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A study to assess the self-instructional modules on knowledge regarding prevention of hearing loss among automobile workers

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Abstract

Noise is the insidious of all industrial pollutants, involving every industry and causing severe hearing loss in every country in the world. Occupational hearing loss includes acoustic traumatic injury and noise-induced hearing loss (NIHL), and can be defined as a partial or complete hearing loss in one or both ears as the result of one's employment. NIHL is an important public health priority because as populations live longer and industrialization spreads. Hearing loss is the third most common disease in the adult population, ranked after cardiovascular diseases and hypertension. It has been estimated that worldwide, as much as 500 million individuals might be at the risk of developing noise-induced hearing loss (NIHL). An evaluative approach pre experimental research design was conducted among 60 automobile workers. Convenient sampling technique was used to select samples. Structured interview was used to collect demographic data. Pre-test was conducted to assess the knowledge on automobile workers followed by administration of instructional module. After 7 days post test was conducted by using same questionnaire. The study finding revealed that after the administration of instructional module among automobile workers. There was statistically significant difference between pre-test and post-test knowledge scores and the hypothesis was accepted. The calculated paired 't' test value of $t=15.1594$ was found to be statistically highly significant at ($P<0.001$). This clearly interferes there is significantly improvement in the post-test level of knowledge regarding prevention of hearing loss among automobile workers.

Keywords: Noise exposure, hearing loss, tinnitus

Introduction

Noise is the insidious of all industrial pollutants, involving every industry and causing severe hearing loss in every country in the world. Occupational hearing loss includes acoustic traumatic injury and noise-induced hearing loss (NIHL), and can be defined as a partial or complete hearing loss in one or both ears as the result of one's employment. Exposure to excessive noise is the major avoidable cause of permanent hearing impairment worldwide [1]. Prolonged exposure to noise at high intensity is associated with damage to the sensory hair cells of the inner ear and development of permanent hearing threshold shift, as well as poor speech in noise intelligibility. There is also evidence that noise exposure frequently leads to tinnitus which might be due to alterations in the central auditory function [2].

NIHL is an important public health priority because as populations live longer and industrialization spreads, NIHL will add substantially to the global burden of disability. Hearing loss is the third most common disease in the adult population, ranked after cardiovascular diseases and hypertension. It has been estimated that worldwide, as much as 500 million individuals might be at the risk of developing noise-induced hearing loss (NIHL) [3]. It is always sensor neural, primarily affecting the cochlear hair cells in the inner ear. It is typically bilateral, since most noise exposures are symmetric. Its first sign is a "notching" of the audiogram at the high frequencies of 3000, 4000, or 6000 Hz with recovery at 8000 Hz [4]. Symptoms of possible NIHL include transient tinnitus (ringing or buzzing in the ear), a feeling that the ears are plugged up, or speech or other sounds muffled after exposure to loud noise.

Individuals with NIHL often notice difficulty understanding conversation, particularly in unfavourable listening conditions [5]. NIHL is inner ear damage, thus it lacks overt symptoms

such as pain, bleeding, or easily noticeable deformity. Individuals with NIHL hardly notice their hearing problem until their communication is noticeably compromised [6]. other major health effects due to the noise pollution are lack of concentration, irritation, fatigue, headache, sleep disturbance, etc. [7]. This OSHA required occupational hearing conservation program must incorporate five factors: (1) periodic noise exposure monitoring, (2) engineering and administrative controls, (3) personal hearing protection, (4) audiometric evaluations and follow-up activities, and (5) employee/manage-meant education and training [8].

Yali Chen *et al.*, 2019 A cross-sectional survey was conducted with 6557 participants from the automotive industry. The questionnaire survey was administered, and individual noise exposure level (LAeq.8h) and hearing loss level were measured. participants, 96.43% were male; the median age was 27.0 years and 28.82% had NIHL defined as adjusted high-frequency noise-induced hearing loss (AHFNIHL). Concerning individual noise levels (LAeq.8h), 62.53% exceeded 85 Db. The trend test showed that the prevalence of AHFNIHL in male workers significantly increased with an increase in LAeq.8h at <94 dB(A) and cumulative noise expo-sure (CNE) in each age group ($P < 0.05$ or $P < 0.01$). Much more human surveys are needed to understand the prevalence and determinants of NIHL in the automotive industry in China [9].

Apiradee Sriopas *et al.*, 2017 this study aimed to assess the level of occupational noise-induced hearing loss and investigate risk factors causing hearing loss in auto part factory workers in the welding units in Thailand. This was a cross- sectional study. The findings confirmed that noise exposure levels of 86–90 dB (A) and exceeding 90 dB (A) significantly increased the risk of hearing loss in either ear. A noise exposure level exceeding 90 dB (A) significantly increased the prevalence of hearing loss in both ears. Regarding, a 10-pack-year smoking history increased the prevalence of hearing loss in either ear or both ears [10].

