International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

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AWARENESS ON AIR POLLUTION LINKED TO CARDIOVASCULAR SYSTEM AMONG DENTAL STUDENTS

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ABSTRACT

Air pollution is the major consideration problem throughout the world. Air pollution is a mixture of solid particles and gases in the air. Car emissions, chemicals from factories, dust, pollen and mold spores may be suspended as particles. The source of air pollution can be from various places like smoke from cars, smoke from factories etc. Air pollution may cause many diseases to humankind for example respiratory diseases, cancer and a lot of other related problems. The aim of this study is to determine the awareness level of air pollution linked to cardiovascular disease. Self-administered design was designed based on awareness of air pollution linked to cardiovascular to dental students. The questionnaire was distributed through an online google form. The study population included 125 dental students. Result was analyzed using SPSS software. The data was collected and analysed statically. From the responses obtained about 67.2% of the participants were aware of air pollution and about 45.6% of the participants were unaware that air pollution causes cardiovascular diseases, in association with the age and awareness level, the p value obtained was 0.000, statistically significant. From this study, many of the dental students are aware about air pollution linked to cardiovascular disease. This study may help the society to have a wide knowledge on air pollution thereby concentrating on their health and air pollution.

Keywords: Air pollution, cardiovascular disease, respiratory distress, dental students

1. INTRODUCTION

Air pollution is the major problem arising all over the world. Air pollution is caused by many kinds of pollutants like vehicles, factories etc. They are in particulate matter which form a pollutant in the air for a certain extent is bearable but when it goes beyond it is called air pollution and it may cause a lot of diseases to mankind, it may affect various systems in our body, CVS, the respiratory etc. Air pollution is the heterogeneous complex mixture of gases, liquids and particulate matter, studies have demonstrated a consistent increased risk of cardiovascular disease in relation to air-pollution, maybe it can be long-term or short-term exposure. There are many disorders of the cardiovascular system including chanced coagulation/thrombosis, a propensity for arrhythmia, acute arterial pressure, vasoconstriction, systemic inflammatory and the chronic promotion of atherosclerosis [1, 2]. The respiratory system may also be affected due to this which on chronic exposure to particulate has been associated with increased rate of bronchitis and other respiratory alignments with loss of lung function and with increased risk of lung cancer [3]. There is the increase in mortality rate and hospital admission due to the exposure of particulate matter of air, there is increased cardiovascular mortality in epidemiological studies. Persons with underlying heart disease appear to be an increased risk for the adverse health effects of particulate air pollution [4]. The association between air pollution and paediatric respiratory emergencies causes respiratory disorders [5].

Respiratory disorders are further subdivided into three categories: upper respiratory illness, lower respiratory illness and wheezing [6]. Administrative database have been studied by comparing regional motility statistical and regional air pollution concentration to case control for the design and found to be efficient for the study of infrequent events not to confronting the rates of SIDS in areas with high levels of air-pollution need to be compared with the rates in the region with lower levels because it is highly never SIDS to control for the many other potential personal risk factors of with that may differ according to religion and to avoid potential confounding [7] .The first AHA writing group concluded that the short-term exposure to particulate matter air pollution contributes to acute cardiovascular morbidity and mortality and long-term exposure to particulate matter can reduce life expectancy by a few years [7-9].

Accordingly, a person who is compromised with known or suspected cardiovascular disease, elderly, diabetic patient, pregnant women and those who have a pulmonary disease should be counselled to reduce the outdoor time for activities in air-pollution is high. This is done by recognising the insidious and pervasive nature of air-pollution, and the odds ratio associated and pollution attributed fraction for the widely underappreciated chemical trigger of acute cardiovascular events **[10]** . Previously our team has conducted numerous studies and reviews on upcoming topics **[5, 11-17]**.

Air pollution may be predisposed to the development and exacerbation of respiratory diseases, such as asthma, chronic obstructive pulmonary disease, lung cancer, there is generally less public awareness for its mortality and morbidity rates are cardiovascular diseases **[12]**. Air pollution exposure is the major problem worldwide and has been associated with CVS. Outdoor and indoor air pollution, which consist of a complex mixture of particulate matter, gases example CO, O_3, NO_2, SO_2 is increasingly recognised as a source of stimulus for cardiovascular diseases. Particulate matter is a mixture of suspended particles in the air that vary in chemical composition and size. They evidence that exposure to air pollution

is not only linked to pulmonary diseases but also mainly to cardiovascular diseases it is increasing **[13, 14]**. Inhaled particles regulate the nitric acid synthesis and affect autonomic dysfunction, with this mechanism affecting the cardiovascular system by elevating the BP **[15]**.

