

Assessment of knowledge, attitude and practice towards dental environment noise among dental students

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ABSTRACT:

INTRODUCTION: The auidal environment of learning-teaching activities at a dental college is identified by high noise levels in relation to other teaching areas, due to the overemphasised noise produced by the use of dental equipment by many users at the same time. Occupational noise is inescapable produced from dental equipment, building facilities, and human voices in the dental environment.

AIM: To assess the knowledge, attitude and practice towards dental environment noise among dental students.

MATERIALS AND METHODS: A self administered survey was conducted and circulated by platform 'google forms to 100 participants and results were analysed using the statistical software SPSS Software version 23 and results were represented using pie charts ($p < 0.05$). The questionnaire was given approval by scientific review code, Saveetha dental college, chennai

RESULTS: Out 100 of the participants, male (44%) and female (56%). About the majority of 77% were aware about the high levels of noise in dentistry and 23% weren't.

CONCLUSION: Dental students were aware about the sound levels and we conveyed them to use earplugs or sound less equipment in the clinic.

Keywords: Attitude, dental, environmental, hearing issues, noise, Occupational hazards.

INTRODUCTION:

Dentistry is regarded as one of the best occupation, but it remains a significantly risky one, with exposure to infectious disease, radiation, hazardous materials, burns, dermatitis, allergies, respiratory disorders, percutaneous injuries, neuropathies, musculoskeletal injuries, eye injuries, psychological problems and noisy disturbances [1]. The auidal environment of learning-teaching activities at a dental college is characterized by high noise levels in relation to other teaching areas, due to the exaggerated noise produced by the use of dental equipment by many users at the same time [2]. The National Institute for

Occupational Safety and Health has recognised noise as one of the ten chief causes of work-related diseases and injuries [3]. Dentists and dental auxiliaries are displayed at different noise levels while working in dental offices or laboratories[4]. The main noise of dental sounds that damage to hearing are high-speed turbine handpieces, high-velocity suction, ultrasonic instruments, vibrators, model trimmers. [5]

Generally, noise is mentioned by its sound level and frequency. Audible sound consists of pressure waves in air with a frequency range of 20Hz to 20kHz. Human hearing does not respond uniformly to all frequencies [6]. Noise-induced hearing loss can be defined as a permanent hearing impairment caused by occupational activity. This type of hearing loss is attributed to prolonged exposure to high intensity noise [7]. This loss begins when high frequencies of about 4000 Hz are reached. Noise pollution is one of the most important situations requiring a solution by the contemporary world [8]. Noise can induce learned helplessness, increase arousal, alter the choice of task strategy, and decrease attention to the task [9]. Noise can have both auditory and non-auditory effects.[10]

It is well known that increased noise levels produce non-auditory effects like stress reactions with variations in heart rate, blood pressure, respiration, blood glucose and lipid levels, associated with psychical consequences like annoyance, mental fatigue and a reduction in efficiency, as well as auditory effects like noise-induced hearing loss [11,12]). Dentists experience high frequency hearing loss at the beginning in the 4000 Hz to 6000 Hz range[11]. Right-handed dentists exhibit greater hearing loss in the left ear. Ultrasonic frequencies can also damage hearing due to the generation of subharmonics and thus hearing should be protected against these frequencies[13]. The dentist should maintain a distance of 35 cm from his eye to the patient's mouth. Our team has extensive knowledge and research experience that has translate into high quality publications [14][15–33]

The aim of the study was to assess the knowledge,attitude and practice towards dental environment noise among dental students and it would satisfy the difficulty and vulnerability of sound related illness to dental students.

MATERIALS AND METHODS:

The study was based on a survey as 100 participants were administered. The responses survey consists of 10 questions and it is circulated using online platform 'google forms' and results were analysed using the statistical software SPSS Software version 21 (www.ibm.com) . The statistical analysis used was the Chi square test. $p < 0.05$ was considered statistically significant. The questionnaire was given approval by scientific review code, Saveetha dental college, chennai. Chart analysis was carried out with the responses recorded in the software and results were represented using pie charts.

