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Knowledge, Attitude and Practice in Relation to Noise-Induced Hearing Loss in Two Factories

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Abstract: There has been a global increase in prevalence of occupational noise-induced hearing loss. The aim of this study is to explore mean score levels on knowledge, attitude and practice regarding noise-induced hearing loss among participants of the two factories and also to determine the frequency of distribution of health education. In this intervention study, there were 203 participants from the two factories in the automobile industry. The sample size required was 23 in each factory. A questionnaire about knowledge, attitude and practice regarding noise-induced hearing loss questionnaires was distributed among the participants. The revealed that there were no differences in mean scores on knowledge, belief, feelings, judgment and practice among participants from the two factories. However, the health education intervention elicited statistically significant changes in mean score of knowledge over time, $F(1.44, 289.45) = 13.54$, $p<0.001$, partial $\eta^2 = 0.063$; mean score of belief subdomain (attitude) over time, $F(1.71, 344.17) = 7.78$, $p = 0.001$, partial $\eta^2 = 0.037$ and mean score of practice over time, $F(1.49, 300.16) = 9.46$, $p<0.001$, partial $\eta^2 = 0.045$, the mean score levels reduced over 6 months compared to the 1st month. This study concludes there were no differences among participants from the two factories on knowledge, attitude and practice regarding noise-induced hearing loss. Regular employee health education at least 6 monthly is required in a hearing conservation program.

Key words: Hearing loss, noise-induced, knowledge, attitude, practice, noise

INTRODUCTION

There are a few conditions that may lead to sensorineural hearing loss. One of the causes is occupational noise-induced hearing loss (Rutka, 2011; Amirabadi, 2012). Unlike conductive hearing loss, sensorineural hearing loss occurs due to interruption of sound waves in the inner ear (ASHA, 2005). The disruption of sound waves due to vestibular-cochlear nerve pathology is known as neural loss whereas if this eighth cranial nerve is spared, then it is referred to as sensory loss. And, when both components are involved, it is known as sensorineural hearing loss. Unlike conductive hearing loss, the prognosis of this hearing loss is poor. This is because the nerve fibers are irreversibly affected. Surgery in sensorineural hearing loss may not be very helpful. This explains the importance of preventing occupational noise-induced hearing loss as it is irreversible and permanent. There has been increased prevalence of occupational noise-induced hearing loss globally; doubled from 120 million in 1995 to 250 million in 2004 (Nelson *et al*., 2005). In United States alone, there were millions of workers exposed to noise levels above the permissible exposure limit. In Germany, one sixth of the working population is exposed to these levels (Concha-Barrientos *et al*., 2004). The countries in the East were not spared either. There were a total of 663 cases of occupational diseases investigated in Malaysia for the year 2010. From this total, around 70% of them were diagnosed to have noise-induced hearing loss, making it as the most common occupational disease in Malaysia (MHR, 2013).

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Hearing conservation programs are integrated in management policy in each industry. This program has many elements that are required to be adhered to by employers as well as employees (Franks *et al*., 1996; Kirchner *et al*., 2012). The elements that are instituted in this program should be sustainable for continuous success in curbing hearing loss due to noise. This in turn will reduce compensation claims from the employees and reduce financial loss of the company. One of the barriers to success of this program was poor cooperation from management together with poor knowledge and understanding among the employees. Thus, continuous education with training regarding importance of this program should be imparted both to employees and employers (WHO, 1997).

The health education is so vital, since it gives information on effects and prevention of hearing loss. The continuous education can also influence these employees towards positive attitudes and practices in preventing hearing loss. The education and training should be given at least once in 2 years (LoM, 2010).

The present study is conducted with the aim of exploring mean score levels on knowledge, attitude and practice regarding noise-induced hearing loss of two factories and also to decide on a suitable frequency of distribution of health education. It is of utmost importance to scientifically determine the frequency for conveying the health education to establish a legal limit, since it will impose cost and enforcement issues.

