

Auditory Lifestyles, Attitudes To Noise And Beliefs About Hearing Loss And Hearing Protection Among Undergraduates In Southern Nigeria

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Abstract

Noise tolerance is a possible reflection of the attitudes of young people, and probably influenced by beliefs on hearing loss and the use of hearing protection devices. This study addressed the attitudes and beliefs of young Nigerians towards noise thereby providing background data that is necessary for design of culturally relevant interventions to reduce noise exposure and hearing loss. This study determined the attitude towards noise and beliefs about hearing loss and hearing protection among young people in Nigeria. It was a cross-sectional study using semi-structured questionnaires was conducted. The subjects were 427 university undergraduate students. Data was collected on their attitudes to noise and beliefs about hearing protection and hearing loss. Youths Attitude to Noise (YANS) and Beliefs about Hearing Protection and Hearing Loss (BAHPL) instruments were completed by the subjects.

Majority of the subjects had neutral attitude towards noise and neutral attitude in Beliefs About Hearing Protection and Hearing Loss while only a minority used any form of hearing protection devices. Indifference is the main attitude of young Nigerians towards noise and hearing loss. Future interventions should focus on the harmful effects of noise, emphasizing the need to avoid exposure to loud noise while encouraging use of hearing protection devices during noise exposure.

Keywords: Attitude, Culture, Young people, Noise, Hearing loss

Introduction

There is a rapid increase in excessive noise exposure worldwide attributable to several factors such as environmental noise (e.g. small-scale industries and traffic) and leisure noise (e.g. concerts) and personal music devices (PMDs)^{1,2}. Exposure to high levels of noise make young people susceptible to noise induced hearing loss (NIHL)^{3,4}. Elevated noise levels are now a

standard feature in musical concerts and the use of PMDs at dangerous volume settings is becoming popular^{5,6}. Nearly 1.1 billion young people are at risk of NIHL due to unsafe use of PMDs, and exposure to damaging sound levels at entertainment venues⁷. Sound pressure level (SPL) at entertainment venues could be as high as 104 - 112dB(A) while the free field equivalent SPL from PMDs can vary between 91 - 121 dB(A) at the maximum volume control settings^{4,8}. This degree of noise exposure has led to a steady increment in the prevalence of NIHL and noise-induced symptoms such as tinnitus and hyperacusis among young people⁹; for example, in Britain and Sweden, the prevalence of hearing loss and tinnitus among young people exposed to loud noise ranged from 33% to 66%^{10,11}. Apart from loud noise exposure, prolonged exposure to relatively lower sound levels could also have adverse auditory effects: significant temporary threshold shift was seen in all individuals attending aerobics classes and about half of those individuals complained of tinnitus¹².

Hearing loss have significant effects on young people in different ways such as social and family interactions, and employability, therefore, promoting hearing health in young people is an important obligation. However, young people are prone to disregard consequences of loud sound exposure. Lack of knowledge about the harmful nature of loud sounds may cause the choice of noise exposure through PMDs or other leisure activities¹³. Peer pressure may also influence participation of young people in activities that have adverse implications on auditory health; in addition, attitudes and personal health beliefs could also influence lifestyles choices including use of hearing protective devices (HPDs) with attendant health impacts⁴. These personal health beliefs may underestimate the risk of hearing loss or conscious denial of hearing loss¹³.

About 17% of young people have some level of NIHL and are unaware of it¹⁴. Though majority of young people reported tinnitus or temporary hearing loss after visiting concerts, only a tiny fraction use HPDs when attending such musical events³. There is sparse data on noise exposure, knowledge and use of HPDs among young people in many African countries including Nigeria. This data paucity may hamper development of culturally sensitive hearing conservation programs. Therefore, there is need to study the auditory lifestyles, attitudes and beliefs towards noise, hearing loss and hearing protection

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among undergraduates Nigerians.

Methods

This is an institutional based study with a cross sectional design which employed self-administered paper questionnaires. The respondents were apparently normal hearing under-graduate's students aged 16-24 years of the University of Uyo, Nigeria.

Respondents were chosen via a 3-stage random sampling technique: random selection of four out of the twelve faculties within the university; selected faculties have fifty-one departments out of which sixteen departments were randomly selected. A proportional recruitment of 427 students from all levels of study in the selected departments was done. The students were approached in the classes and invited to participate in the study, consenting students were recruited and interviewed.

