
Noise Pollution and its Impact on the Workers in the Azzawiya Refinery

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Abstract:

Noise is one of the main forms of pollution effecting the environment, causing various hazardous consequences in humans. Large-scale noise periods are creating increasingly serious health problems; significantly affecting the industrial workers, as well as people living in near industrial areas. This study was conducted in order to determine the effect of noise on employees of Azzawiya Oil Refining Company, Azzawiya, Libya. A questionnaire was distributed to a total of 100 employee volunteers; which included a set of questions about noise pollutions and its effect on them. Noise pollution may act as a risk factor for numerous health disorders and cardiovascular diseases. The more noteworthy results showed that 20% of those who volunteered to be part of this research worked in management, whereas 17% were employed in plant operations and the remaining 63% worked in the industrial field. The research also showed that noise pollution present in the workplace can have a negative effect on their life, with 56% of participants saying the noise had a negative effect on their life, 28% saying noise occasionally effected their day to day life, and the remaining 16% saying it did not have an effect on their life. Furthermore, 46% of employees questioned say they have suffered medical conditions due to the noise pollution, whereas the remaining 54% say they have not. When asked whether they were told they spoke loudly in daily conversation, 50% responded saying most of time, 24% responding saying always and 26% responded with never. Those questioned were also asked if they have experienced Tinnitus. 70% replied with yes; This was split into 31% of those questioned experienced it in both ears, 22% in the right ear and 17% in the left ear. The remaining 30% said they had not experienced Tinnitus. It was evident from the results collected that high levels of noise can have both immediate and long-term effects on hearing. Excessive levels of noise can cause speech interference, hearing defects; namely Tinnitus, health disorders, hearing loss, loss of concentration and fatigue. All personnel present in the surrounding area of the source of

noise require hearing protectors to be presented to them and carrying out frequent medical examinations of employee's level of hearing.

Key Words: *Noise pollution, Industrial noise, Azzawiya Oil Refining Company, Tinnitus.*

I. INTRODUCTION

Noise is derived from the Latin word “nausea” implying ‘unwanted sound’ or ‘sound that is loud, unpleasant or unexpected’. Noise pollution has become major problem affecting cities around the world. which could impact the balance of human life and natural surroundings.¹⁻³ This form of pollution, aggravated by industrialization, has been suggested to be an underlying cause for many health and behavioral problems.⁴⁻⁵

Noise is one of the main forms of pollution effecting the environment, causing various hazardous consequences in humans. Mainly recognised for impairing sensibility to auditory stimuli, noise pollution has other consequences too.⁶⁻⁸

Aside from noise pollution caused by industrial machinery and traffic, another contributing factor less known to individuals is poor urban planning. This form of pollution has an ability to hinder physiological and physiological health; such effects include noise induced hearing-loss, hypertension, high stress levels, sleep disturbances, aggression, annoyance and tinnitus, among others.⁹⁻¹⁰

As previously mentioned, industrial machinery is one of the main causes of noise pollution. The main machines responsible in producing noise pollution include motors and compressors, as well as other.¹¹

Thus noise pollution is a frequent occupational hazard in a variety of workplaces, including saw, crushing and textile mills, the steel and iron industry and aircraft maintenance, as well as many others. Loss of hearing due to noise is one of the leading occupational illnesses in many countries.¹⁻²

The Environmental Protection Agency (EPA)/USA report in 1981 concluded that more than 9 million American citizens are experience noise levels above 85 dB(A) on a daily basis on average. Moreover, this number has raised to around 30 million by the year 1990.¹²⁻¹³

Industrialised countries, such as Germany, have determined that 12 to 15% of industrial workers are exposed to daily average noise level of 85 dB(A) and above; this percentage correlates to almost 4 to 5 million industrial workers in Germany (Pfeiffer, 1992). Numerous cases of occupational related hearing damage has been correlated to the many years of exposure to noise pollution, when working in industrial areas.¹¹

The Aim: This study was conducted in order to determine the effect of noise on employees of Azzawiya Oil Refining Company, Azzawiya, Libya.