Ambient measurements for the levels of nitrogen oxide, CO or black carbon in the air is being highly related to traffic and health outcomes **[16]**. Over the last 15 years risk of cardiovascular disease is with respect to air-pollution is being studied and risk for respiratory diseases due to it very well documented of their pollutants, the air particulate matter which is present in ambient has become a major concern for cardiologist and specialised in environmental medicine due to its day-to-day increasing trend of mortality and morbidity rates **[17]**. Previously our team has conducted numerous studies and reviews on upcoming topics **[18, 19]**. Now we are focusing on an epidemiological survey. The idea for this survey steamed for the current interest in our community. The principal aim of the study is to spread awareness about air-pollution and its link to cardiovascular diseases among dental students.

2. MATERIALS AND METHODS

Self administrated questionnaire consisting of 15 questions was prepared and by an online setting called google docs and was distributed among dental students. The sample size was about 125 dental students. The questionnaire was validated in the standard manner. Measures such as selection of participants randomly, placing restrictions over the participant population and age groups are taken to minimise the bias occurring in sampling. The responses were recorded and the results of the analysis was represented in the form of a pie chart.The data collecting software used was the Survey Planet for descriptive statistics and SPSS version 20. A statistical software of SPSS version 20 and chi test where done and it was a descriptive statistics chart analysis was carried out with the response collected in the software and the results were represented using pie charts.
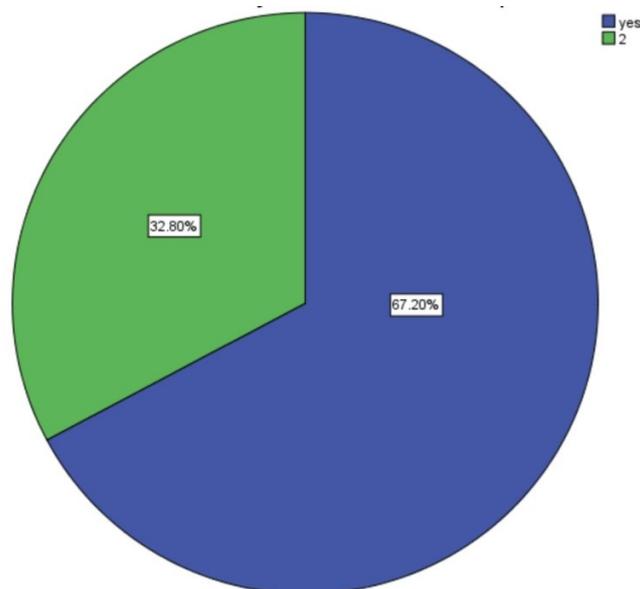
3. RESULTS & DISCUSSION

Figure 1: Pie Chart representing the percentage distribution of awareness about air pollution. Majority of participants 67.20% responded yes (blue) and 32.80% responded no (green).
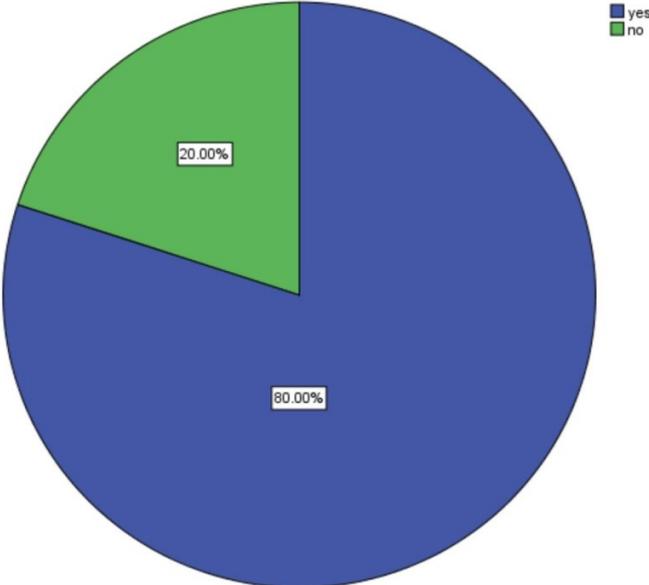
Figure 2: Pie Chart representing the percentage distribution of awareness of air pollution being India the world's largest single environmental health risk. Majority of participants 80% responded yes (blue) and 20% responded no (green).
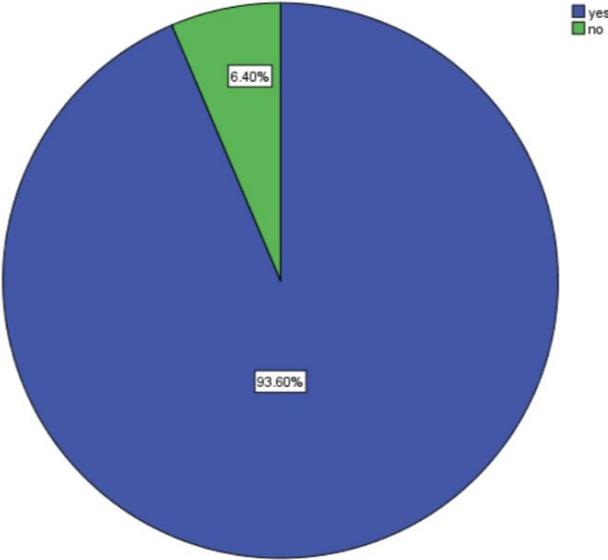

