VER
Vascular & Endovascular Review

Air Pollution: Exacerbating Existing Health Conditions Among Youth

Dr. Ramesh Kumar Tripathi[1], Dr Anvita Verma[2], Anushka Singh[3]

[1]Assistant Professor, Department of Social Work, University of Lucknow, U.P India
[2]Assistant Professor, Department of Social Work, University of Lucknow, U.P India
[3]Research Scholar, Department of Social Work, University of Lucknow, U.P India

ABSTRACT

This study investigated the impact of air pollution on the youth age group 18-29, focusing on physical and psychological health and awareness levels, as well as the way youth gather their information regarding poor air quality. The research adopts a descriptive research design to examine how poor air quality affects the health of youth, assesses their awareness of pollution related health risks, and explores the role of environmental education and media in shaping the thoughts of youth towards air pollution and the ways youth are engaged in advocacy for cleaner air and environmental initiatives. The sample of the study is chosen with the help of purposive sampling, and it's made convenient for the researcher to collected data. The findings of the study reveal significant health impacts on the respiratory system and psychological well-being, alongside limited formal environmental education and generally neutral levels of environmental awareness. These findings highlight the need of strengthen educational initiatives that go beyond simply raising awareness among youth about air pollution. Such programs should inspire people engagement, equipping youth with the knowledge and motivation to contribute actively to environmental solutions. By nurturing perspectives and encouraging people involvement, we can shape a generation committed to sustainability and capable of driving impactful policy reforms.

KEYWORDS: Air pollution, Psychological wellbeing, Environmental education, Environmental awareness.

How to Cite: Ramesh Kumar Tripathi, Anvita Verma, Anushka Singh, (2025) Air Pollution: Exacerbating Existing Health Conditions Among Youth, Vascular and Endovascular Review, Vol.8, No.7s, 102-110.

INTRODUCTION

Air pollution refers to the discharge of harmful gases, particulate matter, and liquid aerosols into the atmosphere at levels that surpass the Earth's natural ability to disperse, neutralize, or absorb them. When these substances accumulate beyond safe thresholds, they can negatively impact health, economic stability, and visual quality of the environment. Prominent pollutants such as carbon monoxide, nitrogen oxides, sulfur dioxide, ozone, airborne particulates, and lead pose serious risks by impairing respiratory health, damaging infrastructure, and reducing visibility. Air pollution encompasses both indoor and outdoor environments and results from the introduction of chemical, physical, or biological agents that alter the natural composition of air. It can lead to premature deaths and chronic health issues worldwide, disproportionately affecting populations in various ways.

Air pollution consists of numerous toxic substances released into the atmosphere from human activities as well as natural processes. Human activities contribute significantly through vehicle exhaust, the use of fuel oils and natural gas for residential heating, emissions from manufacturing processes, and power generation, particularly facilities reliant on coal. Industrial activities emit harmful chemicals into the air. On the natural front, pollutants are introduced through events such as wildfires often triggered by human actions, volcanic activity that expels ash and gases, and the release of methane from decomposing organic matter present in soil ecosystems.

Major Sources of Air Pollution

Fossil Fuels - Fossil fuels are natural energy sources that originate from the decomposed remains of prehistoric flora and fauna, which, after being buried for millions of years, underwent transformation due to intense heat and pressure.
The key types of fossil fuels include coal, petroleum, and natural gas.

Industrial Combustion - Fossil fuels like coal and oil, particularly in power plants, factories, and refineries, result in the emission of various air pollutants, many of which mirror those produced by vehicles and transportation systems.

Petrol And Diesel- They are used in vehicles such as cars, ships, and trains release a variety of pollutants into the air. It includes a range of harmful substances such as carbon monoxide (CO), nitrogen-based compounds (NO_x), sulfur dioxide (SO_2), fine airborne particles (PM), and volatile organic chemicals (VOCs).

Agricultural Activities- Agricultural activities play a major role in releasing various nitrogen-based compounds, including nitric oxide (NO), nitrogen dioxide (NO_2), and ammonia (NH_3), another major pollutant. Additionally, livestock release methane (CH_4) as a byproduct of digestion, which significantly affects the air pollution.
There are several natural phenomena that contribute significantly to atmospheric contaminants.

Desert- Originating Sand and dust storms particularly from regions like the Sahara, Gobi, and Taklamakan disperse fine particles due to the small grain size.

Wildfires- Wildfires become more severe due to weather conditions and release a lot of smoke, carbon monoxide (CO), and nitrogen oxides (NO_x) into the air, causing pollution.

Volcanic Eruptions- Volcanic eruptions emit gases such as sulfur dioxide (SO_2) and ammonia (NH_3), which interact with airborne particles and contribute to the formation of secondary pollutants.
Vegetation - It emits volatile organic compounds (VOCs) as a biological response to environmental stress, insect predation, and interplant signalling, thereby participating in natural VOC cycles.

Major Air Pollutants and Their Impacts
These air pollutants are prevalent in the environment and have various impacts on individuals.