II. MATERIALS AND METHODS

Survey: the study was conducted in April 2017 in Azzawiya Oil Refining Company. Workers volunteers were used to study the effect Noise on them.

1. STUDY DESIGN:

The study was conducted in Azzawiya Oil Refining Company because of the high noise and sounds on a daily basis. Therefore, we took a sample of the workers in the refinery to study the impact of noise on the workers.

2. STUDY POPULATION:

A questionnaire was conducted for 100 staff (92 males and 8 females) between the ages of 23 and 65, asked about the impact of noise on their hearing and daily life.

3. QUESTIONNAIRE ENVIRONMENT:

The employees working near the large machines were selected to conduct the questionnaire and to produce the results of the votes of the large machines on them.

4. METHODS:

In this project we used the questionnaire as a tool to obtain the information and results from the employees of Azzawya Oil Refining Company.

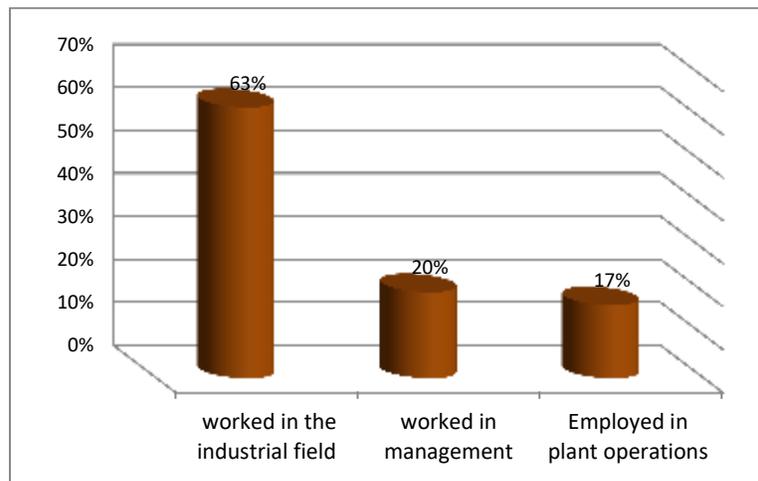
The aim behind a questionnaire is to collect data from individuals, usually from a certain demographic and considered a research tool, and is comprised of a series of questions. The benefits of questionnaires in comparison to other forms of data collection is that they are inexpensive, are easier to carry out than verbal surveys, and select answers allow for ease in accumulating answers. On the other hand, questionnaires are restricted by the requirement that participants must have the ability to read and answer the questions, thus limiting the demographics possible to survey.

III. RESULTS & DISCUSSION

A total of 100 volunteers took part in our questionnaire, which focused on noise pollution in the workplace and its effects. The following information was gathered from this questionnaire. Firstly, the proportion of males to females taking part is 92% males and 8% females; this suggests a large bias towards males in all responses but since noise pollution and the biology of the ear is quite uni-sex, this shouldn't create any bias. The age ranges of those taking part are as follows; 25% of the employees were between the

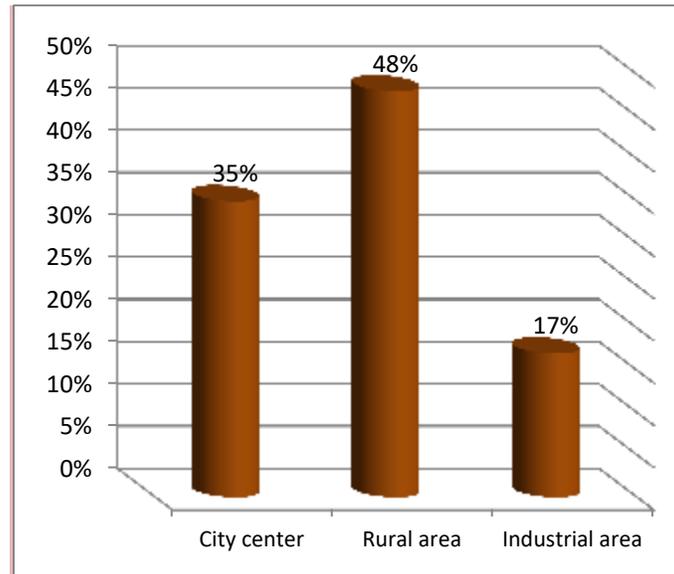
ages of 23 and 25, 30% were between 26 and 35, 26% were between the ages of 36 and 50, and lastly 19% were over the age of 50. This distribution is rather even across all ages, suggesting a good representation of all ages in this questionnaire.