The study questionnaire was adapted from the Dutch version of Youth Attitude to Noise Scale (YANS)¹⁵; Beliefs About Hearing Protection and Hearing Loss (BAHPHL)¹⁶ as well as questions to determine awareness and use of HPDs and auditory lifestyles¹⁷. The YANS instrument was designed to explore adolescents' attitudes towards noise and has nineteen items measured on a five-point Likert scale. The YANS addresses different types of sounds commonly presented to adolescents' and are grouped into four categories. The mean scores for each category were obtained for the individual participants and these were used to derive the general mean for the entire YANS. The scores for the entire YANS and the individual factors were then used to determine the lower quartile, the two middle quartiles and the upper quartile corresponding to negative, neutral and positive attitudes towards noise respectively. Negative attitude reflects that noise is perceived as dangerous and ought to be avoided, a positive attitude implies that noise is perceived as not dangerous and a neutral attitude implies an indifferent perception about noise or ignorance of the hazards of loud noise¹⁸.

The BAHPHL was originally a 31-item instrument developed by the National Institute for Occupational Safety and Health, however, this study adopted the version with 24 items in seven categories¹⁹. Analysis of the BAHPHL is similar to the YANS, into positive, neutral and negative belief towards hearing protection and hearing loss. Ethical approval was obtained from the Ethics Review Committee (UI/EC/13/0212). Informed consent was obtained from all respondents.

The socio-demographic data and responses on YANS and BAHPHL were summarized with descriptive statistics. Tests association of categorical variables was done using Chi-square test. Logistic regression was used to analyze the relationship between dependent variables (socio-demographic

variables, use of HPDs, listening to loud music) and independent variables (attitude to noise, beliefs about hearing protection and hearing loss). The level of statistical significance was set at $p < 0.05$.

Results

The mean age of the respondents was 20.93 ± 2.148 years, with a male to female ratio of 1:0.96 (Table 1). Approximately 46% of the students listened to loud music in enclosed spaces, while 37% were comfortable staying in close proximity to loud speakers during concerts. Other noise related leisure activities the students engaged in included use of PMDs (Table 2). Majority of respondents (59.3%) had no idea of HPDs nor its uses while 40.3% of the respondents do not think HPDs are effective in protecting the ears during noise exposure (Table 2), while most of the respondents were not willing to wear HPDs in noisy environments even when it is dispensed at no cost.

The results of the YANS were grouped into four factors: youth culture, concentration, daily noise and intent to influence. The YANS scores were categorized into negative, neutral and positive attitude as earlier described (Widen et al, 2009)¹⁸. The mean scores of youth culture indicated a neutral cultural attitude towards noise; there is a negative attitude towards ability to concentrate in noisy situations; there is also a negative attitude towards daily noise exposure; while there is a neutral attitude towards intent to influence sound in environment. Overall, the mean score for the entire YANS was 2.05 ± 0.74 , implying the respondents had negative attitude to noise (Table 3). Seven factors were assessed in BAHPHL and the mean scores for each factor presented in Table 4. Overall, the entire BAHPHL mean score was 2.00 ± 0.72 indicating negative beliefs by the respondents. The YANS was significantly related with listening to loud music. Respondents with negative attitude on YANS were less likely to listen to loud music than those with positive attitude (Table 5). The logistic regression of the BAHPHL and HPD use was not statistically significant.

Table 1. Distribution of socio-demographic characteristics of respondents

	Frequency (n)	Percentage (%)
Gender		
Male	218	51.1
Female	209	48.9
Age (years)		
16-20	159	37.2
21-24	268	62.8
Level of Study		
First year	109	25.5
Second year	107	25.1
Third year	106	24.8
Fourth year	105	24.6

Table 2. Auditory lifestyles and use of hearing protective devices

	YES		NO	
	N	%	N	%
Use headphones on PMDs and cellphones	123	28.8	304	71.2
Exposure to loud noise in closed spaces	196	45.9	231	54.1
Close proximity to loudspeakers during concerts	158	37	269	63
Awareness of HPDs	174	40.7	253	59.3
Previous use of HPD	38	8.9	389	91.1
Are HPD effective?	255	59.7	172	40.3
Willingness to wear HPDs if dispensed at no cost in venues with high noise levels	179	41.9	248	58.1

