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A LEGAL STUDY ON AIR POLLUTION IN CHENNAI AND THE EFFECTIVENESS OF THE AIR (PREVENTION AND CONTROL) ACT, 1981

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ABSTRACT

Air pollution is a global environmental concern with significant consequences for public health and the environment. The increasing concentration of harmful pollutants in the atmosphere has resulted in severe consequences for human health, ecological balance, climate conditions, and overall quality of life. Major urban centres in India are witnessing alarming levels of air pollution due to rapid industrial growth, urban expansion, rising vehicular emissions, construction activities, burning of fossil fuels, and improper waste management practices. The Air (Prevention and Control) Act of 1981 in India was enacted to combat air pollution and protect the well-being of citizens. This study aims to assess the effectiveness of the Air Act, 1981, in mitigating air pollution in Chennai, one of India's major metropolitan areas known for its air quality challenges. The main objective of the study is to examine the causes and remedies to tackle the air pollution in Chennai. The research follows an empirical research through convenient sampling methods with a total sample size of 203, including data analysis of air quality parameters, legal analysis of the Air Act, 1981, and surveys to gauge public awareness and compliance. It also evaluates the implementation of pollution control measures, regulatory bodies' effectiveness, and the impact of policy interventions on air quality. Findings indicate that while the Air Act, 1981, provides a robust legal framework, challenges related to enforcement, public awareness, and resource allocation persist. The study underscores the importance of strengthened enforcement mechanisms, increased public awareness, and collaborative efforts between government agencies, industries, and the community to effectively combat air pollution in Chennai. The research contributes to the broader understanding of environmental policy effectiveness in addressing air pollution and offers valuable insights for policymakers, environmental agencies, and stakeholders to refine strategies and regulations for cleaner air in Chennai and beyond.

KEYWORDS: Air , Pollution, Negligence, Accountability, Electric Vehicles, Right to live.

INTRODUCTION

Air pollution is said to be caused when the composition or the quality of air has been altered by an external agent.These pollutants can be in the form of gases, particles, or biological molecules and can have adverse effects on human health, the environment, and ecosystems. Air pollution can occur both indoors (indoor air pollution) and outdoors (outdoor air pollution). Outdoor air pollution typically arises from various sources like industrial emissions, vehicle exhaust, power generation, agricultural activities, and natural events such as wildfires or volcanic eruptions. These sources release pollutants such as carbon monoxide (CO), sulphur dioxide (SO2), nitrogen oxides (NOx), particulate matter (PM), volatile organic compounds (VOCs), and

hazardous air pollutants (HAPs). The Air (Prevention and Control of Pollution) Act, 1981 in India that deals with the prevention, control, and abatement of air pollution. It empowers the central and state pollution control boards to enforce measures for preventing and controlling air pollution. This act provides guidelines for setting emission standards, regulating industrial and vehicular emissions, and managing air quality in specified areas. The Factors affecting the topic-influencing air quality in Chennai include the Industrial Emissions, Vehicular pollution, Construction and Dust, Waste Burning and Landfills, Coastal Geography. Chennai is an industrial hub with a significant number of factories and industrial units. Emissions from these industries, including chemicals, particulate matter, and gases, contribute to air pollution in the city. Chennai also faces various challenges related to vehicular pollution. The increasing number of vehicles on the roads, outdated vehicle technologies, and traffic congestion contribute to high levels of pollutants such as carbon monoxide, nitrogen oxides, and particulate matter. The general trends and recent developments related to the Air Act up until that time includes Strengthening Emission Standards, Air Quality Monitoring and Reporting. There has been a growing emphasis on updating and strengthening emission standards for various sources of pollution, including industries and vehicles. There has been an increased focus on monitoring and reporting air quality levels across different regions in India. National Clean Air Programme (NCAP) was launched in January 2019 which is a comprehensive program with the goal of reducing particulate pollution by 20-30% across 102 Indian cities by 2024. The program emphasises city-specific action plans, strengthening monitoring and enforcement mechanisms, and promoting collaborative efforts among central and state agencies. Significant laws related to air pollution prevention in the United States include The Clean Air Act which is a primary federal legislation governing air pollution control in the United States. It was first enacted in 1970 and has undergone subsequent amendments. The act empowers the Environmental Protection Agency (EPA) to establish and enforce regulations to limit and reduce air pollutant emissions from various sources, including industrial facilities, power plants, vehicles, and other sources. It sets national ambient air quality standards, regulates hazardous air pollutants, and requires states to develop implementation plans to achieve and maintain air quality standards. Under the Clean Air Act, the EPA establishes NAAQS for six criteria pollutants, which are carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulphur dioxide, and lead. These standards set maximum allowable concentrations of these pollutants in outdoor air to protect public health and welfare. The main aim of this research is to study the Air Act,1981 and its effectiveness in Chennai.

OBJECTIVES

- To find effective remedies to reduce air pollution in Chennai
- To analyse the causes of air pollution in Chennai
- To examine the effectiveness of The Air Act, 1981 with respect to Chennai
- To understand the challenges faced in reducing air pollution in Chennai

REVIEW OF LITERATURE

1. **Badami, M.G. The** rapid growth of motor vehicle activity in India and other rapidly industrialised poor countries contributes to high levels of urban air pollution, among other negative socioeconomic, environmental, health and welfare impacts. This article first discusses the local, regional and global impacts of motor vehicle-related air pollutant emissions and the technological, behavioural and institutional factors that have contributed to these emissions in India.

