Awareness about the Noise-Induced Hearing Loss (NIHL) and its relation to headphones use at al Jouf region, Northern Saudi Arabia

Abstract

Background: Noise is an "unwanted sound" with various adverse health effects. Noise-induced hearing loss (NIHL) results from irreparable damage to the inner ear's cochlear hair cells. In addition, a potential consequence of using prevalent personal listening devices (PLDs) puts the users at greater risk of hearing loss when misusing these devices.**Objectives:** This study evaluates the awareness of NIHL and headphones use among general population in Saudi Arabia. **Materials and Methods:** We conducted a cross-sectional study with a representative random sample of the general population of Jouf, Northern Saudi Arabia. A self-administered questionnaire was distributed through the social media. We collected data regarding participants' awareness of NIHL caused by headphone use.**Results:** As regard knowledge about NIHL among the studied population, there were 46.1% admitted to not knowing whether NIHL is a type of conductive hearing loss, 42.5% recognized that a substantial amount of hearing loss is required to impact speech and social development. The data also highlighted a positive trend, with 54.1% acknowledging that noise-induced hearing problems were preventable. Interestingly, a notable portion, 28.1%, were uncertain about the minimum duration of exposure to loud noise that could harm hearing. Similarly, a significant percentage, 24.0%, were unsure about the minimum volume levels that could negatively affect hearing. Additionally, 21.5% unsure whether frequent exposure to hazardous noise leads to hearing loss due to a damaged eardrum. As regard PLD-related practices, there was a significant portion primarily use earphones (40.4%) and listen to audio for 1-2 hours a day (42.5%). Most individuals (40.4%) reported that people surrounding them are usually affected by the noise from their PLDs. Interestingly, a high percentage (71.9%) expressed the recommendation for installing voice limiting features on their ear devices. Additionally, (80.8%) are willing to change their behavior if presented with evidence of the negative impact of loud noise on hearing.**Conclusion:** noise-induced hearing loss (NIHL) is a prevalent and preventable public health issue that affects a significant portion of the population, including individuals in Saudi Arabia. The study highlighted a lack of awareness and knowledge about NIHL and its symptoms among the general population. However, there is a positive trend towards acknowledging the preventability of noise-induced hearing problems. The study also revealed concerning practices related to personal listening devices (PLDs), with a significant portion of respondents using earphones for extended periods and being surrounded by noise from their devices. There is a growing willingness among individuals to change their behavior if presented with evidence of the negative impact of loud noise on hearing.

Keywords: noise-induced, hearing loss, headphones, general population, awareness, Northern Saudi Arabia.

Introduction:

Noise is an "unwanted sound" that harms one's health. “Various factors contribute to noise-induced hearing loss (NIHL). Exposure to loud sounds or noise can cause a merely Transient Threshold Shift (TTS) or a residual Permanent Threshold Shift (PTS) with changes in auditory nerve output growth functions. Damage to cochlear hair cells and related synaptopathy are the leading causes of NIHL. Reversible damage to hair cells contributes to TTS, while mild TTS represents defensive purinergic hearing adaption” (1). “PTS refers to the irreversible loss or destruction of hair cells and synapses. In addition to hair cell damage, permanent damage to cochlear neurons can exacerbate the consequences of NIHL. These systems have the potential for pharmacological intervention and offer various options for preventing hair cell damage or rescuing injured hair cells and spiral ganglion neurons. The buildup of reactive oxygen species and the active activation of intracellular stress pathways, which leads to programmed or necrotic cell death, are among the substrates of hair cell damage”. (2). “When wearing headphones for an extended period, the high-intensity sound will be transmitted to the inner ear, causing damage to the hair cells in the vestibule of the cochlea leading to sensorineural hearing loss” (3).

“NIHL can be unilateral or bilateral, and the severity is determined mainly by the duration and intensity of noise exposure. The intense loud sound for an extended period can result in irreversible hearing loss”. (2). “For example, prolonged listening to 60% of the volume for more than 60 minutes can lead to NIHL. Furthermore, people who listen to 85db for 8 hours per day may develop permanent hearing loss” (4).

