

Noise, Hearing Loss, Use of Hearing Protector Devices and Its Attitudes and Beliefs Among Young Adults

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Introduction

Noise can be defined as sound at an intensity that can hinder with verbal communication and may cause uneasiness of the ears or reduction of hearing sensitivity, defined as hearing damage. Any exposure to noise of significant intensity and duration increases the risk of ear damage and causes permanent hearing affection, known as noise-induced-hearing-loss (NIHL). It is widely believed that exposure to noise for a long duration of a period can lead to hearing loss, which is commonly termed as noise-induced-hearing-loss. NIHL is the second most common type of acquired hearing loss following Presbycusis and there is some evidence that NIHL may be on the rise in adolescents and young adults (Portnuff, Fligor & Arehart, 2011).

Even though many people get exposed to noise daily, there are people who are at a high risk and those whose occupations and lifestyles revolve around noise or loud music. If the exposure is long-term it can lead to a permanent hearing loss. As reported by some authors it is estimated that 11 million individuals suffer from some degree of NIHL (Bogoch, House, & Kudla, 2005; Crandell, Mills, & Gauthier, 2004). A recent report by Henderson, Testa & Hartnick in 2011, compared the data during the period 1984-1988 to 2005-2006 and reported an increase in the exposure to loud noise and music through headphones, and a decrease in the use of hearing protection in the youths of United States. The prevalence of noise-induced hearing loss in female youths had also increased to statistically significant levels compared to 20 years previously. Similarly, the data from the United Kingdom indicate that 20% of youth regularly expose themselves to excessive loud levels of music.

Sources of Noise and Kinds of People Getting Affected More Frequently

The sources of noise exposure can range from Industrial noise to the Personal listening devices. Among this industrial noise is estimated to be the cause of 16% of the disabling hearing loss in adults worldwide. According to the Indian Factory Act, 1948 workers are allowed to work on a limit of 90dBA for eight hours per day, but in the real-world, the Indian working hours are 48 hours per week which will lead to a high risk of noise exposure (Singh, Bhardwaj, & Deepak, 2010).

Adolescents and young adults are getting exposed to noise are mainly through the Personal Listening Devices, attending concerts and night-clubs. The output of Personal Music Players can reach up to 110dBA, with the averaged sound level exceeding 85dBA, for an

average duration of exposure between two and three hours per day. Meyer-Bisch (1996) reported that the sound level at a rock concert is always around 100–115dBA. Considering the same hearing damage risk criteria of 85dBA exposure duration for eight hours, the author suggested that exposure duration of 100dBA should be less than 1.25 hours per week if calculated at the equivalent sound energy.

Temporary Noise-Induced Tinnitus

Another common phenomenon which is reported in adolescents is temporary noise-induced tinnitus with a reported prevalence of 45% and 77%. As the mobile technology usage has been increased in recent times, hearing loss has emerged as a public health concern, especially for adolescents and young adults. In 2006, according to Shargorodsk (2010), nearly one in five adolescents and young adults ages twelve to nineteen suffered from hearing loss. Most of these youth suffer from bilateral high-frequency hearing loss, which is often caused due to noise exposure. Continued excessive noise exposure can induce metabolic and mechanical changes in the organ of Corti leading to noise-induced-hearing-loss.

Review of Literature

There are several scholars who found that high-frequency deterioration of hearing, which was attributed to recreational noise exposure. However, some studies only emphasized the role of Personal Music Players or concerts in the development of NIHL, without considering other leisure activities.

Fligor and Cox in 2004 studied the output levels of portable compact disc players and their risk for causing hearing loss. The authors found that some personal listening devices were capable of producing outputs in excess of 130 dB SPL and concluded that use of personal listening devices with supra-aural headphones should be limited to no more than 60 percent of full volume for 60 minutes per day. This recommendation is the “60-60 Rule.”

A recent study done by Hodgetts, Rieger & Szarko (2007) found out that normal-hearing adults prefer Personal listening devices for listening to music. The authors also found that ear-buds, which are the most popular style of headphones, are most susceptible to ambient noise that can cause users to increase their listening levels, resulting in more sound pressure level being directed to the tympanic membrane.

