

Noise And Type of Works in Beauty Salons and Its Effects on The Health of It Is Workers

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ABSTRACT

This research aims to evidence the effect of noise and long-time standing on the hearing and the skeleton system of the workers and find a method to reduce the noise in the beauty salon, and know if the geometrical design of the beauty salon affects the noise level. The measured parameters in this research include hearing tests, Sound level, the intensity of the sound of the hair drier, and the type of pain in the skeletal system also estimated. Different devices were used in this research, such as a tuning fork for two tests, first was the Weber test, Where the fork was placed in the middle of the upper teeth. It compares at any tip the vibration up is in the left or right or even the second was The Rinne test compares the perception of sounds spread by air conduction with that of bone conduction concluded the mastoid. Also, the sound meter that is used to measure the intensity of the hair drier and the noise level measures the length, width, and height of each salon.

The results showed that there is serious sensorineural hearing loss among the workers, up to 70%, and there is 40% of conductive hearing loss, 60% of them has shoulder pain, 65% have problems in the neck, and 50% have back pain in addition to some sleep disorders.

1. introduction

Hearing loss due to noise exposure in the workplace is a significant health problem with economic consequences. Noise-induced hearing loss is an occupational disease (Lie et.al 2016). Environmental noise has been linked to hypertension in some studies conducted in the community, and there is also some evidence that suggests it may be a small risk factor for coronary heart disease (Stansfield, and Matheson, 2003, Shortt, 2013). The physical environmental factors, such as temperature, illumination, and sound in hair salons, may cumulatively increase the health risks (Senthong. P, 2021). The effects of noise pollution on human health are becoming increasingly important due to the expansion of noise sources. An excellent example of a place where noise has a negative impact is a beauty salon. Measurements of noise levels and their effects on human health were motivated by the paucity of research in this area (EEA report, 2020).

1.1. Noise and Its Harmful on the Human Body

Noise, which is defined as "unwanted sound," is considered to be a stressor on the environment. The term "non-auditory impacts of noise" is a valuable way to describe "all those effects on health and well-being caused by exposure to noise, excluding effects on the hearing organ and effects due to the masking of auditory information (i.e., communication problems)" (Raja et, al 2019). Hearing is critical for one's health and safety. Hearing impairment is typically defined as an increased hearing threshold as clinically measured by audiometry. Hearing loss can be caused by the workplace, the community, or a variety of other factors (e.g., trauma, ototoxic drugs, infection, and heredity) (Keidser et.al,2011). There is widespread

agreement that exposure to sound levels less than 70 dB does not cause hearing damage, regardless of duration (Lie et.al 2016, Goines Lisa, and Louis Hagler.,2007). Continuous noise exposure of (85-90 dB) over a lifetime, particularly in industrial settings, can cause progressive hearing loss with increased hearing sensitivity. Sound characteristics such as intensity, frequency, sound complexity, duration, and noise meaning can all influence how we respond to noise (Le et, al. 2017). The WHO recommends that unprotected exposure to sound levels greater than 100 dB (for example, the sound of a jackhammer or a snowmobile) be limited in duration (4 hours) and frequency (four times per year). The pain threshold is typically 140 dB, a level easily attained in today's boom cars. Levels above 165 dB, even for a few milliseconds, are likely to cause acute cochlear damage (Goines, Lisa, and Louis Hagler, 2007).

Audio or noise pollution is closely related to advance areas, particularly industrial areas. It is typically measured using volume standards, and the decibel is the internationally recognized unit for sound measurement and noise intensity. Noise and the environment's geometry are related to hearing loss and are caused by noise. The ear receives sound waves via a well-balanced and precise system. These sound waves travel to the eardrum and then to the middle ear via the movement of the magnitudes located in them based on the volume of the sound.

The inner auditory cortex sends a signal to the auditory nerve, which sends electrical pulses to the brain, which interprets these pulses to determine the quality, source, and strength of the sound. When exposed to noise for an extended period, these cells are affected and damaged, resulting in hearing loss and other complications. Noise has the potential to trigger endocrine and autonomic nervous system responses that have an impact on the cardiovascular system, making it a risk factor for heart disease. Long-term daily noise levels greater than 65 decibels (dB) or acute noise levels greater than 80 to 85 decibels (dB) begin to produce these effects (Cook, and Hawkins, 2006).