Figure 3: Pie Chart representing the percentage distribution of awareness of the effects of air outdoors and indoors. Majority of participants 93.60% responded yes (blue) and 6.40% responded no (green).
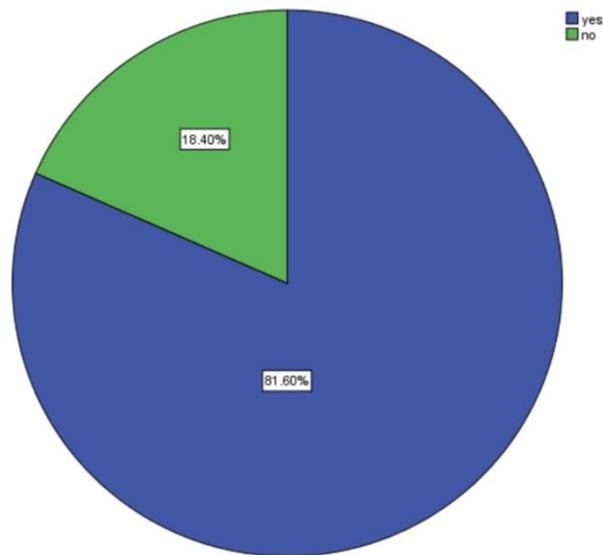
Figure 4: Pie Chart representing the percentage distribution of awareness of the effect on family's health. Majority of participants 81.60% responded yes (blue) and 18.40% responded no (green)
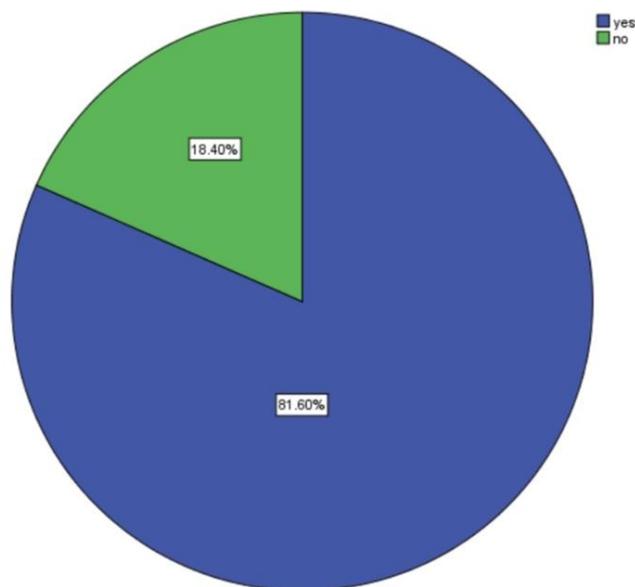