MATERIALS AND METHODS

Study design and population: The questionnaire was created based on and modified from a study (Rus *et al*., 2008) and reviewed by a panel of occupational physicians to ensure good face validity (Sayapathi *et al*., 2012). Pragmatic consensus was reached after in-depth discussion of every single item (Sayapathi *et al*., 2012). In order to ensure good content validity, the scope covered in the questionnaire was maintained from the study (Rus *et al*., 2008). The questionnaire initially was created English, later translated to Bahasa Malaysia and then back to English (forward and backward translation). This translation was done by the Linguistics Department of University Malaya. The self-administered questionnaires consisted of 4 main sections:

- Demographic
- Knowledge
- Attitude
- Practice

Recruitment of study areas was initiated through online requests to safety and health officers. The details of the study were explained to the safety and health officers and human resource managers. Upon approval to conduct this study, information was provided about this study to the participants. The participation of employees was voluntary and included obtaining written informed consent.

All subjects in each factory exposed to a noise level above the action level were recruited into this study. The daily noise doses were = 0.5 in both factories (LoM, 2010) where the amount of exposure is half the permissible exposure limit. The exclusion criteria were subjects who refused to participate and contract workers, since they were not permanently employed. This information was obtained from a questionnaire.

Internal consistency, reliability and factor analysis of the questionnaire: There were a total of 116 participants in a pilot study to assess internal consistency and factor analysis of the questionnaire. The average age of these participants was around 37 years (±9.9), ranging from 22-64 years old. Around 65% of them were Malays and more than half of them were working between 1 and 10 years while another 40% were working beyond 10 years in the company. More than half were earning <RM3000 monthly. Almost 40% had attained secondary school education and almost half continued education in college or university. More than 70% of them never smoked and a majority of them never consumed alcohol. Around 15% of them had hobbies that may contribute to noise-induced hearing loss. Among them, 60 participants were given the questionnaire in English and 56 of them were distributed a Bahasa Malaysia questionnaire as depicted in Table 1. The English language questionnaires were distributed in an oil and gas company while the Bahasa Malaysia ones were distributed in a concrete factory.

Sample size: The participants were from two factories in the automobile industry, exposed to noise levels beyond the action level. All of them worked in a shift of 8 h. The total population exposed to noise levels above action level was 260. Of the eligible participants, 203 of them participated in this study. The non-respondents were those who were involved in very busy work procedures and who had the predilection to not participate in the study. Based on the results of an earlier study (Rus *et al*., 2008), the sample size required was 19 respondents for each factory based on a two-sided significance level of

Table 1: Questionnaire

Parameters	Noise induced hearing loss among workers
Knowledge	
K1	Hearing loss due to noise is not permanent
K2	Hearing loss may not occur if a worker is exposed to loud noise
K3	Hearing loss may not occur if a worker is exposed many times to a noisy environment
K4	Hobbies like shooting and scuba diving may cause hearing loss
K5	Smoking increases risk of hearing loss when working in a noisy environment
K6	Ear discharge is the earliest sign of hearing loss due to noise
K7	There is medicine available to treat hearing loss due to noise
K8	Hearing loss can't be prevented by wearing ear plugs or ear muffs
K9	There is a law to protect employees from being exposed to loud noise
Attitude belief	
AB1	I believe it is right to wear one ear plug only during communication in a noisy environment
AB2	As an employee, I think I do not need to know the law on noise control
Attitude feeling	
AF1	I feel my employer should be informed if I have hearing loss
AF2	I feel it is the responsibility of me and my employer together to reduce noise exposure
AF3	I feel nothing is wrong if we are not being informed about the results of audiograms (stating hearing loss level)
AF4	I feel nothing is wrong if we are not being informed on the results of initial noise exposure monitoring
Attitude judgment	
AJ1	I will ignore hearing loss since it does not lead to death
AJ2	I will ignore hearing loss since it is not painful
AJ3	I will wear ear plugs or ear muffs in a noisy industry
AJ4	I will undergo regular hearing assessments to detect hearing loss
Practice	
P1	I undergo hearing assessment to detect hearing loss
P2	I attend health education to know the effects of noise
P3	I wear earplugs or ear muffs to protect from hearing loss
P4	I wear only approved ear plugs or ear muffs
P5	I will get information from the safety and health committee regarding noise