“Hearing loss is usually unnoticed until it becomes so severe that conversing becomes impossible” (5). “NIHL is a significant social and public health issue, Even though it is almost entirely avoidable” (6), (7). “Without adequate hearing protection, widespread personal listening devices (PLDs) potential consequences put users at greater risk of hearing loss when these devices are misused” (8,9).

“It was discovered that the most common sources of information on the effects of noise exposure and NIHL were parents/relatives/peers, high school education, and the Internet. Furthermore, few of them knew about the impact of noise exposure and NIHL” (5). “The possibility of reduced awareness experienced by listeners in noisy or other environments is a significant concern regarding the use of headphones among college students” (6). “The explanation could be ineffective education in this area and the failure of most students to use hearing protection” (5). “Therefore, early and consistent educational programs on hearing health and conservation are required to raise awareness of hearing damage caused by noise exposure, particularly at the elementary school level” (5).

“WHO recommends limiting the user's time or sound volume of PLDs” (10). “Long-term headphones users should learn detecting e to detect early symptoms of hearing loss and take appropriate action to prevent further deterioration” (11). “The first step toward prevention is understanding which loud sounds can harm the hearing system” (12). “A few preliminary signs and symptoms usually accompany the presence of NIHL. Tinnitus frequently occurs immediately after exposure to excessive noise” (5).

“Listening to music for long periods and at high intensity is associated with temporary threshold shifts, tinnitus, noise sensitivity, and distortion, which may increase the risk of permanent hearing loss” (13). In Saudi Arabia, there is a paucity of literature about using noise-induced hearing problems caused by headphones use.

Study objectives:

Thus, our study aimed to assess the prevalence and awareness of PLDs use and NIHL among the general population inJouf, Northern Saudi Arabia.

Specific objectives:

To determine the prevalence of Noise-Induced Hearing Loss (NIHL) and headphones use among the general population inJouf, Northern Saudi Arabia.
To identify the factors associated with NIHL among the study population.
To identify the factors associated with headphones use among the study population.
To assess the Knowledge about NIHLamong the study population.

Methodology:

Study design:
This study was conducted using a cross-sectional study design, which is a type of observational study that involves the collection of data at a single point in time.

Study area:
This study was carried out inJouf City, Northern Saudi Arabia.

Study population:
The study included individuals aged 18 years and above who are residing in Jouf City, Northern Saudi Arabia. The focus is on the general population, which encompasses individuals from different socioeconomic backgrounds, educational levels, occupations, and regions within the country.

- ***Inclusion Criteria:*** All the population, males and females aged (18-65 years) who agree to participate in the study, any nationality, and can read and write.
- ***Exclusion Criteria:*** participants with chronic hearing problems, mentally retarded, can’t read and write and those who disagreed to participate. The exclusion criteria also included individuals with a history of dementia or cognitive impairment.
- ***Sample size:*** The sample size for this study was calculated using the following formula:n = (Z^2 * p * q) / d^2

Where n = required sample size, Z = confidence level (standard value of 1.96 for 95% confidence), p = estimated proportion of population with adequate knowledge about pancreatitis (based on previous studies), q = 1-p, and d = margin of error (5% or 0.05). Assuming an estimated proportion of **50%** and a margin of error of **5%,** the required sample size was approximately **384** participants. By adding 10% to compensate the missing and incomplete questionnaire, the sample size will be approximately **402** participants.

Study period:
The study was conducted during the period from 5th October to 15th December 2023.

Sampling technique:
A convenience sample was selected through the distribution of an online questionnaire was used. The questionnaire was distributed on social media such as WhatsApp groups and Twitter accounts.