Figure 5: Pie Chart representing the percentage distribution of awareness of cardiovascular diseases. Majority of participants 81.60% responded yes (blue) and 18.40% responded no (green).
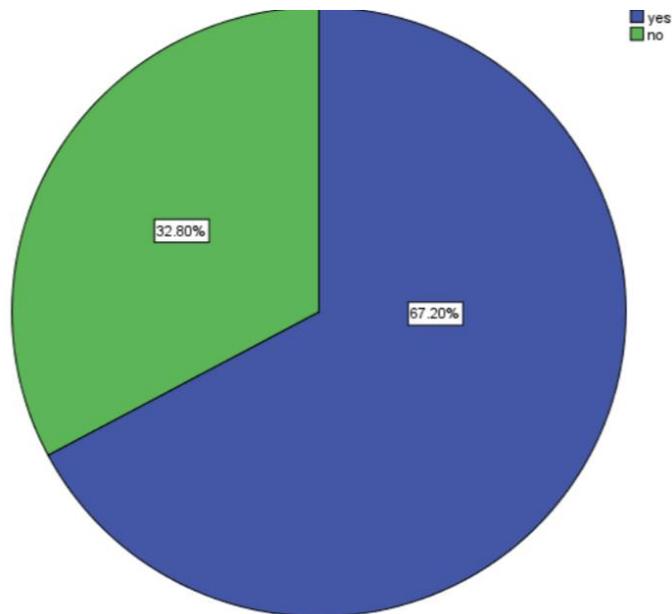
Figure 6: Pie Chart representing the percentage distribution of awareness of linking air pollution and cardiovascular disease. Majority of participants 67.20% responded yes (blue) and 32.80% responded no (green).
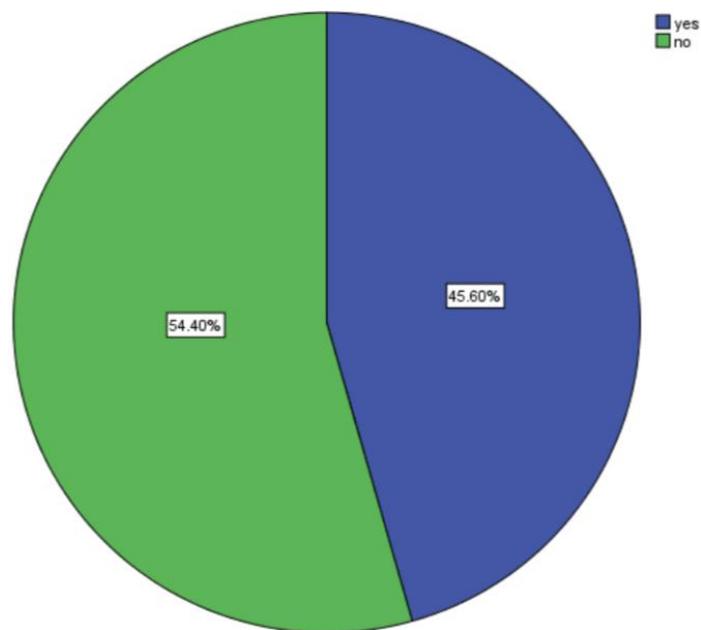

Figure 7: Pie Chart representing the percentage distribution of awareness of long term exposure to air pollution associated with cardiovascular disease. About 45.60% participants responded yes (blue) and majority 54.40% responded no (green).
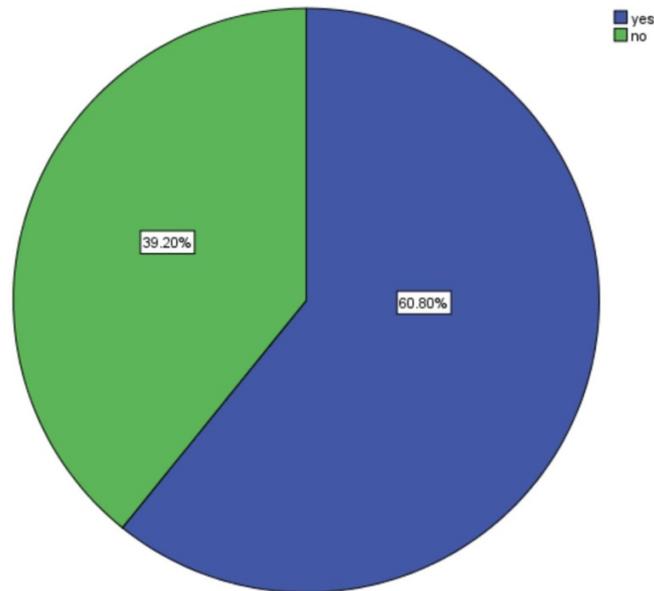
Figure 8: Pie Chart representing the percentage distribution of awareness of air pollution aggravating cardiovascular disease to severity of more diseases. Nearly 39.20% participants responded no (green) but the majority of 60.80% responded yes (blue)
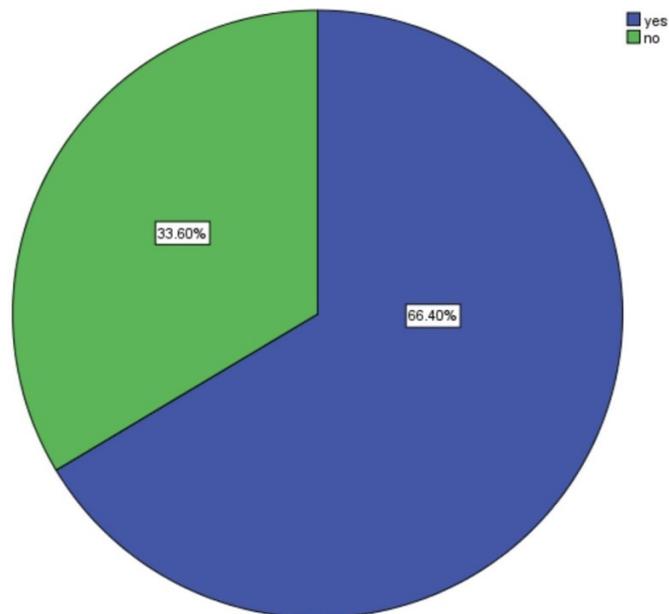