Particulate Matter (PM): Generated from household heating appliances, vehicular emissions, and cooking devices, these fine particles can affect the respiratory system and bloodstream, increasing the risk of cardiovascular ailments and aggravating asthma symptoms.

Ammonia (NH_3): Ammonia is released through agricultural activities; this colourless gas promotes the formation of particulates and impairs respiratory health.

Nitrogen Oxides (NO_x): Produced by internal combustion engines and thermal power plants, these gases cause airway irritation, accelerate the degradation of the ozone layer, and facilitate particulate matter formation.

Carbon Monoxide (CO): An invisible and highly toxic gas that is emitted during fuel combustion and from gas leaks. It interferes with oxygen circulation in the body, potentially resulting in fainting, neurological damage, or even death.

Sulphur Dioxide (SO_2): Released during mining operations and the burning of sulphur-containing fuels. It also contributed to acid rain formation and can damage freshwater habitats.

Volatile Organic Compounds (VOCs): Found indoors from sources like paints, furniture, tobacco smoke, and cleaning agents, VOCs may lead to health issues such as chronic fatigue, sleep disorders, and increased cancer risk.

Ozone (O_3): Ozone exists in two layers of Earth's atmosphere: the stratosphere (upper atmosphere) and the troposphere (ground level). In the stratosphere, ozone plays a critical role by absorbing harmful ultraviolet rays from the sun, thus acting as a protective shield for life on Earth.

Ozone found at ground level poses significant health risks. It is a major constituent of smog and forms through chemical reactions between sunlight and pollutants emitted by vehicles and industrial processes. This form of ozone is especially prevalent during warmer months and tends to peak in concentration during the afternoon and early evening.

Acid Rain: When sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) mix with water vapor and oxygen in the air, they form sulfuric acid and nitric acid. These acids then descend to Earth as acid rain, causing harm to natural ecosystems and corroding man-made structures.

Smog: Smog is an atmospheric pollutant formed by a mix of airborne particles and ground-level ozone. This toxic blend impairs visibility and triggers respiratory issues, especially in urban and industrial regions.

OBJECTIVE OF THE STUDY

- To assess the impact of air pollution on the health of youth.
- To analyse awareness level among youth regarding the health effects of air pollution.
- To examine the importance of environmental education and media in shaping youth behavior in improving air quality and health.
- To give suggestions and recommendations for minimizing the impact of air pollution.

HYPOTHESES OF THE STUDY

- Extended exposure to polluted air appears strongly associated with growing psychological challenges among young people.
- Youth who actively engage in eco-friendly practices (e.g., avoiding peak hour travel, using public transport, indoor air monitoring) experience lower perceived health risks associated with air pollution.

RESEARCH METHODOLOGY

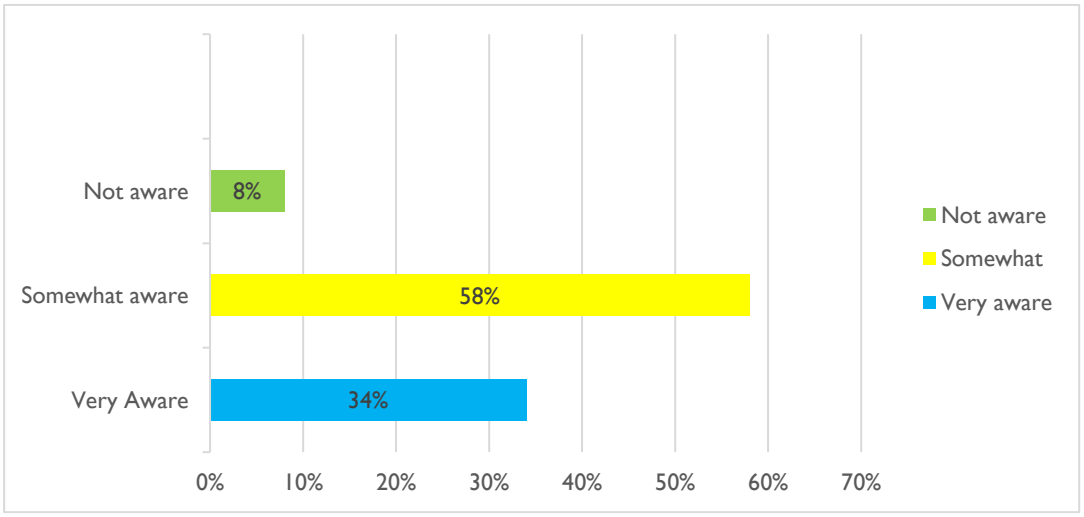
Research Design: Descriptive Research
Universe and Sample: The youth of the University of Lucknow, Lucknow, U.P, India, will be the universe, and 100 youth with

age limits of 18-29 years will be purposively selected as the sample. Because the focus of the study is 18-29-year-old youth, purposive sampling enables efficient and targeted selection to fulfill the research objectives.