Instrument:
"The data was collected using an author-designed questionnaire developed from previous research. The questionnaire consisted of multiple-choice questions assessing sociodemographic data (age, sex, education level, job, place of residence, use of headphones), awareness of risk factors of NIHL, symptoms of NIHL, and protection against NIHL. The questionnaire also contained questions about the headphones used by the participants. This questionnaire was distributed among participants, preceded by a brief explanation of the aim of the study. After the validation, we sent the questionnaire to the participants through various Social Media platforms (WhatsApp, Twitter, etc.)". [31]

Pilot study:
A pilot study was performed on ten individuals to ascertain the tool's feasibility, applicability, and clarity, and we have done any modifications. However, we excluded individuals in the pilot study from the final analysis.

Statistical analysis:
All data was coded, entered, and analyzed using the statistical program of Statistical Package for Social Science (SPSS) version 28. Qualitative data was expressed in terms of percentages. The Chi-square ($\chi 2$) test of independence was used to examine and compare the qualitative data between the two groups. Differences were considered statistically significant if a P-value is less than or equal to 0.05.

Results:

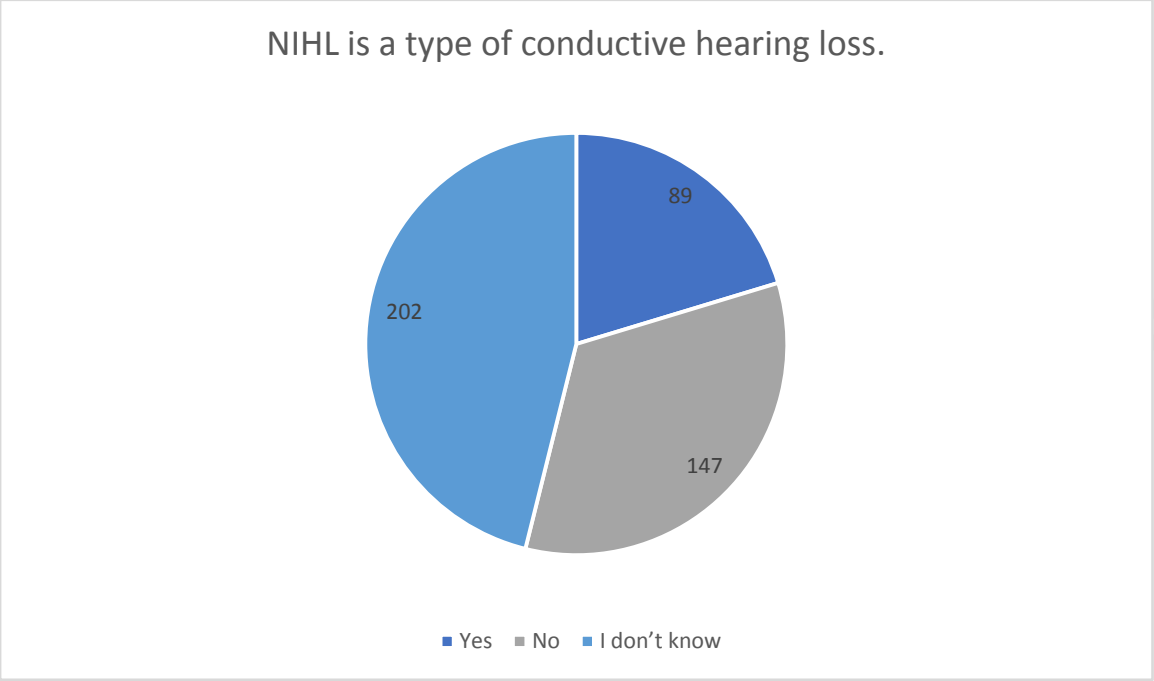
Table (1) displays various demographic parameters of a group of people. Firstly, the distribution of participants across different age groups reveals that the majority fall within the 21-30 age bracket, accounting for 43.4% of the total sample size. This is followed by the 31-40 age group at 19.2% and the 41-50 age group at 17.1%. Interestingly, individuals aged 18-20 constitute only

11.6% of the participants, while those aged 50 and above represent 8.7% of the sample. In terms of gender distribution, males significantly outnumber females, with 63.7% and 36.3%, respectively. Moreover, when it comes to education level, the data indicates a high percentage of participants with a university degree or higher, comprising 67.1% of the total sample. This is followed by individuals with a Secondary education level at 19.6%, Preparatory education at 9.4%, and those with a Primary education level at 3.9%. These findings suggest a relatively young and predominantly male participant group with a notable proportion holding a university degree or higher.