Figure 9: Pie Chart representing the percentage distribution of awareness that India stands as one of the highest in air pollution level. Majority of participants 66.40% responded yes (blue) and 33.60% responded no (green).
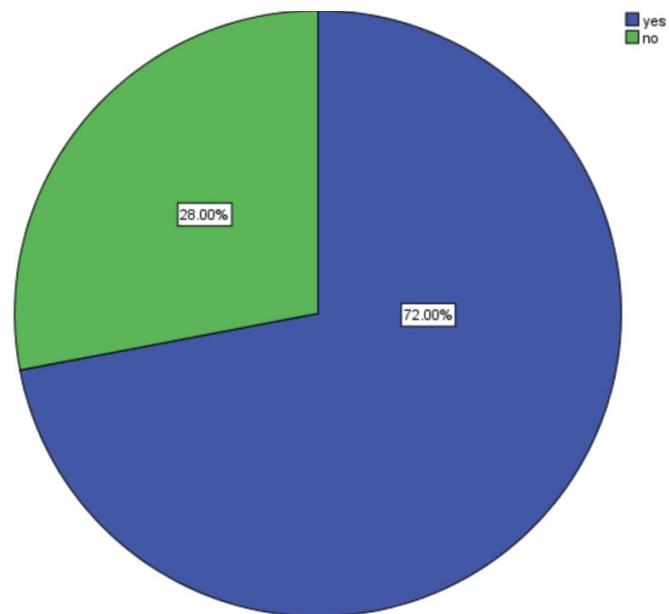
Figure 10: Pie Chart representing the percentage distribution of awareness of symptoms of cardiovascular diseases in regard with air pollution. Majority 72% participants responded yes (blue) and 28% responded no (green).
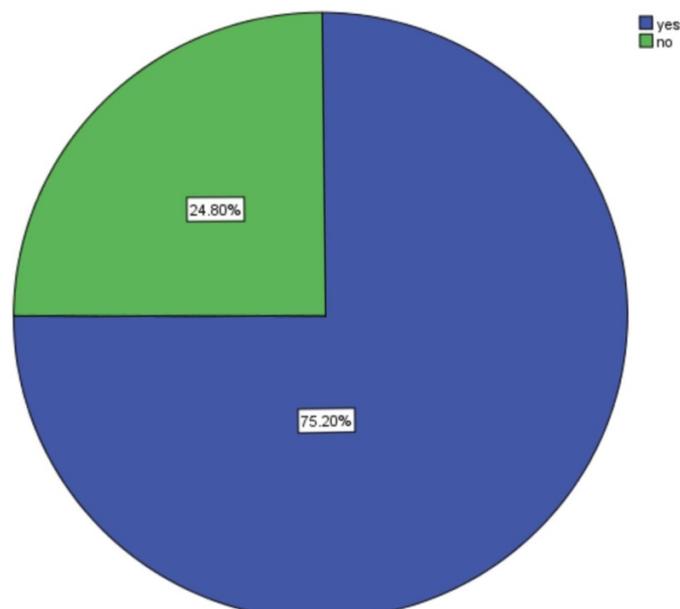