Following this they were asked in which field they operated in, and the results showed that 20% of those who volunteered to be part of this research worked in management, whereas 17% were employed in plant operations and the remaining 63% worked in the industrial field. Since those in the industrial field are most susceptible to noise pollution this industry heavy distribution highlights the possible magnitude of the issue (Fig.1).



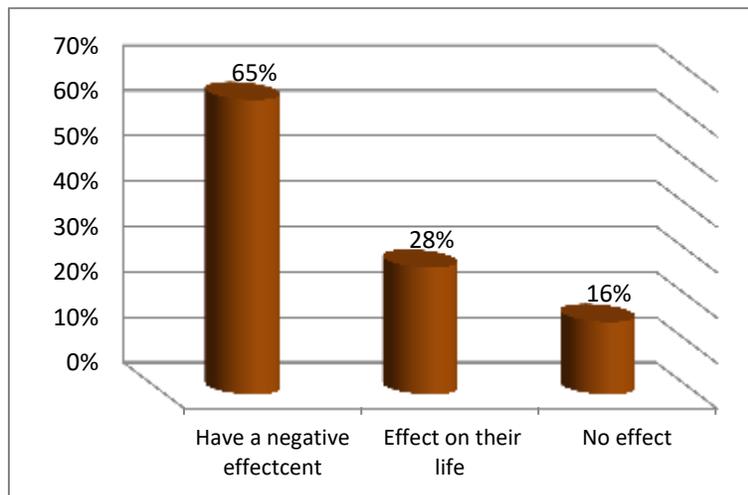
Figures. 1: Employees field in the company

Furthermore they were asked what type of area they live in, and results showed that 48% lived in rural areas, 17% lived in an industrial area and the remaining 35% lived in the city center. With a large proportion living in a commonly quiet living conditions (rural), this strengthens the viewpoint that home living conditions aren't having effect on the noise pollution they experience(Fig.2).



Figures. 2: Employee living areas of the company

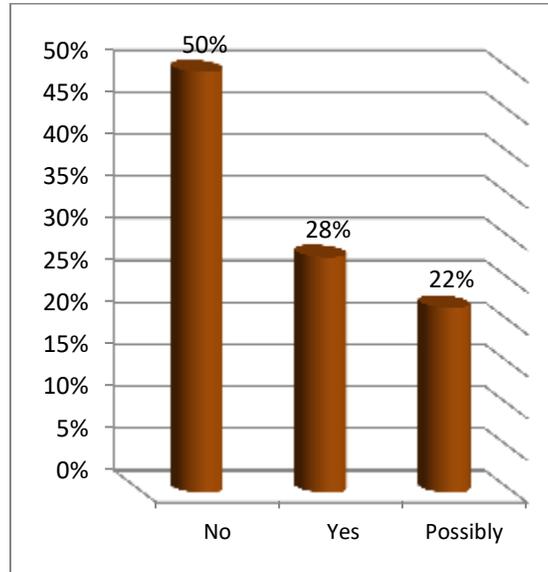
The research also showed that noise pollution present in the workplace can have a negative effect on their life, with 56% of participants saying the noise had a negative effect on their life, 28% saying noise occasionally effected their day to day life, and the remaining 16% saying it did not have an effect on their life. This strongly suggests action needs to be taken to improve the quality of life of these employees. (Fig.3).