0.05 and power of 80%. The calculation of sample size was based on power and sample size calculations software (Dupont and Plummer, 1990; Pearson and Hartley, 1970). Taking into account 20% who failed to follow up, the required sample size was 23 in each factory. Sample size limitations were addressed by communicating with the employees through phone calls and providing them with incentives to participate.

Measures

Noise area and personal noise exposure measurement: Noise area measurement was done using sound level meters (LoM, 2010), calibrated and approved by the Department of Occupational Safety and Health (DOSH; Larson Davis, Model Spark 706 RC and Spark 703+). Sound level meters were calibrated just before and after noise measurement.

Noise exposure among employees was measured using a personal exposure noise dosimeter (LoM, 2010), calibrated and approved by DOSH (Larson Davis, Model Spark 706 RC and Spark 703+). The measurement was done in each job area, exceeding the action level of each factory. One employee represented a group of employees from the same job area (LoM, 2010). The noise dosimeters were worn by the participants for the entire shift while at work and were switched off during breaks. The average noise exposure was taken and recorded. The exchange rate of 5 dB was applied during measurement of noise. The dosimeters were calibrated just before and after noise measurement.

We categorized workers by area not as individuals. This was practiced since among individuals, sound levels fluctuate more from day to day than in the overall group (Rubak *et al*., 2006).

Intervention

Hearing conservation education: Hearing conservation education was given to participants of both factories, factory 1 and 2. This education was disseminated in the form of pamphlets. The pamphlets were distributed among the participants when the noise level was above the action level in the job area. Hearing conservation education was given at beginning of the study, 1st and 6th month a week after the distribution of questionnaire. The pamphlets used were in English or Bahasa Malaysia as shown in Appendix A.

Statistical analyses: The data analyses were performed using SPSS version 20 for Windows. Data for participants who were lost to follow-up were replaced by baseline values using the intention-to-treat principle. The test which was carried out to analyze reliability of the questionnaire was also used to detect internal consistency of scale as a whole. The relationship between the individual items in the scale could be determined. The Alpha (Cronbach's) Model used is based on average inter-item correlation. Factor analysis was done to identify the contents of questions that can be grouped by the same factor whereby these items would share the same subjects or groups. By doing so, the items measured would be related to the hypothesis. This method of data reduction was conducted and explored using the principal axis method. After the initial extraction of factors, a promax rotation was done. An independent t-test was used to analyze differences in mean on knowledge, attitudes and practice levels between the workers of the two factories. Repeated ANOVA measures were conducted to determine whether there were statistically significant differences in mean on knowledge, attitude belief, feelings, judgment and practice levels among participants from the two factories over time. A $p<0.05$ was considered statistically significant.

Ethical considerations: Written authorization to conduct this study was obtained from the relevant personnel in the automobile industry. Ethical approval was then obtained from the Research and Ethics Committee, University of Malaya (MEC Ref. No: 848.37). The participants' information sheets were distributed to the participants, specifying the objectives, maintenance of confidentiality and that the participants were free to opt-out at any time during the study. Contact details were given in the event the participants needed to clarify any doubts pertaining to the study. The written informed consent forms were collected before participants were allowed to take part in this study.