Figure 11: Pie Chart representing the percentage distribution of awareness that decreasing air pollution decreases the morbidity rate. Majority of participants 75.20% responded yes (blue) and 24.80% responded no (green).
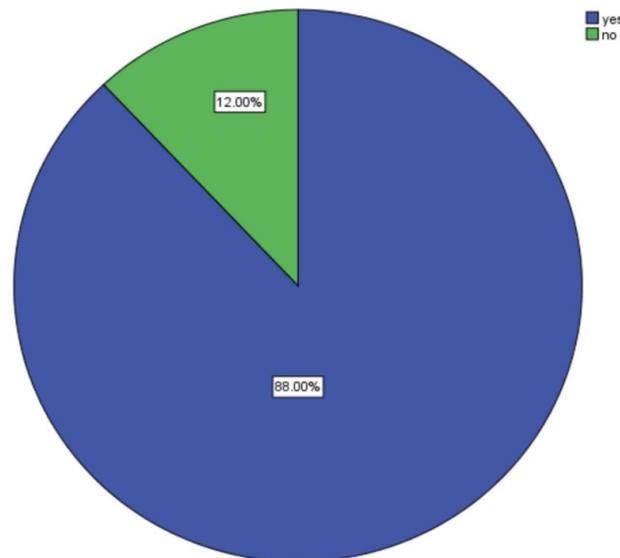
Figure 12: Pie Chart representing the percentage distribution of experience of discomfort while in a traffic jam. Majority of participants 88% responded yes (blue) and 12% responded no (green).
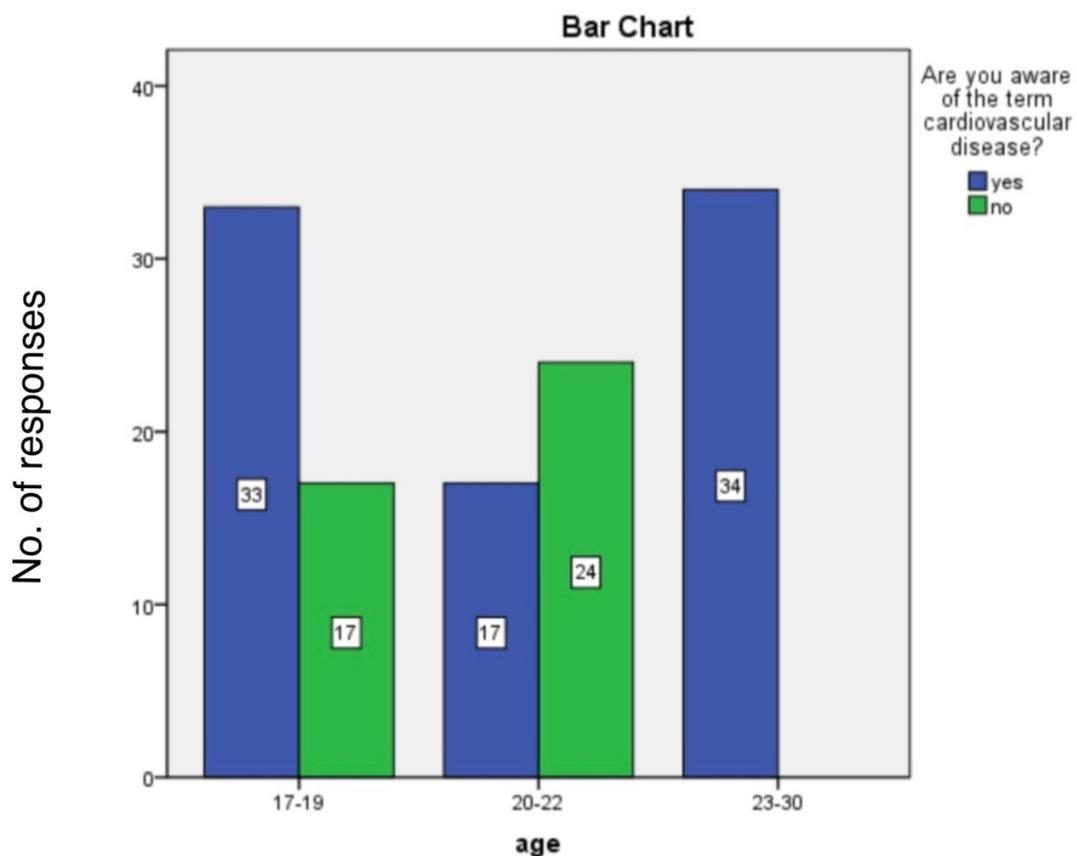
Figure 13: Bar chart represents the association between age and opinion on whether they are aware about cardiovascular disease. X axis represents the age and Y axis represents the individual opinions on who are aware (blue) and not aware (green). Out of the 84 participants who were aware, 23-30 years age group were more aware than other age group participants. Pearson's chi square value: 28.949, DF- 2, P value = 0.000(<0.05), statistically significant.