Source of Data Collection: Primary, Secondary, Tertiary
Techniques of Data Collection: Interview and Observation
Tool of Data Collection: Interview Schedule, Observation Guide
Analysis and Interpretation of Data: Through Editing, Coding and Tabulation

RESULTS AND DISCUSSION

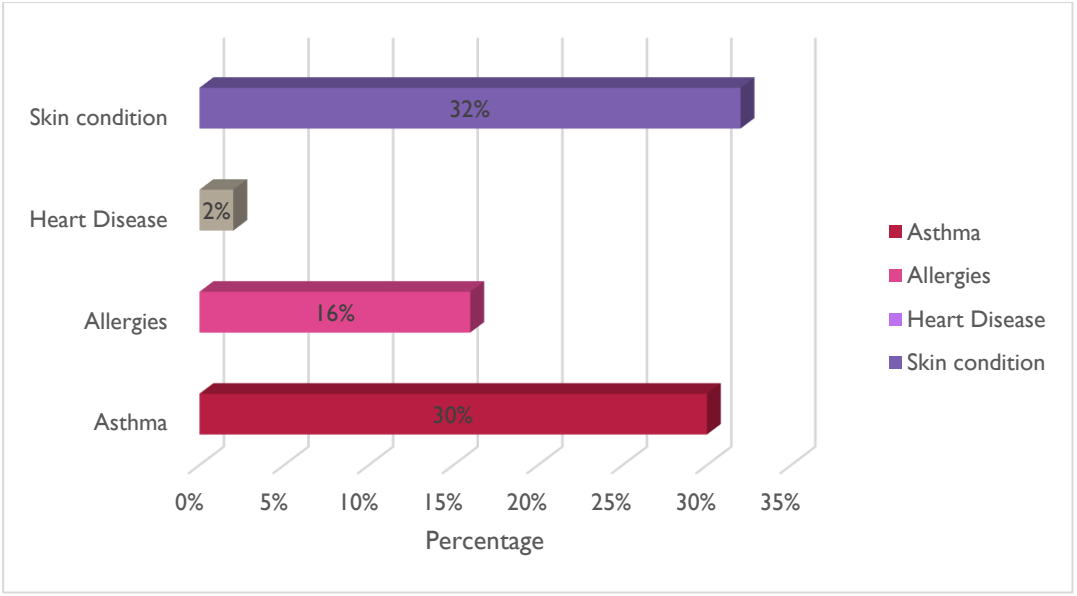
Awareness regarding Health Risks cause due to with Air Pollution



58% of respondents were somewhat aware regarding the health risks cause due to air pollution, while 34% of respondents were aware of the health risks and 8% were not aware at all. The primary objectives of the study are to assess awareness, yet only 34% of participants report being aware. Awareness can be enhanced through social media, campaigns, and educational initiatives.

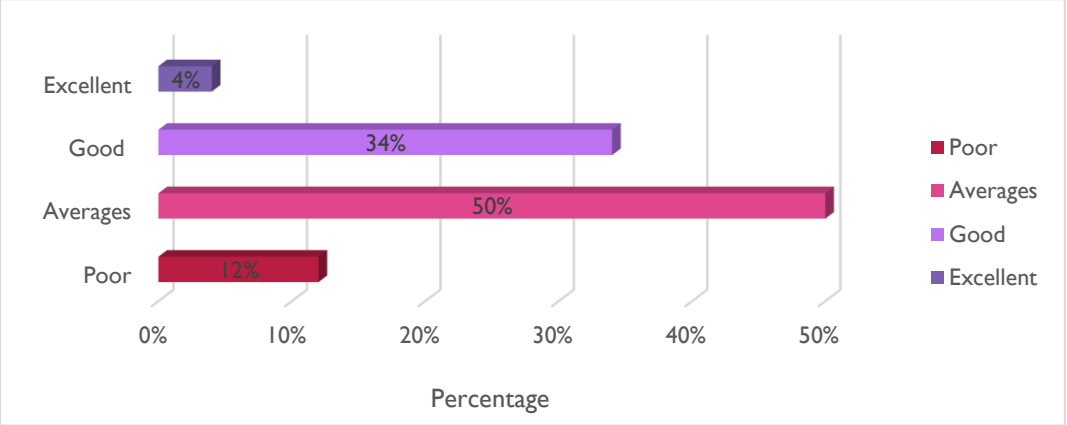
Health Problems cause due to air pollution Among Youth

As we know, due to poor quality of air pollution, individuals are facing certain diseases that somehow affect their daily life.



As mention in above graph, 30% of respondents reported that they are diagnosed with asthma, 16% were have allergies, 2% are diagnosis of heart diseases and 64% of respondents reported that they have certain skin condition like acne and hyperpigmentation. Asthma and various skin-related issues appear to be significantly prevalent among young individuals.