Table (1): Sociodemographic characteristics of participants (n=438)

Parameter		***No.***	***Percent (%)***
Age	18 - 20	51	11.6
	21 - 30	190	43.4
	31 - 40	84	19.2
	41 - 50	75	17.1
	50 +	38	8.7
Gender	Female	159	36.3
	Male	279	63.7
Education level	Primary	17	3.9
	Preparatory	41	9.4
	Secondary	86	19.6
	University or more	294	67.1

Figure (1): Illustrates if participants think that NIHL is a type of conductive hearing loss.



As illustrated in table (2), The findings reveal various key parameters related to NIHL awareness within the sample group. It is noteworthy that a considerable portion of the participants, 46.1%, admitted to not knowing whether NIHL is a type of conductive hearing loss, indicating a potential lack of understanding in this area. Moreover, a significant proportion, 42.5%, recognized that a substantial amount of hearing loss is required to impact speech, language comprehension, communication, and social development. The data also highlights a positive trend, with 54.1% acknowledging that noise-induced hearing problems are preventable, underscoring the importance of education and preventive measures. Interestingly, a notable portion, 28.1%, were uncertain about the minimum duration of exposure to loud noise that could harm hearing, suggesting a need for further education on this topic. Similarly, a significant percentage, 24.0%, were unsure about the minimum volume levels that could negatively affect hearing, indicating a potential gap in knowledge regarding sound intensity and its impact on hearing health. Furthermore, the data underscores the need for increased awareness, as evidenced by the varying levels of uncertainty among participants regarding the time required to adapt to environmental sounds after exposure to loudness. Additionally, the findings emphasize the critical role of education in dispelling misconceptions, with a notable proportion, 21.5%, unsure whether frequent exposure to hazardous noise leads to hearing loss due to a damaged eardrum. Overall, the data sheds light on the existing knowledge gaps and misconceptions surrounding NIHL and its implications, highlighting the importance of comprehensive education and awareness campaigns to promote hearing health and prevent irreversible damage caused by excessive noise exposure.

Table (2): Parameters related to knowledge about NIHL and its symptoms among the studied population (n=438).

Parameter		***No.***	***Percent (%)***
NIHL is a type of conductive hearing loss.	Yes	89	20.3
	No	147	33.6
	I don't know	202	46.1
A significant amount of hearing loss must occur to negatively affect speech, language comprehension, overall communication, and social development.	Yes	186	42.5
	No	168	38.4
	I don't know	84	19.2
Noise- induced hearing problems is preventable	Yes	237	54.1
	No	141	32.2
	I don't know	60	13.7
The minimum duration of listening to a loud noise source that could negatively affect one's hearing is	30 minutes	91	20.8
	1 hours	87	19.9
	1 hour and a half	73	16.7
	2 hours and more	64	14.6
	don't know	123	28.1
The minimum volume level that could negatively affect hearing is	20-40 dB	59	13.5
	41-60 dB	113	25.8
	61-80 dB	99	22.6
	81-90 dB	38	8.7
	91-100 dB	24	5.5
	don't know	105	24.0
The time you need to adapt with surrounding environmental sound when exposed to loudness (in hours)	1 hour	148	33.8
	5 hours	120	27.4

	10 hours	46	10.5
	15 hours	9	2.1
	don’t know	115	26.3
Frequent exposure to hazardous noise causes hearing loss due to a damaged eardrum.	Yes	192	43.8
	No	152	34.7
	I don’t know	94	21.5
One of the most common causes of hearing loss is excessive noise exposure	Yes	195	44.5
	No	155	35.4
	I don’t know	88	20.1
High volume levels affect hearing	Yes	263	60.0
	No	125	28.5
	I don’t know	50	11.4
Repeated and prolonged exposure to loud noises can cause irreversible hearing loss.	Yes	148	33.8
	No	191	43.6
	I don’t know	99	22.6

Figure (2): Illustrates duration of listening session per day among participants.