Figure 14: Bar chart represents the association between age and opinion on whether they are aware of air pollution as the world's largest environmental health risk. X axis represents the age and Y axis represents the individual opinions on who are aware (blue) and not aware (green). Out of 100 participants who were aware, 17-19 age groups were more aware about air pollution as the world largest environmental health risk than other age groups. Pearson's Chi Square value: 20.805 DF- 2 P value = 0.000(<0.05), statically significant.
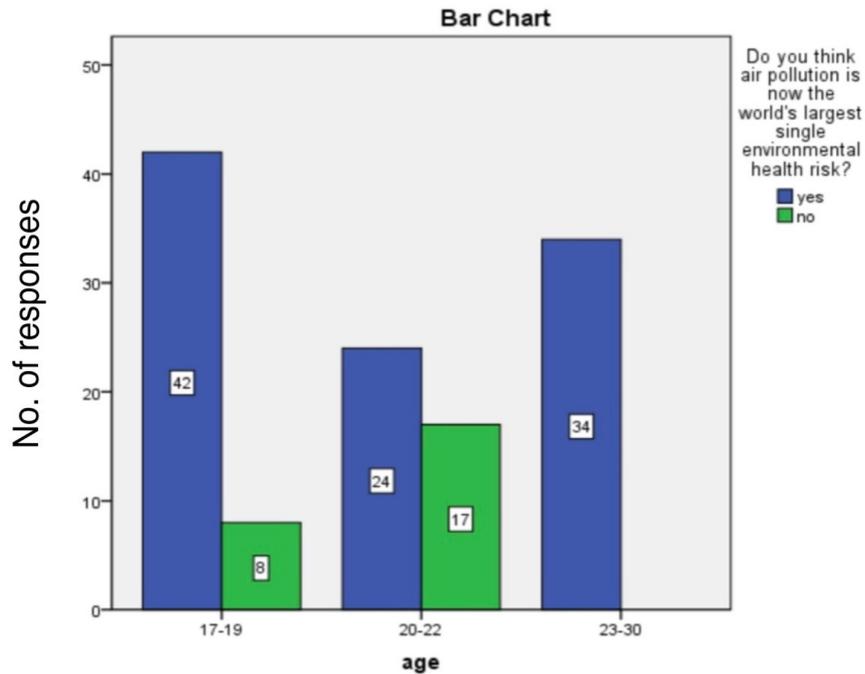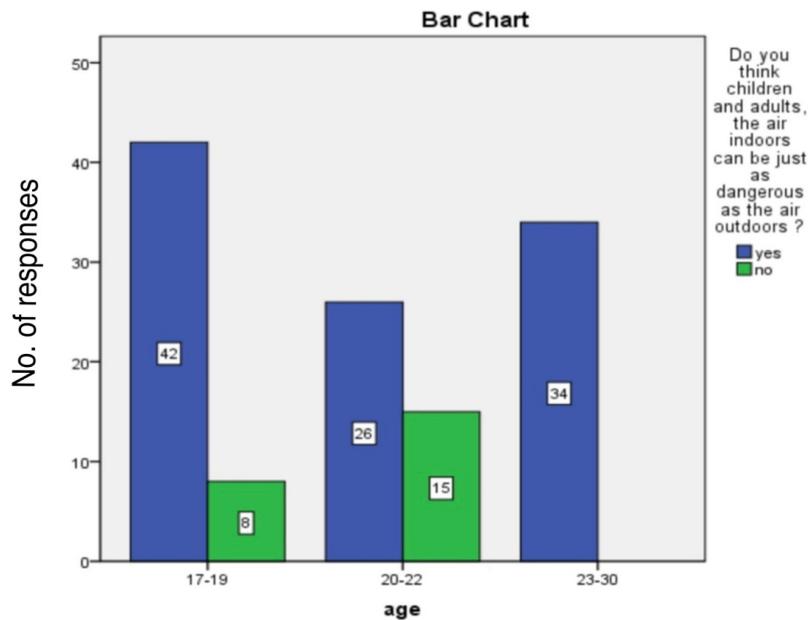