1.2. Type of work and back pain

Over 80% of people will suffer from low back pain at some point in their lives. There are several types of non-specific low back pain because the cause is not consistent across the population. One subtype of low back pain is caused by prolonged standing (GILLIAM et.al, 2021).

More than half of people who have never had a low back injury will experience transient low back pain when performing a prolonged standing occupational simulation without the option to sit. Many service and manufacturing tasks necessitate prolonged standing, and with the introduction of sit-stand desks into the office workplace, even more employees will be standing. Many workplaces health and safety organizations recommend using standing aids to prevent the harmful effects of prolonged standing; however, only a small number of these standing aids have been validated (Gallagher, 2014). The impacts of lumbopelvic posture and movement patterns on the development of standing-induced low back pain. In this work, the effect of noise on the hearing system and the type of work in a beauty salon related to back and shoulder pain are practically studied.

2. Materials and Methods

This study's data consisted of 20 workers ranging in age from (18 to 50) years. This information was gathered at random from 16 beauty salons (Ankawa, Zanko, and Terawa) in Erbil city. This study included two types of the test; - Weber and Rinne test for the hearing system, the intensity of noise in the beauty salon, and the sizes of the beauty salon also measured.

2.1 Measurement device

The sound level meter reacts to sounds similar to the human ear and provides objective, reproducible measurements of sound level at a beauty salon. The intensity of Sound pressure levels is measured by using a sound level meter, as shown in figure (1). The sound level meter was fixed in the center of the salons at

shoulder level. The size of beauty salons was measured as shown in figure (2), and the type of insulation in the salon wall was known in Table (1).

Table (1): A-chart of workers includes physiology parameter of workers, and B-information about the different beauty salon

A	
Name	
age/yr	
sleeping/hr	
duration of work/yr	
back pain	
cervical pain	
shoulder pain	

B	
location	
shield of wall	
size/m²	
height/m	
type of roof	
electrical generator	
number of chairs	
background intensity/dB	

in Erbil city.



Figure (1): Sound meter type (auto-ranging NM102).



Figure (2): Beauty salon that taken data in Erbil city.

2.1 Hearing Problems

Hearing system exposed to three types of hearing problems (loss) such as:

2.1.1. Conductive hearing loss

Conductive hearing loss occurs when an issue with the outer or middle ear interferes with sound transmission to the inner ear. It can be caused by earwax buildup, ear infections, or a punctured eardrum. This problem can be diagnosed by Rinne test shown in figure (3).

2.1.2. Sensorineural Hearing Loss

Sensorineural Hearing Loss occurs when the hearing organ, Cochlea, and/or auditory nerve are damaged or malfunctioning, rendering them unable to transmit electrical information to the brain accurately. Temporary sensorineural hearing loss is uncommon. It can be passed down through families or acquired as a result of natural ageing, diseases, accidents, or noise contact.

2.1.3. Mixed hearing loss

Bone conduction loss and air conduction loss due the age or the type of work and the inflammation of the ear.

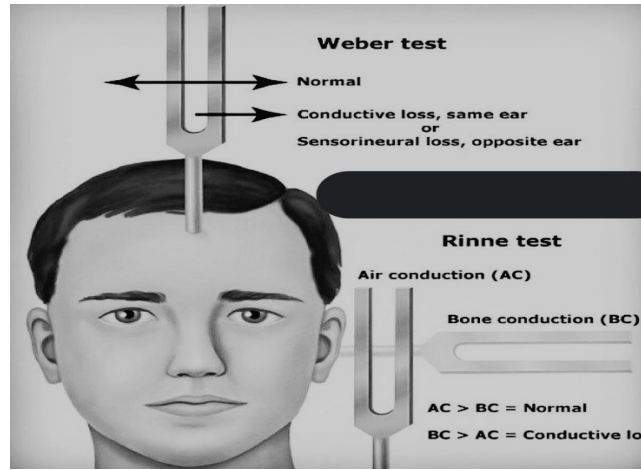


Figure (3): Rinne test (testing conductive hearing loss), Weber test (Sensorineural Hearing Loss).

