SJIF Impact Factor: 7.001| ISI I.F.Value:1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 5 | Issue: 5 | May 2020 - Peer Reviewed Journal

THE EXTERNAL EAR HEALTH STATUS AMONG STUDENT NURSES AT THE UNIVERSITY COLLEGE HOSPITAL, IBADAN

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ABSTRACT
The external ear is often affected by both congenital and acquired diseases. On account of its location, the effects of any disease of the entity on the external ear are readily apparent. A prospective study was carried out on 131 student nurses undergoing a basic study in Nursing at University College Hospital, Ibadan, Nigeria. This was made up of 11(8.4%) males and 120 (91.6%) females with a male: female ratio of 1:9 and a mean age of 21.6 years. Cerumen auris (10.7%), preauricular sinus (1.9%) and allergic ear disease (9.9%) were the leading pathogens seen in their external ears. Poor external ear health among future health workers should be promptly addressed to mitigate suboptimal performance while in service.
KEYWORDS: *external ear, pre-auricular sinus, cerumen auris. health*

1.0 INTRODUCTION

Preventable ear diseases have been found to be a challenging health problem especially among the youths that form the bulk of the workforce of a given nation. This is more important when considering a group of youths whose day to day optimal performance is dependent on healthy external ear status. Most patients with painless ear diseases hardly ever present early to the hospital in our environment. Hospital presentation is usually as a result of associated complications of the ear disease or significant hearing impairment[1-3]. It should be noted that a large percentage of Nigerian youths who had ear diseases as children were not likely to enjoy the services of Otorhinolaryngologists; due to the fact that there is dearth of such specialists in Nigeria[1]. In addition to the foregoing, a large percentage of Nigerian children who will eventually become youths live in rural areas where access to quality healthcare is lacking[1,2] . People who have ear diseases with associated significant hearing loss often reported a profound impact on their emotional, physical and social well-being. They are more likely to report symptoms of depression, dissatisfaction with life, reduced function and withdrawal from social activities [2,4]. However, if a student nurse in his or her formative professional life is faced with the challenges of significant external ear disease, optimal performance during training and subsequently as an employee might be retarded.

The aim of this study was to assess the external ear health status of student nurses who were undergoing basic nursing programme at UCH, Ibadan.

The limitations encountered during the course of this study were essentially the filling of the questionnaires and examination which were done in the subjects' classrooms. These constituted a form of external

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pressure to some students. The short period for break time led to several visits to each class as the study would have to stop once the tutor enters the class.

2.0 LITERATURE REVIEW

The external ear can be affected by both congenital and acquired diseases. Otological diseases had been studied and documented among various age classes and ethnic groups in Nigeria and in other parts of the world. Okoye et al in Port Harcourt, Nigeria, reported a prevalence of 55.2% of 559ntological diseases among geriatric patients aged 60 years and above which represented 4.7% of the total number of patients seen during the study period[7]. Of the 559ntological diseases reported, otomycosis accounted for 17.5%, while cerumen auris accounted for 15.3%.

Chronic suppurative otitis media (CSOM) was the most common ear disease; accounting for 25% of all 559ntological diseases[8]. Okafor in Enugu, Nigeria had noted that many of the CSOM cases in the elderly had persisted since childhood[8]. From this, it can be deduced that some external ear diseases may co-exist with a chronically discharging ear disease which invariably may affect the functionality of these patients even in their youthful days. Adeosun reported cerumen in 42.2% of school entrants in Mushin Local government of Lagos state, Nigeria[3]. If the quantity of wax in the external auditory canal is significant, optimal learning in such a school entrant may be hampered; resulting in poor school performance even at the post- secondary school level. Akinpelu et al in Ile-Ife, Nigeria reported a prevalence of 33.9% of CSOM among children aged 0 – 5 years. The least common ear diseases seen in the study were cholesteatoma, tinnitus and tumour constituting (0.2%) each. This group of children were equally significantly affected by external ear diseases[1]. In school screening for hearing loss in Ghana by Amedofu et al, otoscopy revealed cerumen in 15% of children while 0.2% had discharging ears[9]. From this, it is obvious that more people are affected by external ear disease; even though the degree of affectation is less disabling compared with the effects of middle and inner ear diseases. Ogisi et al in Benin City, Nigeria reported in their study that those with hearing impairment had more abnormal otoscopic findings. Of the 292 children who had otoscopy done, 28% had external canal or tympanic membrane abnormalities[2]. One of the widely studied infective external ear pathology is otomycosis. Fasunla et al reported that most frequently isolated fungal microbes in the external ear are *Aspergillus niger* and *Candida albican*. Nwabuisi et al and Lucent also came up with similar findings [10-12]. Lasisi et al reported a prevalence of 18.2% of otomycosis among diabetic patients, while Salisu reported a prevalence rate of 0.9% among medical students [6, 13] . Otomycosis is very discomforting and could affect the concentration of the affected individuals. It should also be emphasized that it could spread from one individual to another especially when they share a common item as the use of the ear piece of a stethoscope.