RESULTS

The average age of participants from both the factories was 27. The majority of the participants were Malay males who accounted for >90% off the subjects. Most of these workers were single and >60% of them had once-smoked. About 3% of these subjects had once-consumed alcohol. More than one third of these employees had only secondary or primary school education and hence, most of them earned <RM3000 per month. Almost 90% of them have worked for <5 years in these factories. More than a third were exposed to hobbies which may contribute to hearing loss such as listening to loud music, scuba diving or shooting. There were 106 participants from factory 1. The remaining 97 of the subjects were from factory 2. In factory 1, employees were working in Production Control (PC) Press and Quality Control (QC) Press with welding and maintenance departments. In factory 2, the workers were in PC and QC resin, kaizen and painting departments. There were more than a fifth of subjects in each department. The differences in basic socio-demographic characteristics such as age, smoking, alcohol consumption and duration of work among participants between the two factories were not statistically significant.

Internal consistency reliabilityof questionnaire: The five domains; knowledge, belief, feelings, judgment and practice were analyzed separately. The results are shown in Table 2. The correlation value of each item from the domains with at least one other item in the construct on average was acceptable at least 0.3.

Table 2: Internal consistency reliability on various domains

Domain	Cronbach's alpha
Knowledge	0.879
Belief	0.723
Feeling	0.747
Judgment	0.737
Practice	0.849

Table 3: Pattern matrix on various domains

Items	Factor 1	Items	Factor 2
Knowledge domain			
	Risk factors and prevention of hearing loss		Causes of hearing loss and policies protecting workers
K6	0.913	K2	0.933
K5	0.722	K3	0.532
K8	0.711	K1	0.507
K9	0.661	-	-
K4	0.613	-	-
K7	0.587	-	-
Belief domain			
	Hearing protection devices ans laws on preventing hearing loss	-	-
AB1	0.753	-	-
AB2	0.753	-	-
Feelings domain			
	Outcomes of hearing loss	-	Prevention of hearing loss
AF4	0.966	AF2	0.888
AF3	0.847	AF1	0.867
Judgment domain			
	Prevention of hearing loss	-	Risk factors for hearing loss
AJ3	0.864	AJ1	0.637
AJ4	0.903	AJ2	0.752
Practice domain			
	Prevention of hearing loss	-	-
P2	0.830	-	-
P1	0.773	-	-
P5	0.727	-	-
P3	0.678	-	-
P4	0.648	-	-

Factor analysis of the questionnaires: The correlation value of the items of the knowledge construct from the pattern matrix with at least one other item in the construct on average was at least 0.5 (acceptable) as depicted in Table 3. The Kaiser-Meyer-Olkin measures for knowledge, belief, feelings, judgment and practice constructs were 0.879, 0.500, 0.525, 0.601 and 0.791, respectively. The Bartlett's test of Sphericity was statistically significant ($p<0.001$) for all the domains.

As depicted in Table 4, an independent sample t-test was run to determine if there were differences in mean scores for knowledge, belief, feelings, judgment and practice domains between participants from factory 1 and 2 at baseline. There were no statistically significant associations between the two factories and mean scores for all the domains at outset (baseline).

As shown in Table 5, repeated ANOVA measures were conducted to determine whether there were statistically significant differences in mean scores among participants from the two factories in the knowledge, attitude (belief, feelings, judgment) and practice domains

Table 4: Comparison of mean scores among participants at baseline

Domain	Factory 1 (n = 106) Mean (SD)	Factory 2 (n = 97) Mean (SD)	Mean differ. (95% CI)	t-statistic	p-value*
Knowledge	0.10 (4.01)	0.08 (3.94)	0.02 (-1.08, 1.12)	0.04 (201)	0.970
Belief	7.46 (1.59)	7.36 (1.79)	0.10 (-0.37, 0.57)	0.43 (201)	0.669
Feeling	14.84 (3.33)	14.70 (3.19)	0.14 (-0.77, 1.04)	0.30 (201)	0.763
Judgment	15.05 (3.26)	15.80 (2.86)	-0.76 (-1.60, 0.09)	-1.76 (200.65)	0.080
Practice	9.62 (2.92)	9.82 (2.61)	-0.20 (-0.97, 0.57)	-0.52 (201)	0.605

