Does Knowledge of Hazards of Exposure to Noise Change Attitudes and Translate Into Healthful Practices?

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Citation

Abstract

To determine the knowledge, attitudes and practices concerning noise pollution and whether knowledge correlated with attitudes and practices, a study was done among Student Nurses in Nigeria. A total of 55 students were included (Age range 18-30 years, Mean 21.7 years, SD - 2.7). Music was the sound used for the assessment. Detailed information regarding music preference, loudness preference under various circumstances, knowledge of hazards of noise, exposure to noise, sources of information and attitude to loud noise was collected. A high level of knowledge (98.2% for knowledge of adverse effects of noise on hearing and 80% on adverse effects on health) was found. Correlating with that was a high level of preference for soft sounds (96.4% for own music and 80% for gatherings) and a majority demonstrating an attitude of strong opposition for noise (e.g. 87.3% would support legislation against noise) suggesting a high level of knowledge and a positive correlation with practice and attitude. However, being a study on a predominantly female population of Medical personnel in a religious institution, other studies are needed to be able to generalize these findings to other populations.

INSTITUTION WHERE THE WORK WAS DONE

Seventh-day Adventist School of Nursing,
Seventh day Adventist Hospital
Ile-Ife, Nigeria

INTRODUCTION
DEFINITION OF NOISE

Noise is often arbitrarily defined as an unpleasant or undesired sound ([1], [3]). Implicitly it refers to a subjective classification of sound. Physically, sound is produced by mechanical disturbance propagated as a wave motion in air or other media and physical sound evokes physiological responses in the ear and auditory pathways([2]). Psychologically, sound is a sensory perception originating as a mental event evoked by physiological processes in the auditory and other parts of the brain. Thus, it is merely through the perceptual analysis of sounds that the complex pattern of sound waves may be classified and labeled noise, music, speech, etc. From a physical point of view, therefore, there is no difference between the concepts of sound and noise, although it is an important distinction for the human listener ([2]). Thus sound can have a range of different physical characteristics, but it only becomes noise when it has an undesirable physiological or psychological effect on people. And long agreed among experts, it is not possible to define noise exclusively on the basis of physical parameters of sound. Rather, it is common practice to define noise operationally as audible acoustic energy that adversely affects, or may affect, physiological and psychological wellbeing ([2]).

Noise is probably the most widespread nuisance. However, it is actually more than just a nuisance, constituting a real and present hazard to health. It can produce serious physical and psychological stress and though we seem to adjust by ignoring noise, the ear never closes and the body still responds. Annoyance, the most common symptom of irritability has been made the basis of many noise abatement programs whilst the more subtle and more serious health hazards caused by noise has been given much less attention.

It is true that the effects of noise on health are often misunderstood or unrecognized and well documented studies are still required to clarify the role of noise as a public health hazard, but we know from existing evidence that the danger is real. Of the many hazards, hearing loss is the most clearly observable and measurable ([4], [5], [6]). Other sensory effects on the ear include aural pain and tinnitus ([7], [8]). The other hazards are more difficult to pin down. They include a risk

of increased susceptibility to infection and disease, a complicating factor in heart problems and other diseases, effects in the unborn child when exposed to environmental and industrial noise, learning difficulties, poor health and other effects in infancy and childhood, sleep disruption and insomnia, danger to mental and social well-being and even danger to life ($_5$).

Why is the problem of noise pollution ever increasing? Could it be because the link between noise and many disabilities or diseases has not yet been conclusively demonstrated or could it simply be due to ignorance of the harmful effects of noise? If people knew, would their practices not reflect that knowledge? Traditionally, it is believed that knowledge influences attitudes, perceptions and practices. However, this has been recently shown not to be necessarily so with respect to some health behaviors e.g. risky sexual behavior in HIV/AIDS. There may be other social factors that need to be addressed. Which model is applicable to the change in behavior necessary to reduce noise pollution?

Unfortunately, no knowledge attitude and practice studies on noise pollution could be found in literature even after a thorough literature search and so we cannot answer that question with respect to noise pollution. That is what we set out to investigate in this study.

METHOD

DEFINITIONS

For the purposes of this study, music, which is universally listened to, is the sound used for the assessment (Please see above for definition of sound). One's own music is also controllable as opposed to some other sources of sound over which one may not have control whether or not it is acceptable.