Ijaduola et al in Lagos, Nigeria had reported the otorhinolaryngologic manifestations of Recklinghausen's disease in Nigerians. Of the 13 patients seen, 30.77% had both external meatal stenosis and conductive deafness. The involvement of the pinna was seen in 23.31% while cranial nerves involvement occurred in 30.77% [14]. Recklinghausen's disease poses a lot of cosmetic challenges to an individual who is suffering from it. The external ear affectation by the disease may compromise optimal learning. Prakash et al in India reported a prevalence of 75% of 559ntological diseases out of the 1245 children aged 5 to 12 years. Wax and CSOM were the most common ear diseases reported[15]. It has been advocated that if primary health care is made to address common ear pathologies, hearing impairment will be stemmed.[16,17]

External ear pathology expected in this group of volunteers (student nurses in basic nursing programme) may be similar in variety to those obtainable in school children. However, as a result of the older age group (youth) in this study, the frequencies of occurrence of the types of 559ntological diseases are expected to vary. It is estimated that 2% to 6% of the general population in the UK suffers from cerumen impaction at any given time[18]. This is a major external ear disease. About 4% of primary care patients will consult their clinician for cerumen impaction[19]. In a study of 1507 adults screened for hearing loss, 2.1% had occluding cerumen.[19] In a study of general population; cerumen impaction was reportedly present in 10% of children and 5% of normal healthy adults. Fifty seven percent (57%) was reported in older patients living in nursing homes while 36% of patients with mental retardation had cerumen impaction[19-21]. The foregoing report indicates that the more an individual is capable of independent self- care, the less likely the tendency to have cerumen impaction. Cerumen impaction is invariably associated with other ear complaints like hearing loss, otalgia, tinnitus and vertigo[21]. The figure 1 below shows the cross section of the external ear.

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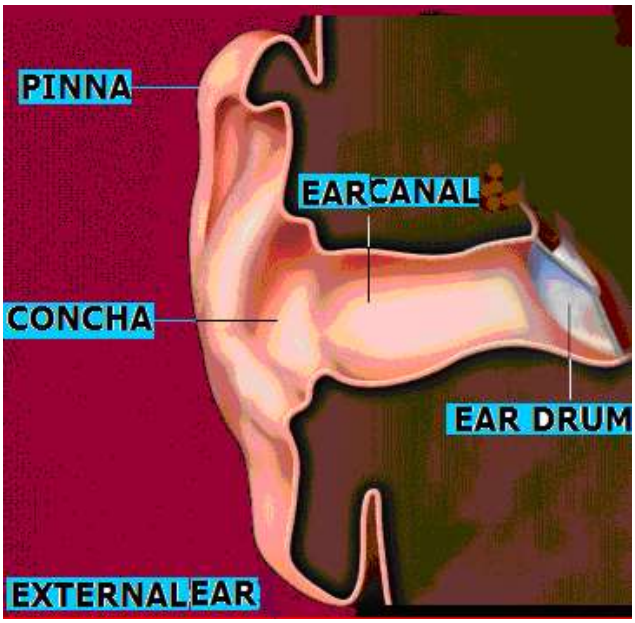

*Source: (**Blatrix, et al**[23])*

3.0 METHODOLOGY

This was a cross-sectional descriptive study of the health status of the external ear among student nurses at the University College Hospital, Ibadan.

***STUDY AREA*:** This is the School of Nursing of the University College Hospital, Ibadan, Nigeria. The school was established in 1952 and headed by a principal. It is made up of 3 arms: 1st year, 2nd year and 3rd year.