3.Results and Discussion

3.1. Effect of Noise on the Hearing System.

A-The hearing test type (Rinne test) for workers in beauty salons showed that 40% of them have an air conduction problem due to using a long-time hair drier in a beauty salon for both ears is shown in fig (4).this type of hearing problem Conductive hearing loss occurs secondary to lesions in the external auditory canal, tympanic membrane (TM), or middle ear. These lesions prevent sound from being effectively conducted to the inner ear. The loss develops over time because of chronic exposure to noise > 85 decibels (dB—see Sound Levels). Even before the hearing loss can be documented, noise exposure can damage auditory neurons and their synapses on hair cells; this damage is referred to as "hidden hearing loss" (Pham,2017).

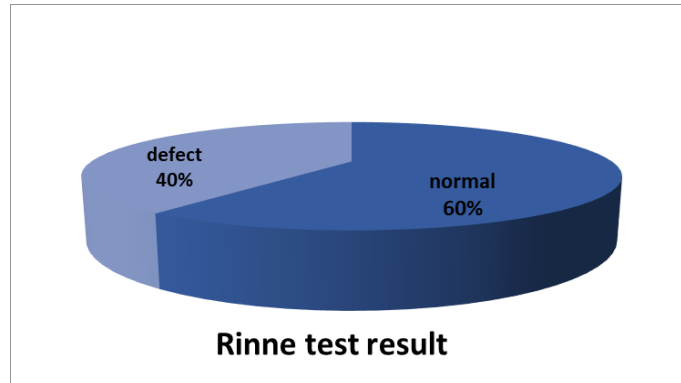


Figure (4): Rinne test result for beauty salon workers.

The second test of the hearing system is (the Weber test) for workers. The results showed that 70% of them have a sensorineural problem shown in figure (5). The workers who hold the hair drier with their right hand have a problem in their right ears (RE), and others who hold it with their left hand have problems in their left ears (LE) due to the high noise produced by the hair drier and the long time used this device. People vary somewhat in susceptibility to noise-induced hearing loss, and nearly everyone loses some hearing if they are exposed to sufficiently intense noise for an adequate time. Repeated exposure to loud noise ultimately results in the loss of hair cells in the organ of Corti (Liberman, and Kujawa, 2017.)

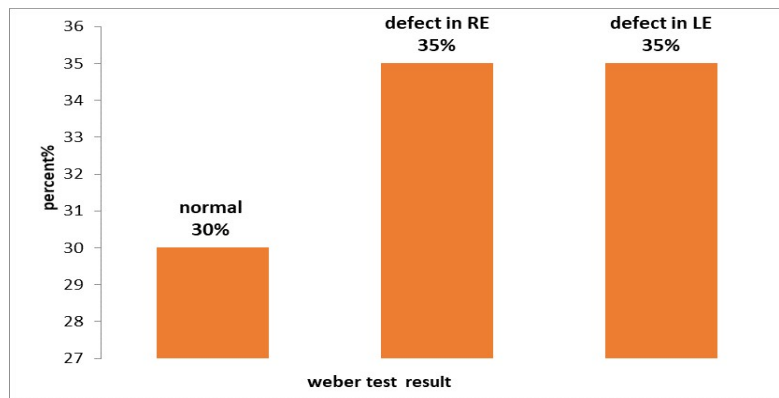


Figure (5): Weber test for both ear (RE) and (LE).

3.2. Types of Works and their Effect on the Beauty Salon Worker’s Health:

The prolonged standing during the work and the position of their hands, their heads, and the way they hold the hair drier were the main reasons for those serious defects on their bodies, especially the skeletal system, which may become more dangerous with time. Where the result of the study showed that 60% of the workers have shoulder pain, 65% have cervical pain, and 50% have back pain, as shown in figure (6). Standing effectively reduces the blood supply to the loaded muscles. Insufficient blood flow accelerates the onset of fatigue and causes pain in the muscles of the legs, back and neck (these are the muscles used to maintain an upright position). The worker suffers not only muscular strain but also other discomforts.