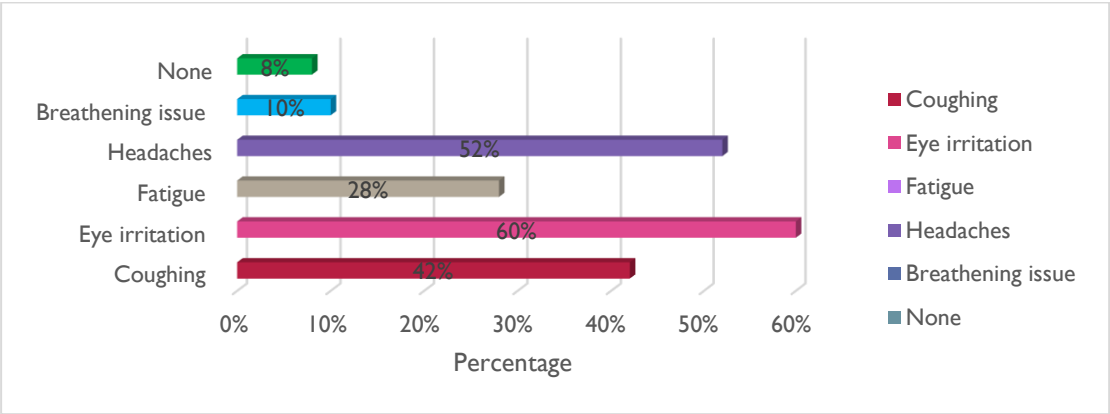
Respiratory Health of Youth



50% of respondents have average general respiratory health, 34% indicate having good general respiratory health, 12% have poor respiratory health, and 4% of respondents have excellent general respiratory health.

Health Symptoms During High Pollution Periods

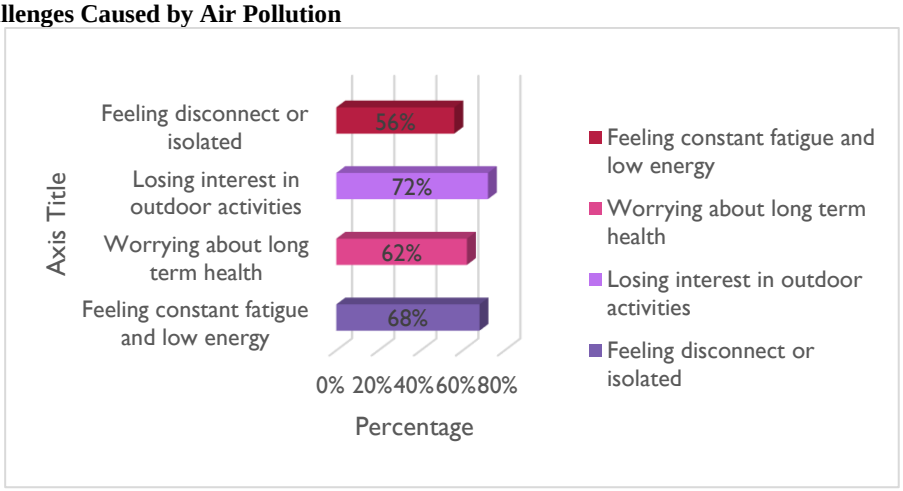
The high pollution periods occur during the months of October to January and worst time of the day is morning 6-9 AM, evening 5-9 PM.



60% of respondents are experiencing eye irritation during the high pollution periods, 42% of respondents are having coughs during the high pollution periods, 28% of respondents have experienced fatigue during the high pollution periods, 52% of respondents have headaches, 10% of respondents have breathing issues during the high pollution periods, and 8% of respondents have none of these health symptoms during the high pollution periods.

These findings highlight the significant impact of air quality on health of young people. As pollution levels rise, it is important to implement measures to reduce exposure and protect the well-being of young individuals in affected areas.

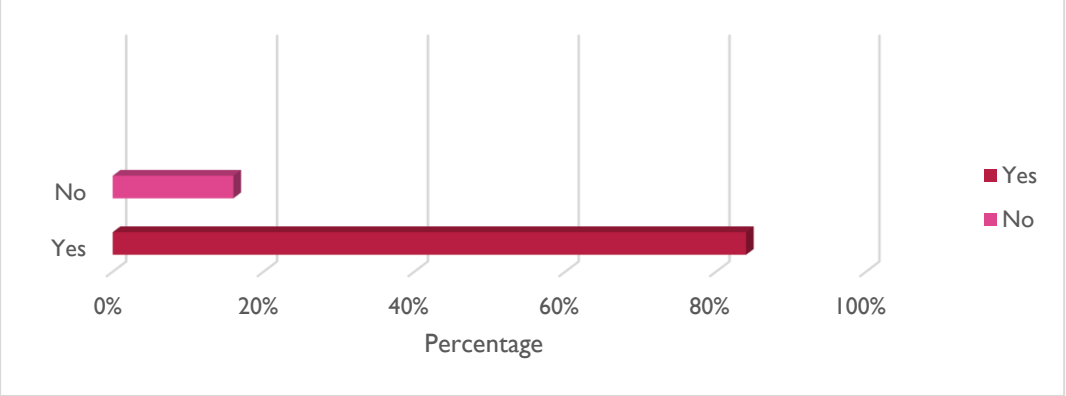
Psychological Challenges Caused by Air Pollution



