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# Prevalence of Hearing Loss among the Undergraduate Students with Normal Hearing Abilities of the University of Ibadan, Ibadan Nigeria

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## **Abstract**

*This study investigated the prevalence of hearing loss among the undergraduate students of the University of Ibadan. An ex-post-facto research design was adopted for the study. Five research questions and one hypothesis were generated and tested. A multi-stage random sampling technique was adopted to select 120 students of 20 samples each from six Faculties of the University. The research instruments used were the clinical otoscope, and a calibrated Audiometer. Descriptive statistics of Mean, frequency counts and simple percentages were used to analyze the five research questions, while independent t-test was used to analyze the null hypothesis at 0.05 level of significance. The results indicated that hearing loss is common among the normal hearing undergraduate students of the University. Based on the findings, it was recommended that the general public especially the youth should avoid exposure to excessive loud noise, and hearing assessment should be included in the expected medical assessment of the newly admitted students of the University of Ibadan.*

## **Introduction**

Normal hearing is the ability to understand speech without relying on any special aids or techniques (Heward, 2006). It has been observed over time that human beings hear before they speak, and their hearing vocabularies greatly exceed their speaking vocabularies. In other words, hearing enables us to know far more than we can say. Most students in all levels of educational systems use their hearing as a gateway to learning. Whenever this normal process is deficient or defective, the condition known as 'Hearing Loss' has occurred.

Hearing loss however, refers to the condition in which individuals are fully or partially unable to detect or perceive at least some frequencies of sounds which can typically be heard by others. It exists when an individual is not sensitive to the sounds normally heard by his kind. Olusanya, Ijaduola, Okolo, Owolawi and Adeosun (1999) described hearing loss as a deficit in auditory sensitivity that interferes with speech recognition and for which intervention strategies are known and available. Having hearing loss makes it difficult but not necessarily impossible to understand speech with or without amplification. People who have hearing loss still use the auditory channel to learn even though what they hear may be distorted (Werts, Culatta, Tompkins, 2007). Hearing loss can either be permanent or fluctuating, and can negatively affect or hinder the educational performance of students, including those in the Nigerian Universities; because persons with hearing impairment are usually isolated from constant flow of information which normal hearing people take for granted, and find it difficult to understand concepts in various subjects due to the fact that many teachers have no training in effective communication with them (Fakomogbon, 1999). Hearing is an invaluable asset of man and when it is defective, it poses a serious threat to people because hearing is crucial to learning.

The children with hearing impairment may be intelligent, but without the ability to understand their peers, express their feelings and wants; they are likely to be frustrated and this may result in an extended period of becoming withdrawn. Such abnormal behaviour inevitably has repercussion for the normal process of interaction, which in turn has implication for cognitive development and development of social skills (Oyewumi, 2000). Turnbull, Turnbull, Shank and Smith (2004) affirmed that impairment in hearing, either permanent or fluctuating, may adversely affect a student's educational performance but is not included under the definition of deafness. Hearing loss may be slight, mild, moderate, severe or profound, but remains abnormal in any case because hearing loss simply means absence of normal hearing. Any kind that is found in an individual places him or her at disadvantage when compared with those who have normal hearing, since a great deal of thing is learnt through hearing.



Hearing impairment constitutes a significant disability in all age groups. Olusanya et. al., (1999) in corroboration with other studies have advocated for early identification and habilitation of individuals with hearing loss. The prevalence of hearing loss above 40dB is known worldwide to exist. The study of the prevalence of hearing loss undertaken by the Medical Research Council Institute of Hearing Research in the United State reported an overall prevalence of hearing loss above 25dB in the better ear as 16.1% of the adult population and above 40dB as 3.9%. It is estimated that there are probably 4.2 million people aged more than 3 years with a hearing loss above 40dB in the better ear. Olusanya et. al., (1999) attested to this fact that in Nigeria, a few studies on school children gave a prevalence rate of 2.8% to 13.9% for hearing loss.

Evidences have shown based on the studies that hearing impairment still constitutes a significant disability in all age groups all over the world, and some of its etiological factors, especially in neonates and among young children had been highlighted in studies. Yet, there are still some people with normal hearing, most especially youths who have hearing loss but not significant enough to be labeled as persons with hearing impairment or hard of hearing. Based on the above, it is evidently clear that the so called normal hearing individuals may still have some degree of hearing loss in the better ear especially the students attending higher institutions of learning. This category of youth all over the world is highly vulnerable to hearing-loss, considering their kind of lifestyle and the nature of exposure as well as technological gadgets capable of generating noise-effects on their hearing functions. Therefore, this study intends to survey the prevalence of hearing-loss among undergraduate students with normal hearing abilities of the University of Ibadan.