SAMPLE SIZE DETERMINATION

The sample size was calculated using the Fisher's formula[24]

$$N = \frac{(Z_1 - \propto)^2 (P)(1-P)}{d^2}$$

where

N = minimum sample size.

At 95% confidence level, $(Z_1 - \alpha) = 1.96$ from statistical tables.

P is the best estimate of the prevalence obtained from literature. But because of the absence of previous study to give estimate, an assumption of a prevalence of 50% is made.

d =Precision, for the purpose of this study, it is estimated as 10%.

Therefore

$$N = \frac{1.96^2 \times (0.5)(0.5)}{0.1^2}$$

N = 96.04; approximately 100.

Total = 100 subjects.

However, in view of the advice on the possibility of withdrawals, I increased my sample size to 135.

STUDY POPULATION: The school has 3 arms: 1st year, 2nd year and 3rd year. It has a total population of 163 students. This was made up of 40 students in year 1, 61 students in year 2 and 62 students in year 3

TECHNIQUE: A stratified simple random method using non replacement balloting was adopted

INCLUSION CRITERIA

* All student nurses undergoing a basic nursing programme.
* Volunteers who were randomized and have signed a written consent.

EXCLUSION CRITERIA:

*Nursing students who were not into a basic nursing programme.
* Refusal to give consent.

STUDY DESIGN AND PROCEDURE: The study was a cross sectional descriptive type. The randomized subjects in each of the three (3) classes were counseled on the stages of the research and written consent obtained (appendix I). This was followed by the administration of a semi-structured questionnaire (appendix II). The questionnaire contains information on demographic variables and relevant medical history with emphasis on external ear symptoms. The subjects were asked specific ear symptoms which included itchiness in the ear, ear pain, ear discharge, tinnitus and vertigo. Predisposing factors to external ear diseases like previous ear trauma, frequent bathing in rivers and swimming pool without adequate protection and underlying ill-health were asked for. This was followed by

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examination of the ears, nose and throat. External ear examination was done using a battery powered head lamp and a hand-held Welch Allen otoscope. The degree of ear wax occlusion was graded on a 3-grade scale of <25%, 25-74% and >74%[18]. This was followed by tuning fork tests using 512Hz tuning fork. Air conduction and bone conduction were assessed.
Subjects that needed ENT treatment after the study were promptly attended to at no personal cost.

DATA MANAGEMENT AND ANALYSIS: Data collection was done using a proforma.
Data obtained was entered and analysed using SPSS (Statistical Package for Social Sciences) 20. Demographic variables were represented using tables and charts while summary statistics was done using means and proportions. Test of association for categorical variables was done using Chi square. Test of association for quantitative variables was done using t- test and ANOVA. Level of statistical significance was set at p value of <0.05

PERIOD OF STUDY: The study was done over a period of five (5) months

4.0 RESULTS

The study comprised of 131 subjects, out of which 116 completed the study. This was made up of 11 (8.4%) males and 120 (91.6%) females with a male to female ratio of 1: 9 (Figure2). The age range was 18 – 29 years with a mean of 21.6 years. The standard deviation was 2.6; while the standard error was 0.2.