Another important concern in youth is awareness about hearing protector devices (HPDs). Though they are aware of the positive sides of using HPDs they rather chose not to use them (Bogoch, House & Kudla, 2005). Bogoch et al (2005) reported that over 40 % of the attendees reported that they are ready to use if free HPDs are provided. Whereas in another study conducted by Goggin et al., (2008) found that only 7% of the participants would use HPDs if they were complimentary. This result shows that either the youth have a minimal concern about their hearing health or they completely lack the knowledge about the harmful effects of getting exposed to loud noise.

The study by Gilles (2014) found the more negative attitude towards hearing protection and hearing loss have built up in the youth. When Chung, Des, Meunier & Eavey (2005) evaluated the effect of noise exposure and found that hearing impairment is found to be a causative factor that affects the general health among young people. When certain studies speak about negative approach towards the noise, hearing loss and hearing protector devices among youth, on the other hand, there are also studies which state that the youth are aware of the hearing protection.

The study by Crandell, Mills & Gauthier (2004) concluded their study by showing that the youth have a high degree of knowledge about the use of HPDs for the protection of ear damage. Similar findings were quoted by Widen et al., (2009) when they compared the attitudes of the USA and Swedish citizens. Similarly, Zocoli, Morata, Marques & Corteletti (2009) stated that 1.6% of his tested population reported the use of HPDs.

Though almost all the youth of this generation are very much interested in the recreational noise or the leisure activities, majority of them are not concerned about the hazardous effect due to it. This may be due to the lack of awareness or poor concern about the hearing system. This is being said through some studies. (Shargorodsky et.al, 2010; Smith, Davis et.al, 2000). There are youngsters who lack the knowledge about the use of HPDs and the protection of the inner ear from the permanent damage.

Need for the Study

There are several studies which talk about the positive as well as the negative attitudes and beliefs towards the use of hearing protectors against the hearing loss due to sound or noise exposure. Thus, this study was done to find out the attitude and belief among the young generation regarding the use of HPDs, their attitude and belief towards the hearing loss that can be caused due to the noise exposure. Though there are enough studies which state regarding the attitude and beliefs of youth regarding these factors, they all have been conducted in the western population and in the Indian context such studies are negligible. Therefore, this study has been conducted to find out the attitudes and beliefs towards noise, hearing loss and hearing protector devices among youth in India.

The Aim of the Study

The aim of the study is to investigate the attitude and beliefs towards the noise, hearing loss and hearing protector devices among young adults.

Method

Subjects

A total of 100 college students in the age range of 18-22 years from two different colleges of Kasaragod were selected for the study. The number of boys and girls were randomly selected. All the participants were Malayalam speaking individuals.

Materials

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Anu A., MASLP, and Dr. Binoy Shany, MS., Ph.D.

Noise, Hearing Loss, Use of Hearing Protector Devices and Its Attitudes and Beliefs Among Young Adults

A set of 30 questions were selected for the preparation of the Questionnaire. The questionnaire was prepared in English; the questions were selected from the Youth Attitude Towards Noise Scale (YANS) (Olsen & Erlandsson, 2004) which was used in many survey-based studies, and from various other questionnaires which were available on internet. The new questionnaire thus prepared was then translated into Malayalam by a person proficient in English and Malayalam. The questionnaire was then verified and validated by 5 experienced audiologists and final questionnaire was prepared. The questionnaire contained 3 subsections namely 1) noise 2) hearing loss and 3) hearing protector devices.

Procedure

For obtaining the basic information the students were asked to fill their name, age, and gender. The participants were told that the remarks for each question should be completely based on their personal opinion.

The questionnaire was distributed among the students of the class 1st year B.Sc. degree to 3rd- year B.Sc. degree within the age range of 18 to 21 and they were asked to read the questions and rate their remarks from 1 to 5 on the rating scale. Where point 5 indicates, the subject strongly agrees with the statement and point 1 indicates the subject strongly disagree with the statement. Subjects were told that there would be no punishment and their opinion will not be published among others.

