The objective of this study is to find out frequency of noise induced hearing loss and its association in textile mill workers.

Methods:
An analytical cross sectional study was conducted on 125 textile mill workers with non-probability purposive sampling having 5 to 10 years working experience in spinning and weaving units of age 25 to 40 years (males). Data was collected by performing Otoscopy, tympanometry and pure tone audiometry in noise controlled room, analyzed and evaluated with the help of statistical package for social sciences version 25.00. Pearson chi square was used and P value was equal or less than 5% was taken as significant.

Results:
Total number of 125(100%) were tested to check their hearing levels by standard pure tone audiometry. Out of 125(100%) 14(11.2 %) were with normal hearing, 28(22.4%) with mild hearing, 36(29%) with mild to moderate hearing, 34(27%) with moderate hearing, 12(10%) with moderately severe hearing and 1(0.8%) with severe hearing levels. Out of 125(100%) 50 (40%) were diagnosed with low level of anxiety, 43(34%) were with moderate level of anxiety and 32(26%) were with severe level of anxiety in all the participants working in the textile mill.

Objective:
The objective of this study is to find out frequency of noise induced hearing loss and its association in textile mill workers.

Conclusion:
It is concluded that the mill workers are on the risk of developing hearing loss of different severity levels which also cause anxiety to them.

Key words:
Noise induced hearing loss, pure tone audiometry, Carhart Notch, Anxiety, Occupational Noise.

Introduction:
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Introduction:
Hearing impairment is a natural ageing as well as the most common reason of disability in the world. Around 1 in 4 adults 45 years of age have medium or higher hearing loss.¹ 360 million people identified by the World Health Organization suffered from impaired hearing loss, around 5.3% of the population of the planet.² Anxiety is a widespread psychiatric illness affecting 350 million people worldwide. Hearing loss can increase the worsening of health quality of life and damaged hearing, which can lead to social behavior, anxiety, interpersonal vulnerability and conflicts for the affected individuals. Several cross-sectional studies have shown that anxiety in the elderly population triggers hearing loss independently. Some studies have, however, reported contradictory findings.¹ The clear correlation between hearing loss and anxiety in adults of all ages in the United States was confirmed by a nationwide survey. Hearing impairment was the 13th most important contributor to the global disease burden in 2002 and is estimated to contribute ninth worldwide and seventh in high-income countries by 2030.³ 12.7% of people over the age of 12 are reported to be impacted in the United States alone. Considering the importance of global and national hearing loss, it is important to recognize its social effects.⁴ Hearing damage due to workplace noise

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Failure to focus, irritate, tiredness, fatigue, sleep disturbances are other significant health consequences. The key industries that cause excessive noise and expose workers to harmful noise are textiles, printing, slag mills, mining, etc. Most of this condition can be caused by occupational noise exposure. Intense exposure to the sound may result in partial or total hearing impairment. The transformation in the auditory & neural configuration of inner ear of the delicate system has been believed after exposure to suggest threshold sensitivity and no permanent or delayed auditory function consequences.

**Methods:**

The study was carried out in one of the textile mill’s spinning and weaving units. Total 125 workers participated in this study. All male workers having 5 to 10 years working experience with the age range of 25 to 40 years included in this study by using analytical cross sectional study design and non-probability sampling technique. All other cases of co-morbidities which can result in hearing loss were excluded from the study. Otoscope, Tympanometry, Standard Pure tone audiometer were used for the assessment. Otoscope is an instrument used to examine the outer and middle ear to rule out any kind of ailment while. Tympanometer is an instrument which is used to check the middle ear status i.e. middle ear pressure, compliance and ear canal volume. And audiometer is an instrument which is used to determine the degree and type of hearing loss. Beck anxiety inventory is used to check anxiety. It has 21 items. Internal consistency for the BAI = (Cronbach’s a=0.92) Test-retest reliability for the BAI = 0.75 the BAI was moderately correlated with the revised Hamilton Anxiety Rating Scale (.51), and mildly correlated with the Hamilton Depression Rating Scale (.25) Data was collected by performing Otoscopy, tympanometry and pure tone audiometry in noise controlled room, analyzed and evaluated with the help of statistical package for social sciences (SPSS) version 25.0.
Results:
Total no. of Marital Status of Subjects is 125 with 1.6640 mean, .47424 Std. Deviation, 1.00 Minimum and 2.00 Maximum. While, total no. of Socio economic Status is 125 with 1.9920 mean, .08944 Std. Deviation, 1.00 Minimum and 2.00 Maximum. Whereas, total no. of Education of the subjects is 125 with 1.6800 mean, .64258 Std. Deviation, 1.00 Minimum and 3.00 Maximum.

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Marital Status of Subjects</th>
<th>Socio Economic Status</th>
<th>Education of the subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1.6640</td>
<td>1.9920</td>
<td>1.6800</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.47424</td>
<td>.08944</td>
<td>.64258</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Maximum</td>
<td>2.00</td>
<td>2.00</td>
<td>3.00</td>
</tr>
</tbody>
</table>

Table 1: Statistics for Marital status of subjects, socio economic and education
Out of 125, 14(11.2 %) were with normal hearing, 28(22.4%) with mild hearing levels, 36(29%) with mild to moderate hearing levels, 34(27%) with moderate hearing levels, 12(10%) with moderately severe hearing levels and 1(0.8%) with severe hearing levels. As results are showing that out of 125(100%), 111(86%) were diagnosed at different level of hearing loss variance in percentage and severity as well as only 14(11%) of 125(100%) had normal hearing. (Figure 1)

![Hearing Loss In Textile Mill Workers](image)

Figure 1: Hearing Loss in Textile Mill Workers
According to table 1, 11 mill workers who have 5-6 years of experience have moderate hearing loss, 15 worker with 7-8years experience have mild to moderate hearing loss and 8 workers with more than 8 years have moderate hearing loss. There was insignificant association between working experience and hearing loss.