RESULTS:

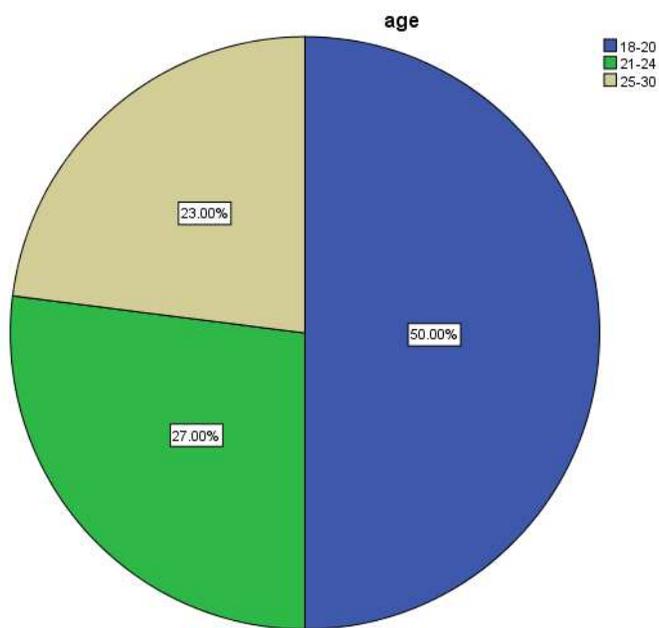


Fig 1: Pie chart representing the percentage distribution of participants based on their age groups, green colour represents 21-24 age groups (27%), blue colour represents 18-20 (50%), brown colour represents 25-30 age groups (23%).

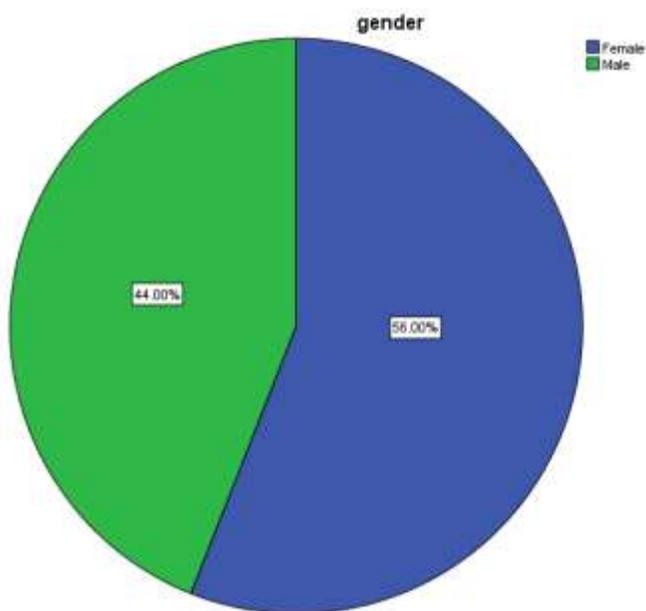


Fig 2: Pie chart representing the percentage distribution of participants based on their gender, green colour represents male (44%) and blue colour represents female (56%).

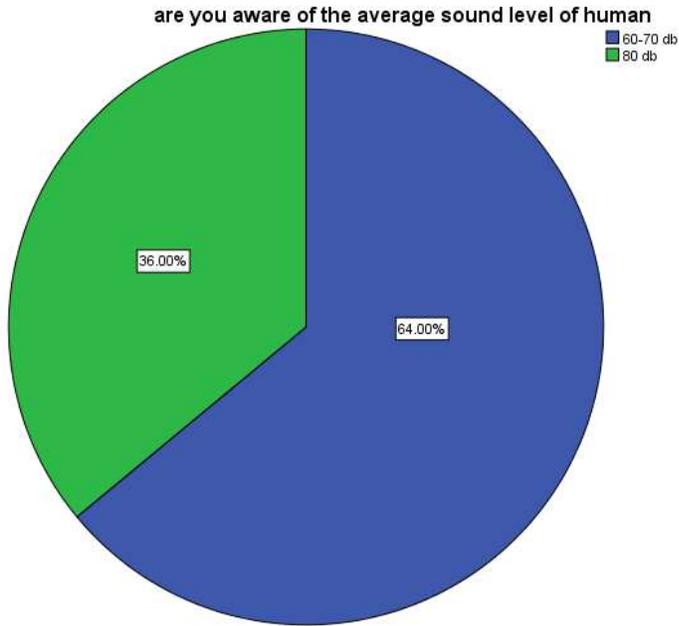


Fig 3: Pie chart representing the percentage distribution of participants based on their opinions of awareness of average sound level of human, green colour represents 80 dB (36%), blue colour represents 60-70 dB (64%)

