anger, pain, irritation and insomnia. Likewise, 9.75% (16 participants) of participants reported that their activities of daily life have been to be considerably affected during episodes of tinnitus such as, difficulty to concentrate on work (26 participants, 15.85%), social life (11 participants, 6.70%) and awful effects with either family or friends (20 participants, 12.19%).

3.4. Attitude towards Tinnitus

Among the participants who were aware of the condition of tinnitus, only 29.62% (29 participants) of the participants were aware that tinnitus could be treated. A positive attitude towards tinnitus was observed in 32.23% (98 participants) of the participants out of which 87.75% (86 participants) have experienced tinnitus at least once in their lifetime. Another group of participants (12.80%; 21 participants) who have experienced tinnitus were of the belief that, they could not do anything about coping with the tinnitus which is annoying. Non-scientific strategies like pouring oil and wax cleaning and ear balance exercises have been adopted by at least few of the participants to relieve from the adverse effects of tinnitus.

7 participants out of 304 (4.26%) have sought professional help and have received counselling. It was found that 4 participants (2.43%) have used maskers for relieving from tinnitus and 2 of them have reported it to be useful. Further, 60.95% (100 participants) of participants with tinnitus could reassure themselves that they could cope up or tolerate with their tinnitus. 39.14% (119 participants) of the participants could think that seeking timely management will be helpful in controlling the impact of tinnitus. The increase in the percentage of participants with the positive notion that tinnitus could be clinically rehabilitated might be the reflection of the awareness they received from the survey addressing the tinnitus management.

4. Discussion

The aim of the current survey was to investigate the awareness and experience of tinnitus among young adults. The following objectives were framed to achieve the aim: (1) to develop a self-administered questionnaire on awareness and experience of tinnitus, auditory behaviors, effect of tinnitus and attitude towards tinnitus among healthy young adults in the state of Karnataka, India and (2) To study the awareness and experience of tinnitus among healthy young adults.

The result of the survey revealed that more than 50% of the participants were aware of the term tinnitus and remaining were unaware. Despite of being aware or unaware of tinnitus, when the description of tinnitus was briefed in the following session of the questionnaire, it was observed that more than 54% of the participants could appreciate that they had experienced tinnitus at least once in their life time. Previously reported study with similar objective revealed that there was a low level of awareness about tinnitus.[18] The reported study was performed on a smaller group of the participants and the current study used a larger population of young adults. Gilles et al., 2013 also revealed that there has been a significant rise in the percentage of young adults with the experience of tinnitus over past few years. The possible reason for this increased trend in experience of tinnitus in younger population could be due to exposure to leisure noise.[15,17]

The description of the type and factors such as intensity, duration, and the frequency of occurrence of the tinnitus varied among the participants. Among the participants more than half of them perceived ringing type (55.48%) whereas one-third of them were unable to identify the type of tinnitus. Similarly, ringing type was reported to be the most commonly experienced type of tinnitus in young adults.[18] Concerning the loudness level perceived, more than half of the participants were reported that they perceived the tinnitus in softer levels. Approximately half the participants reported that the duration of tinnitus was lasting for 3 seconds to 1 minute. In contrast, perception of tinnitus at louder levels were also been reported among adults.[19] Experience of a ringing and transient type of tinnitus after exposure to excessive noise was reported among majority of the young adults.[15] If moderate level of tinnitus is persisting for a while, it can have an adverse effect on quality of life.

Existing literature provides in depth information of tinnitus in older adults with hearing loss[3,8,10,11] whereas, the current study focussed on healthy young adults, hence the reported hearing loss associated with tinnitus was negligible. Other factors such as exposure to loud noise, recreational noise exposure and prolonged use of personal listening devices also could have contributed to induce tinnitus in young adults. It was found that about 60.85% of the young adults were users of either personal listening devices or earphones/headphones at loud volumes and had frequent exposure to recreational or loud noise. These individuals reported of experiencing ringing type tinnitus at moderate levels.

These results concurs with the existing literature where, it was revealed that, there is a significant rise in tinnitus experienced by adolescents and young adults due to regular and continuous listening of music on personal stereo devices.[8,9,20,21] The findings from the study by Bhatt I. S., 2018, also agree to the statement that young adults may be exposed to traumatic sound through personal music players and can have debilitating effects.[22] Music exposure, firearm noise exposure and occupational noise exposure were identified to be the three major areas causing tinnitus in young adults.[22] Despite the very high prevalence of tinnitus in the young population the rate of hearing protection and the knowledge about the risks of loud music was extremely low.[23] This similarity in results raised a concern that most of the young adults were not well advised regarding the causes of tinnitus and consequences of high level of noise exposure on health.

The participants reported that, the quality of life was deficiently affected due to tinnitus. The reported effects were stress, fatigue, annoyance, anger, pain, social withdrawal, and insomnia. In addition, majority of the participants who had experienced tinnitus reported that, the lack of concentration had an impact on their academic performance as well as work efficiency. Studies have reported that tinnitus- related handicap in daily living is due to psychological factors such as depression and anxiety.[16] In the same line, studies have suggested that there could be a detrimental effect on the quality of life of individuals with tinnitus and requires counseling and intervention.[18,20,24]

Majority of the participants in the current survey believed that, tinnitus is a non-treatable condition. The participants reported of coping or tolerating mechanism and 60% of the participants reassured themselves that it would eventually fade over time. Few of the participants had reported that, they had tried various home remedies and exercises for tinnitus. Whereas, a small proportion believed that they could do nothing to reduce the effect or cope with this condition. Similar to these findings, another study has reported that, participants who sought medical assistance were few.[18] The possible reason could be the lack of awareness about the debilitating effect of tinnitus or the impact of tinnitus on day-to-day life. However, a major proportion of the participants in this study agreed to the notion that seeking timely management will be helpful in controlling the impact of tinnitus and thereby, improving the quality of life. Thus, these findings suggest that, this positive notion among young adults will aid those experiencing tinnitus to seek medical help to reduce the effects of tinnitus and improve their quality of life.

5. Conclusion

The present survey revealed that a significant percentage of participants were unaware of the condition of tinnitus even though majority have experienced it at least once. Responses also suggested that most of the young adults were not mindful about the healthy listening habits and auditory behaviors to be followed and the impact of loud noise exposures on hearing. Other important aspect to be taken into account is that only few number of participants were aware that tinnitus could be manageable and how important is the management. Hence, it needs to be emphasized that the adolescents and young adults should be made aware of the risk of listening to high-volume music and controlled use of personal listening devices as well as prolonged exposure to recreational noise and also to maintain healthy listening habits. Future preventive campaigns should focus more on creating awareness and practice of healthy listening behaviors.

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7. Conflict of Interest

The authors declare no conflicts of interest.

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