Data Analysis

Mean and standard deviation (SD) for each section as well as for each question was found out separately in order to find out whether the subjects have a positive attitude towards the protection of hearing by using hearing protectors due to noise exposure.

Results

The aim of the study was to investigate the attitude and beliefs towards noise, hearing loss and hearing protector devices among young adults. In the present study of attitude towards noise, hearing loss and hearing protector devices among young adults which were conducted on college students, the obtained scores were subjected to descriptive statistics. The performance of the subjects with respect to their attitude towards the three subsections of the questionnaire; noise, hearing loss and hearing protector devices are explained in following sections:

1) Performance of young adults on Noise.

QUESTION	N	MEAN	SD
Question 1	100	3.2626	1.17444
Question 2	100	3.2222	1.35944
Question 3	100	3.2626	1.30608
Question 4	100	2.8485	1.55422

Question 5	100	2.6263	1.26641
Question 6	100	3.2424	1.27848
Question 7	100	3.6263	1.25019
Question 8	100	3.6566	1.19661
Question 9	100	3.8384	1.39757
Question 10	100	3.3636	1.24092

Table-1: Indicates the mean values for the questions in subsection Noise of the questionnaire

The results from the subsection noise are included in the table-1. The table-1 includes the mean value of the questions which were included in the subsection. The mean value shows that; the subjects have a good awareness towards the negative impact of noise that can effect on their hearing.

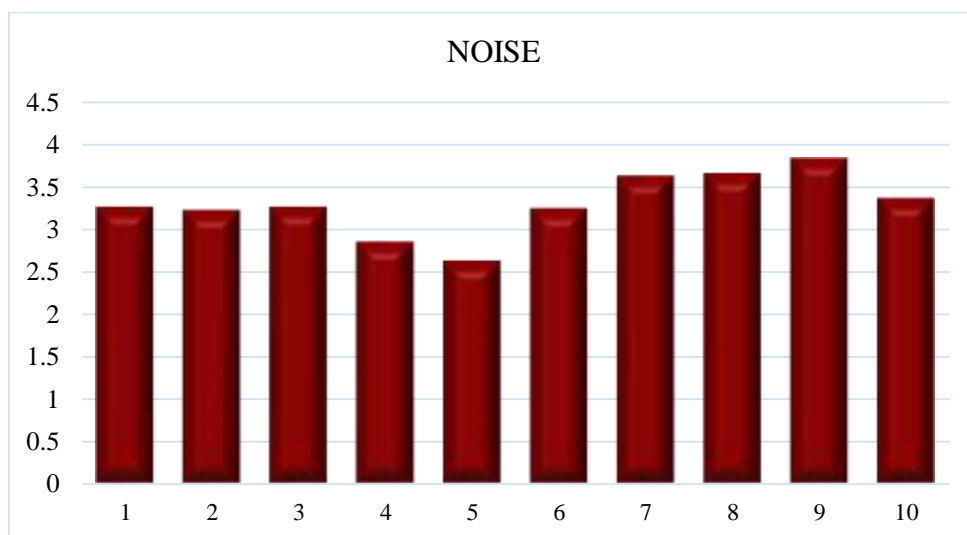


Figure-1: Indicates the mean values for the questions in the subsection Noise of the questionnaire.

Figure-1: Shows the results for the questions included in subsection Noise. The x-axis denotes the questions of the subsection and the y-axis denotes the mean score of each question included in the subsection. The mean value of each of the 10 questions of this subsection holds good and strong evidence that, the subjects are aware of the negative impact of noise that can alter their life quality. This result indicates that the youth have a positive attitude towards the noise.