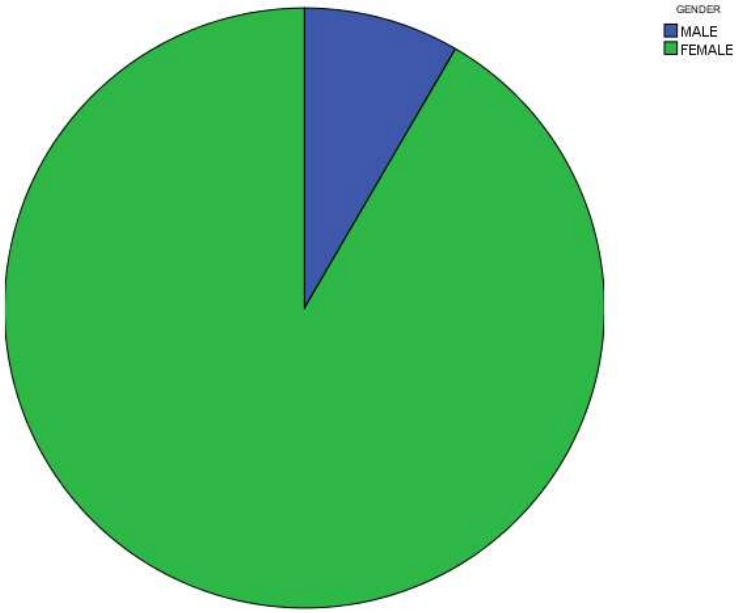

Figure 2: **Gender Distribution**

Table 1a: Gender distribution
n= 131 Participants.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	11	8.4	8.4	8.4
	FEMALE	120	91.6	91.6	100.0
	Total	131	100.0	100.0	

Table Ib showed that, of the 131 students that took part in the study, first year students constituted 30 (22.9%), second year students constituted 44 (33.6%) while third year students constituted 57 (43.5%).

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Table 1b shows distribution based on years in training.
n = 131 Participants.

YEARS IN TRAINING

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YEAR 1	30	22.9	22.9	22.9
	YEAR 2	44	33.6	33.6	56.5
	YEAR 3	57	43.5	43.5	100.0
	Total	131	100.0	100.0	

Table II: Age distribution of subjects
n=131 Participants.

SERIAL AGE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 YRS	4	3.1	3.1	3.1
	19 YRS	19	14.5	14.5	17.6
	20 YRS	34	26.0	26.0	43.5
	21 YRS	23	17.6	17.6	61.1
	22 YRS	21	16.0	16.0	77.1
	23 YRS	7	5.3	5.3	82.4
	24 YRS	5	3.8	3.8	86.3
	25 YRS	2	1.5	1.5	87.8
	26 YRS	4	3.1	3.1	90.8
	27 YRS	7	5.3	5.3	96.2
	28 YRS	4	3.1	3.1	99.2
	29 YRS	1	.8	.8	100.0
	Total	131	100.0	100.0	

PATTERN OF CLINICAL SYMPTOMS

The most prevalent ear symptom was itchiness in the ear, 54 (41.2%) and the least common was otorrhoea, 1(0.8%). None of the students reported vertigo (Table III).

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Table III: Ear symptoms among participants.

n = 131 Participants

EAR SYMPTOMS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ITCHINESS AND OTALGIA	13	9.9	9.9	9.9
	ITCHINESS AND TINNITUS	5	3.8	3.8	13.7
	ITCHINESS AND OTORRHOEA	1	.8	.8	14.5
	OTALGIA AND TINNITUS	1	.8	.8	15.3
	EAR ITCHINESS	35	26.7	26.7	42.0
	OTALGIA	10	7.6	7.6	49.6
	TINNITUS	2	1.5	1.5	51.1
	NO EAR SYMPTOMS	64	48.9	48.9	100.0
	Total	131	100.0	100.0	

Risk factors encountered among subjects. Undue exposure to noise was reported by 112 (85.5%), while 31 (23.7%) and 7 (5.3%) engaged in habitual ear cleaning and swimming respectively (Table V).

Table V: Risk factors (RF) encountered among subjects

n =131 Participants.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	HABITUAL EAR CLEANING AND NOISE EXPOSURE	28	21.4	21.4	21.4
	SWIMMING AND NOISE EXPOSURE	2	1.5	1.5	22.9
	nil attitudinal RF	11	8.4	8.4	31.3
	HABITUAL EAR CLEANING	3	2.3	2.3	33.6
	SWIMMING	5	3.8	3.8	37.4
	NOISE EXPOSURE	82	62.6	62.6	100.0
	Total	131	100.0	100.0	

History of Allergy was reported in 13 (9.9%) of the respondents while 4 (3.1) had recent external ear diseases (Table VIII)

Examination revealed 5 (1.9%) cases of preauricular sinuses; all asymptomatic. Debris was seen in 8 (3.1%) right external auditory canals (EAC) and in 7 left EAC. Wax was seen in 18 (6.9%) and 10 (3.8%) right and left ears respectively. The prevalence was 10.7%. Normal tympanic membrane was seen in 122 (46.6%) and 115 (43.9) ears on the right and left respectively (Table VI). The pinnae appeared normal in all the subjects.