2. **Ravishankara, A.R** In the cities of developing countries, outdoor air pollution has appeared in recent years, mainly caused by particles with a diameter of less than 2.5 μm (PM2.5). This leads to millions of premature deaths. Outdoor air pollution was also seen mainly as a problem in cities. We use satellite-based boundaries to divide India's population into urban and non-urban areas consistent with census data.
3. **Ravindra, K., Sidhu, M.K** This paper centres on the Indian situation as a case ponder and presents the current status of discussing quality in India with uncommon reference to particulate matter. The idea proposes that air-quality systems be created that can portray and figure contamination levels with wellbeing advisories for open and for contamination crisis measures.
4. **Rao, N.D., Kiesewetter** The evidence indicates that lower-income households bear a greater burden of mortality risk resulting from indirect sources. According to this observation, the implementation of pollution controls across industries could potentially minimise the disparities in the effects of ambient air pollution.
5. **Jindal, Surinder K** Respiratory diseases can be easily prevented by addressing household air pollution, a widespread risk factor. The most effective intervention to reduce the burden of HAP related diseases is likely to be the replacement of solid cooking fuels with clean fuels like LPG gas, as demonstrated by India's 'Ujjwala' program.
6. **Shehzad, K., Sarfraz, M** The reputed states of India, namely Delhi and Mumbai, experienced a substantial decrease in Nitrogen Dioxide levels, according to the study. In addition, there is a faint trace of Nitrogen Dioxide visible along the Maritime route in the Indian Ocean. Improving the environmental quality in India would have positive effects on its neighbouring countries, namely China, Pakistan, Iran, and Afghanistan.
7. **Guttikunda, S.K** This text provides an overview of emission sources and control options aimed at improving air quality in Indian cities. The focus is specifically on interventions such as urban public transportation facilities, travel demand management, emission regulations for power plants, clean technology for brick kilns, road dust management, and waste management to prevent open waste burning. In order to construct a successful air quality management plan in Indian cities, it is imperative to consider suggestions such as public awareness and scientific studies.
8. **Guttikunda, S.K., Nishadh, K.A** With a population of 22 million (making up 1.6% of the national total), Delhi stands as one of the most polluted capital cities worldwide. Approximately half of the published literature in India is dedicated to examining air pollution in Delhi. In addition to the capital city, the impact of air pollution extends beyond its boundaries. Despite the fact that Tier 1 and Tier 2 cities make up more than 30% of India's population, there is currently limited information and efforts to measure the impacts they have.
9. **Holian, M.J** By utilising the resulting estimates, one can conduct tests to investigate the impact of income, literacy, population, and other variables on four specific air pollution measures, namely sulphur dioxide, nitrogen dioxide, and two different measures of particulate matter. In our analysis, after considering various factors, we

discovered that the connection between social and economic progress and pollution differs depending on the type of pollution and development indicators. Specifically, we observed a decrease in particulate matter with higher income levels, no apparent link between income and sulphur dioxide emissions, and a rise in nitrogen dioxide emissions as income increases.

10. **Kumar, K., Pande, B.P** This study examines six years of air pollution data from 23 cities in India to analyse and predict air quality. The dataset has undergone effective preprocessing and important features have been chosen based on correlation analysis. An exploratory data analysis is conducted to uncover hidden patterns within the dataset, revealing pollutants that directly impact the air quality index. In the year 2020, a substantial decrease in nearly all pollutants was noted, stemming from the effects of the pandemic.