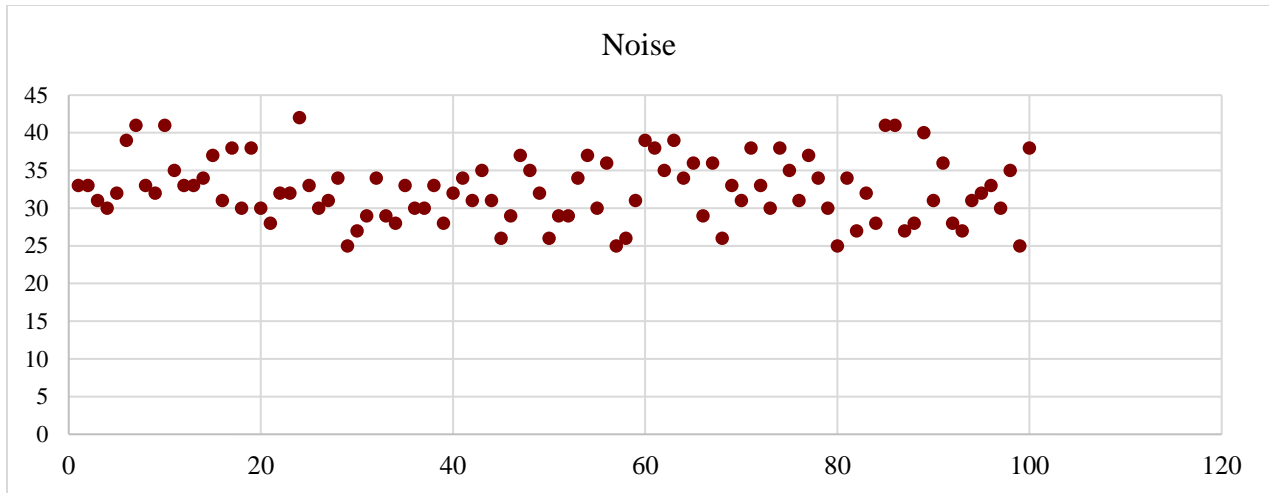


Figure-2: Indicates the responses of young adults towards Noise.

Figure-2: Shows the response pattern of the participants. X-axis denotes the number of participants in the study (N=100) and Y-axis denotes the total score of each participant for the respective subsection.

2) Performance of young adults on Hearing Loss.

QUESTION	N	MEAN	SD
Question 1	100	4.1414	1.15184
Question 2	100	4.0303	1.07337
Question 3	100	3.9394	1.14123
Question 4	100	3.9293	1.05223
Question 5	100	3.4242	1.12568
Question 6	100	3.3131	1.18362
Question 7	100	3.6566	1.27904
Question 8	100	3.7172	1.17838
Question 9	100	3.7576	1.22133
Question 10	100	4.0101	1.27371

Table-2: Indicates the mean values for the questions in subsection Hearing Loss of the questionnaire.

The table-2 indicates the mean score of the 100 subjects who participated in the study. The mean score for each of the ten questions included in the subsection was found out. The result shows a good mean value with an average score of about 70% on all questions. This indicates that the subjects have a better and positive attitude towards the protection of hearing from damage.

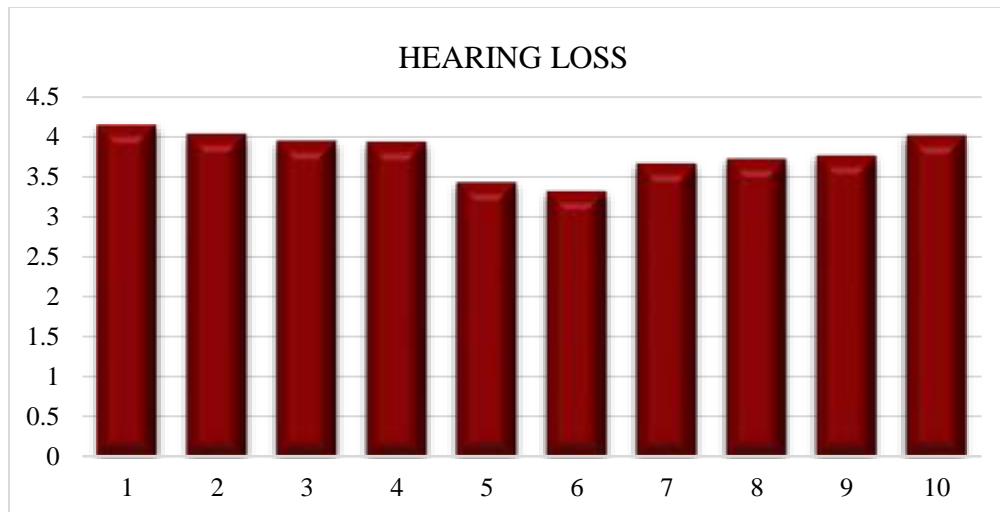


Figure-3: Indicates the mean values for the questions in subsection Hearing Loss of the questionnaire.