### Research Questions

In order to have a focus on the prevalence of hearing loss among the normal hearing undergraduate students of the University of Ibadan, the following questions were answered by this study.

1. Is hearing loss common among the normal hearing undergraduate students of the University of Ibadan?
2. What are the types of hearing loss common among the student?
3. Do normal hearing female undergraduate students have more incidence of hearing loss than the male normal hearing undergraduates?
4. Are the students having unilateral hearing loss more than students having bilateral hearing loss?
5. What are the degrees of hearing loss among the students?

### Research Hypothesis

H<sub>01</sub>. There is no significant difference in the hearing threshold between male and female students.

## Research Methodology

### Research Design

This research study made use of the descriptive survey design of ex-post-facto type because the independent variables in the study have already occurred and were not manipulated in any way during the study.

### Population for the Study

This study made use of undergraduate students with normal hearing of the University of Ibadan, Ibadan, Nigeria.

### Sample and Sampling Techniques

A sample of 120 students with normal hearing status was used for this study. Multi-stage random sampling technique was used to draw samples from the six (6) faculties of the University.

### Instrumentation

The following instruments were used in the study

#### (a) Clinical Otoscope

It was used to perform clinical otoscopy, as it supplied the required cone of light and magnification of the middle ear. It helped the researcher to evaluate the state of the external ear canal, nature and position of the tympanic membrane, possible otitis media, and wax accumulation, presence of foreign bodies, and possible congenital abnormalities that might influence the test.

#### (b) Audiometer

A diagnostic pure tone audiometer was used to obtain results for the study. Maico 53, a portable diagnostic audiometer was used, in which all parameters for its electro-acoustic and biological calibration were confirmed before it was used in sequence through the use of otological normal ears to ascertain threshold reliability. The measurement of the hearing threshold followed the established audiometric procedure recommended by the American National Standards Institute (ANSI, S3.21:1986).

### Method of Data Analysis

The data collected was analyzed using the descriptive statistics of mean, frequency counts, percentages and inferential statistics of independent t-test.



## Demographic Characteristics of Students

The nature of the students used for this study such as gender and age were considered.

**Table 1: Gender Distribution of Students**

Gender	Frequency	Percentages
Male	52	43.3
Female	68	56.7
<b>Total</b>	<b>120</b>	<b>100</b>

Table 1 as presented above shows that 52 male students were with normal hearing threshold representing 43.3% of the total samples, and 68 (56.7%) female students who were with normal hearing participated in the study.

**Table 2: Age Distribution of Students**

Age Range	Frequency	Percentages
17-21	38	31.7
22-26	59	49.2
27-31	17	14.2
32-36	3	2.5
37-41	2	1.7
42-46	1	0.8
<b>Total</b>	<b>120</b>	<b>100</b>

Table 2 above shows that the majority of students used for the study were within the age range of 22-26 years. This represents 49.2% of the total sample. This is followed by those in the age range of 17-21 years, 27-31 years, 32-36 years, 37-41 years and 42-46 years which represents 31.7%, 14.2%, 2.5%, 1.7% and 0.8% respectively of the students used for the study.

## Presentation of Research Questions

**Research Question 1:** Is hearing loss common among the normal hearing students of the University?



**Table 3** Hearing Variables

Hearing	Frequency	Percentages
Normal Hearing	70	58.3
Hearing Loss	50	41.7
<b>Total</b>	<b>120</b>	<b>100</b>

Table 3 showed that 50 (41.7%) students out of the study sample of 120 had evidence of hearing loss; the remaining 70 (58.3%) students did not show any sign of hearing loss. This revealed that hearing loss is common, even among the normal hearing students of the University of Ibadan.

### Discussion of Findings

In answering Question 1, Table 3 showed that 70 (58.3%) students had no hearing loss, while 50 (41.7%) students had hearing loss. This result indicated that there is a prevalence of hearing loss among the normal hearing students of the University of Ibadan. This finding corroborated the findings of a study which was conducted by Colleen Le Prell et al, as reported in the Healthday (2011) Newsletter. The research involved 56 students with an average age of 21 years. The students were asked to assess their own hearing and then underwent hearing tests. With this approach, the researchers found that one quarter of the students who believed they had normal hearing were confirmed having varied degree of hearing loss.