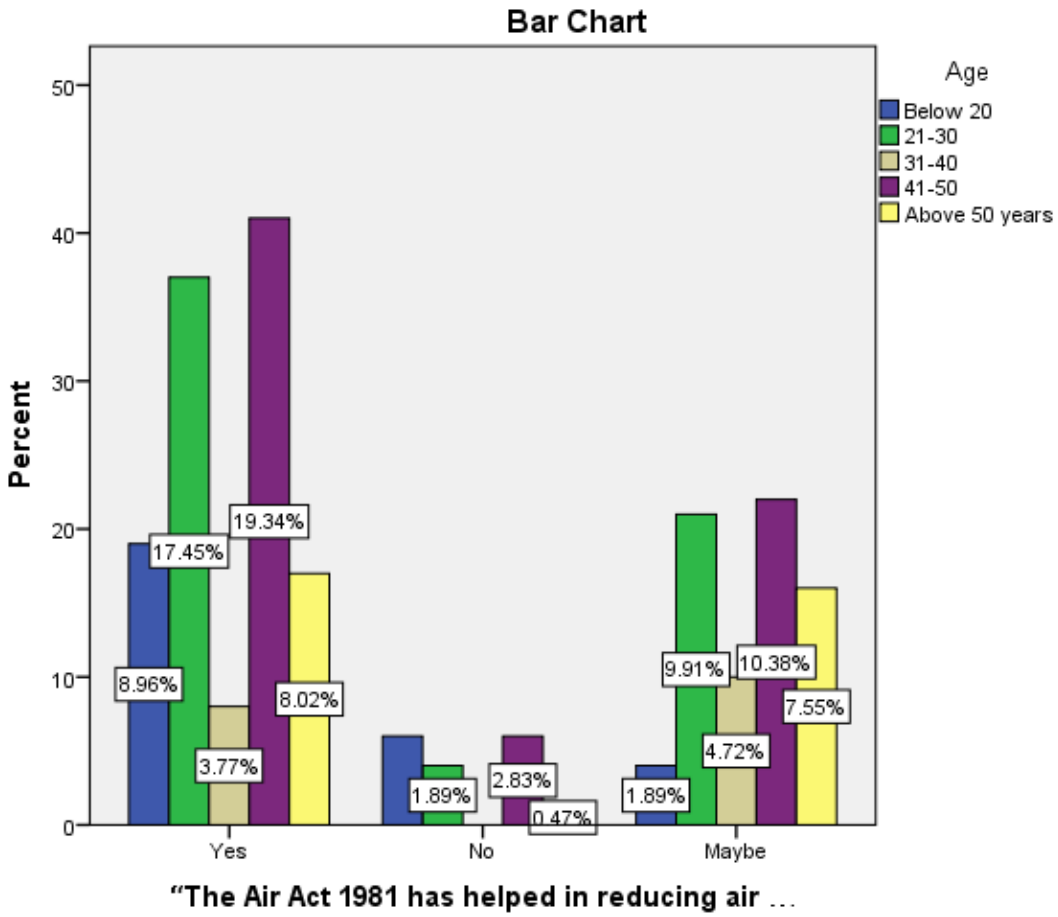
METHODOLOGY

The research method employed was empirical research. The sampling method employed was a convenient sampling technique. The research includes a total of 203 samples in its sample size. The collection of the sample frame took place within a public vicinity and its surrounding vicinity of Poonamallee, Chennai. Age, gender, occupation, educational qualifications, and marital status served as the independent variables in this study. The dependent variables include challenges, the implementation of the act, and remedies for controlling air pollution. The research employs clustered bar charts as the statistical tool.

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ANALYSIS

Figure: 1



LEGEND: The figure shows the age distribution pertaining to the Statement "The Air Act 1981 has helped in reducing air pollution".

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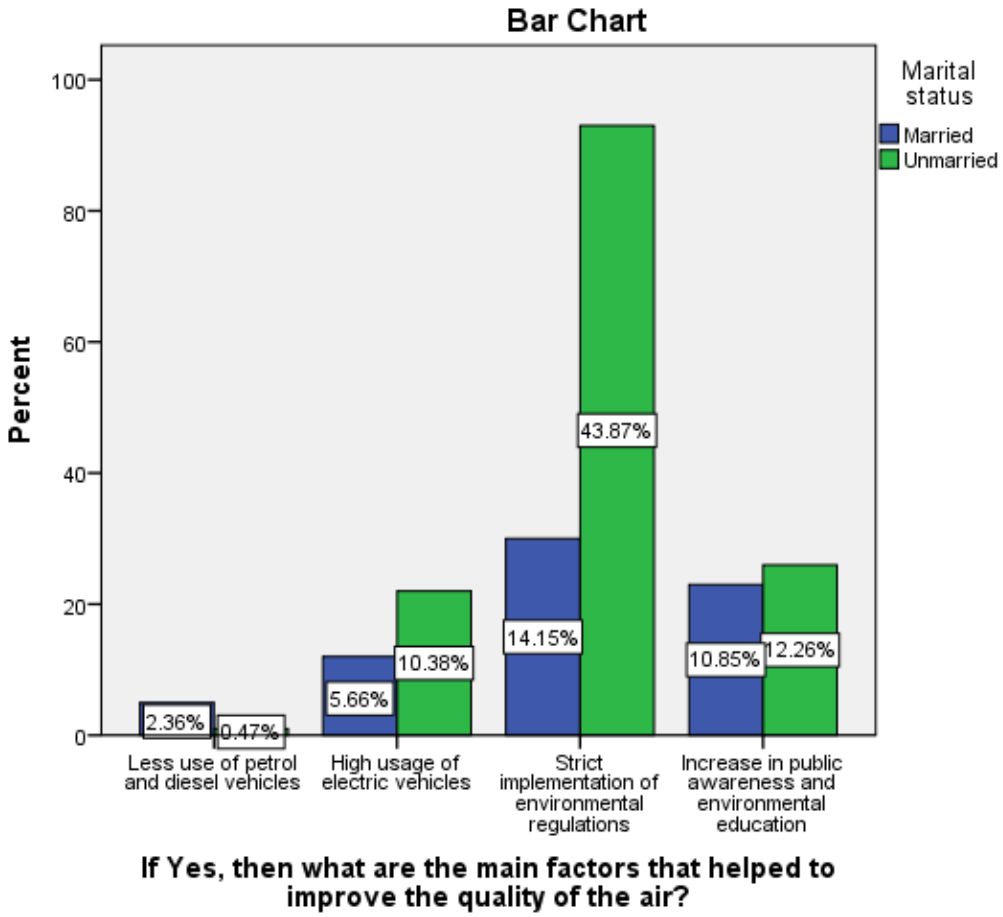
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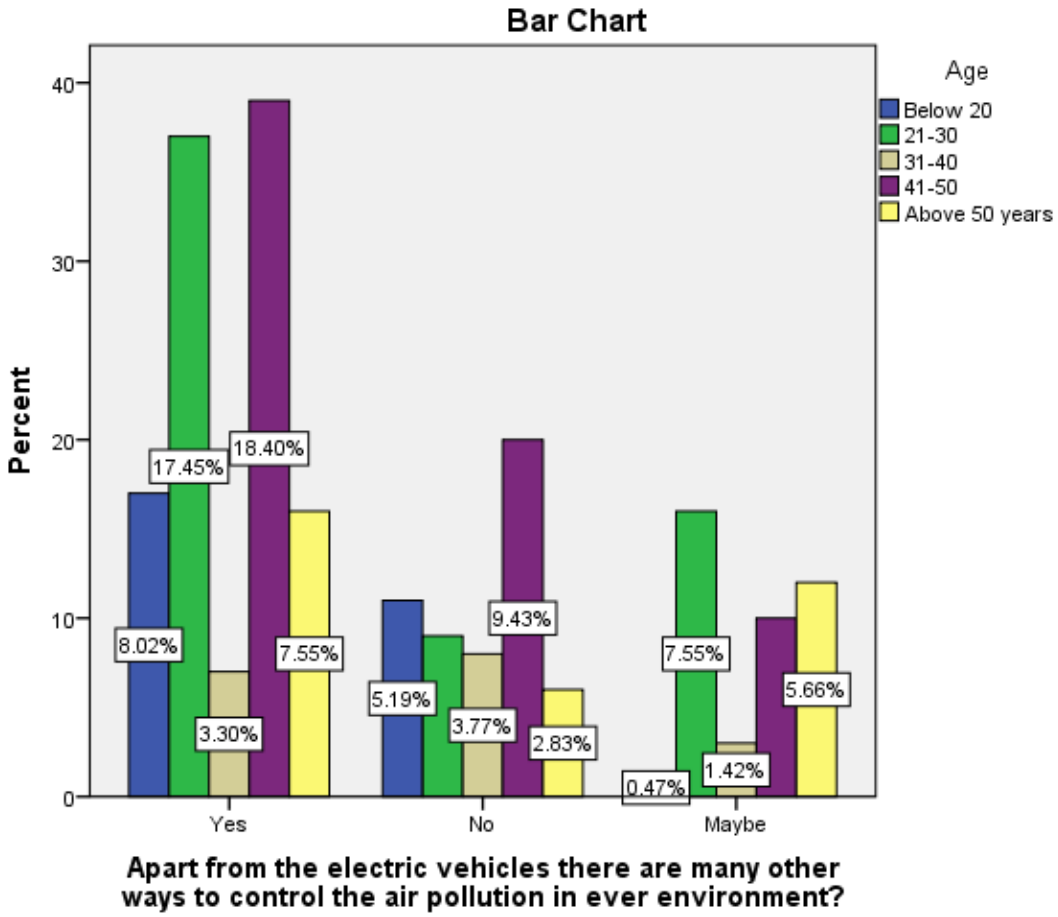
Figure: 2