Figure-3: shows the result of the questions included in subsection hearing loss. X-axis denotes the questions regarding the attitude of youth towards hearing loss and the y-axis include the scores of each question. The total number of questions was 10 in the particular subsection. The scores of each question were 1, 2,3,4,5. The figure indicates that the youth have a positive attitude and belief towards the hearing loss. They are aware regarding the factors that affect the hearing.

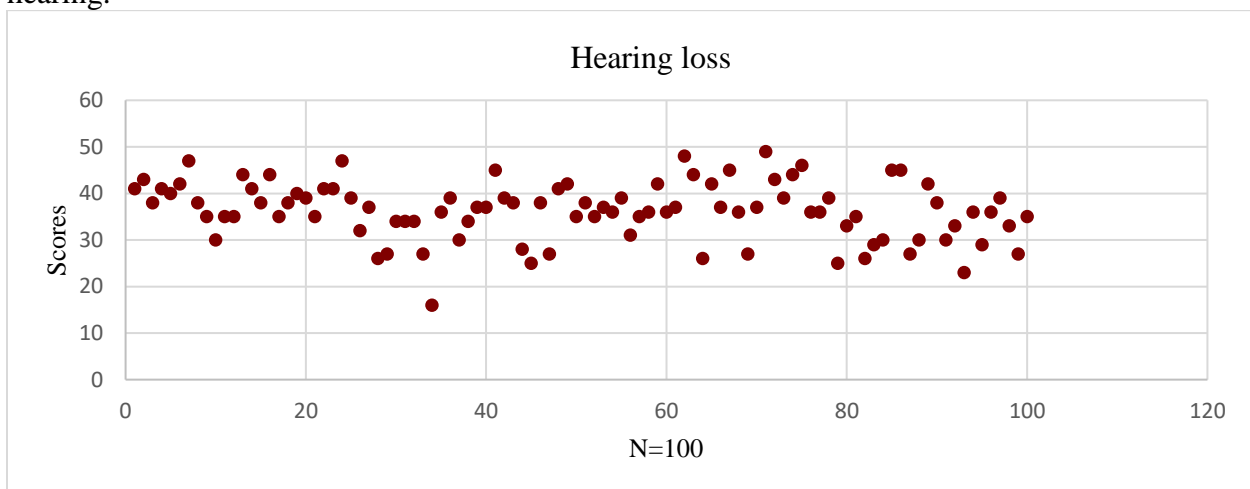


Figure-4: Indicates the responses of young adults towards Hearing Loss

Figure-4: Shows the response pattern of the participants for hearing loss subsection. The x-axis denotes the number of participants in the study (N=100) and Y-axis denotes the total score of each participant for the respective subsection.

3) Performance of young adults on Hearing Protector Devices.

QUESTION	N	MEAN	SD
Question 1	100	2.8990	1.12934
Question 2	100	3.3131	1.24250
Question 3	100	3.5657	1.21354
Question 4	100	3.3434	1.03176
Question 5	100	3.3434	1.12632
Question 6	100	3.0404	1.20305
Question 7	100	3.3636	1.21600
Question 8	100	3.5556	1.10861
Question 9	100	3.3333	1.04978
Question 10	100	3.1414	1.21227

Table-3: Indicates the mean values for the questions in subsection Hearing Protector Devices of the questionnaire.