*Statistical significance is based on independent t-test

Table 5: Comparison of mean scores of various domains between participants from factory 1 and 2

Domain	Time period	Factory 1 (n = 106) Mean (SD)	Factory 2 (n = 97) Mean (SD)	Mean (95% CI) dBA	p-value*
Knowledge	Baseline	0.10 (±4.01)	0.08 (±3.94)	0.05 (-0.98 to 1.09)	0.920
	1st month	0.84 (±3.90)	0.75 (±3.98)		
	6th month	0.68 (±3.82)	0.63 (±3.89)		
Belief	Baseline	7.46 (±1.59)	7.36 (±1.79)	0.32 (-0.14 to 0.77)	0.172
	1st month	7.86 (±1.61)	7.36 (±1.91)		
	6th month	7.83 (±1.62)	7.48 (±1.84)		
Feeling	Baseline	14.84 (±3.33)	14.70 (±3.19)	0.13 (-0.73 to 0.99)	0.761
	1st month	15.22 (±3.38)	15.00 (±3.35)		
	6th month	15.09 (±3.39)	15.05 (±3.37)		
Judgment	Baseline	15.05 (±3.26)	15.35 (±2.86)	0.60 (-0.20 to 1.41)	0.140
	1st month	15.56 (±3.08)	7.36 (±3.02)		
	6th month	15.35 (±3.14)	16.02 (±3.02)		
Practice	Baseline	9.62 (±2.92)	9.82 (±2.61)	0.09 (-0.61 to 0.79)	0.798
	1st month	10.25 (±2.82)	10.31 (±2.75)		
	6th month	10.08 (±2.68)	10.09 (±2.66)		

*Statistical significance is based on repeated measures ANOVA

over a period of 6 months. Health education intervention on participants from the two factories elicited statistically significant changes in the mean scores of knowledge, belief and practice domains over time. The mean scores of the knowledge construct increased from pre-intervention to the 1st month (0.70 (95% CI, 0.31-1.10), p<0.001) and from pre-intervention to 6th month (0.56 (95% CI, 0.17-0.96), p = 0.002) but there was nostatistically significant different in the mean scores of this construct from the 1st-6th month (0.14 (95% CI, -0.07-0.35), p = 0.320). The mean scores of the belief subdomain increased from pre-intervention to the 1st month [0.20 (95% CI, 0.02-0.38), p = 0.027] and from pre-intervention to the 6th month (0.25 (95% CI, 0.08-0.41), p = 0.002] but there was no change in the mean scores of the belief subdomain from the 1st-6th month [0.05 (95% CI, -0.08-0.17), p = 1.000]. The mean scores of the practice construct increased from pre- intervention to the 1st month [0.55 (95% CI, 0.19-0.92), p = 0.001] and from pre-intervention to the 6th month [0.37 (95% CI, 0.03-0.71), p = 0.031] but there was no change in the mean scores of the practice domain from the 1st-6th month [0.19 (95% CI, -0.02-0.39), p = 0.082]. Health education intervention did not lead to any statistically significant changes in mean scores of the feeling and judgment constructs over a period of 6 months. The analysis revealed that there were no differences in mean scores on knowledge, belief, feelings, judgment and practice domains among participants from the two factories.