LEGEND: The figure shows the marital status pertaining to the Statement If yes, then what are the main factors that helped to improve the quality of the air.

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Figure: 3



LEGEND: The figure shows the age distribution pertaining to the "Apart from the electric vehicles there are many other ways to control the air pollution in every environment" .

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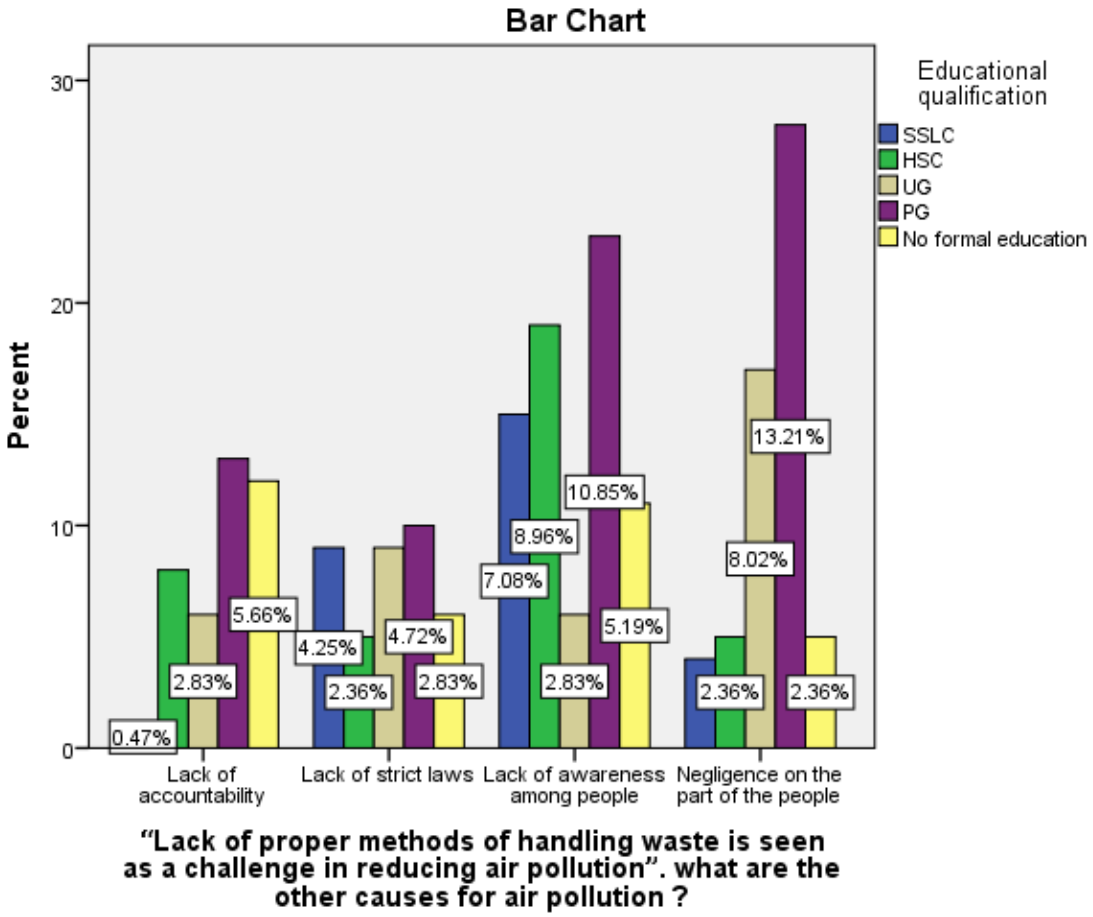


Figure:4

LEGEND: The figure shows the educational qualification pertaining to the statement "Lack of proper methods of handling waste is seen as a challenge in reducing air pollution". What are the other causes for air pollution ?