Figure 15: Bar chart represents the association between age and opinion on whether they are aware of children and adults differentiating the air indoors and outdoors. X axis represents the age and Y axis represents the individual opinions on who are aware (blue) and not aware (green). Out of 102 participants who were aware, 17-19age group were more aware than other age groups. Pearson's chi square value: 16.889, DF: 2, P value = 0.000(<0.05), statistically significant.
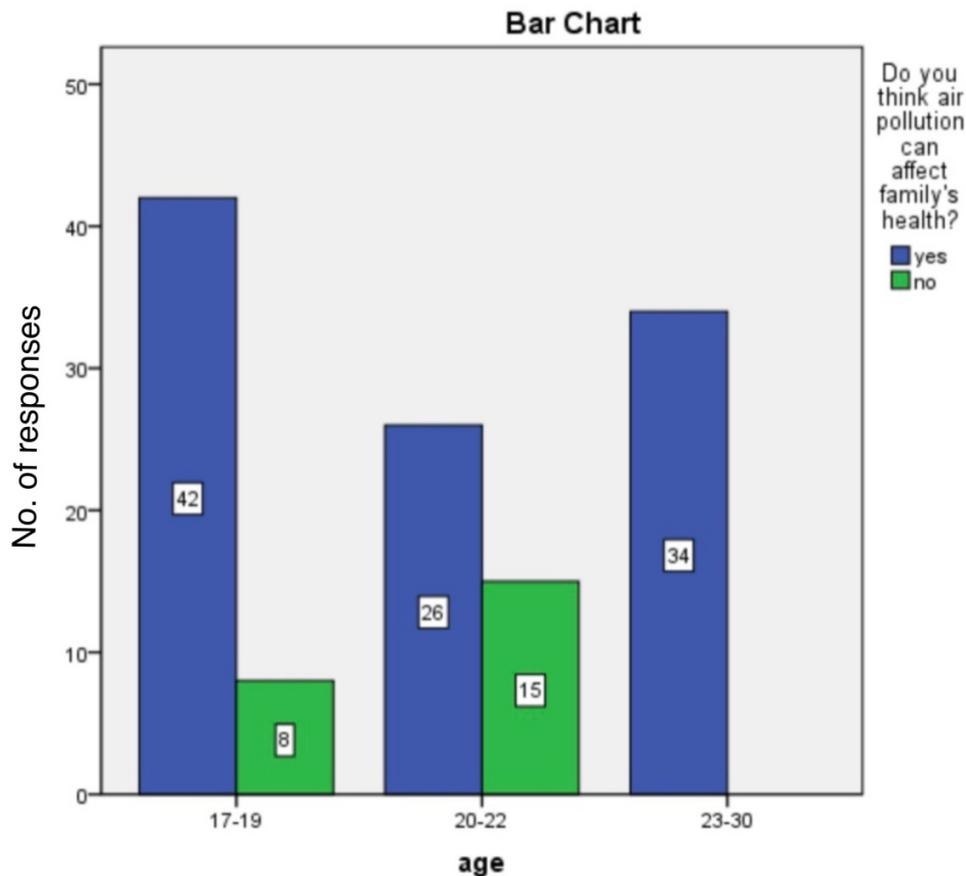
Figure 16: Bar chart represents the association between age and opinion on whether they are aware of air pollution affecting family's health.X axis represents the age and Y axis represents the individual opinions on who are aware (blue) and not aware (green). Out of 102 participants who were aware, 17-19 age groups were more aware than other age groups. Pearson's chi value: 16.889, DF: 2, P value= 0.000(<0.05), statistically significant.

In the present study, 67.2% of the population are aware of air pollution and the remaining 32.8% are unaware about it **(Figure 1)**. 80% of the participants agreed that air pollution is an environmental health risk and 20% of the participants responded no **(Figure 2)**. This result was similar to the previous literature **[20]**. 81.6% of participants responded that air indoor and outdoor pollution is harmful but 18.4% not agreed **(Figure 3)**. This statement was agreed with existing studies **[13, 20]**.

81.6% of participants responded that air pollution affects family health and 18.4% responded no **(Figure 4)**. 67.2% responded that they were aware of cardiovascular diseases and 32.8% respondent no **(Figure 5)**. 45.6% agreed that air-pollution effects on cardiovascular diseases and remaining 54.4% were unaware **(Figure 6)**. 60.8% of the population responded that long term exposure develops cardiovascular disease and 39.2% disagreed that **(Figure 7) [21]**.

66.4% of the people responded to the aggravation of security for more reasons to air-pollution and 33.6% answered no **(Figure 8) [22]**. India being the highest air-pollution state for this question, 60.8% answered yes and 39.2% and said no **[23] (Figure 9)**. 75.2% participants were aware of the cardiovascular symptoms and the remaining 28% responded were unaware **(Figure 10)**. 72% participants were aware about decrease in pollution it will decrease morbidity and 28%were unaware **(Figure 11)**. 88% participants have experienced severe discomfort during traffic jams and 12% have not experienced **[16] (Figure 12)**. Bar chart represents the association between age and opinion on whether they are aware about cardiovascular disease. 33 answered yes and 17 responded no in the age group of 17-19, 17 responded yes and 24 responded no in the age group 20-22 and in the age group of 23-30 responded, all answered yes **(Figure 13)**. 42 answered yes, 8 responded no in the age group of 17-19. 24 responded yes and 17 responded no in the age group, in the age group 23-30, all 34 responded yes **(Figure 14)**. 42 responded yes, 8 responded no in the age group of 17-19, 26 responded yes and 15 responded no in the age group 20-22 and in the age group 23-30 all answered yes **(Figure 15)**. 42 responded yes, 8 responded no in the

age group of 17-19. 26 responded yes, 15 responded no in the age group 20-22. In the age group of 23-30, all 34 responded yes **(Figure 16)**.

4. CONCLUSION

Air pollution is the major problem occurring worldwide. Air-pollution causes many disorders like atherosclerosis, pulmonary diseases and cardiovascular diseases. This study has taken to give awareness about air pollution linked to the cardiovascular system. The study has focused on focusing on the decreasing adverse effects of air-pollution on the cardiovascular system and spreading awareness to dental students about how air-pollution affects cardiovascular systems and human health.

5. ACKNOWLEDGEMENT

6. CONFLICT OF INTEREST

All the authors declare no conflict of interest in the study.

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