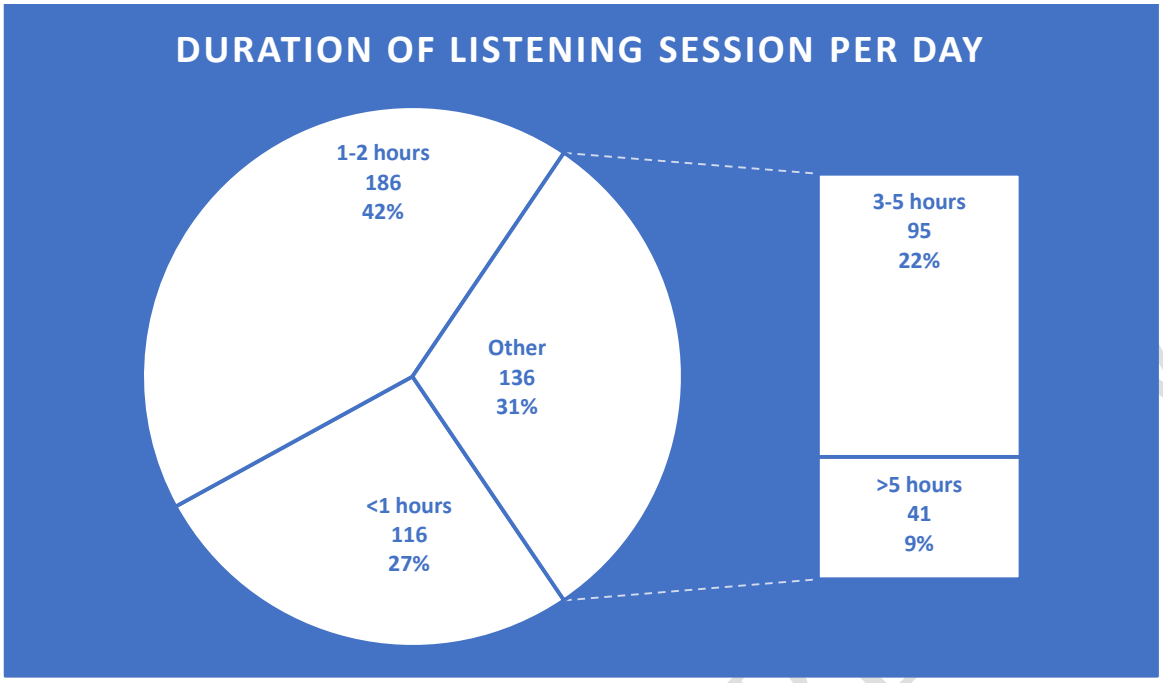


Table (3) outlines various aspects such as the types of PLDs used, duration of listening sessions per day, impact of PLD noise on surrounding individuals, level of device volume, typical volume levels used, common purposes of device use, type of earphones preferred, awareness of the dangers of loud noise exposure on hearing ability, willingness to change behavior based on evidence of noise impact, and opinions on installing voice limiting features and warning indicators on audio devices. It is evident from the data that a significant portion of the respondents primarily use earphones (40.4%) and listen to audio for 1-2 hours a day (42.5%). Most individuals (40.4%) reported that people surrounding them are usually affected by the noise from their PLDs. Interestingly, a high percentage (71.9%) expressed the recommendation for installing voice limiting features on their ear devices, indicating a growing awareness of the importance of protecting hearing ability. Additionally, a large majority (80.8%) are willing to change their behavior if presented with evidence of the negative impact of loud noise on hearing. The data also highlights the preferences for different volume levels, with the majority (58.0%) opting for intermediate levels. Furthermore, the most common purpose of device use was found to be entertainment (44.1%), followed by education (13.5%). The split between those who currently have enough information concerning the dangers of loud noise exposure on hearing ability (51.1% yes, 48.9% no) suggests a need for further education and awareness campaigns on this issue. Overall, the data underscores the importance of promoting responsible PLD usage and raising awareness about the potential risks associated with exposure to loud noise.