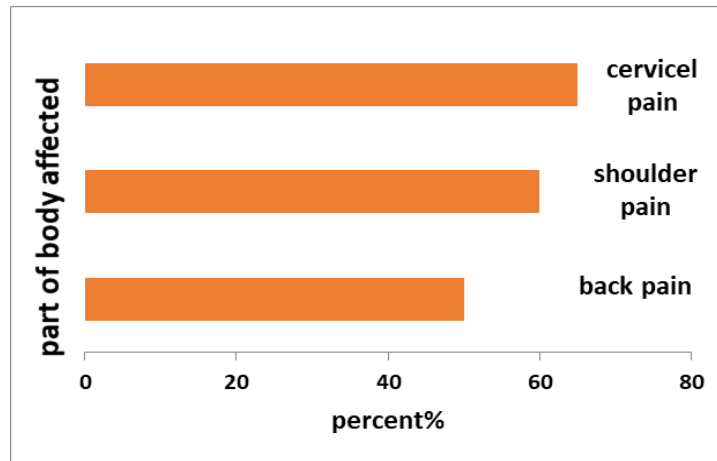


Figure (6): Effect of long-standing on workers in salon.

3.3.Noise and it is effect on the Sleeping of workers:

Due to long exposure to noise and tiredness during the hours of work which may reach ten hours daily, most of the workers have sleep disturbances where they may sleep (5 to 6) hours per day, 65% of them had problems, as shown in figure (7).

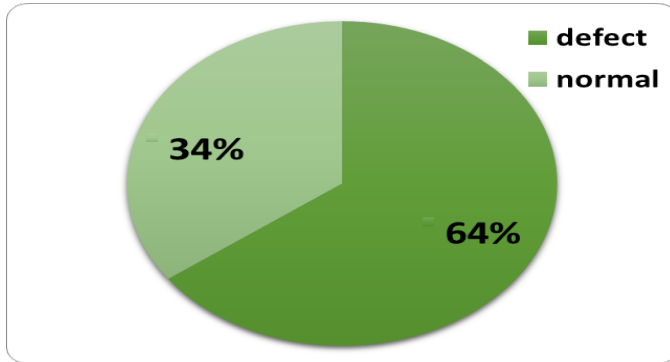


Figure (7): sleep disorder for workers in the beauty salon.

noise has been shown to fragment sleep and, as a consequence, lead to a redistribution of time spent in the different sleep stages, typically increasing wake and stage 1 sleep and decreasing slow wave sleep and REM sleep, i.e. causing a shallower sleep (Basner et,al.2014)

3.4 Geometrical Design of Beauty Salon and the Sound Level.

After the data had been taken and analyzed, we noticed that the bigger the salon, the lower the intensity of noise shown in figure (8). We also figured out that the salons located on the street have the lowest value of noise level. In addition to that, glass shielding can reduce the noise level the best.

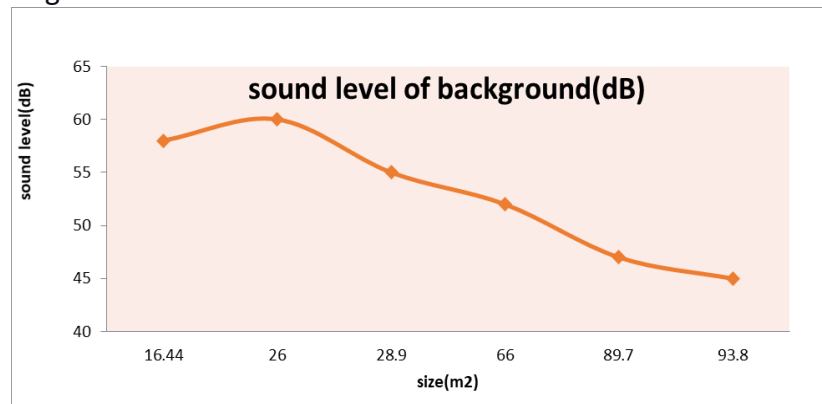


Figure (8): sound level of background with the size of beauty salons.