68% of respondents feel constant fatigue and low energy due to poor quality air, 72% of respondents are losing interest in outdoor activities, 62% are worried about long-term health effects, and 56% feel disconnected or isolated due to air pollution, which is

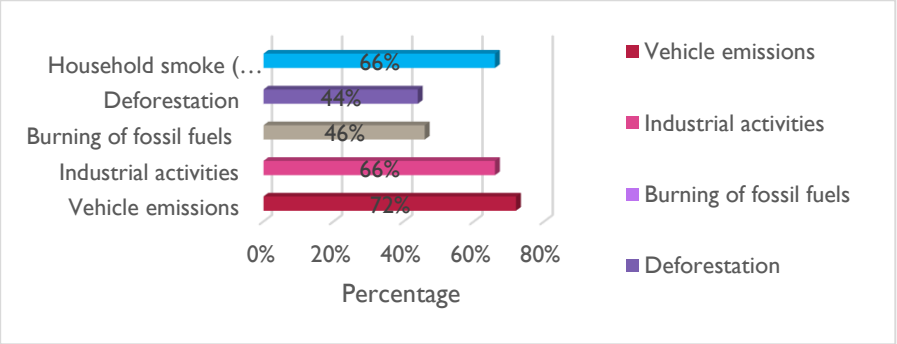
one of the major psychological problems that the youth are facing these days.

Stress level on Days Noticeable Pollution
Noticeable pollution occurs between October and January, especially around the time of Diwali.



84% of respondents said yes that they experience stress or irritation on days noticeable pollution while 16% said No that they haven't experience stress or irritation on days noticeable pollution. By looking at the data we can say that air pollution is affecting the psychological heath of youth and that's proved the hypothesis.

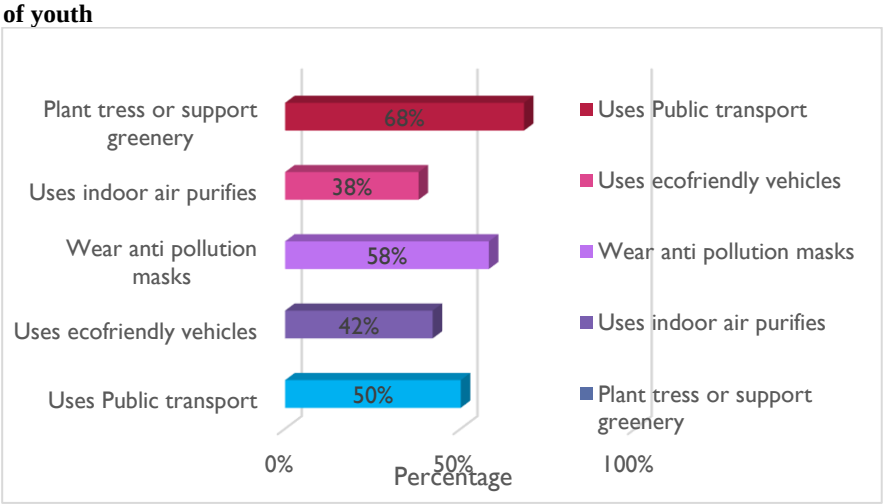
Awareness regarding Causes of Air Pollution
According to the World Health Organization (WHO), the primary sources of pollution include cooking, heating, vehicles, power generation, and industrial activities.



72% of respondents believe that vehicle emission cause air pollution, 66% identified industrial activities is major contributor, 46% consider burning of fossil fuel is a major reason ,44% respondents believe deforestation, 66% of respondents pointed to household smoke, cooking, burning waste as major reasons for air pollution.

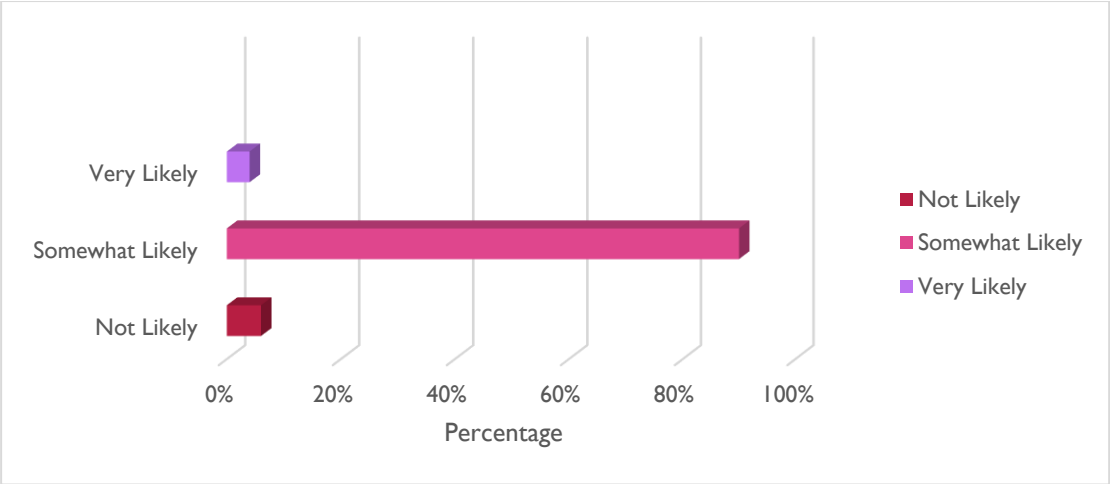
By looking at the finding we can say that vehicle emission is major cause of the air pollution and by ecofriendly activities we can control the emission from vehicle.