Loudness, technically called the sound pressure level or the intensity of the sound, is assessed subjectively in this study since it is known that for most people sound becomes annoying at a sound pressure level of 65dB($_2$). It is also assessed by allowing the respondents to choose on a scale from very soft to very loud.

Knowledge in this study is the awareness of the harmful effects of noise and is assessed by two straight questions about knowledge of harmful effects of noise on hearing and health.

Attitude in this study is the respondent's mental state or feeling towards the fact that loud noise has adverse effect on hearing and health. Questions to test attitude asked how respondents relate to loud music in others and support or opposition to legislation against noise.

Practice is defined as what the respondent actually does, i.e., his habit, and was assessed by asking for preferred level of loudness under various situations: personal preference, when in a gathering and preferred level when using headphones.

STUDY POPULATION

The study population is the student population of the Seventh day Adventist School of Nursing, Ile-Ife, Nigeria. These are post -secondary students training to obtain the diploma in Nursing that leads to R.N. certification after 3 years. This population comprises a hundred and ninety one students. Eighteen are males and the rest are females. There are three levels of study, i.e., parts 1, 2 and 3. There are 70, 51 and 52 females in these classes respectively.

This is a curious group because since they are health professionals in training one expects that they are familiar with the harmful effects of noise. The reason for choosing this population is to be able to correlate knowledge with the attitudes and practices. It will help answer the question whether knowledge of the harmful effects of noise actually affect the attitudes and practices.

STUDY DESIGN

This is a cross-sectional Knowledge, attitude and practice (KAP) study.

SAMPLE SIZE CALCULATION

To obtain a sample for estimates with no more than ± 10% sampling error at the 95% confidence level for the population, we estimate that for our 191-member population in whom we expect members not to be very varied (about an 80/20 split) in the characteristics we are investigating, we use a statistical table to obtain a number of around 45. In order to make allowance for non-response and further reduce the sampling error the number was increased to 55.

SAMPLE SELECTION

Samples were selected by stratified random sampling, stratifying into 4 groups. These 4 groups are the females from each of the classes and the males. A list of all the students was obtained and grouped into these categories and then using a random number table samples were randomly

drawn within each group making sure the samples are in proportion to the total. Thus 21, 14 and 14 females were drawn from each of the female groups while 6 males were drawn: 2, 3 and 1 from each of the classes. All forms were turned in.

INSTRUMENT

This was a self administered structured questionnaire (See Appendix) which was distributed and collected by hand. Most of the questions were structured in a Yes/No coded format and a few questions structured in a coded scale format. The questionnaire was pre-tested among the students and then reviewed based on the pretest experience.

Apart from the questions mentioned above to test knowledge attitude and practice, other questions were incorporated to introduce variables that could probably contribute to whatever results are obtained.

DATA MANAGEMENT, STATISTICAL ANALYSIS AND INTERPRETATION OF RESULTS

After the questionnaires were collected they were reviewed to identify missing data. Since respondents were known, they were contacted to supply missing data. Data collected was entered using SPSS 10.0. Data was verified and cleaned by entering into two different spreadsheet and summaries compared following which mistakes were corrected. Data analysis was also done with SPSS 10.0.

RESULTS / FINDINGS

The findings were as follows:

All 55 respondents returned their forms. There were 49 females and 6 males.

Mean age was 21.7 years, standard deviation was 2.17 years. Minimum age was 18years and maximum age, 30 years and both median age and mode were 21 years. 41.8% were year 1 students and 30.9 and 27.3 were years 2 and 3 students respectively. All (100%) listen to music.

98.2 % knew that noise had harmful effects on hearing while only 1.8% thought noise had no effect on hearing. 80% thought noise has other harmful effects, 7.3% thought noise had no other harmful effects and 12.7% did not know.

87.3% would support legislation against noise, 9.1% are indifferent while only 3.6% disagreed with legislation against noise. 80% often ask others to reduce the volume of their music, others do not.

96.4% listen to music that is from soft to medium volume while only 3.6 % like it loud. Only 16.4% have people have people asking them to reduce the volume of their music. Out of the 38.2% who use headphones or earphones, none like it loud. In gatherings, only 20% like the music loud. Out of this proportion only 3.6% likes it very loud.