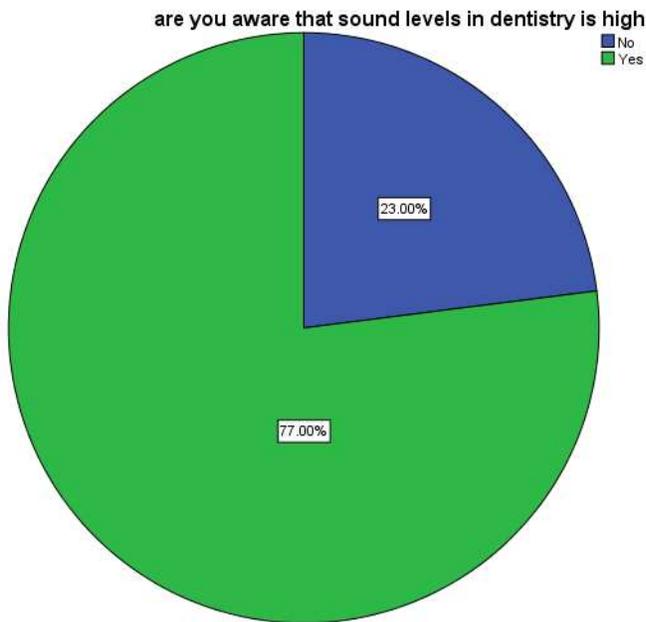


Fig 4: Pie chart representing the percentage distribution of participants based on their opinions of awareness of sound level in dentistry. Green colour represents yes and blue colour represents no. 77% responded yes and 23% responded no.

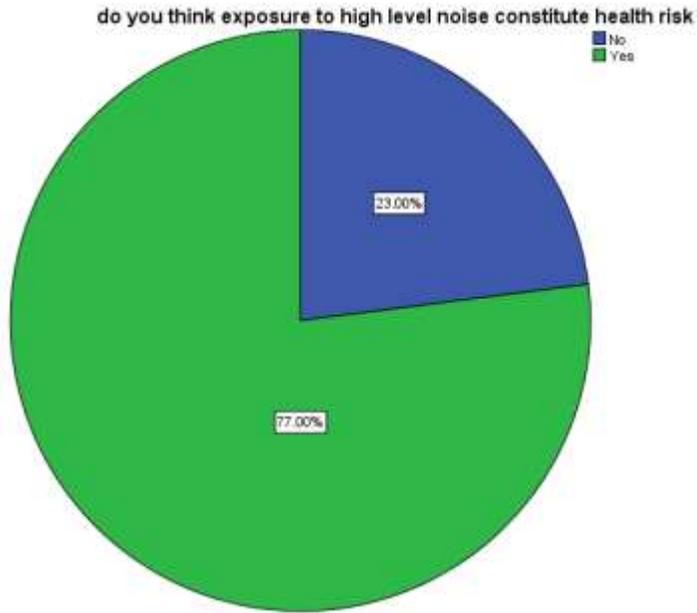


Fig 5: Pie chart representing the percentage distribution of participants based on their opinions of perception of exposure level constituting to health risk. Green colour represents yes and blue colour represents no. 77% responded yes and 23% responded no.

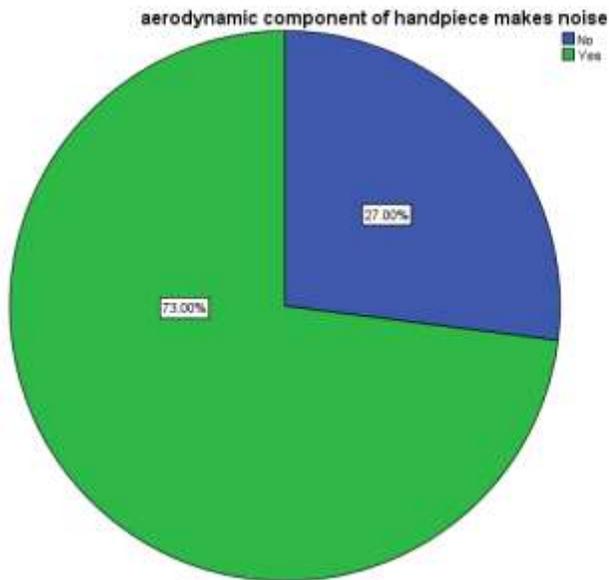


Fig 6: Pie chart representing the percentage distribution of participants based on their opinions of awareness of the aerodynamic component of hand piece making noise. Green colour represents yes and blue colour represents no. 73% responded yes and 27% responded no.