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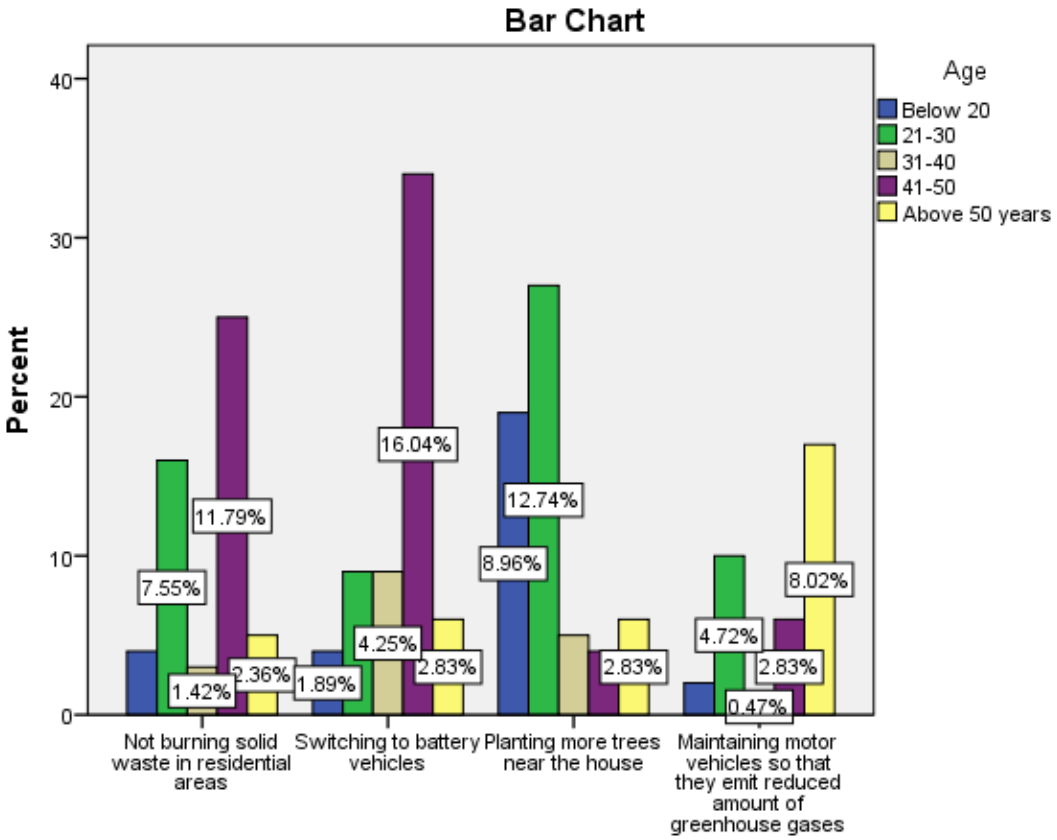
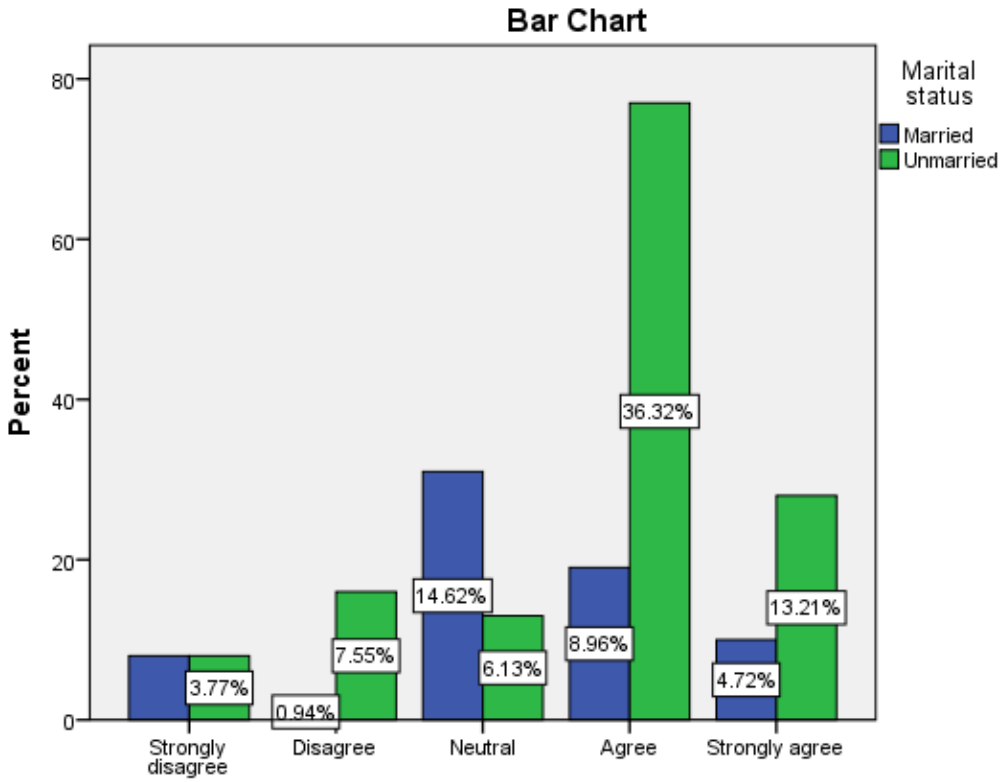


Figure:5

LEGEND: The figure shows the age distribution pertaining to the "Which of these remedies would you consider as an effective remedy to tackle air pollution in Chennai".