**Research Question 2:** What are the types of hearing loss common among the students?

**Table 4:** Observed Types of Hearing Loss – Right Ear Analysis

Types	Frequency	Percentages
Normal Hearing	70	58.3
Conductive Hearing loss	19	15.8
Sensorineural Hearing Loss	21	17.5
Mixed Hearing Loss	10	8.3
<b>Total</b>	<b>120</b>	<b>100</b>

Table 4 revealed that in the right ear, conductive and sensorineural hearing losses were common among the students with 19 and 21 frequency ratio respectively. That is 15.8% of the total sample had conductive hearing loss, while 17.5% had sensorineural hearing loss in their right ears.

**Table 5: Observed types of Hearing Loss - Left Ear Analysis**

Types	Frequency	Percentages
Normal Hearing	70	58.3
Conductive Hearing Loss	16	13.3
Sensorineural Hearing Loss Mixed	27	22.5
Hearing Loss	7	5.8
<b>Total</b>	<b>120</b>	<b>100</b>

Table 5 showed that on the left ear, conductive and sensorineural hearing losses were the types of hearing loss common among the students, with 16 (13.3%) students having conductive hearing loss and 27 (22.5%) students having sensorineural hearing loss.

### Discussion of Findings

In answering Research Question 2, table 4 showed that in the right ear, 19 (15.5%) students had conductive hearing loss, and 21 (17.5%) students had sensorineural hearing loss. Table 5 revealed in the left ear, that 16 (13.3%) students had conductive hearing loss, and 27 (22.5%) students had sensorineural hearing loss. This study was in line with the findings of Olusanya (1997), in which otoscopy, audiometric, tympanometric examinations were carried out on 359 school entrants, and 67 children had otitis media with effusion, which is one of the etiological factors of conductive hearing loss. The study was also in line with National Acoustic Laboratories (2005), findings of a research carried out at Guildford Young College in which 35 students and 3 teachers were screened for hearing loss. At the end of the study, 1 student was identified with profound hearing loss and 10 students had significant hearing loss. Their hearing losses were identified as consequences of loud noise exposure over a prolonged period. Prolonged loud noise exposure is an etiological factor of sensorineural hearing loss.

**Research Question 3:** Do normal hearing female students have more incidence of hearing loss than the male?

**Table 6: Hearing Loss among Male and Female Students.**

Gender	Frequency	Percentages
Male	28	56
Female	22	44
<b>Total</b>	<b>50</b>	<b>100</b>

Table 6 showed that 28 (56%) male students and 22 (44.0%) female students had evidence of hearing loss. This indicated that the male normal hearing students have more incidence of hearing loss than the female



## Discussion of Findings

Table 6 showed that the male normal hearing students have more incidence of hearing loss than the female with 28 (56.0%) male and 22 (44.0%) female out of the total number of 50 students having hearing loss. This study therefore corroborated with the study of Hallahan and Kaufman (2006) which opined that young males are at greater risk than young females due to male oriented activities such as gun firing and automobile engine repair activities.

**Research Question 4:** Are the students having unilateral hearing loss more than the students with bilateral hearing loss?

**Table 7: Unilateral and Bilateral Hearing Loss among the Students**

Types of Hearing Loss	Frequency	Percentages
Unilateral Hearing Loss	11	22
Bilateral Hearing Loss	39	78
<b>Total</b>	<b>50</b>	<b>100</b>

Table 7 showed that 11 (22%) students had unilateral hearing loss and 39 (78%) students had bilateral hearing loss. This revealed that the students having bilateral hearing loss are more than students having unilateral hearing loss.

## Discussion of Findings

Table 7 provided answer to the fourth Research Question: are the students having unilateral hearing loss more than student with bilateral hearing loss? The table showed that 11 (22%) students had unilateral hearing loss and 39 (78%) students had bilateral hearing loss. This revealed that the students having bilateral hearing loss are more than students having unilateral hearing loss.

**Research Question 5:** What are the degrees of hearing loss common among the students?

**Table 8: Degree of Hearing Loss- Right Ear.**

Degree	Frequency	Percentages
Normal Hearing	70	58.3
Slight Hearing Loss	50	41.7
Mild Hearing Loss	-	-
Moderate Hearing Loss	-	-
Severe Hearing Loss	-	-
Profound Hearing Loss	-	-
<b>Total</b>	<b>120</b>	<b>100</b>

Table 8 above revealed that 70 (58.3%) students had normal hearing, and 50 (41.7%) students had slight hearing loss in the right ears. None of them had mild, moderate, severe or profound hearing loss.

