

Knowledge, Behaviors, and Attitudes about Noise-induced Hearing Loss among Adults in Albaha Region: A Cross-sectional Study

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ABSTRACT

Background: Worldwide, more than one billion people are affected by hearing loss. Noise-induced hearing loss (NIHL) is reported among the most prevalent occupational diseases. However, little is known about the current level of knowledge and attitude towards NIHL among general population.

Objective: The purpose of this study was to investigate the knowledge, behaviors, and attitudes of adult population in Albaha Region of the Kingdom of Saudi Arabia concerning the factors that contribute to Noise-induced hearing loss (NIHL) and the use of hearing protection.

Methods: A 16-item self-administrated questionnaire was used to measure the knowledge, habits, attitudes, and perception of NIHL and each participant's use of hearing protection. The questionnaire included multiple choice and fill-in-the-blank format questions. The questionnaire was divided into two sections: 1) demographic information, including age, sex, college major, and prior coursework regarding hearing in noise; 2) knowledge of hearing, the auditory mechanism, and noise-induced hearing impairment.

Results: we received 296 valid responses. Fifty-nine percentage were male, 37 % percentage were students, 21 % were soldiers and 17 % were teachers. Only 19 % said that hearing loss cannot be cured and 53 % knew that it can happen at any age. Interestingly, 94 % never wore an ear plug before.

Conclusion: Our study showed low percentage of correct answers about causes and protective measures against hearing loss. Future health care program should consider initiatives and public health campaigns to improve the public's knowledge and attitude.

Key words: knowledge, noise-induced hearing loss, Saudi Arabia.

INTRODUCTION

Worldwide, more than one billion people are affected by hearing loss⁽¹⁾. Noise-induced hearing loss (NIHL) is reported to be the most prevalent occupational disease in the United States⁽²⁾. Interestingly, it has been estimated that one-third of all cases of hearing loss can be attributed to noise exposure and that it is the most common preventable cause of hearing loss⁽³⁾.

The effect of NIHL represents an increasing burden on both the individual and society. The financial burden to society is significant and continues to rise, with an estimated \$242.4 million annual expenditure in compensation for work-related hearing loss in the United States⁽²⁾.

NIHL may be inflicted by short bursts of loud sound or continuously elevated noise levels. Such exposures lead to cochlear hair cell damage, damage to surrounding supporting cells, and ultimately degeneration of associated auditory nerve fibers. The level of inner ear damage and associated hearing loss are correlated to the intensity and duration of noise exposure⁽⁴⁾.

Although it is one of the most widespread disabilities in Westernized society, little is known about the current level of knowledge and attitude towards NIHL among general population.

A previous cross-sectional study by **Crandell et al.**⁽⁵⁾ included 200 college-aged young adults, and concluded that this group of population exhibited considerable knowledge about the effects of noise on the auditory system. Yet, their findings also provided evidence that there should be concern about educating young adults about the severity and risk of exposure to excessive noise⁽⁵⁾. Another cross-sectional study, that involved 83 workers, showed a negative attitude of workers towards NIHL preventive measures⁽⁶⁾.

The purpose of this study was to investigate the knowledge, behaviors, and attitudes of adult population in Albaha Region of the Kingdom of Saudi Arabia concerning the factors that contribute to NIHL and the use of hearing protection.

METHODS

Ethical considerations

This study got an ethical approval from the Institutional Review Board of the Faculty of Medicine, Albaha University. All participants received a detailed explanation about the study purpose and methods, and an informed consent was taken from each participant. Investigators were responsible for keeping the security of the data that were not used for any other purpose outside this study. Confidentiality of the data was maintained by making code numbers for each participant.

Study design

This is a cross-sectional study that was carried out among residents of Albaha Region (KSA). Medical or paramedical personnel and non-Saudi subjects were excluded from the study. The study was conducted throughout July to September, 2017 to assess awareness regarding NIHL among males and females Saudi subjects.

Data collection instrument:

The researchers used a self-administrated questionnaire that was published elsewhere⁽⁵⁾. A 16-item questionnaire was used to measure the knowledge, habits, attitudes, and perception of NIHL and each participant's use of hearing protection.

The questionnaire consisted of multiple choice and fill-in-the-blank format questions. The final questionnaire was divided into two sections: 1) demographic information, including age, sex, and occupation; 2) knowledge of hearing, the auditory mechanism, and noise-induced hearing impairment, subject's habits concerning exposure to noise and use of hearing protection, and attitudes about the use of hearing protection.