Table (3): Parameters related to* PLD-related practices *(n=438).

Parameter	***No.***	***Percent (%)***

Type of PLDs used	Headphones	100	22.8
	Earphones	177	40.4
	Car PADs	43	9.8
	Multiple devices	118	26.9
Duration of listening session per day	<1 hours	116	26.5
	1-2 hours	186	42.5
	3-5 hours	95	21.7
	>5 hours	41	9.4
How often are the people surrounding you affected by the noise from your PLDs?	Always	62	14.2
	Usually	177	40.4
	Never	102	23.3
	Sometimes	97	22.1
Level of device volume	High	112	25.6
	Intermediate	254	58.0
	Low	72	16.4
Typical level of volume used (%) in percent	0-49	90	20.5
	50-59	137	31.3
	60-69	98	22.4
	70-79	52	11.9
	80-89	35	8.0
	90-100	26	5.9
Most common purpose of device use	Education	59	13.5
	Entertainment	193	44.1
	Relieving loneliness (socialization)	42	9.6
	Research or studying	63	14.4
	Others	81	18.5
Type of earphone	In ear	200	45.7
	Out ear	238	54.3

Currently have enough information concerning the danger posed by exposure to loud noise(s) on hearing ability	No	214	48.9
	Yes	224	51.1
Recommend that the factory should install a voice to limiting feature on my ear device	No	123	28.1
	Yes	315	71.9
You are ready to change your behavior if you hear/see evidence that suggests that loud noise/sound levels affect hearing	No	84	19.2
	Yes	354	80.8
Recommend putting warning indicators on audio devices to limit volume levels	No	59	13.5
	Yes	379	86.5

Table (4) shows that the thought that NIHL is a type of conductive hearing loss among participants has statistically significant relation to age (p value=0.008) and education level (p value=0.0001). It also shows a statistically insignificant relation to gender.

Table (4): Relation between if the participants think that NIHL is a type of conductive hearing loss and sociodemographic characteristics.

Parameters		***NIHL is a type of conductive hearing loss***			***Total (N=438)***	***P value****
		Yes	**no**	**Don't know**		
Gender	Female	85	59	15	159	0.074
		35.9%	41.8%	25.0%	36.3%	
	Male	152	82	45	279	
		64.1%	58.2%	75.0%	63.7%	
Age	18 - 20	20	23	8	51	**0.008**
		8.4%	16.3%	13.3%	11.6%	
	21 - 30	118	48	24	190	
		49.8%	34.0%	40.0%	43.4%	
	31 - 40	36	37	11	84	
		15.2%	26.2%	18.3%	19.2%	

	41 - 50	46	21	8	75	
		19.4%	14.9%	13.3%	17.1%	
	50 +	17	12	9	38	
		7.2%	8.5%	15.0%	8.7%	
Education level	Primary	5	9	3	17	**0.0001**
		2.1%	6.4%	5.0%	3.9%	
	Preparatory	9	29	3	41	
		3.8%	20.6%	5.0%	9.4%	
	Secondary	36	35	15	86	
		15.2%	24.8%	25.0%	19.6%	
	University or more	187	68	39	294	
		78.9%	48.2%	65.0%	67.1%	

P value was considered significant if ≤ 0.05.