Ecofriendly Habits of youth



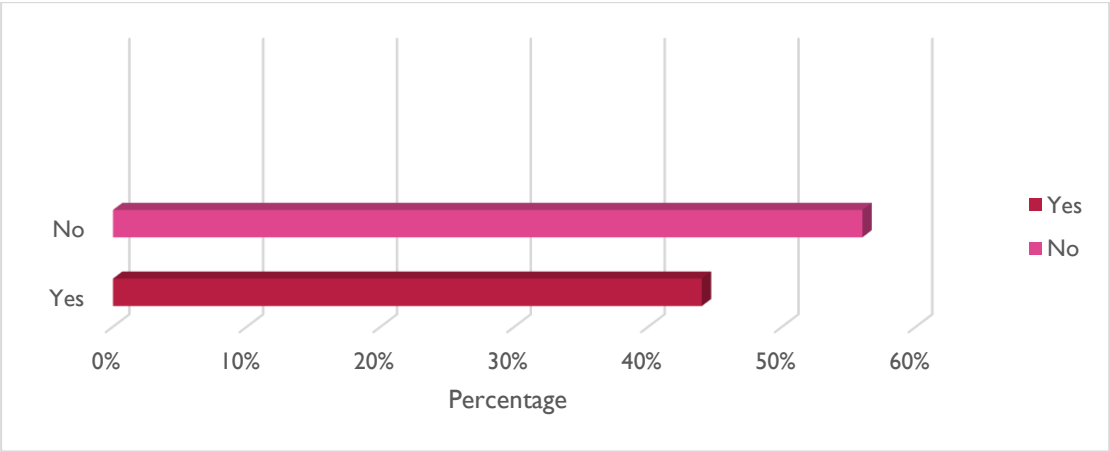
59% of respondents use anti-pollution masks, 50% indicated that they use public transport, 42% stated that they use eco-friendly bicycles, 38% use indoor air purifiers, and 68% of respondents plant trees and support greenery.

Eco-friendly Habits help in reduce your Health Risks



90% respondents stated that it is somewhat likely that eco-friendly habits help in reducing health risks, 4% respondents have said it is not likely that eco-friendly habits help reduce health risks, and 6% felt it is very likely that eco-friendly practices help mitigate health risks. So, the hypothesis proved right that eco-friendly practices do help in avoiding health risks.

Formal Education about Environmental Issues

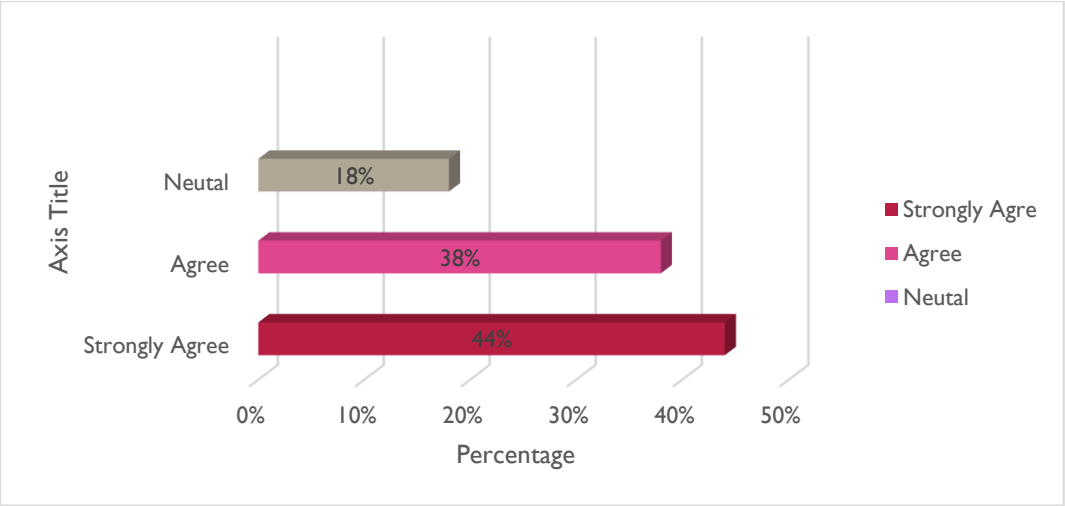


56% respondents had not received formal education about environmental issues; 44% respondents have received formal education about the health issues cause to air pollution.