Statistical analysis

Data were analyzed with SPSS software (version 22). The distribution of participants in

the defined groups according to their characteristics was reported by the corresponding frequencies and percentages, while the mean and standard deviation (SD) were reported for numerical scores.

RESULTS

In the present cross-sectional study, we retrieved 296 surveys. Mean age of our sample was 32±12. Sixty percent were men, 37 % were student and 11 % were housewives. **Table (1)** shows distribution and baseline characteristics of our sample.

Table (1): Distribution and baseline characteristics of our sample

	N	%
Age (mean±SD)	32±12	
Sex (male)	174	59
Occupation		
Student	110	37
Soldier	64	21
Nurse	6	2
Paramedical	9	3
House wife	33	11
Retired	23	7.8
Teacher	51	17

Our analysis showed that 78% of participants agreed that doctors can typically cure hearing loss. Fifty-nine percent said that high frequencies noise is the cause of hearing loss. Interestingly, the majority of people never wore earplugs when exposed to loud noise.

The limited use of earplugs was for different reasons. The most common reason was the limited knowledge. Fortunately, 56 % would wear it if earplugs were dispensed at no cost in environments that have high noise levels. **Table (2)** shows the knowledge, behaviors, and attitudes about noise-induced hearing loss among adults in Albaha region.

Table (2): Knowledge, behaviors, and attitudes about noise-induced hearing loss among adults in Albaha region

Questions		N	%
Which part of your ear is primarily hurt by noise?	The outer ear	90	30
	The inner ear	102	34
	All of the above	104	35
Hearing loss caused by noise:	Can typically be cured by a doctor	230	78
	Cannot typically be cured	56	19
	Can typically cured with bed rest	10	3
At what frequencies (pitches) do individuals typically lose their hearing because of noise?	High frequencies	174	59
	Low frequencies	18	6
	Both high and low frequencies	102	34
	Individuals can lose their hearing at any frequency because of noise	2	0.6
Noise will generally only damage your hearing if:	You are over 40 years of age	80	27
	You are over 60 years of age	58	19
	Noise will damage your hearing at any age	158	53
Which signs indicate when noise is too loud?	Your ears feel "stuffy" after exposure to the sound	55	18.5
	Your ears "ring" or "buzz" after exposure to the sound	75	25
	Your hearing seems to get worse for a while, but is OK later	33	11.5
	Your ears bleed	45	15
	You have to shout to talk with a friend in that environment	33	11.5
	Your ears hurt because of the noise	55	18.5
Which of these activities do you take part in?	Shooting guns	182	8.9
	Motor boating	138	6
	Nightclubs	198	9
	Riding a motorcycle	284	13
	Rock concerts	140	6
	Car races	134	6
	Hunting (with a gun)	138	6
	Military experience	282	13
	Mowing the lawn	134	6
	Walkman personal stereos	134	6
	Construction work	288	14
Do you wear earplugs when exposed to loud noise	Never	278	94
	Sometimes	2	0.6
	Infrequently	16	5.4
Why do you, or would you, not wear ear plugs?	Never thought about it	40	13.5
	Cosmetics	2	0.6
	Distorts sound	46	15.5
	Don't spend enough time in loud areas	2	0.6
	Unnecessary	20	6
	Forget to bring/wear	2	0.6
	Limited Knowledge	184	62
If earplugs were dispensed at no cost in environments that have high noise levels, would you be more willing to wear them	Yes	166	56
	No	130	44
Listening to my favorite music at very loud levels is potentially harmful to my hearing.	Yes	214	72
	No	82	27
The best way to protect my hearing in noisy environments would be to use	Earplugs	72	24
	Earmuffs	98	33
	Earplugs and earmuffs	126	42

DISCUSSION

Prevalence of children affected with hearing loss was estimated to be approximately 26 children out of 1000 and over 1350 students at special schools for the hearing impairment^(7,8). The present study investigated the knowledge, behaviors, and attitudes of adult population in Albaha Region of the Kingdom of Saudi Arabia concerning the factors that contribute to noise-induced hearing loss (NIHL) and the use of hearing protection. Early identification and intervention is best achieved when patients are aware of conditions that could be a risk for developing hearing loss.