Tables 3. Mean Scores for YANS Factors and Entire YANS

Factors	No of question	Obtained Score (mean \pm S.D)	Negative Attitude (mean cut-off mark)	Neutral Attitude (mean cut-off mark)	Positive Attitude (mean cut-off mark)
Youth culture	8	2.01 \pm 0.72	1.00-2.00	2.01-2.87	2.88-5.00
Concentration	3	1.86 \pm 0.83	1.00-2.32	2.33-3.32	3.33-5.00
Daily noise	4	2.02 \pm 0.74	1.00-2.50	2.51-3.74	2.75-5.00
Intent to influence	4	2.02 \pm 0.80	1.00-1.50	1.51-2.24	2.25-5.00
Entire YANS	19	2.05 \pm 0.74	1.00-2.26	2.27-2.77	2.78-5.00

Table 4. Mean Scores for BAHPHL Factors and the Entire BAHPHL

Factors	Number of questions	Obtained Score (mean \pm SD)	Negative attitude (mean cut-off mark)	Neutral attitude (mean cut-off mark)	Positive attitude (mean cut-off mark)
Susceptibility to hearing loss	6	2.01 \pm 0.76	1.00-2.00	2.01-2.99	3.00-5.00
Severity of consequences of hearing loss	3	2.06 \pm 0.88	1.00-1.33	1.34-2.32	2.33-5.00
Benefits of preventive actions	3	1.97 \pm 0.74	1.00-1.33	1.34-2.99	3.00-5.00
Barriers to preventive actions	4	1.93 \pm 0.78	1.00-2.75	2.76-3.74	3.75-5.00
Behavioral intentions	3	2.04 \pm 0.79	1.00-2.00	2.01-3.32	3.33-5.00
Social norms	2	2.04 \pm 0.75	1.00-2.00	2.01-3.49	3.50-5.00
Self-efficacy	3	2.09 \pm 0.80	1.00-2.00	2.01-2.99	3.00-5.00
Entire BAHPHL		2.00 \pm 0.72	1.00-2.25	2.26-2.89	2.90-5.00

Table 5 Logistic Regression Models: explaining use of hearing protective devices and listening to loud music.

YANS	Listening to loud music		
	OR	CI	P-value
Negative Attitude	0.47	0.27-0.78	0.005
Neutral Attitude	0.51	0.31-0.81	0.004
Positive Attitude (Reference)			
BAHPHL	Use of hearing protective devices		
Negative Attitude	1.17	0.45-3.02	0.741
Neutral Attitude	0.87	0.39-1.89	0.723
Positive Attitude (Reference)			

Discussion

Young people in this study followed a pattern of risky activities inimical to auditory health by engaging in recreational activities with loud noise exposure similar to a habitual noise exposure documented among young Americans²⁰. This similarity of youth culture may be due to the pervasiveness of the social media and the internet; interestingly, the same tools of social media and internet may provide an opportunity to replicate effective interventions in modifying attitude of young people to noise in different countries.

A larger proportion of the respondents exposed themselves to noise from PMDs more than noise from other activities. This probably stemmed from the worldwide mass adoption of PMDs with subsequent increase in the exposure of young people to loud noise^{13,21}. The PMDs are nearly always used with headphones which have sound intensities that range from 75dB to 136dB, and the volume of these headphones are often set between 75dB and 105 dB⁴.

Though this study did not collect data on the average use of PMDs, other studies have shown that young people spend an average of 3 hours weekly exposed to loud noise from PMDs²². Moreover, young people are often exposed to multiple sources of recreational noise which contributes to their overall risk of NIHL⁶ thus, an increasing proportion of young people experience auditory symptoms such as threshold shifts, hyperacusis, distortion, and tinnitus^{3,20}. About 15% of young people experience hearing loss similar to or worse than their parents, primarily due to the cumulative effect of listening to loud music²³.

The neutral attitude on the YAN scale to noise from social sources confirms an indifference of young Nigerians to the harmful effects of noise from leisure sources. The respondents displayed a negative attitude towards daily noise suggesting a subtle acceptance of the noisy environment that characterizes communities in many developing countries²⁴. The respondents demonstrated a negative attitude to concentrating in noisy situation, implying they may take evasive actions to preserve concentration in a noisy environment. This raises interesting observations on PMDs use and its impact on concentration. PMDs usage may impair safety by causing distractions and worsening auditory perception especially when concentration is required such as road-use and operating machinery²⁵. It is possible that the negative attitude to concentrating in noisy situation may imply that the respondents are concentrating on the source of the music to the detriment of the events in their immediate vicinity. This is may provide additional platform to advocate against the use of PMDs in situations where auditory perception of the environment is required.