DISCUSSION

A questionnaire was distributed to measure different, underlying constructs. One construct, 'knowledge', consisted of nine questions with a high level of internal consistency (DeVellis, 2003; Mcmillan and Schumacher, 2001) as determined by a Cronbach's alpha of 0.879 whereas the belief construct consisted of two questions and had an accepted level of internal consistency as determined by a Cronbach's alpha of 0.723. The feelings construct consisted of four questions with an accepted level of internal consistency (DeVellis, 2003; Mcmillan and Schumacher, 2001) as determined by a Cronbach's alpha of 0.747 together with the judgment construct consisting of four questions as determined by a Cronbach's alpha of 0.737. One construct, 'practice', consisted of five questions and had a high level of internal consistency (DeVellis, 2003; Mcmillan and Schumacher, 2001) as determined by a Cronbach's alpha of 0.849. The Correlation value of the other items in the constructs were within an acceptable range as there was convergent and discriminant validity and also these items had showed values within an acceptable range in Corrected Item-total Correlation (>0.3) (Razman *et al*., 2010).

A principal axis factoring was run on the questionnaire that measured knowledge, belief, feelings, judgment and practice on noise-induced hearing loss among 116 employees. The suitability of the principal axis method was assessed prior to analysis. Inspection of the correlation matrix showed all variables on average had correlation coefficients >0.3 which is considered as positive correlation (Mukaka, 2012; Kubinger *et al*., 2007). The overall Kaiser-Meyer-Olkin measure for knowledge, belief, feelings, judgment and practice were 0.879 classified as meritorious (Kaiser, 1974), 0.500, 0.525, 0.601 classified as acceptable and 0.791 classified as middling (Kaiser, 1974). The Bartlett's test of Sphericity were statistically significant ($p<0.001$) for all the constructs indicating the data was likely factorable.

There were no differences observed in mean scores among participants on various constructs between the two factories at baseline. Over a period of 6 months, there were no differences of mean scores among the participants. However, there were dissimilarities on mean scores among these participants from baseline results for knowledge, belief and practice constructs. The health education intervention elicited statistically significant changes in mean score on knowledge level over time, $F (1.44, 289.45) = 13.54$, $p<0.001$, partial $\eta^2 = 0.063$ with mean score increased from 0.10±4.01 pre-intervention to 0.84±3.90 at the 1st month and to 0.68±3.82 at the 6th month (post-intervention) in factory 1 and the mean score increased from 0.08±3.94 pre-intervention to 0.75±3.98 at the 1st month and to 0.63±3.89 at the 6th month (post- intervention) in factory 2. The health education intervention also elicited statistically significant changes in mean score on belief level over time, $F (1.71, 344.17) = 7.78$, $p = 0.001$, partial $\eta^2 = 0.037$ with mean score increased from 7.46±1.59 pre-intervention to 7.86±1.61 at the 1st month and to 7.83±1.62 at the 6th month (post- intervention) in factory 1 while there was no change in mean score 7.36±1.79 pre-intervention with 7.36±1.91 at the 1st month but increased to 7.48±1.84 at the 6th month (post-intervention) in factory 2. The health education intervention elicited statistically significant changes in mean score on practice construct over time, $F (1.49, 300.16) = 9.46$, $p<0.001$, partial $\eta^2 = 0.045$ with mean score increased from 9.62±2.92 pre-intervention to 10.25±2.82 at the 1st month and to 10.08±2.68 at the 6th month (post-intervention) in factory 1 and the mean score also increased from 9.82±2.61 pre-intervention to 10.31± 2.75 at the 1st month and to 10.09±2.66 at the 6th month (post-intervention) in factory 2. According to Portney and Watkins (2009), the effect sizes were "moderate" for the knowledge domain and "small" for belief and practice constructs (Portney and Watkins, 2009). The mean scores of knowledge, belief and practice constructs have increased over a period of 6 months from pre-intervention. This shows that the levels of knowledge, belief and practice have increased similarly among participants from the two factories over 6 months.

Health education should be imparted more regularly to employees and not once in 2 years as per the current regulation (LoM, 2010). It should be conveyed at regular 6 month intervals as the score levels declined over 6 months compared to the 1st month.