Materials and Methods

An evaluative approach with pre experimental (pre-test and post-test) research design was used to conduct the study. The study was conducted in automobile industry at sriperumbudur, kancheepuram district 60 samples were selected by using a convenient sampling technique. The inclusion criteria for the sampling are who are all willing to participate in this study, who are all available at the time of data collection and able to read and write in Tamil. The data collection period was done with prior permission from the HR of the automobile Industry. The purpose of the study was explained to the samples and written informed consent was obtained from them. The data collection was started on 15.03.2020. The demographic data were collected using a stru8ctured knowledge questionnaire was used to assess the knowledge of automobile workers regarding prevention of hearing loss. After the pre-test, the investigator gave the instruction followed by information initially for about 30 minutes using the self-instructional modules on knowledge regarding prevention of hearing loss. At the end of the teaching 10-15 minutes were allotted for discussion to clear their doubts. After 7 days post test was conducted by using

the same questionnaires. The same procedure was followed for all selected samples. The data were analyzes using descriptive and inferential statistics.

The sample characteristics were described using frequency and percentage. Paired t test also used to assess the pre test and post test score and the p value is <.05. The result was extremely significant(s). Chi square test was used to test the association between categorical variables, $P < .05$ was taken as statistically significant.

Result and Discussion

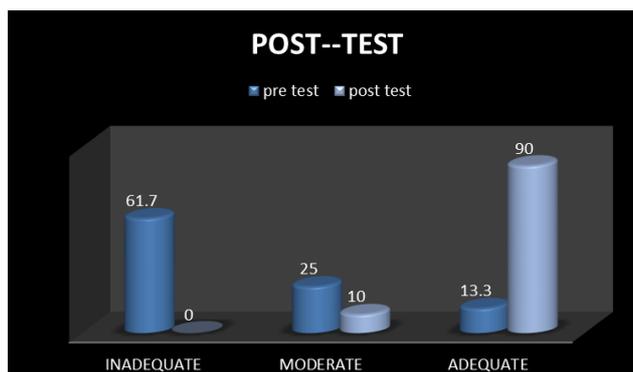
Section A: Frequency and percentage distribution of demographic variables among automobile workers

Table 1 shows that, most of them 27(45%) were in the age group of 21 – 30 years, higher secondary 25(41.7%) had monthly income of 6000-8000(43.3%), 31(51.7%) were married, 32(53.3%) belonged to nuclear family 45(75%) were non-vegetarian, most of them year of experience 3-10 years (50%), 25(41.7%)samples are lived in urban area.

Section B: Frequency and percentage distribution of pre-test and post-test level of knowledge on prevention of hearing loss among automobile workers.

The table 2 depicts that 37(61.7%) had inadequate knowledge 15(25%) had moderately adequate knowledge and 8(13.3) had adequate knowledge.

Where as in the post test, 6(10%) had moderately adequate knowledge 54(90%) had adequate knowledge.



Section C: Comparison of mean score and standard deviation score of pre-test and post-test knowledge based on inadequate, moderate and adequate.

Among 60 samples shows the mean score of knowledge for inadequate (4.5135), moderate (14.0667) and adequate (21) and standard deviation score for inadequate (2.2438), moderate (1.0328) and for inadequate (1.6036) in pre test. Among 60 samples shows the mean score of knowledge for moderate (16.3333) and adequate (21.94444) and standard deviation score for moderate (1.633) and for inadequate (1.8876) in post test.

Section D: Comparison of mean score, standard deviation, mean difference and paired t value of pre-test and post-test level of knowledge among prevention of hearing loss among automobile workers

Variables	Mean	Standard Deviation	Mean Difference	Paired 't' Test	
				't' Value	P Value
PRE-TEST	21.38	2.51	0.810	t=15.1594	P=0.0001
POST-TEST	9.10	6.50		df=59	(S)

The pre test mean score of knowledge was 21.38 ± 2.51 and the post test mean score was 9.10 ± 6.50 . The mean improvement score was 0.810. The calculated paired „t“ test value of $t=15.1594$ was found to be statistically highly significant at $p < 0.0001$ level.

Section E: Association of post test level of knowledge on prevention of hearing loss among automobile workers with their selected demographic variables.

A show that is association between the demographic variables of adolescent girl's mother regarding early marriage and early pregnancy. There was statistically significant found insignificant age, significant education, significant occupation and significant family income.

Conclusion

The study revealed that the instructional module was highly effective in improving knowledge of auto mobile regarding prevention of hearing loss.

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