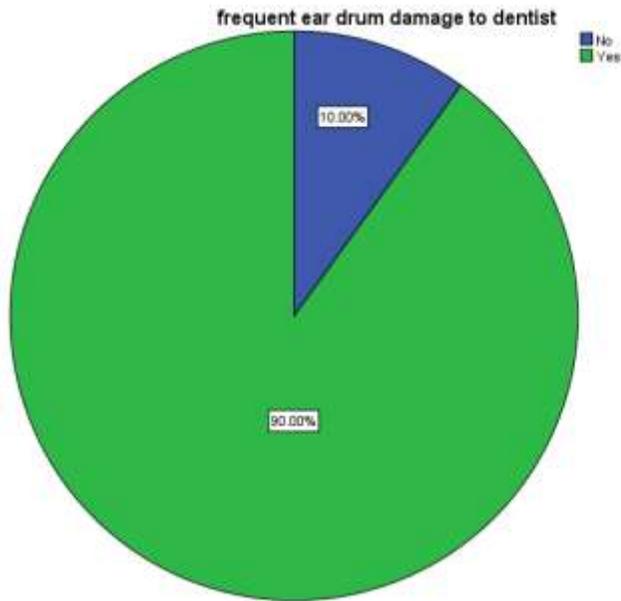


Fig 7: Pie chart representing the percentage distribution of participants based on their opinions of awareness about the frequent eardrum damage to dentists. Green colour represents yes and blue colour represents no. 90% responded yes and 10% responded no.

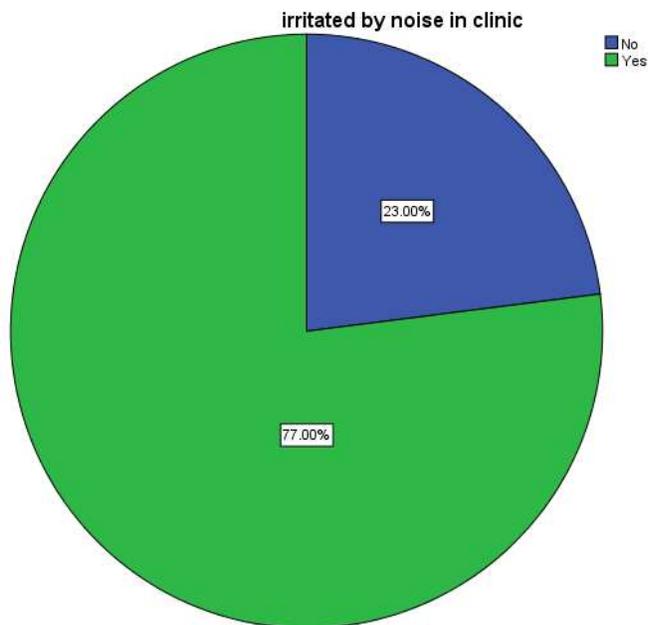


Fig 8: Pie chart representing the percentage distribution of participants based on their opinions of perception of getting irritated by noise in clinic. Green colour represents yes and blue colour represents no. 77% responded yes and 23% responded no.

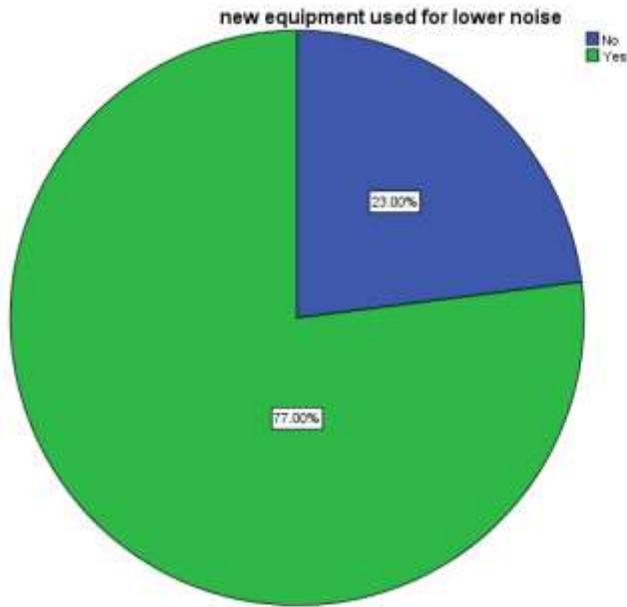


Fig 9: Pie chart representing the percentage distribution of participants based on their opinions of perception of new equipment used to lower noise. Green colour represents yes and blue colour represents no. 77% responded yes and 23% responded no.