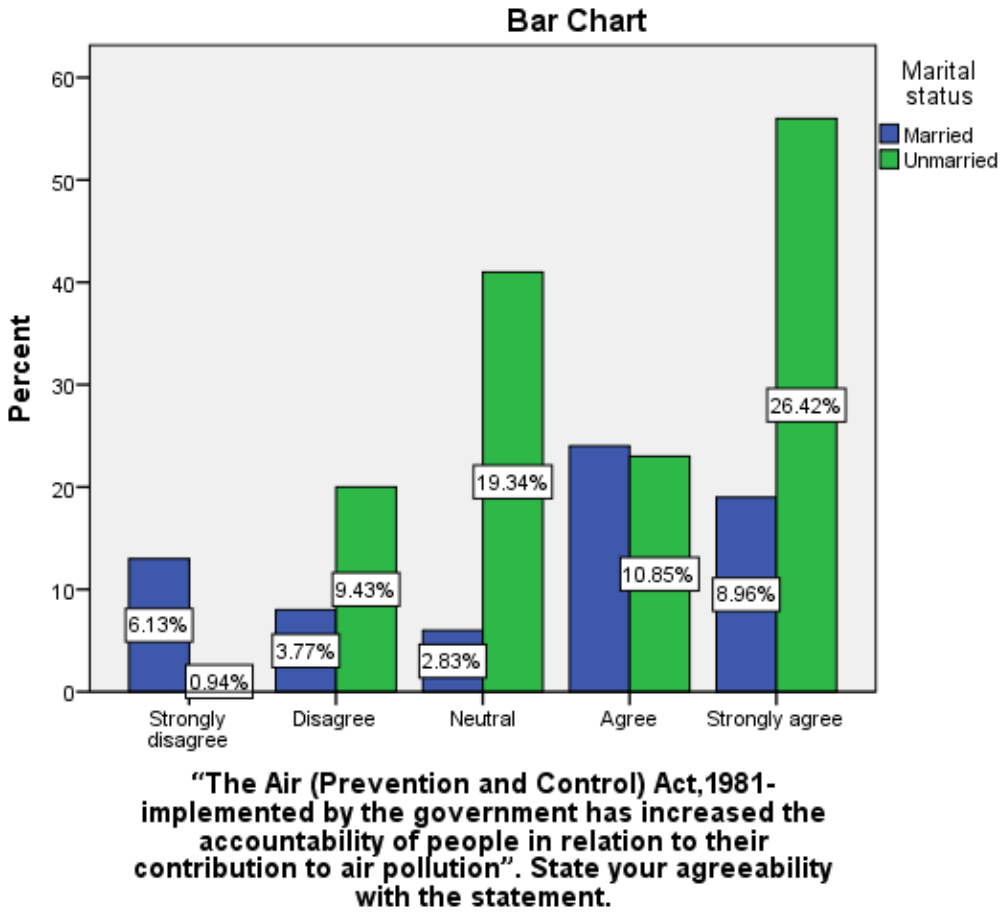
Figure:6



"Air pollution can affect lung development and also cause cardiac problems".It is the duty of the government to ensure that it's people are cared for. State your agreeability with the statement.

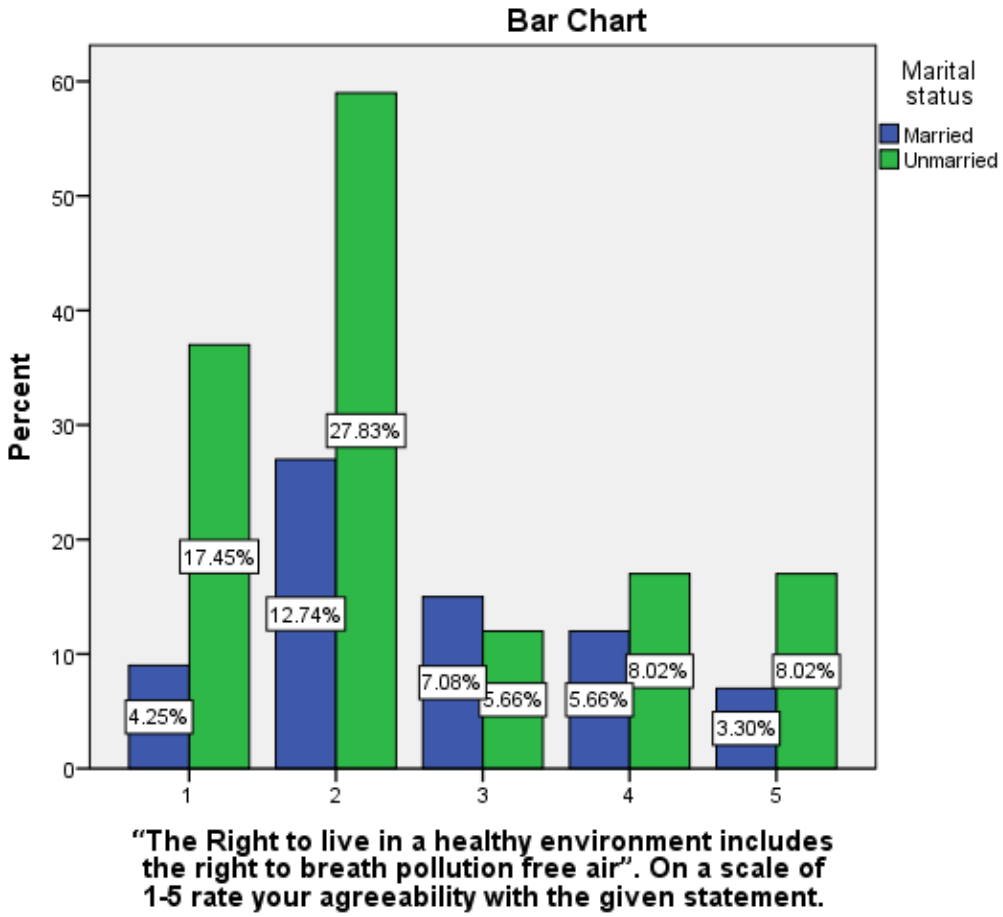
LEGEND: The figure shows the marital status pertaining to the "Air pollution can affect lung development and also cause cardiac problems".It is the duty of the government to ensure that its people are cared for.