85% own music sets and 75% listened to music daily. 100% listen to gospel music, 20% to rock, 30.9% to Jazz, 50.9 to classical music,32.7 to reggae,10.9 to apala, 21.8 to fuji, 30.9% to juju, 56.4% to highlife, 45.5% to makosa, 40% to afrobeat, 10.9% to dadakuwa and waka, 78.2% to acapella and 40% to blues.

The most frequent source of information was school with 69%. Next was media with 54.5%. Friends as a source were 34.5%, books, 32% and parents, 24%.

DISCUSSION

Since all 55 respondents returned their forms, this study was not biased by a non respondent error. The sample size of 55 is approximately 29% of the total population. This slight over-sampling, which was deliberate, was to make allowance for a non-respondent bias helps to ensure that our estimates will have less than a ± 10% at the 95% confidence interval.

Since the sampling was a stratified random sampling with each segment of the population proportionately represented the result can definitely be said to be representative of the population and can be generalized to all similarly composed populations. This brings us to the first major limitation of this study: the fact that this is a predominantly female population. The obvious conclusion is that one cannot generalize these findings to a predominantly male population or even to a population that is comprised of equal proportions of males and females. A possible strength however is that this study will add to the number of predominantly female studies which are extremely few in this environment especially in Educational institutions in Nigeria where males tend to dominate.

Can this study be generalized to other School of Nursing populations? One seemingly confounding factor is the paucity of males in this study. A close look however at the populations of schools of Nursing in Nigeria will show that virtually all of them have this predominantly female population structure. Thus we believe that it will be possible to generalize this study to other School of Nursing

populations in Nigeria. Schools of Nursing in Nigeria may yet prove to be a fertile ground for studies on predominantly female populations.

All the respondents are medical personnel in training. This may seem to be a limitation that would prevent generalizing to populations that are not medical since the knowledge level among these would definitely be greater than among the general population. However this is not a study designed only to determine knowledge level. The respondents were chosen because it was known that the knowledge level among them would be high. The study is to determine whether the high knowledge would be reflected in a correspondingly high level of positive attitudes and practices. Thus since the critical characteristic here is high knowledge rather than being medical personnel we do not see the respondents' being medical personnel a limiting factor but rather, a strength.

Mean age in this study was 21.7 years and both median and mode were 21 years. Standard Deviation was 2.17 years. This is clearly a young age group study. No wonder 100% listen to music. This is significant in this 'high-tech' age of sophisticated musical sets which produce unimaginably loud levels of noise. If all young people listen to music, at all costs it must be ensured that they are protected from effects of abuse. Do these young people know the effects of noise on health? If they do, is their knowledge being translated into positive attitudes and practices? If this is not so, we need to find out why so that we may be able to plan appropriate interventions.

As expected, the level of knowledge was high. Almost all (98.2%) knew noise has a harmful effect on hearing and a vast majority (80%) knew that noise has other harmful effects on health. It is interesting to note that the very percentages mentioned above mirror the state of knowledge on the harmful effects of noise on health. The effects on hearing are very well established and though we know noise has other effects on health the evidence is not as conclusive. This explains why not as many people know of the other harmful effects of noise. Nonetheless it is significant to note that all this notwithstanding, the level of knowledge is high.

Do these impressively high levels of knowledge translate into positive attitudes and practices? According to this study, they do. And the figures are equally impressive. 87.3% would support legislation against noise and 80% of them often ask others to reduce the volume of their music. These

are positive attitudes against noise pollution. Only 3.6% like listening to loud music and only 16.4% of people have people asking them to reduce the volume of their music. And of the 38.2% who use headphones, none like it loud. These all demonstrate positive practices.

It is interesting to note that the most frequent source of information was school with almost seven-tenth of the population. More than half have the media as their source. Friends, books and parents are other though less frequent sources. These pieces of information are vital for people who plan programs for young people.

Without belaboring the facts, the conclusions are clear. This is a group of young people who love listening to music. All of them do. Possibly by virtue of the fact that they are medical personnel in training they do know that noise does have harmful effects on hearing and on health. This study has been able to demonstrate that corresponding with their level of knowledge there is also a high level of positive attitudes and practices against noise pollution.