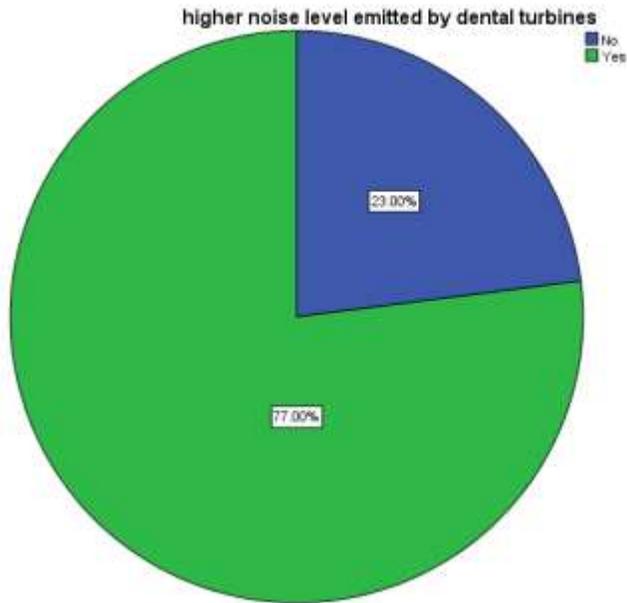


Fig 10: Pie chart representing the percentage distribution of participants based on their opinions of awareness about higher noise are emitted by dental turbines. Green colour represents yes and blue colour represents no. 77% responded yes and 23% responded no.

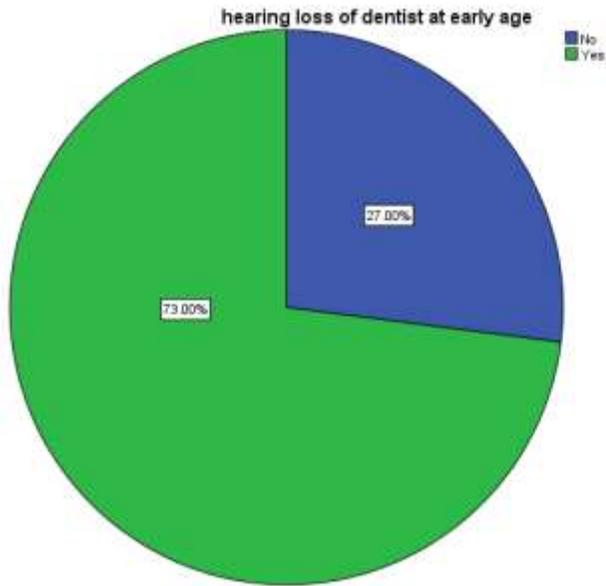


Fig 11: Pie chart representing the percentage distribution of participants based on their opinions of awareness about hearing loss of dentists at early age. Green colour represents yes and blue colour represents no. 73% responded yes and 27% responded no.

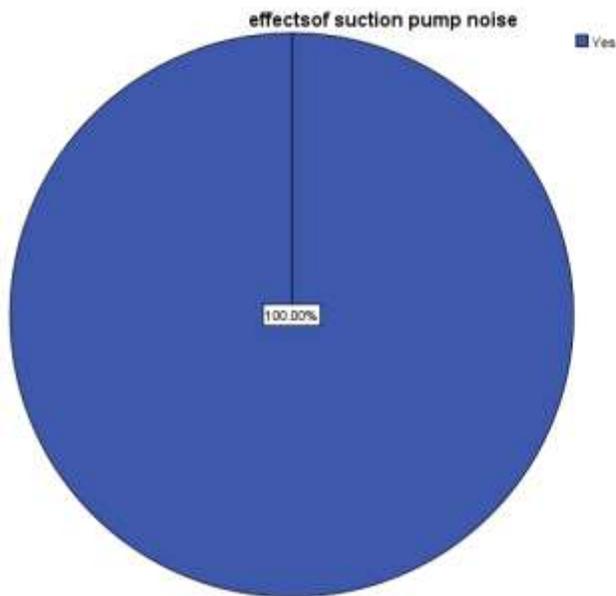


Fig 12: Pie chart representing the percentage distribution of participants based on their opinions of awareness of effects of suction pump causing irritation to both practitioner and patient. Green colour represents yes and blue colour represents no. Majority of 100% participants responded yes.