Table (5) shows that the thought that one of the most common causes of hearing loss is excessive noise exposure among participants has statistically significant relation to age (p value=0.011) and education level (p value=0.0001). It also shows a statistically insignificant relation to gender.

Table (5): Relation between if participants that one of the most common causes of hearing loss is excessive noise exposure and sociodemographic characteristics.

Parameters		***Excessive noise is a major cause of hearing loss***			***Total (N=438)***	***P value****
		Yes	**no**	**Don't know**		
Gender	Female	68	64	27	159	0.218
		34.9%	41.3%	30.7%	36.3%	
	Male	127	91	61	279	
		65.1%	58.7%	69.3%	63.7%	
Age	18 - 20	14	24	13	51	**0.011**
		7.2%	15.5%	14.8%	11.6%	
	21 - 30	89	56	45	190	

		45.6%	36.1%	51.1%	43.4%	
	31 - 40	31	35	18	84	
		15.9%	22.6%	20.5%	19.2%	
	41 - 50	42	27	6	75	
		21.5%	17.4%	6.8%	17.1%	
	50 +	19	13	6	38	
		9.7%	8.4%	6.8%	8.7%	
Education level	Primary	3	11	3	17	**0.0001**
		1.5%	7.1%	3.4%	3.9%	
	Preparatory	4	30	7	41	
		2.1%	19.4%	8.0%	9.4%	
	Secondary	39	31	16	86	
		20.0%	20.0%	18.2%	19.6%	
	University or more	149	83	62	294	
		76.4%	53.5%	70.5%	67.1%	

P value was considered significant if ≤ 0.05.

Discussion:

"Noise-induced hearing loss (NIHL) is one of the most common avoidable reasons for hearing impairment worldwide. Worldwide, more than one billion people are affected by hearing loss" (14). "Noise-induced hearing loss (NIHL) is reported to be the most prevalent occupational disease in the United States" (15). "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" (16). "Noise-induced hearing loss is a significant public health issue in Saudi Arabia, with a notable prevalence among the population". [32] According to recent studies, it has been reported that approximately 16% of the Saudi population suffers from some form of hearing loss, with a significant portion of these cases attributed to exposure to high levels of noise. In particular, individuals working in industries such as construction,

manufacturing, and transportation are at a higher risk of developing noise-induced hearing loss due to prolonged exposure to loud machinery and equipment.

"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. 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" (17). The source of loud noise differs and can be either occupational or recreational (18); although noise related to work can be more serious, recreational noises are more frequent in the current period. "NIHL has become an international issue in the last two decades due to the growing use of smartphones. Additionally, there has been a rise in the use of personal listening devices (PLDs), which involve headphones and earphones". (19) "Misuse of these devices can lead to difficulty in understanding speech, tinnitus, unsteadiness, and reduced hearing capability". (20)

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. (21) 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. Another cross-sectional study, that involved 83 workers, showed a negative attitude of workers towards NIHL preventive measures. (22) Thus, we aimed in this study to assess the awareness of NIHL and headphones use among general population in Saudi Arabia.

As regard knowledge about NIHL and its symptoms among the studied population, we have found that 46.1% out of 438 participants, admitted to not knowing whether NIHL is a type of conductive hearing loss, 42.5% recognized that a substantial amount of hearing loss is required to impact speech, language comprehension, communication, and social development. The data also highlights a positive trend, with 54.1% acknowledging that noise-induced hearing problems are preventable, underscoring the importance of education and preventive measures.