College Curriculum to include Environmental Awareness

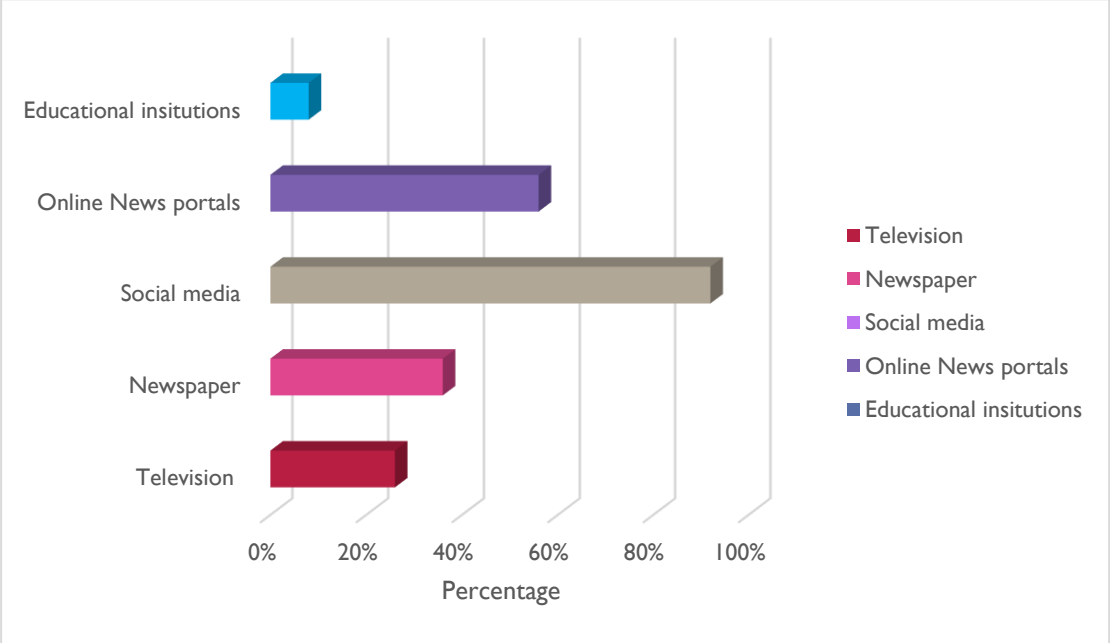
To aware the youth related to Environment is important duty of colleges because it helps young people understand the precautions needed to maintain a sustainable environment and the preventive measures to take during periods of high pollution. While environmental issues are commonly taught at the secondary and high school levels, but many undergraduate and postgraduate programs lack structured environmental education.

Although the University Grants Commission (UGC) proposed new guidelines in 2023 to incorporate environmental studies into undergraduate curricula, widespread implementation remains inconsistent. Introduce a mandatory environmental studies component across all undergraduate and postgraduate disciplines, such as commerce, humanities, law, and business management.



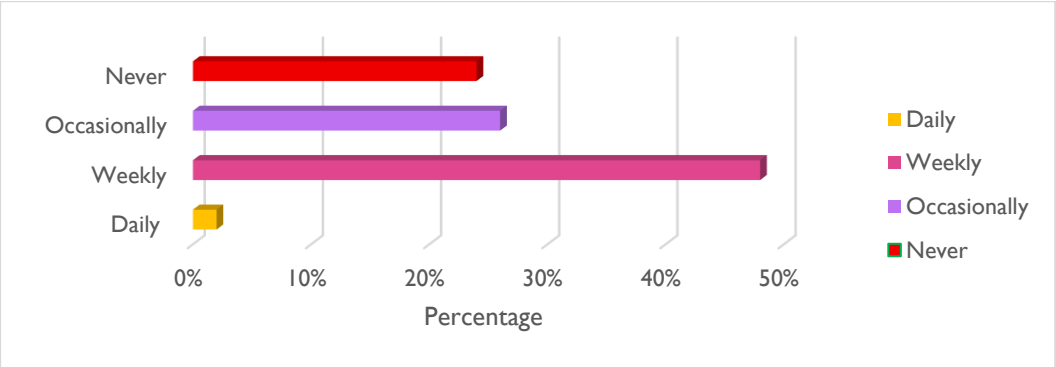
44% respondents are netrual that school and college curriculum should increase more environmental awareness, 18% respondents are strongly agree that school and college curriculum should increase more environmental awareness, 38% respondents were agree school and college curriculum should increase more environmental awareness.

Influence of various Media Source



As per the findings, the media sources which influence the views on air pollution in which social media is considered as the most dominant platform, 96% respondents acknowledging it as a key source shaping their views, Online news portals follow as the second most influential medium, impacting 56% respondents. 36% respondents believe that newspaper influence their view on air pollution, 26% respondents are influenced by Television, educational institutions have the least impact, with just 8%.