From the table-3, it can be understood that the youth are aware of the use of HPDs or the conservation of hearing. The mean value for each question which was included in the subsection is included in the table. The mean value of almost all the questions in the present subsection is high, which is a clear indication of the positive attitude and belief of the youth towards the hearing protection or HPDs

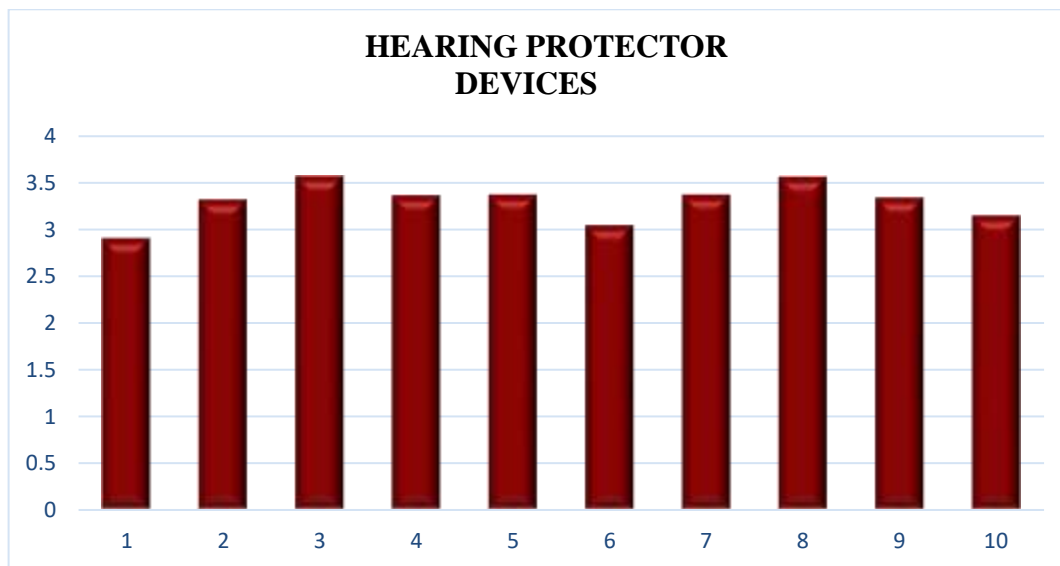


Figure-5: Indicates the mean values for the questions in subsection Hearing Protector Devices of the questionnaire.

Figure-5: Shows the results of the questions included in subsection hearing protector devices. The x-axis denotes the questions regarding the attitude of youth towards hearing protector devices and the y-axis include the scores of each question. The results show that the

attitude and belief of youth towards the HPDs are positive. The total number of questions was 10 in the particular subsection. The scores of each question were 1,2,3,4, 5.

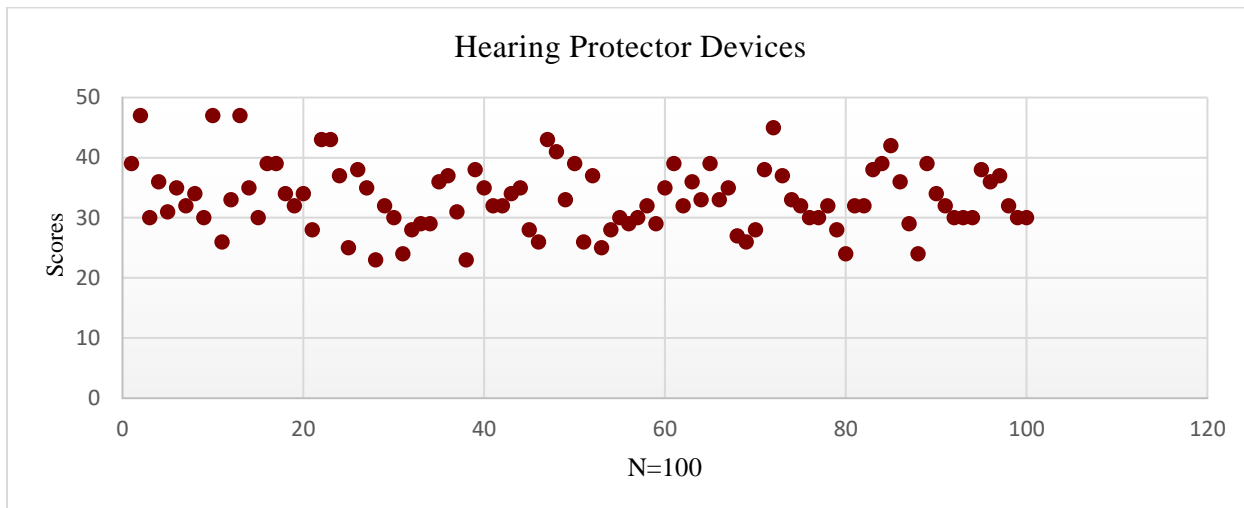


Figure-6: Indicates the responses of young adults towards Hearing Protector Devices.