Interestingly, a notable portion, 28.1%, were uncertain about the minimum duration of exposure to loud noise that could harm hearing. Similarly, a significant percentage, 24.0%, were unsure about the minimum volume levels that could negatively affect hearing. Additionally, the findings emphasize the critical role of education in dispelling misconceptions, with a notable proportion, 21.5%, unsure whether frequent exposure to hazardous noise leads to hearing loss due to a damaged eardrum. On the other hand, another study conducted by Faisal Alzahrani et.al (2023) (23) revealed that 87.2% understood that high sound degrees could harmfully impact their hearing. This is in agreement with the survey carried out in Saudi Arabia (24). Moreover, Alsaab et al. studied a total of 409 active military personnel in the Eastern Region of Saudi Arabia. The authors found a high prevalence rate of hearing loss among 71.6% of the study participants. The study also showed that their awareness towards NIHL was low (45.7%) (25). On the other hand, a study conducted by Nelson et al. (2018) (26) found that only 50% of participants were aware of the risks of noise-induced hearing loss, with 70% reporting exposure to loud noise at work. This study highlights the lack of knowledge and awareness about the potential consequences of noise exposure on hearing health which is consistent with our results. Moreover, in a survey conducted by Smith et al. (2020) (27), it was found that among young adults aged 18-30 years, only 30% were aware of the risks of noise-induced hearing loss. Despite high levels of noise exposure from recreational activities such as concerts and clubs, there was a lack of knowledge about the potential long-term consequences on hearing health. However, a study by Johnson et al. (2019) (28) examined knowledge and awareness about noise-induced hearing loss among workers in a manufacturing plant. The results showed that only 40% of participants had received information about hearing protection and the risks of noise exposure in the workplace.

As regard PLD-related practices, we have found a significant portion of the respondents primarily use earphones (40.4%) and listen to audio for 1-2 hours a day (42.5%). Most individuals (40.4%) reported that people surrounding them are usually affected by the noise from their PLDs. Interestingly, a high percentage (71.9%) expressed the recommendation for installing voice limiting features on their ear devices, indicating a growing awareness of the importance of protecting hearing ability. Additionally, a large majority (80.8%) are willing to change their behavior if presented with evidence of the negative impact of loud noise on hearing. On the other hand, a cross-sectional study done in Saudi Arabia published a survey in 2017 which aimed to evaluate the participant's beliefs and knowledge regarding NIHL (29). “With 739 responses, 25%

reported having mild-to-severe hearing loss. Uniquely, most of them were males and using volume level of more than 80%. Nonetheless, approximately 75% of participants preferred reducing the volume level over reducing the number of sessions per day for listening. Another recent study done in 2020 aimed to analyze the risk of using PLDs and hearing loss in college and school-going students, by using an audiometry mobile application followed by a questionnaire. The study contained a total of 3000 students with 72% of them being unaware of NIHL. Also, 3.2% of participants were identified to suffer from HL with 50% of those reported the use of PLDs for more than 6 h per day. Most of the participants identified with HL were headphone users (81%). Furthermore, the vast majority of students (90%) used more than 60% volume setting. About 65% of students used their listening devices for more than 6 years where 81% of students experienced episodes of tinnitus and 72% had episodes of vertigo" (30).

Conclusion:

In conclusion, noise-induced hearing loss (NIHL) is a prevalent and preventable public health issue that affects a significant portion of the population, including individuals in Saudi Arabia. The study highlighted a lack of awareness and knowledge about NIHL and its symptoms among the general population, with many participants uncertain about the minimum exposure levels that could harm hearing. However, there is a positive trend towards acknowledging the preventability of noise-induced hearing problems. Education and preventive measures are crucial in raising awareness and dispelling misconceptions about NIHL. The study also revealed concerning practices related to personal listening devices (PLDs), with a significant portion of respondents using earphones for extended periods and being surrounded by noise from their devices. Encouragingly, there is a growing willingness among individuals to change their behavior if presented with evidence of the negative impact of loud noise on hearing. Efforts towards early and consistent educational programs on hearing health and conservation are essential to address the increasing burden of NIHL and promote hearing protection practices in the population.

Ethical Approval and Consent:

This study obtained ethical approval from the Institutional Review Board (IRB) of Jouf University. Informed consent was obtained from all study participants before they participate in

the study and the questionnaire was collected from respondents and were treated with confidentiality with keeping optimal privacy.

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