**Table 9: Degree of Hearing Loss- Left Ear**

Degree	Frequency	Percentages
Normal Hearing	70	58.3
Slight Hearing Loss	50	41.7
Mild Hearing Loss	-	-
Moderate Hearing Loss	-	-
Severe Hearing Loss	-	-
Profound Hearing Loss	-	-
<b>Total</b>	<b>120</b>	<b>100</b>

Table 9 above revealed that 70 (58.3%) students had normal hearing, while 50 (41.7%) students had slight hearing loss in the left Ear. None of them had a record of mild hearing loss, moderate hearing loss, severe hearing loss or profound hearing loss.

### Discussion of Findings

Table 8 showed in the right-ear, that 70 (58.3%) students out of the total sample of 120 had normal hearing threshold, while 50 (41.7%) students had hearing loss in the right ear, and the degree of those with the loss falls in slight hearing loss. While Table 9 revealed that, in the left ear, 70 (58.3%) students had normal hearing, and 50 (41.7%) students had slight hearing loss. None had mild, moderate, severe or profound hearing loss.

### Presentation of Hypothesis

**Hypothesis One:** There is no significant difference in the hearing thresholds between male and female students.

**Table 10: Hearing thresholds of Male and Female Students-Right Ear.**

Hearing Thresholds (dB) Right Ear	N	Mean	S.D.	Crit-t	Cal-t	DF
Male	52	23	9.9	1.96	15.57	118
Female	68	18.10	8.7			



Table 10 revealed that t-calculated was 15.57 and the t-critical at 0.05 level of significance was 1.96. Since the t-calculated (15.57) is greater than t-critical (1.96), the null hypothesis is thereby rejected. Therefore, there is a significant difference in the hearing threshold between male and female students in the right ear.

**Table 11: Hearing Thresholds of Male and Female Students-Left Ear**

Hearing Thresholds (dB) Left Ear	N	Mean	S.D.	Crit-t	Cal-t	DF
Male	52	23	10.84	1.96	13.42	118
Female	68	18.47	9.23			

Table 11 showed that the t-calculated was 13.42, while the t-critical at 0.05 level of significance was 1.96. Since, the t-calculated (13.42) is greater than the t-critical (1.96); hence the null hypothesis is therefore rejected. Therefore the table indicated that there is a significant difference in the hearing thresholds between male and female students in the left ear.

### Discussion of Findings

Tables 10 and 11 showed that there is a significant difference between the hearing thresholds between male and female participants.

### Conclusion

This study investigated the prevalence of hearing loss among the presumed normal hearing undergraduate students of the University. Based on the data collected and analyzed, it is necessary to conclude that there is the existence of hearing loss among the normal hearing undergraduate students of the University. The prevalence of the loss is about 1 in every 3 students. The study also discovered that the students sampled were having slight hearing loss in either one ear or both. The phenomenon is common among the majority of the samples used for the study who earlier claimed normal hearing. The samples appeared as normal hearing individuals with subjective evaluation but with the comprehensive audiological examination, it was discovered that 50(41.7%) individuals were having slight hearing loss, and if adequate audiological preventive measures and good life-style were not maintained they might graduate into the category of persons with hearing impairment.

However, the prevalence of hearing loss especially among youth can be reduced, at least to the barest minimum if not totally prevented by addressing the etiology factors of hearing loss.

## Recommendations

With high prevalence of hearing loss among the normal hearing undergraduate students as shown in the findings of this study, the following recommendations became imperative:

- The youths especially males should avoid the exposure of their hearing functions to technological gadgets such as ear-piece of personal music player that can generate damaging noise. Night clubbing where loud music is played should be avoided also.
- Ear protectors should be worn by youths that engage in menial jobs or stay in noisy environments such as automobile, industrial and gun firing environments
- The university authorities should include hearing assessment in the expected medical assessment of the newly admitted students.
- The university authorities should curb noise pollution caused by the use of generating sets near and within faculties on the campus.
- There should be provision of modern -day equipment in the Audiology Unit of the department of Special Education, so that there will be possibility of hearing assessments such as Auditory Brain stem Response (ABR) and Evoked Otoacoustic emission.
- Government should establish Audiology Units or Departments in all tertiary institutions in Nigeria.

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