Fifty-three percentage of our sample said that hearing loss can happen at any age and only 19 % knew that there is no cure. Another study showed that 95 % and 85 % knew that respectively⁽⁵⁾. In our survey, although 42 % of participants knew that earplugs and earmuffs can protect against hearing loss, 94 % never wore it before. That may be because of the body image, cosmetic concerns that overweight the serious damage that can happen and the limited knowledge^(9,10). Low percentage (56 %) would consider wearing earplugs if they were offered them free in places with loud noise. Our population was exposed to various recreational activities that increase risk of hearing loss. Construction work represented 14 % of the activities that our sample participated in. Military experiences and riding motor cycles represented 13 % each. Different results were reported in other studies, where road traffic was the highest represented source of noise (73 %) followed by music and home noise (26%) in another study⁽¹¹⁾. Nearly 15% of the workers said that bloody discharge is one of the signs of NIHL. Signs to suggest NIHL include difficulty in understanding spoken words in a noisy environment, need to be near or look at the person speaking to help understand words, familiar sounds are muffled, complaints that people do not speak clearly and ringing noise in the ears⁽¹²⁾. Another study showed that 20 % believed that discharge from ear is an early sign of deafness due to exposure to loud noise⁽⁶⁾.

In identifying the limitation in this study, information in the questionnaires was obtained by self-reporting and therefore may be subjected to recall bias. In general, our study showed low level of knowledge and attitude towards NIHL. Comparable results were reported by other studies^(6,11). Awareness improvement occurs after health educational programs using pamphlets and

regular training⁽¹³⁾. Similar educational campaign should be considered in our community.

CONCLUSION

The poor knowledge level about NIHL among Saudis was below satisfactory level. This may lead to higher prevalence of NIHL in the future. Our study showed low percentage of correct answers about causes and protective measures against hearing loss. Future health care program should consider initiatives and public health campaigns to improve the public knowledge and attitude.

REFERENCES

- Vos T, Flaxman AD, Naghavi M *et al.* (2012):** Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*, 380(9859):2163-2196.
- Basner M, Babisch W, Davis A *et al.* (2014):** Auditory and non-auditory effects of noise on health. *Lancet*, 383(9925):1325-1332.
- Le TN, Straatman LV, Lea J *et al.* (2017):** Current insights in noise-induced hearing loss: a literature review of the underlying mechanism, pathophysiology, asymmetry, and management options. *J. Otolaryngol. Head Neck Surg.*, 46(1):41.
- Stucken EZ and Hong RS (2014):** Noise-induced hearing loss: an occupational medicine perspective. *Curr. Opin. Otolaryngol. Head Neck Surg.*, 22(5):388-393.
- Crandell C, Mills TL and Gauthier R (2004):** Knowledge, behaviors, and attitudes about hearing loss and hearing protection among racial/ethnically diverse young adults. *J. Natl. Med. Assoc.*, 96(2):176-186.
- Rus RM, Daud A, Musa KI *et al.* (2008):** Knowledge, attitude and practice of sawmill workers towards noise-induced hearing loss in kota bharu, kelantan. *Malays. J. Med. Sci.*, 15(4):28-34.
- Bafaqeh SA, Zakzouk SM, al Muhaimid H *et al.* (1994):** Relevant demographic factors and hearing impairment in Saudi children: epidemiological study. *J. Laryngol. Otol.*, 108(4):294-298.
- Daghistani K, Abdulkarim A, Bamanie A *et al.* (2014):** Investigation of the genetic causes of non-syndromic hearing loss in the Western region of Saudi Arabia. *BMC. Genomics*, 15(2):P50-P50.
- Rosenstock IM (1966):** Why people use health services. *Milbank Mem. Fund. Q.*, 44(3): 94-127.
- Jones CL, Jensen JD, Scherr CL *et al.* (2015):** The Health Belief Model as an explanatory framework in communication research: exploring parallel, serial, and moderated mediation. *Health Commun.*, 30(6):566-576.
- Ismail AF, Daud A, Ismail Z *et al.* (2013):** Noise-induced hearing loss among quarry workers in a north-eastern state of malaysia: a study on knowledge, attitude and practice. *Oman Med. J.*, 28(5):331-336.
- Dobie RA (2017):** Cost-Effective Hearing Conservation: Regulatory and Research Priorities. *Ear and Hearing*, <https://insights.ovid.com/pubmed?pmid=29251690>
- Sofra D, Delgado H, Masmont-Berwart S *et al.* (2014):** The therapeutic education: an awareness program for health professionals. *Rev. Med. Suisse.*, 10(433): 1225-1243 and 1249-1250.