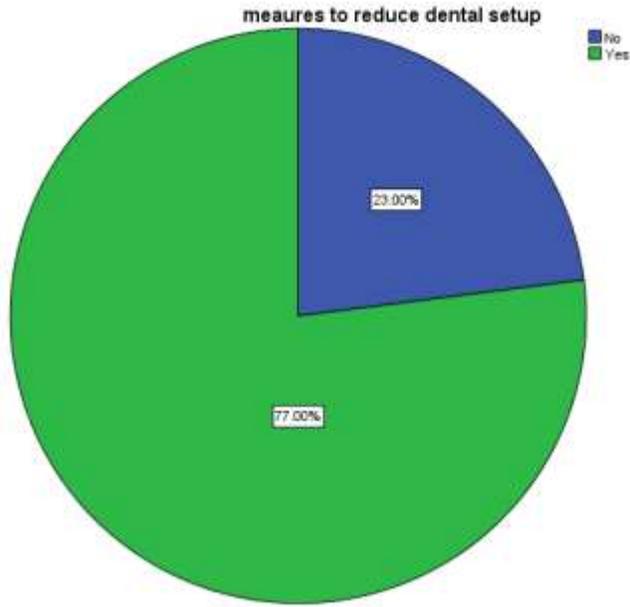


Fig 13: Pie chart representing the percentage distribution of participants based on their opinions of perception that measures in dental setup can reduce noise. Green colour represents yes and blue colour represents no. 77% responded yes and 23% responded no.

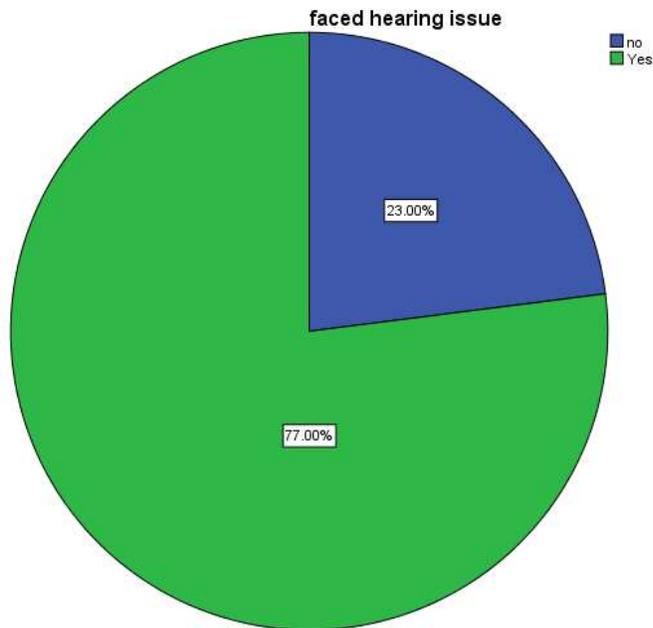


Fig 14: Pie chart representing the percentage distribution of participants based on their opinions experience of hearing issues. Green colour represents yes and blue colour represents no. 77% responded yes and 23% responded no.

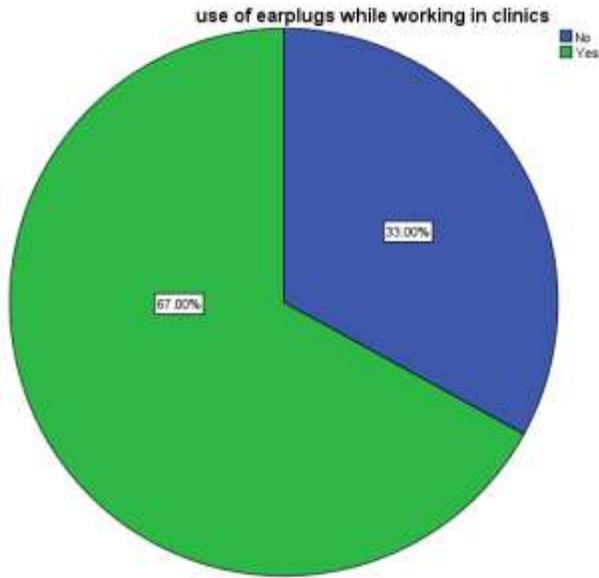


Fig 15: Pie chart representing the percentage distribution of participants based on their opinions of usage of earplugs while working in a clinic. Green colour represents yes and blue colour represents no. 67% responded yes and 33% responded no.