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Table VII: External ear findings among subjects.
n= 262 ears.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	RT Ear preauricular sinus	2	0.8	0.8	1.5
	LT Ear preauricular sinus	3	1.1	1.1	3.8
	RT Ear Debris	8	3.1	3.1	9.9
	LT Ear Debris	7	2.7	2.7	15.3
	RT Ear wax	18	6.9	6.9	29.0
	LT Ear wax	10	3.8	3.8	36.6
	RT Intact and shiny TM	122	46.6	46.6	60.3
	LT Intact and shiny TM	115	43.9	43.9	80.9
	RT Intact and dull TM	11	4.2	4.2	89.3
	LT Intact dull TM	11	4.2	4.2	97.7
	RT Retracted TM	1	0.4	0.4	98.5
	LT Retracted TM	2	0.8	0.8	100.0

Seven (7) of the participants had wax in the EAC occupying >74% [8] of the canal space. Age range was 19-24 years. They had ear syringing done. Those with lesser degree of wax in the EAC had manual removal with the use of Jobson Horne probe (Table VII).

TABLE VIII: Age and degree of canal obstruction by wax among subjects.
n=131 Participants.

Count						
		DEGREE OF WAX				
		<25	26-74	75-100	NO WAX	Total
Age in years	18	0	0	0	4	4
	19	1	2	2	14	19
	20	4	5	0	25	34
	21	0	2	4	17	23
	22	0	4	0	16	20
	23	0	1	0	6	7
	24	0	0	1	4	5
	25	0	0	0	2	2
	26	0	0	0	4	4
	27	0	1	0	7	8
	28	1	0	0	3	4
	29	0	0	0	1	1
Total		6	15	7	103	131

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5.0 DISCUSSION

For student nurses to acquire dependable skills in their training, their sensory organs must be functional. The presence of obvious external ear defects like macrotia, microtia, meatal stenosis, meatal atresia and symptomatic preauricular sinus among others constitute major cosmetic embarrassment which could reduce the self - worth of the individual among other effects.

A total of 28 ears had wax in this study; accounting for a prevalence of 10.9%. Three (3) of the students had bilateral cerumen auris, while 22 of the students had unilateral cerumen auris. Ahmad examined the ears of children from a deaf school in Ibadan and reported a prevalence of 39.4%[4], while Adeosun reported a prevalence of 42.2% among school entrants in Mushin Local government of Lagos State[3]. A higher prevalence in these studies might be due to the characteristics of the study population. Salisu reported a prevalence rate of 10.2% among clinical medical students of University of Ibadan[6]. The similar value compared with the index study might be due to increasing age and educational level resulting in a better health awareness status among student nurses and clinical medical students. Only 6 of the participants had symptoms associated with cerumen auris such as otalgia and tinnitus. Cerumen auris was associated with conductive hearing loss (mild) when the degree of occlusion was 75% or more. All the subjects with impacted wax had ear syringing after softening the wax.

Preauricular sinus was the only congenital external ear anomaly observed among the student nurses studied. Five (5) cases of preauricular sinus were seen accounting for a prevalence of 1.9%; 3 were observed on the left and two on the right. None was symptomatic and no history of previous infection in any of them. They were seen in 3 students- 2 had bilateral, while 1 had it on the left. Salisu had reported a prevalence of 1.4% among clinical medical students[6].

In our world today, allergy has become a very important component of pathologies affecting the head and neck region[18]. The head and neck are the most commonly affected target sites in allergic conditions. In this study, all the 13 (9.9%) participants with a history of allergy had debris in their external auditory canal and patchy discoloration of the pinnae. Further examination also showed that 10 out those with history of allergy had intact and dull tympanic membrane.

6.0 CONCLUSION

Poor aural health among future health workers should be promptly addressed through periodic ear examination and adoption of hearing preservation measures. Regular comprehensive otologic check-up for prospective nurses (student nurses) at least annually should be advocated. Those with allergy require further management to rule out the involvement of the middle ear, skin and paranasal sinuses.

ETHICAL CONSIDERATION

This study was performed in accordance with the declaration of Helsinki. Ethical approval was obtained from the Joint University of Ibadan/University College Hospital, Ibadan Ethical Review Board. To conduct the study, understood informed consent was also obtained from the participants. Written permission was obtained from the school principal.

FUNDING: Self-sponsored
CONFLICT OF INTEREST: NONE

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