Figure:7



LEGEND: The figure shows the marital status pertaining to the statement "The Air (Prevention and Control) Act,1981-implemented by the government has increased the accountability of people in relation to their contribution to air pollution".

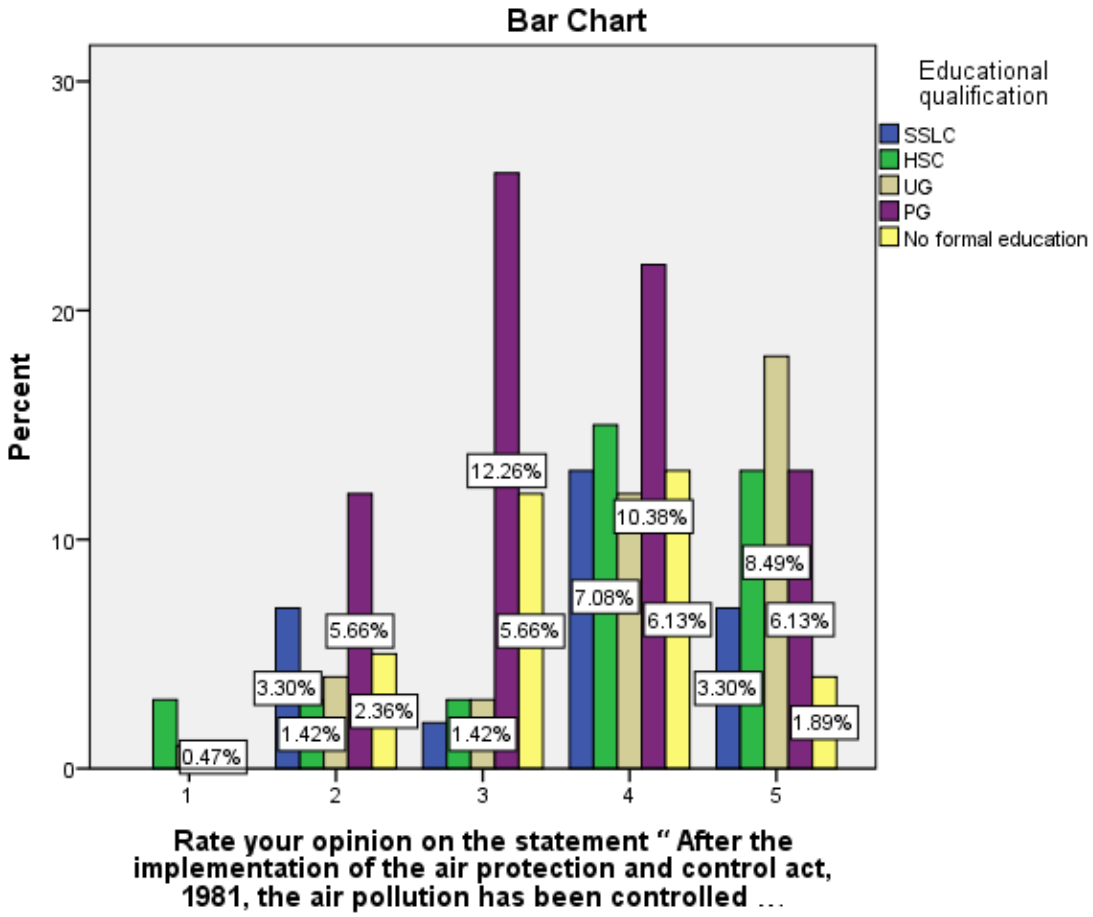
Figure:8



LEGEND: The figure shows the marital status pertaining to the statement "The Right to live in a healthy environment includes the right to breath pollution free air".

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Figure:9



LEGEND: The figure shows the educational qualification pertaining to the statement " After the implementation of the air protection and control act, 1981, the air pollution has been controlled massively".

RESULTS

In **(figure 1)** 19.34% of age group 41 to 50 say Yes and 9.91% of age group 21 to 31 says Maybe to the statement "The Air Act 1981 has helped in reducing air pollution". In **(figure 2)** 43.87% of unmarried say strict implementation of environmental regulations and 5.66% of married say high usage of electric vehicles to the question "if yes, then what are the main factors that helped to improve the quality of the air". In **(figure 3)** 18.40% of the age group 41-50 and 17.45% of the age group 21-30 say Yes and 3.77% of the age group 31-40 say No to the "Apart from the electric vehicles there are many other ways to control the air pollution in every environment". In **(figure 4)** 13.21% of PG students say negligence on the part of the people and 2.83% of UG students say lack of accountability to the statement "Lack of proper methods of handling waste is seen as a challenge in reducing air pollution". What are the other causes for air pollution? In **(figure 5)** 16.04% of the age group 41-50 say switching to battery vehicles and 12.74% of the age group 21-30 say planting more trees near the house to the question "Which of these remedies would you consider as an effective remedy to tackle air pollution in Chennai". In **(figure 6)** 36.32% of Unmarried people agree and 14.62% of married people say neutral to the statement "Air pollution can affect lung development and also cause cardiac problems". In **(figure 7)** 26.42% of the Unmarried say strongly agree and 6.13% of the married say strongly disagree with the statement "The Air (Prevention and Control) Act,1981-implemented by the government has