Figures. 3: The effect of noise on the daily lives of employees

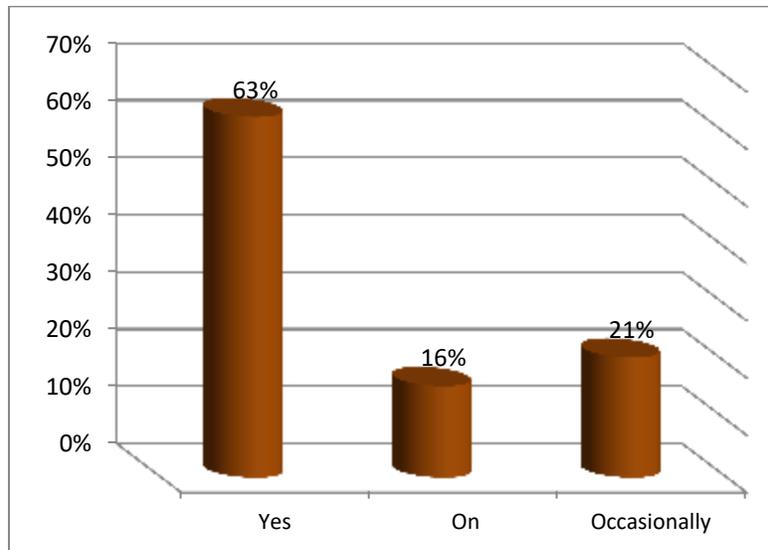
The participants optimism was also discussed, asking whether they expected a perement solution to be available, with 50% answering no, 28% answering yes and 22% answering

possibly. The optimism shown by the volunteers or a solution indicate that a solution is wanted (Fig.4).



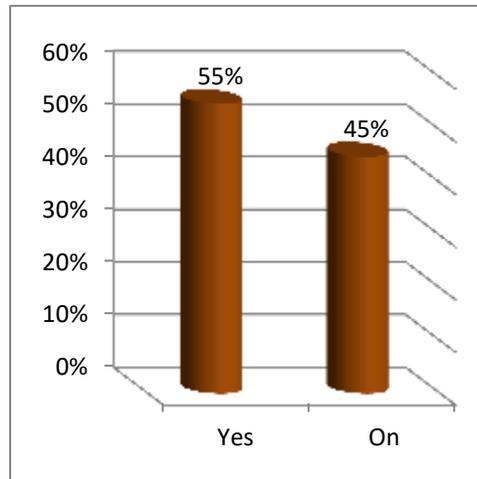
Figures. 4: The employees' expectation for noise solutions

To better understand the effect possible solutions could have on employees, they were asked if wearing ear plugs would cause discomfort. 63% of employees answered yes, 16% answered no and the remaining 21% answered occasionally. This suggests possible alternative solutions may be required to counteract noise pollution (Fig.5).



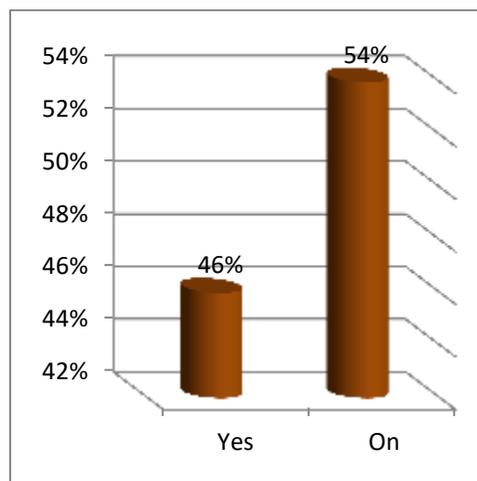
Figures. 5: Percentage of ear plugs' discomfort for employees

One possible issue that that could cause oversight of this issue within the company is the employees lack of education on the issue. They were therefore asked whether they know of the possible medical conditions caused by excessive noise or if they have ever researched the matter. 45% of employees answered that they had, whereas 55% has answered that they hadn't, suggesting a majority lack of knowledge on the matter, which would favor a lack of action being taken within the company internally(Fig.6).