3.5 Sound level of different types of Hair Drier and geometrical design of beauty salon.

As we move away from the noise source, its intensity decreases because the sound energy from the source is dispersed over a greater area then the energy intensity declines with the square of the distance from the source (Inverse Square Law).

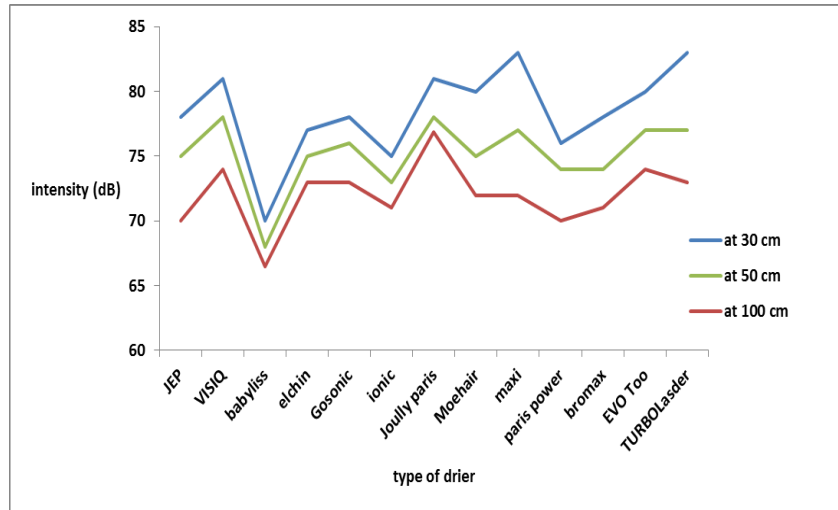


Figure (12): intensity of different types of hair drier as a function of distance.

The sound level of the hair drier drops through 6 decibels for every doubling of a distance shown in figure (9). The best type of hair drier is (Babyliss) because it has the least value of intensity, and the worst type is maxi and (Turbolasder) because they have the highest value of intensity, as shown in the figure below:



Figure (10):A;- babyliss drier

B; turbolasder hair drier

Geometrical design means internal design, and the area of the beauty salon figure (11), the high roof, the type of shielding of Wales number of chairs and the type of hair drier all this has a negative effect on the health of workers in the beauty salon.



Figure (11): Internal design of beauty salon in Erbil city.

4.Recommendation

- 1- Because loud music is a known source of toxic noise, keep your audio equipment at a comfortable low volume and take frequent breaks from listening.
- 2- Wear hearing protective devices (HPDs) such as earplugs or earmuffs when working in noisy environments (earplugs that are made of either rubber, plastic, wax, or cotton, which can reduce noise by 30 dB.)
- 3- The design of the building adheres to specific criteria to reduce noise levels. Of course, using rough and curved surfaces made of special materials helps a lot in reducing noise effects.
- 4- It would be better if the salons were on the bystreet to avoid the noise coming from the transportation.
- 5- Cover the floor with material that absorbs sounds, like (carpets).
- 6- If you suspect you have hearing loss, get tested and treated as soon as possible.

7- utilize standing aids to avoid the negative effects of protracted standing.



Figure (12) A-foam earplugs

B- plastic earplugs



Figure (13): back strap

5. Conclusion

Because noise is a significant public health issue, that can cause hearing loss, cardiovascular illness decreased productivity, sleeps disruption, reduced teaching than learning, and raised drug usage. The research has been done in Erbil city and showed that there are some dangerous effects on people who work in beauty salons because of the noise level they have been exposed to during their daily work and the long time they expend working on their feet, the result was serious sensorineural hearing loss between the workers up to 70%. There was 40% of conductive hearing loss, 60% of them had shoulder pain, 65% problems in the neck and 50% have back pain in addition to some sleep disorders.