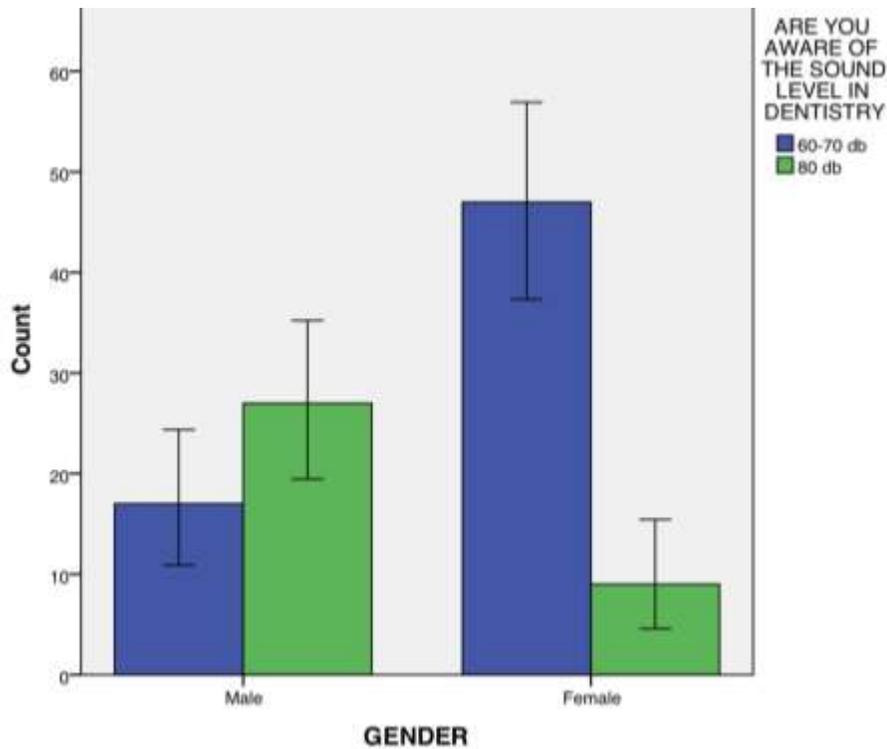


Fig 16: Bar chart showing the association between gender and opinion on the awareness of sound levels in dentistry.

Bar graph represents the individual opinion on the awareness of sound levels in dentistry..X axis represents gender ,Y axis represents individuals who answered 80 dB (green) and who answered 60-70 dB (blue). Out of 100 participants, 47 responded 60-70 dB and 9 responded 80 dB among females and 17 responded 60-70 dB and 27 responded 80 dB among males. Gender does have an influence on the general opinion and awareness.

Pearson's Chi square value : 21.938^a, DF: 1, P value= 0.000 (<0.05) and it was statistically significant

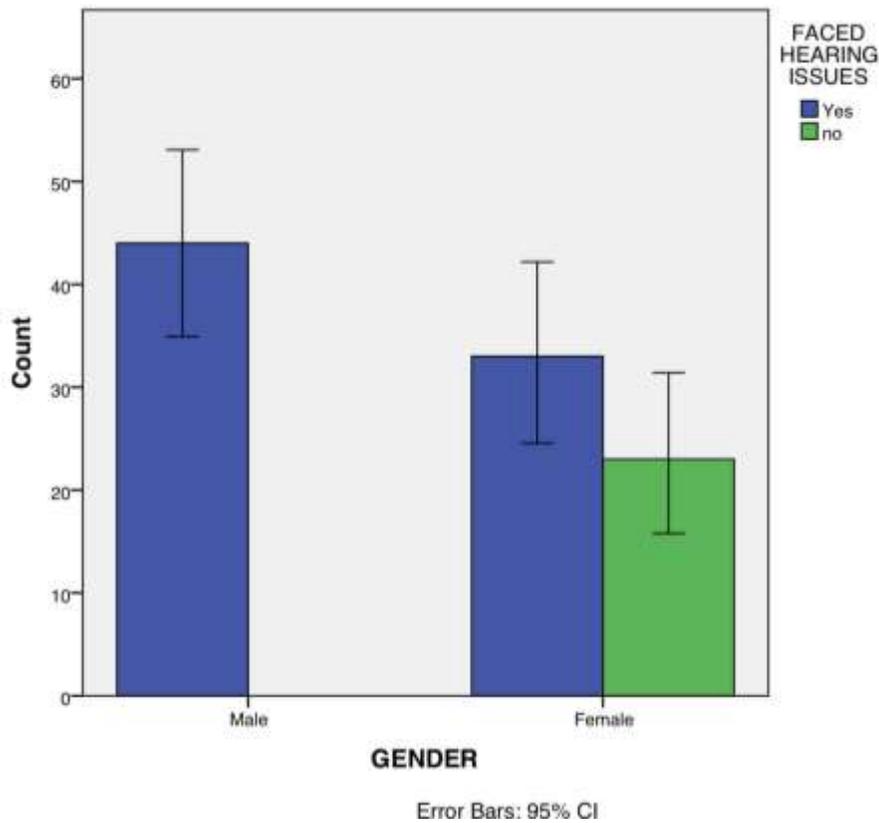


Fig 17: Bar chart showing the association between gender and opinion on the experience of facing hearing loss.