increased the accountability of people in relation to their contribution to air pollution". In **(figure 8)** 27.83% of Unmarried peoples rated 2 and 3.30% of married peoples rated 5 to the statement "The Right to live in a healthy environment includes the right to breath pollution free air". In **(figure 9)** 12.26% of the PG students rated 3 and 8.49% UG students rated 5 to the statement " After the implementation of the air protection and control act, 1981, the air pollution has been controlled massively".

DISCUSSION

In(Figure 1) A notable disparity exists between age groups, with 19.34% of individuals aged 41 to 50 affirming the positive impact of the Air Act, while only 9.91% of those aged 21 to 31 express uncertainty. This suggests a generational difference in perceptions about the Act's effectiveness. **In (Figure 2)** Unmarried individuals, constituting 43.87%, overwhelmingly acknowledge the strict implementation of environmental regulations as a crucial factor in improving air quality. Conversely, only 5.66% of married individuals attribute air quality improvement to high electric vehicle usage, indicating diverse opinions among marital status groups. **In (Figure 3)** Respondents aged 41-50 (18.40%) and 21-30 (17.45%) recognize the presence of alternative methods beyond electric vehicles for controlling air pollution. However, a smaller percentage (3.77%) of individuals aged 31-40 express scepticism, emphasising the need for tailored strategies for different age cohorts. **In (Figure 4)** PG students (13.21%) emphasise negligence, while UG students (2.83%) highlight lack of accountability regarding waste management challenges. These findings underscore the importance of education in raising awareness about the sources and consequences of air pollution. **In (Figure 5)** Preferences for solutions vary, with 16.04% of those aged 41-50 favouring battery vehicles and 12.74% of individuals aged 21-30 advocating for planting more trees. These results indicate a diverse range of opinions on effective remedies, emphasising the need for multifaceted approaches. **In(Figure 6)** A substantial 36.32% of unmarried individuals acknowledge the health risks associated with air pollution, whereas 14.62% of married respondents remain neutral. This suggests a stronger awareness among unmarried individuals regarding the health implications of air pollution. **In(Figure 7)** Attitudes toward the Air Act's impact on individual accountability reveal a divide, with 26.42% of unmarried respondents strongly agreeing, while 6.13% of married individuals strongly disagree. This disparity highlights the differing perceptions of the Act's effectiveness in promoting accountability among different marital status groups. **In (Figure 8)** Unmarried individuals (27.83%) emphasise the right to a pollution-free environment, while a smaller proportion of married individuals (3.30%) rate this aspect highly. This underscores the varying importance placed on environmental rights among different demographic segments. **In(Figure 9)** Perception of the Act's impact on air pollution control varies among educational levels, with 12.26% of PG students and 8.49% of UG students expressing confidence in its effectiveness. These findings indicate a need for targeted educational initiatives to enhance understanding of legislative measures.

LIMITATIONS OF THE STUDY

A significant restriction of the study lies within the sample frame. The sample frame is significantly limited due to its small scope. Hence, it becomes challenging to apply this to a broader demographic. An additional constraint lies in the sample size, as it does not provide sufficient grounds to make assumptions about the overall thoughts of the entire population residing in a specific country, state, or city. The study is limited due to the greater impact of the physical factors.

SUGGESTION

The punishment for the air pollution should be high even whoever caused it even if it has been done by the general public or by industry because then only everyone will not pollute the air. Raising Awareness and Environmental

Education: Evaluate the effectiveness of awareness campaigns and environmental education programs in fostering a sense of responsibility among citizens. Investigate how informed communities can contribute to reducing air pollution by adopting eco-friendly practices, supporting clean energy initiatives, and holding polluting industries accountable. Promotion of Renewable Energy Sources: Investigate the potential of renewable energy sources such as solar, wind, and hydropower in replacing fossil fuels for electricity generation. Analyse policies and incentives that can accelerate the adoption of renewable energy technologies, thereby reducing air pollution from power plants. Enhancing Urban Planning and Public Transportation: Study urban planning strategies that promote compact cities, reduce urban sprawl, and improve public transportation systems.

CONCLUSION

From the above research we can see that people are aware of air pollution and its consequences. The Air Act,1981 although it has been enacted to reduce pollution in most urban and semi urban areas the quality of air has declined significantly. Respondents have also mentioned that the quality of the air in their surroundings has not improved by the Air Act. The reduction in air pollution and pollutants during the Covid-19 pandemic has shown us that human activity is the main cause that has lead to air pollution this includes industrial pollutants,vehicle pollution and any other activity that are human related.It is important to ensure that the air that surrounds us is clean, Because when a person inhales polluted air it causes various health problems such as asthma, Bronchitis, Heart disease. Children Growing in such an environment could develop respiratory problems. Right to live in a clean environment is a Fundamental Rights and Human activities should not degrade the quality of life of not only Humans but also other living creatures that we share this Earth with. It is important to ensure. This can be reduced by creating accountability on the people and industries that contribute most towards the degradation of air quality - They should filter the smoke emissions effectively, develop alternate measures to do the same job and Give breaks so that the effects of pollution are not overwhelming in nature. People should restrain themselves from doing activities that can cause harm to the environment.

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