Figure-6: Shows the response pattern of the participants for hearing protector devices subsection. The x-axis denotes the number of participants in the study (N=100) and the y-axis denotes the total score of each participant for the respective subsection.

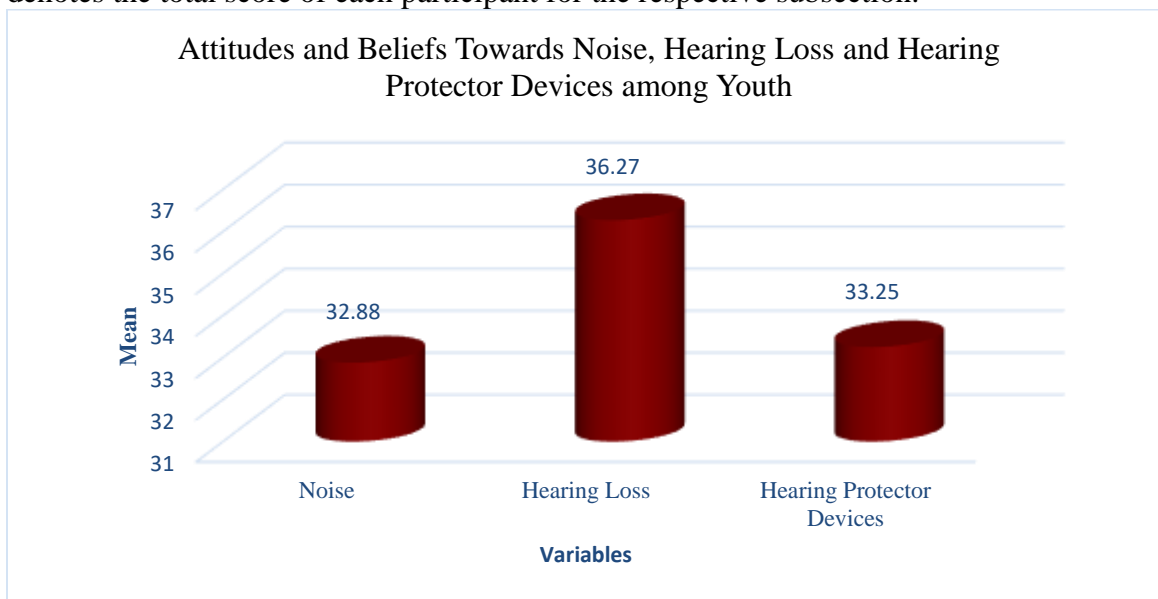


Figure-7: Indicates mean value of all questions in each subsection of the questionnaire.

Figure-7: shows the overall performance of the participants for the 3 subsections noise, hearing loss and hearing protector devices. The x-axis includes the variables and the y-axis includes the mean score of the subsections. The overall score of each subsection is 50. The

overall mean values of each subsection have an average score of 60%. And among the three subsections, the score for the subsection hearing loss is the highest. This can be because, the youth are more concern about their hearing health and they consider that, the ears should be protected as the hearing loss can interfere with their day to day life.

Thus, from the above figure, it is clear that the youth are more aware of the hearing loss and the factors affecting it, and they tend to protect it from the hazardous noise exposure.

Discussion

Noise, as per the literature says, is the unwanted source of sound in nature. Though it is a type of sound, it is not so pleasing to the human ear. There are people who are getting exposed to loud sounds or noise that can lead to the condition known as NIHL. In the 21st century, the hearing loss due to the noise exposure is common. There are people who show awareness towards the hearing protection and at the same time, there are people who just ignore the harmful side of being getting exposed to the noise that can damage the hearing system. Youth is one among them. Through the use of personal listening devices and attending the concerts they indirectly damage their hearing. But still, there are individuals who have awareness towards the protection of the hearing and about the use of hearing protector devices. HPDs to an extent can help the individuals in the protection of their hearing from the harmful side effects of noise.