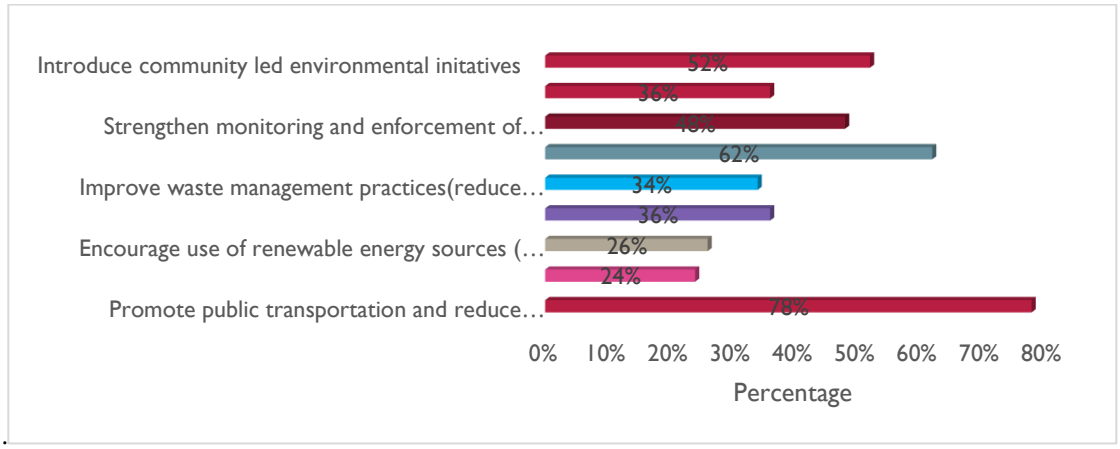
Habits of youth to Check the Air Quality Index (AQI)



As per the Findings, 48% respondents check the air quality index (AQI) of your areas weekly, 26% respondents check AQI occanisally, 24% respondents never check AQI, while 2% respondents check the AQI daily. 48% check AQI weekly is really good sign that youth are concerned about the air pollution.

Figure 11- Suggestions and Recommendations

One of the objectives of the study is to know the suggestions and recommendations of youth in controlling air pollution. The graph illustrates the precautions proposed by young people concerning air pollution



78% respondents recommended the promotion public transportation and reduce private vehicle usage, 24 % recommend the implement stricter emissions regulation for industries, 26% suggested encourage use of renewable energy sources (solar, wind, etc.), 36 % respondents recommend develop more green spaces and tree-planting initiatives, 34% respondents recommend improve waste management practices(reduce open burning),62% respondents recommends enhance public awareness campaigns and school programs,48% respondents recommend strengthen monitoring and enforcement of pollution norms , 36% respondents recommend provide subsidies or incentives for eco-friendly vehicles,52% introduce community led environmental initiatives.

There are several ways through which air pollution can be mitigated.

- Promote public transport and using budgets friendly alternatives
- Switch off the light when not in use
- Embrace recycling and reusing
- Say no to plastic bags
- Prevent of forests fire and smoke
- Use fans instead of air conditioners
- Avoid bursting firecrackers,
- Limit the use of chemical-based products
- Promote Afforestation

Air pollution is a major concern for youth's health. From the findings we can say that the youth need to be more aware regarding the precautions and prevention one needs to take in poor quality air. By looking at the data, 58% of respondents are somewhat aware of the air pollution, which is satisfying, but they are not fully aware, which needs to change. Asthma and certain skin conditions like acne and hyperpigmentation are most prominent among the youth. The prior finding also reveal that individual is suffering from asthma in poor air quality. Only 4% of respondents of General Respiratory Health were excellent, which is not a good sign. Eye irritation, coughing, and headaches are highly prevalent among young people as major symptoms during high pollution. 72% of respondents are losing interest in outdoor activities, which is not just a psychological issue, but it will also affect their physical health and social well-being. 84% experience stress or irritation on days with noticeable pollution, which is a huge number. It also shows how badly air pollution is affecting the youth. Use of vehicles should be put under control because,

as per the finding, 72% of respondents believe that vehicle emissions create air pollution the most. 59% of respondents are wearing anti-pollution masks, but the number needs to increase when it comes to ecofriendly activities. But only 65% of respondents believe that being ecofriendly is very likely to help in reducing air pollution, which is not a good sign because ecofriendly habits are the first step that people can take to remove air pollution. When it comes to formal education regarding environmental education, the number needs to be 100%, but only 44% had received formal education. We should focus on increasing the percentage and making it 100%. The major suggestion given by the respondents is to promote public transport and reduce private vehicle usage, which is 98%. We all know that breathing in good quality air is necessary for humans, but because of certain activities, it has become a luxury, so we need to take proper precautions for these issues so that the young generation has good health and a sustainable environment to breathe in.

CONCLUSION

Air pollution poses a significant risk to the physical and mental well-being of young individuals. Survey findings reveal a high prevalence of respiratory issues, increased stress, and reduced participation in outdoor activities. Although some level of awareness exists, eco-friendly habits among youth remain inconsistent. To protect their well-being, it is crucial to enhance environmental education, promote sustainable practices, and reduce emissions from vehicles.

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