There was a possibility of a cross-over effect where employees from the two factories may be placed in the other factory during the study. This was avoided by informing the employer that the duration of this study was for 6 months and that the participants should be placed in the same department and factory during this study period. The measurement of personal noise exposure level was done for only one subject in each work area. The measurement was done as such since all workers in a job area were exposed to similar levels of noise intensity. This is also in accordance to regulations for noise in Malaysia (LoM, 2010) where not all workers in a job area are required to undergo personal noise exposure measurement.

There were no differences on possible confounding factors among participants of the two factories such as smoking (Carmelo *et al*., 2010), consumption of alcohol (Upile *et al*., 2007) and exposure to hand-arm vibration (Pengwichaianad and Bouphan, 2014). There were also no significant differences noted among participants from the two factories on risk for hearing loss from hobbies such as listening to loud music (Pettersson, 2013), shooting (Levey *et al*., 2012) and scuba diving (Pawlaczyk-Luszczynska *et al*., 2004). Age and employment duration among employees in both factories were also not significantly different.

Noise level was measured using a sound level meter and personal noise dosimeter. The former would measure noise at the point of time whereas the latter measures average exposure of an employee to noise over the job area (Pettersson, 2013). Universal sampling was adopted within these two factories. The findings were limited to the automobile industry but anticipated to be representative of knowledge, attitude and practice regarding noise-induced hearing loss among workers exposed to noise levels above the action level. More studies in future are required to be conducted on different types of industries and to ensure higher response rates among participants to confirm the findings.

CONCLUSION

The knowledge, belief and practice towards noise-induced hearing loss had improved overtime, after affording health education in the form of pamphlets but there were no differences in the outcomes between participants from the two factories. All efforts to increase knowledge and improve attitude and practice towards mitigating noise-induced hearing loss should be implemented through continuous education and training.

RECOMMENDATIONS

This education and training should be given at regular intervals. Moreover, network of primary health services should be developed to provide integrated services and necessary awareness to workers for their health Improvement (Pengwichainad and Bouphan, 2014).

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APPENDIX

Appendix A: Pamphlet on noise-induced hearing loss.

Pamphlet on noise-induced hearing loss among employees

General aspects and causes of hearing loss:

- Noise may result in hearing loss
- Hearing loss due to noise is permanent
- Hearing loss may occur if one is exposed to loud noise many times and even for short duration of exposure if noise intensity is high
- Besides ageing, hearing loss may occur if workers are exposed to activities such as loud music, scuba diving and shooting

Risk factors of hearing loss:

- Hypertension, diabetes, smoking and consumption of alcohol increase risk of hearing loss when one is working in a noisy environment

Consequences of hearing loss:

- The workers will have difficulty in understanding and discriminating words during conversation
- The workers will be under stress and not involving themselves in activities at the workplace such as meetings and discussions, training or courses, since having difficulty hearing makes those difficult
- The relationship among family members will be affected; the spouse may give less attention since having difficulty in hearing
- The workers may have difficulty to hear warning signals

Symptoms and signs of hearing loss:

- Hearing loss among workers
- Ear discharge is not a sign of noise-induced hearing loss

Treatment of hearing loss:

- There is no medicine available to treat noise-induced hearing loss
- Surgical interventions may help

Prevention:

- Hearing loss can be prevented by wearing ear plugs or ear muffs but using cotton is not effective
- It is the responsibility of employers to make available ear plugs or ear muffs to employees at no cost
- The ear plugs should be replaced once they are damaged
- The workers should wear appropriate ear plugs or ear muffs
- The 2 ear plugs should be worn continuously even during communication in a noisy environment
- The ear plugs should not be worn if one is having ear discharge
- Health education and training should be attended to learn to recognize the consequences of hearing loss and also usage and care of ear plugs or ear muffs
- There are laws to protect employees from exposure to loud noise

Practice:

- The employers should inform employees if tests results indicate hearing loss
- The employers should inform employees of the results of hearing assessments and noise area monitoring
- It is the responsibility of both employers and employees to reduce noise exposure
- Information regarding noise should be obtained from Safety and Health committee

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