There are many western studies that speak about the attitude and beliefs of youth towards the protection of the hearing. In literature, the findings related to the attitude towards the noise and hearing loss say that the youth are least bothered about the hazard caused due to the noise exposure (Serra, Busoni, Richter, Minoldo et.al, 2005; Vogel, Brug, Van der Ploeg & Raat, 2010). However, there are certain studies which say that the youth have a positive attitude towards the noise, hearing loss and hearing protective devises. In the recent times, many of the new generations tend to protect their ears from damage as they are well aware of it. Though there are still populations who are completely unaware of the negative impact of noise.

Thus, the present study was taken-up to find out the attitude and beliefs towards the noise, hearing loss and hearing protector devices among young adults. The result of the present study shows that; the youth are aware regarding the protection of their hearing from the noise by the use of HPDs. The higher percentage was obtained for the various subsection of the questionnaire regarding the attitude and beliefs towards hearing loss. This may be due to the increased awareness towards the protection of hearing (Vogel, Brug, Van der Ploeg & Raat, 2011). Chen, Huang & Wei (2008) reported that Children's knowledge and their noise protective behavior were correlated positively.

Several researchers (Barlow, 2010; Chesky, Pair, Yoshimura & Landford 2009) have found that the undergraduate music students had a more positive attitude towards the hearing protection and they were assiduous in protecting their hearing. Researchers also say that youth are aware of the use of HPDs for the conservation of hearing (Crandell, Mills & Gauthier, 2004; Zocoli, Morata, Marques & Corteletti, 2009). Similar findings were obtained for the present study also. Though the youth is exposed to noise through personal listening devices and other Leisure

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Anu A., MASLP, and Dr. Binoy Shany, MS., Ph.D.

Noise, Hearing Loss, Use of Hearing Protector Devices and Its Attitudes and Beliefs Among Young Adults

activities they try to protect their hearing and are more concerned about it. They are also aware of the measures to adapt in order to protect their hearing.

Conclusion

Noise can be defined as sound at an intensity that can hinder with verbal communication and may cause uneasiness of the ears or reduction of hearing sensitivity. Noise is unwanted sound and is judged to be unpleasant, loud or disruptive to hear. Though noise has a great hazardous face, it has become an inevitable factor in our daily life. Most of the people get exposed to noise in one or the other way on a daily basis. But many of them are not at a risk than those whose occupations and lifestyles revolve around noise or loud music. Exposure to long-term noise exposure can damage the inner ear and can be the reason for the permanent hearing loss named as noise-induced-hearing-loss (NIHL). An estimate of eleven million individuals suffers from some degree of NIHL (Bogoch, House, & Kudla, 2005; Crandell, Mills, & Gauthier, 2004).

Even though most of the people are affected by noise, youth are more likely to be the victims of the noise exposure. Therefore, this study was conducted to find out the attitude and beliefs of youth towards the noise, hearing loss, and hearing protector devices.

A total number of 100 students from 2 different colleges of Kasaragod were randomly selected for the study. The previously prepared questionnaire was provided with the participants and was instructed to rate the questions based on their personal opinion. The questionnaire consisted a total number 30 questions which were further subdivided into three subsections namely, noise, hearing loss, and hearing protector devices. Each subsection includes 10 questions. The questions were provided with a 5-point rating scale. The SD and mean scores were calculated. The overall scores revealed that the youth are aware of the dangerous effects of noise and they have a positive attitude towards the protection of the hearing (Vogel, Brug, Van der Ploeg & Raat, 2011).

From the above results obtained in the current study, it was concluded that youth are more aware of the side effects that can occur due to the exposure to the loud noise. As the noise pollution is growing day by day, increased awareness towards the noise and the harmful damage it can cause to hearing as well as to the entire life-style of this generation, the positives attitudes and beliefs towards these can help them to protect themselves.

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Noise, Hearing Loss, Use of Hearing Protector Devices and Its Attitudes and Beliefs Among Young Adults

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Anu A., MASLP

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