However, some questions are raised that have to be answered. With respect to noise pollution, is the relationship that simple? Is simply increasing knowledge of noise pollution and its harmful effects sufficient to promote positive attitudes and practices? Or are there other important factors that may prevent this simple relationship? The specific question here is whether there is something about being medical personnel that helped to translate the high knowledge level into positive attitudes and practices in these people. To answer this question, this study needs to be repeated in non-medical people. Secondly, could the fact that this institution is a religious institution have affected the results? And in this age of gender sensitivity one needs to ask if the results are biased by the female preponderance. Would the results have been different if our population was predominantly male?

Other studies are needed to address these challenges since as has been mentioned earlier; a thorough literature search has failed to yield any previous KAP studies on noise pollution. To the Author's knowledge, this may be the first and thus the debate is only just beginning.

APPENDIX : QUESTIONNAIRE NOISE AND HEALTH SURVEY

This Survey is designed to assess respondents' awareness of the effects of noise on hearing and on health and see if their

knowledge correlates with their attitudes and practices. Please take a few minutes to complete the questionnaire. Your response to this survey is very important as the results will help in designing a health education program on noise and hearing.

Instructions: In each question, please mark the most appropriate response or fill in the space .

Name: Address: 1. Age: _____ 2. Gender: [ ]1 Female [ ]2 Male 3. Level of study? [ ]1First year [ ]2Second year [ ]3Third year 4. Do you listen to Music? [ ]1Yes [ ]2No 5. What type of music do you listen to? Please mark yes or no for each option. a) Gospel [ ]1 Yes [ ]2 No b) Rock [ ]1 Yes [ ]2 No c) Jazz [ ]1 Yes [ ]2 No d) Classical [ ]1 Yes [ ]2 No e) Reggae [ ]1 Yes [ ]2 No f) Apala [ ]1 Yes [ ]2 No g) Fuji [ ]1 Yes [ ]2 No h) Juju [ ]1 Yes [ ]2 No i) Highlife [ ]1 Yes [ ]2 No j) Makosa [ ]1 Yes [ ]2 No k) Afrobeats [ ]1 Yes [ ]2 No l) Dadakuwa [ ]1 Yes [ ]2 No m) Waka [ ]1 Yes [ ]2 No q) Acapella [ ]1 Yes [ ]2 No r) Blues (R & B) [ ]1Yes [ ]2No s) Others (Please Specify) 6. Do you own a music set or radio? [ ]1 Yes [ ]2 No 7. How often, on the average, do you listen to music? [ ]1 Daily [ ]2 Every other day [ ]3 Twice a week [ ]4 Weekly [ ]5 Less frequently 8. How loud do you like your music? Please circle the most appropriate figure on the scale from 1 to 5 : Very loud 5 4 3 2 1 Soft 9. Do others ever ask you to reduce the volume of your music? [ ]1 Yes [ ]2 No 10. Do you ever ask for music volume to be lowered (For example in taxis, rooms, religious meetings)? [ ]1 Yes [ ]2 No 11. Do you use headphones/earphones? [ ]1 Yes [ ]2 No 12. How loud do you put the volume when you use headphones? Please circle the most appropriate figure on the scale from 1 to 5 (If you answered No to Question 11 above, please mark the box labeled 'not applicable'): Very loud 5 4 3 2 1 Soft [ ]6 Not applicable 13. How often, on the average, do you attend gatherings in which music is played? [ ]1Once weekly [ ]2Once in 2 weeks [ ]3Once in 3 weeks [ ]4Once in a month Other5 (Please specify) 14. How loud do you prefer the music at these gatherings? Please circle the most appropriate figure on the scale from 1 to 5 : Very loud 5 4 3 2 1 Soft 15. What effect do you think loud noise has on hearing? [ ]1 Beneficial [ ]2 Harmful [ ]3 No effect 16. Do you think loud noise has any other effect on health? [ ]1 Yes. (Please specify   ) [ ]2 No [ ]3 Don't know 17. What is your source of information on loud music and its effects on health and hearing? Please mark Yes or No to each option. a) Friends [ ]1Yes [ ]2 No b) Media [ ]1Yes [ ]2 No c) Book [ ]1Yes [ ]2 No d) School [ ]1Yes [ ]2 No e) Parent [ ]1Yes [ ]2 No f) Others (please specify)_____ 18. Do you think noise controlling regulations should be put in place in Nigeria or in your school or community? Please circle the most appropriate figure on the scale from 1 to 5: Strongly agree 5 4 3 2 1 Strongly disagree YOU ARE DONE!! THANKS A LOT!!

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