The neutral attitude in the “intent to influence” domain suggest unwillingness by young people to overcome resistance and obstacles in securing a noise

free environment, reflecting probable willingness to accept noise generated by friends or acceptance of a prevalent “noise culture”. This attitude could be an obstacle to recruitment of young people as effective ambassadors of noise reduction activities or voluntary achievement of a behavioral change²⁶. The neutral attitude may also be due to the lack of information on the harmful consequences of noise or the assumption that such harm is futuristic²⁷. However, this seeming indifference to changing the noisy environment is a possible target for interventions: provision of adequate knowledge and positive peer pressure may result in attitudinal change to noise. This optimism is buttressed by the negative attitude seen in the mean score the entire YANs, suggesting that the respondents' may adopt risk-reducing actions to protect themselves when exposed to noise.

On the BAHPHL respondents showed neutral attitude towards susceptibility to hearing loss, severity of consequences of hearing loss and benefit of preventive actions suggesting that young people may unwittingly expose themselves to harmful loud noise without taking cognizance of the results of such actions. This indifference could be a manifestation of poor knowledge among the respondents on the hazards of noise exposure³; it could also be related to a belief of invincibility of the youth.

Failure to protect hearing during exposure to potentially harmful loud sounds, is a risky behavior. Contemporary images of youthfulness, healthy bodies and behaviors that involve loud music often depicted in the media may cause young people to regard HPDs as old fashion and encourage tendency towards noise exposure. Further reinforcement of these risky actions may occur with the perception that such actions improve their status among peers²⁸. The majority of young people in this study participated in noisy activities yet, 93.9% of these subjects do not use HPDs. Other explanations for risky auditory behaviors may be the lack of perception of vulnerability to NIHL²⁹ or inability to synchronize messages on protection of hearing with lifestyle preferences and actions³⁰.

Prior experience of auditory symptoms (e.g. tinnitus) or a positive attitude towards hearing health increases motivation to take protective action against noise¹⁵. However, it's important to determine other factors that will motivate young people to take evasive auditory actions such as perception of the threat to health – this is a key determinant in developing effective strategies for evasive actions³¹. Age, information depth, cultural norms and practice are major determinants of health beliefs and behaviours³². Differences in cultural habits of young people may influence their beliefs about hearing protection and hearing loss³³, though the global village model of information dissemination appears to put young people worldwide in similar cultural models with respect to

response to loud music.

Young people in school environment usually experience lower level of parental influence, but the likelihood of engagement in risky or protective behaviours may be partly influenced by parental oversight¹³. Parental oversight could play a significant role in reduction of risky health behaviour among young people³⁴. The study respondents exhibited positive attitude both in their behavioral intention and social norms towards hearing loss and hearing protection and neutral attitude about self-efficacy. This might likely influence their decision-making process on the use of HPDs when exposed to noisy environment; thus, suggesting that there is need to educate young adults about severity and risk of exposure to excessive loud noise. Better knowledge about the damaging effects of noise and the utilization of hearing protection can improve hearing conservation practices among young people; when such education programs are presented early in the educational system it can be very effective in increasing the knowledge of the dangers of noise, and, thus, decreasing the incidence of NIHL²⁰.

Even though legislation exists to enforce regulations of maximum allowed daily noise doses in occupational settings³⁵ similar recreational noise exposure legislation to regulate maximum allowed daily noise dose is not available, in spite of the association of recreational noise to NIHL⁵. The scenario is more precarious in many developing countries due to the limitation of health care access. Unfortunately, the inadequate enforcement of existing legislation on occupational noise exposure does not suggest a swift passage of legislation on recreational noise exposure. Though only a minority of the respondents indicated willingness to wear free HPDs in loud noise environments, it may be argued that if health policy makers in developing countries initiate vigorous attempts to communicate information to young people on the risks of exposure to excessively loud noise; provide legislation that HPDs are important and require its usage in high-decibel recreational settings (similar to the requirement in occupational settings), and decide that it is essential in public health interest to establish the upper limits of decibel output of PMDs, then it may be possible to witness a shift from the current risky behaviors to hearing conservative actions.

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