<table>
<thead>
<tr>
<th>Experience of the mill workers</th>
<th>Normal</th>
<th>Mild</th>
<th>Mild-Moderate</th>
<th>Moderate</th>
<th>Moderate-severe</th>
<th>Severe</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-6 years</td>
<td>5</td>
<td>7</td>
<td>15</td>
<td>11</td>
<td>3</td>
<td>0</td>
<td>0.374</td>
</tr>
<tr>
<td>7-8 years</td>
<td>5</td>
<td>15</td>
<td>17</td>
<td>15</td>
<td>7</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>More than 8 years</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>28</td>
<td>36</td>
<td>34</td>
<td>12</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Association between Experience of the mill workers and Hearing Loss in both Ears

Discussion:
An analytical cross sectional study was conducted on a group of 125 textile mill workers. They were evaluated clinically, audio logically and interviewed personally to fill demographic data. The purpose of my study was to estimate frequency of noise induced hearing loss. Present study based on the purpose to find out the frequency of noise induced hearing loss in textile mill workers with severity levels of noise induced hearing loss. In this study the severity of hearing loss increases from normal hearing to profound hearing loss. Textile mill workers of age 25 to 40 years working in noisy environment have more exposure of 90dB to100dB to noise due to work environment which can lead to develop noise induced hearing loss of different severity levels, assessed by Audiological evaluation along with developing hearing impairment ranging from normal to profound level of noise induced hearing loss. Total sample consisted of 125 individuals in whom there were, majority of the individuals (29) were in the moderate-severe range, (28) individuals in the mild-moderate and moderate range, (15) individuals in the mild range, (14) individuals in the normal range and (11) individuals in the severe range. as shown in Table1.3 in results it also justify the objectives that there is greater frequency of noise induced hearing loss in textile mill workers and in previous research by Deborah Imel explored hearing loss caused by workplace noise among textile factory workers aged 25 to 45 years. The proportion of the population exposed to work noise by using the
US National Institute for Safety and Health at Work (NIOSH) was determined noise exposure data, modified by the distribution of workforce by occupational class and economic sector, and the levels of economic activity within each WHO sub-regions. The study found that 16% of adult hearing disorders with disabilities (over four million DALYs) are due to workplace noise from 7% to 21% in the different sub-regions. The effects of occupational noise exposure are higher for men than women in every sub-region and higher in developing regions. He found that workplace noise is a significant cause of hearing loss in adults.\(^1\)

Another study conducted that noise is a genuine word related to health risk in the material production line which was contemplated. The significant hazard factors for NIHL were the term and the degree of noise introduction. This relationship is like that saw in past investigations in Thailand and Egypt. The higher disorder levels in the weaving and spinning areas, reflected in higher disorders of NIHL among laborers in those segments, have likewise been reported by past investigations in different nations. Despite the fact that the rejection measures are the equivalent with different examinations and permit equivalence of discoveries, they can possibly cause underestimation of the NIHL level. The "solid laborer impact" could likewise be associated with causing underestimation of the NIHL level since there is no efficient wellbeing administrations for word related medical issues in the manufacturing plant. This implies laborers experiencing serious hearing misfortune may have left the production line, leaving moderately solid specialists in the industrial facility. In which case, the NIHL gauge from a cross-sectional study would think little of the genuine greatness of the issue. This proposes the real NIHL level could be higher than what was seen in this examination. Weavers and spinners in the production line were presented to average degrees of disorder over 85 dB(A), as far as possible worth set by numerous mechanical nations in Europe and Joined States.\(^1\) Just as in some African nations, including Zimbabwe\(^1\) and Kenya\(^2\). The noise level of about 100 dB (A) in the weaving segment is practically identical to the 99.5 dB (A) level estimated in weaving areas of material factories in Asmara (9), 102.5 dB (A) in Hong Kong (18), 101.3 dB (A) in Thailand (17), 100 dB (A) in Egypt (16,21), and 99-102 dB (A) in a jute weaving factory in the UK \(^15,16,20\). Based on the study findings, application of hearing conservation program through expansion and enforcement of regulations to identify and monitor occupational risk groups, and restriction of importation of equipment which emits dangerous levels of noise are recommended. In addition, engineering modifications of buildings and machinery to reduce noise levels, and promotion of safety and health programmes, including promotion of workers' awareness on self-protective measures, such as the use of personal protective device (PPD), should be considered.

**Conclusion:**

It is concluded that noise in textile mills have great impact in developing noise induced hearing loss in textile mill workers which is associated with anxiety. The findings of the study supports my argument by statistical data. The mill workers are on the risk of developing hearing loss of different severity levels which also cause anxiety to them. It can highly affect their interpersonal, social, and professional life.

**References :**


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