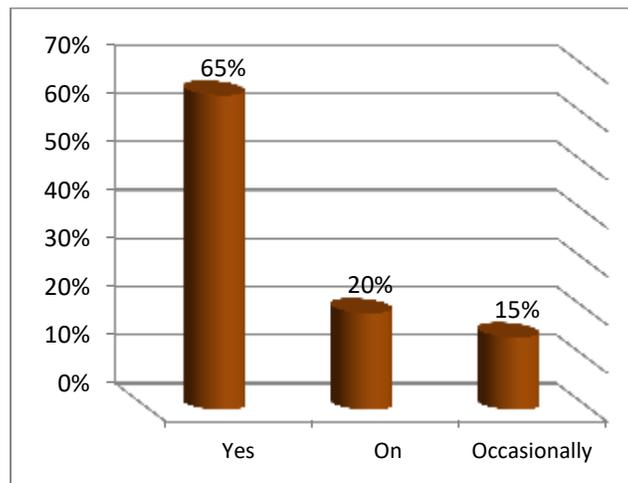
*Figures. 6:*Percentage of knowledge about noise damage for employees

Furthermore, 46% of employees questioned say they have suffered medical conditions due to the noise pollution, whereas the remaining 54% say they have not. This further suggests action needs to be taken (Fig.7).



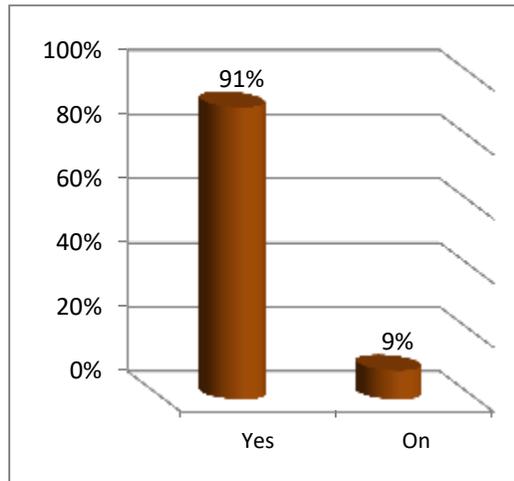
Figures. 7: Percentage of employees sick due to noise

Excessive noise can not only present medical issue but can also effect concentration when carrying out work. When employees were asked if excessive noise affected their concentration, 65% answered yes, 20% answered sometimes and the remaining 15% answered no, showing clearly that for the majority of workers that loud noise would affect their concentration (Fig.8).



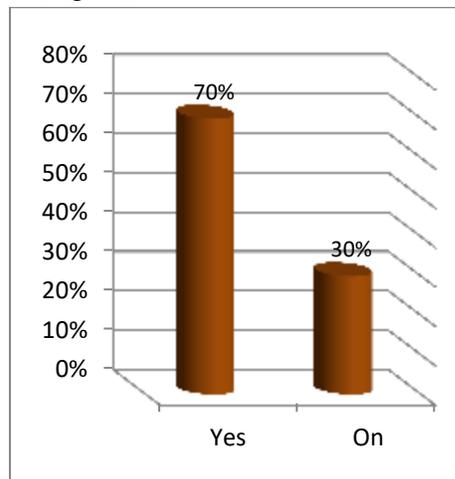
Figures. 8: Percentage of sounds affect your concentration during work

A very common medical issue with noise pollution and excessive noise is Tinnitus, a ringing or buzzing sound in the ear. The employees were asked if they had experienced Tinnitus in in the past, with results showing that 65% experienced Tinnitus often, 26% occasionally experienced it and only 9% had not experienced it. This strongly emphasizes the degree to which the noise pollution is having an effect, with 91% of employees having experienced Tinnitus(Fig.9).



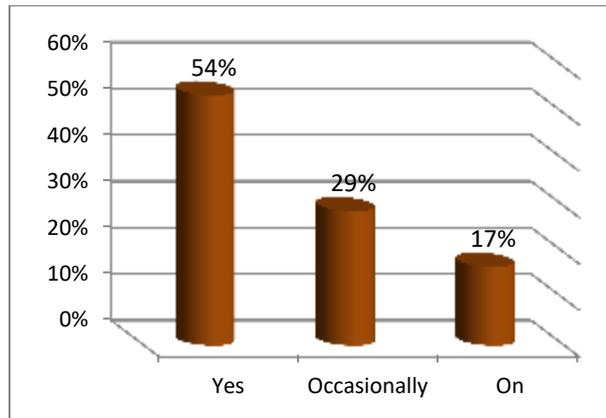
Figures. 9: Percentage of employees having noise pollution

Those questioned were also asked if they have experienced Tinnitus. 70% replied with yes; This was split into 31% of those questioned experienced it in both ears, 22% in the right ear and 17% in the left ear. The remaining 30% said they had not experienced Tinnitus. This worrying result highlights the seriousness of this issue, and it's clear that the effects are real and advanced(Fig.10).