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ژاوه ژاو و جوړی کار و کاریگه ریه کانی له سهر کریکارانی نارایشتگاگان

پوخته:

ئامانجی ئەم تووژینه وهیه به لگهی کاریگه ری ژاوه ژاو و وهستانی ماوهیه کی زوره له سهر بیستن و سیستمی ئیسه که په یکه ری کریکاران و دۆزینه وهی شیوازیکه بو که مکردنه وهی ژاوه ژاو له نارایشتگا که و بزانییت ئایا دیزاینی ئەندازه بی نارایشتگا که کاریگه ری له سهر ئاستی دهنگه دهنگ ههیه یان نا. ئەو پارامیته رانهی که لهم تووژینه وهیه دا پپوراوون بریتین له تاقیکردنه وهی بیستن، ئاستی دهنگ، توندی دهنگی وشککه ره وهی قژ، و جوړی ئازار له سیستمی ئیسه که په یکه ردا که ههروه ها خه ملپندراوه. لهم تووژینه وهیه دا ئامیری جیاواز به کارهینرا وهک چنگالی کوکردنه وه بو دوو تاقیکردنه وه، یه کهم تاقیکردنه وهی وپهر بوو که چنگاله که له ناوه پراستی ددانی سهره وه دانرابوو به راورد دهکات له ههر نووکیکدا له رزینه که بو سهره وه له چه پ یان راست یان ته نانه ت، دووه میان تاقیکردنه وهی رین به راورد دهکات له تیگه یشتنی دهنگه کان که به هوی گواستنه وهی ههواوه بلاوده بنه وه له گهل گواستنه وهی ئیسه که کان. ههروه ها ئەو پپوره ری دهنگ که به کاردییت بو پپوانی توندی وشککه ره وهی قژ و ئاستی دهنگ، دریزی و پانی و به رزی ههر سالونیک به به کارهینانی شریتی پپوانه ده پپوویت. ئەنجامه کان ده ریانخستوو که له ده ستدانی بیستنی ههستیاری ده ماری جددی له نیو کریکاراندا ههیه تا ۷۰٪ و ۴۰٪ له ده ستدانی بیستنی گواستنه وه ههیه، ۶۰٪ یان ئازاری شانیان هه بووه، ۶۵٪ کیشه ی ملیان هه بووه و ۵۰٪ یان ئازاری پشتیان ههیه له جگه له هه ندیک تیگچوونی خه و.

الضوضاء ونوع العمل وتأثيراته على العمليات في صالونات التجميل

ملخص:

يهدف هذا البحث إلى إثبات تأثير الضوضاء والوقوف الطويل على السمع والهيكل العظمي للعاملين وإيجاد طريقة لتقليل الضوضاء في صالونات التجميل ومعرفة ما إذا كان التصميم الهندسي لصالونات التجميل يؤثر على مستوى الضوضاء. تشمل المعلمات التي تم قياسها في هذا البحث اختبارات السمع ، ومستوى الصوت ، وشدة الصوت لمجفف الشعر ، ونوع الألم في نظام الهيكل العظمي المقدره أيضًا. تم استخدام أجهزة مختلفة في هذا البحث مثل الشوكة الرنانة لاثنتين من الاختبارات ، الأول كان اختبار ويبر حيث تم وضع الشوكة في منتصف الأسنان العلوية ، ومقارنة بين كلا طرفي السمع ، والثاني هو اختبار Rinne الذي يقارن الأصوات المنتشرة عن طريق التوصيل الهوائي مع التوصيل العظمي. كما أن مقياس الصوت المستخدم لقياس كثافة صوت مجفف الشعر ومستوى الضوضاء في صالونات التجميل ، قياس الطول والعرض والارتفاع لكل صالون باستخدام شريط قياس. أظهرت النتائج أن هناك ضعف سمع حسي عصبي خطير بين العاملين يصل إلى 70% وهناك 40% من فقدان السمع التوصيلي و 60% من العاملين لديهم آلام في الكتف و 65% لديهم مشاكل في الرقبة و 50% يعانون من آلام الظهر بالإضافة إلى بعض اضطرابات النوم.