Bar graph represents the individual opinion on the awareness of sound levels in dentistry. X axis represents gender ,Y axis represents individuals who responded yes (green) and who responded no (blue). Out of 100 participants, 23 responded no and 33 responded yes among females and 44 responded yes among males, Gender does have an influence on the general opinion and awareness.

Pearson's Chi square value : 23.469^a, DF: 1, P value= 0.000 (<0.05) and it was statistically significant

DISCUSSION:

The above pie chart depicts the percentage distribution of participants, Figure 1 represents the age group of participants, 21-24 age groups (27%), blue colour represents 18-20 (50%), brown colour represents 25-30 age groups (23%). Figure 2 represents the gender of the participants, where male (44%) and blue colour represents female (56%). Figure 3 represents awareness of the average sound level of humans, where 36% responded 80 dB, and 64% responded 60-70 dB. Compared with another article [34] concluded that all noise levels at the dental clinics were below 85 dB(A), The noise levels in the dental laboratories had much higher maxima, with some cutting activities, steam cleaning, and sandblasting up to 90 dB. Contrary to this. [35] Noise levels in a pediatric clinic approach the level of risk of hearing loss 85 dB(A) and conclude that it may have a serious effect on both providers and patients. Figure 4 represents awareness of sound level in dentistry. 77% responded yes and 23% responded no. Compared with the article. [36] they measured noise levels varied between 64 and 97 dB(A). The differences in sound levels when the equipment was merely turned on and during cutting operations and also between used and brand new equipment were recorded.

Figure 5 represents perception of exposure level constituting health risk. 77% responded yes and 23% responded no. [37] Noise levels in a pediatric clinic approach the level of risk of hearing loss [85 dB(A)]. This would have a serious effect on both providers and patients. Figure 6 represents awareness of the aerodynamic component of hand piece making noise. 73% responded yes and 27% responded no. Figure 7 represents awareness about the frequent eardrum damage to dentists. 90% responded yes and 10% responded no. [34] The results indicate that the dental professionals' noise sensitivity and job-performance drops are mainly affected by loudness of noise. Figure 8 represents the perception of getting irritated by noise in the clinic. 77% responded yes and 23% responded no.

Figure 9 represents the perception of new equipment used to lower noise. 77% responded yes and 23% responded no. [38] reported that the noise levels measured varied between 64 and 97 dB(A). The differences in sound levels when the equipment was merely turned on and during cutting operations and also between used and brand new equipment were recorded. Figure 10 represents awareness about higher noise emitted by dental turbines. 77% responded yes and 23% responded no. [39] who used audiometric recorders at ear level and at a 1m distance from the noise source. Sound level measurements ranged from 60 to 99 dB(A), with used equipment found to be noisier than new equipment.

Figure 11 represents awareness about hearing loss of dentists at an early age. 73% responded yes and 27% responded no. [40] From the results found in this study the noise exposure of the lecturers and students are never lower than 85 dB(A), in the best situations. Figure 12 represents awareness of the effects of suction pumps causing irritation to both practitioner and patient. Majority of 100% participants responded yes. Figure 13 represents the perception that measures in dental setup can reduce noise. 77% responded yes and 23% responded no. Figure 14 represents experience of hearing issues. 77% responded yes and 23% responded no. [41] Noise level was measured again after applying 4 different noise cancelling devices to the model ear. The noise level of dental handpieces was 82.5 - 84.4 dB. When 4 types of noise canceling devices were applied, the noise level reduced to 67.4 - 73.8 dB. All 4 devices had a statistically

significant effect in reducing the noise of the handpiece. Figure 15 represents usage of earplugs while working in a clinic. 67% responded yes and 33% responded no.

Fig 16 depicts a correlation graph between gender and awareness of sound levels in dentistry. Out of 100 participants, 47 responded 60-70 dB and 9 responded 80 dB among females and 17 responded 60-70 dB and 27 responded 80 dB among males, Pearson's Chi square value : 21.938^a, DF: 1, P value= 0.000 (<0.05) and it was statistically significant. Fig 17 depicts a correlation graph between gender and association between gender and opinion on the experience of facing hearing loss. Out of 100 participants, 23 responded no and 33 responded yes among females and 44 responded yes among males, Pearson's Chi square value : 23.469^a, DF: 1, P value= 0.000 (<0.05) and it was statistically significant.

CONCLUSION:

Occupational noise is unavoidably produced from dental equipment, building facilities, and human voices in the dental environment. Within the limits of study, sufficient awareness and knowledge about dental environmental noise among dental students. Dental students were aware about the sound levels and we conveyed them to use earplugs or sound less equipment in the clinic.

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CONFLICT OF INTEREST: Nil

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