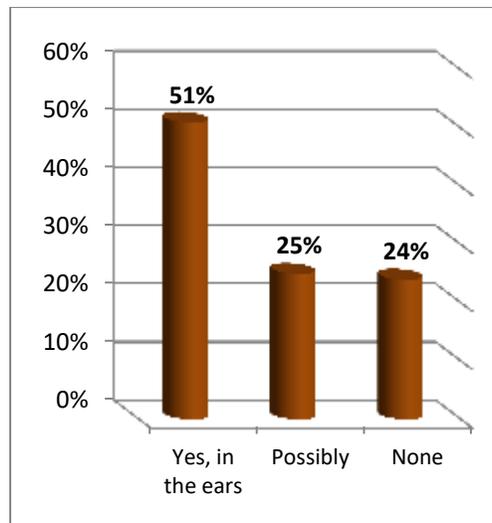
Figures. 10: Percentage of feeling of tinnitus for the employees

Employees were also asked if they had any difficulty with hearing. The results shows that 54% did have difficulty with hearing, 29% occasionally had difficulty with hearing and 17% did not have difficulty with hearing. This also suggests that action needs to be taken for the sake of employees hearing, since such a high proportion have difficulty with hearing(Fig.11).



Figures.11: Percentage of hearing problems for the employees

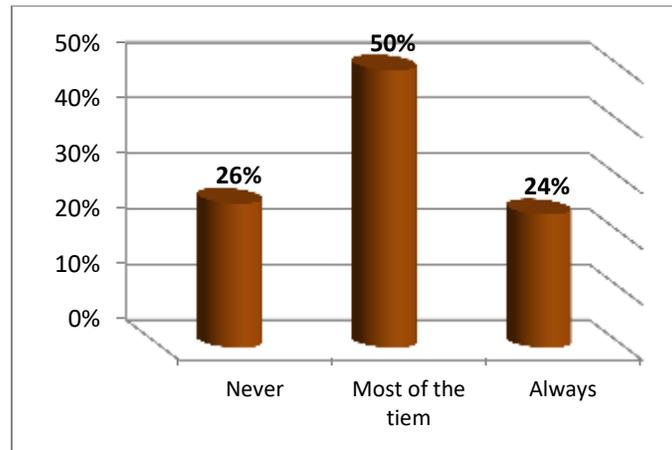
Employees were asked if they felt a difference in the strength of their hearing between their left and right ear when making a call on a phone, a quick rough test to identify if they had any disparity in their hearing between their ears. 51% of employees said they found they did, 25% felt they occasionally felt a disparity and 24% felt they did not (Fig.12).



Figures.12: Percentage of changes of strength of hearing for the employees during phone calls.

When asked whether they were told they spoke loudly in daily conversation, 50% responded saying most of time, 24% responding saying always and 26% responded with

never. This is a clear indication of hearing deterioration, and with these circumstances it strongly suggests this is caused by noise pollution at the workplace(Fig.13).



Figures.13: Percentage of change of employees' sound level during daily conversations

IV. CONCLUSION

We conclude from this research that workers in the Azzawiya Oil Refining Company exposed to a large amount of high noise and as a result of that these noise affect their daily lifestyle and weaken their ability to hear gradually, if the period of their working in the refinery was very long, it will affect their ability to hear and also the performance of their tasks and ratios. Many employees have a tones in their ears and most of the employees do not have sufficient knowledge of noise problems and how they affect their hearing and they do not know the proper way to protect their hearing from the damage.

V. RECOMMENDATIONS

Provide information and training to educate the employees about dangers of Noise pollution and required precautions. Therefore, a recommendation should be pointed out such as awareness of employees is how to wear earplugs or proper earmuffs. Regularly monitor and review the effectiveness of the measures by measuring noise levels or conducting health surveillance for the employees.

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