

**Environmental pollution affecting mental health****Monisha Arora\***

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Published: 29/04/2024

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**Abstract:**

*Environmental pollution is a pressing global issue with far-reaching impacts on human health and well-being. While much attention has been given to the physical health effects of pollution, its influence on mental health has gained increasing recognition in recent years. This paper explores the complex relationship between environmental pollution and mental health outcomes, highlighting the various pathways through which pollution exposure may contribute to psychological distress, psychiatric disorders, and impaired cognitive function. Drawing upon existing literature and empirical evidence, the paper examines the psychological mechanisms underlying the link between pollution and mental health, including neuroinflammation, oxidative stress, neurotoxicity, and disruptions in neurotransmitter systems. Moreover, it discusses the socio-demographic and environmental factors that may exacerbate vulnerability to pollution-related mental health effects, such as socioeconomic status, geographic location, and exposure to multiple environmental stressors. The paper also discusses implications for public health policy, intervention strategies, and future research directions aimed at mitigating the adverse mental health impacts of environmental pollution and promoting resilience in affected populations.*

**Keywords:**

Environmental pollution, Mental health, Psychological distress, Psychiatric disorders, Cognitive function, Neuroinflammation, Oxidative stress, Neurotoxicity, Neurotransmitters, Socio-demographic factors, Public health policy.

**1. Introduction:**

The negative impacts of environmental pollution are becoming more and more obvious in all facets of human existence, making it a critical worldwide concern. Environmental pollution has long been known to have negative effects on physical health, but in recent years, its effects on mental health have also come to light. This essay explores the complex link between environmental pollution and mental health, focusing on the negative effects that contaminants in the soil, water, and air may have on psychological health.

Pollutants released into the environment, such as air pollutants such as particulate matter (PM), nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), volatile organic compounds (VOCs), and heavy metals, are collectively referred to as environmental pollution. While soil pollution refers to the presence of pollutants like pesticides, heavy metals, and industrial waste in the soil, water pollution entails the contamination of water bodies with chemicals, pathogens, and other dangerous substances.

The connection between exposure to environmental pollution and a range of mental health problems has been demonstrated by several research. For example, there is evidence linking air pollution to a higher risk of anxiety, depression, and cognitive deterioration. Particularly linked to aggravating



symptoms of mental illnesses are nitrogen dioxide and particulate matter, which are frequently present in cities with heavy traffic.

Another major factor in the development of mental health issues is water pollution. When contaminants such as lead, arsenic, and mercury are found in sources of drinking water, it can cause neurological diseases and psychological disorders. In addition, drinking contaminated water has been connected to higher stress levels and worse psychological health in general.

If the dangers to mental health from soil contamination are smaller than those from air and water pollution, they nonetheless exist. Attention deficit hyperactivity disorder (ADHD) and autism spectrum disorders (ASDs) are two neurobehavioral illnesses that have been linked to exposure to soil pollutants such as pesticides and heavy metals. Children who are exposed to high amounts of soil contamination are more susceptible to these detrimental effects on their mental health.

The effects of environmental pollution on mental health are disproportionately felt by certain communities. The majority of environmental deterioration often affects low-income areas and minority groups, who are more exposed to toxins as a result of things like living close to industrial sites and having limited access to clean water and air resources. This phenomena, which is referred to as environmental injustice, prolongs socioeconomic injustices and exacerbates already-existing health disparities.

Aside from children, pregnant women, and the elderly, other vulnerable groups include those who are more susceptible to the negative effects of environmental pollution on mental health. Long-term exposure to air and water pollution can cause cognitive decline and dementia in older persons, while prenatal exposure has been related to behavioral issues and developmental difficulties in children.

Environmental pollution may have significant psychological effects on people as well as direct physiological consequences on groups and individuals. Eco-anxiety and ecological sadness are a result of the devastation of natural habitats brought about by pollution, which also feeds emotions of hopelessness, loss, and alienation from the natural world. Furthermore, stress levels can be raised and sentiments of hopelessness and helplessness can be exacerbated by the belief that environmental deterioration poses an existential danger.

Furthermore, because communities may encounter greater conflict over resource access and environmental justice problems, environmental degradation can undermine social cohesiveness and communal well-being. Social networks can be strained and feelings of alienation and loneliness might result from displacement brought on by natural catastrophes and health issues connected to pollution.

Mitigation and adaptation methods must be part of a multifaceted strategy to address the effects of environmental pollution on mental health. Reducing air pollution emissions, cleaning up polluted soil, and improving water quality are all essential for maintaining public health and lessening the psychological effects of pollution. In addition to improving mental health, green infrastructure investments, sustainable urban design, and the switch to renewable energy sources can help reduce environmental pollution.

Furthermore, strengthening social support networks and community resilience is crucial for assisting people in overcoming the psychological consequences of pollution. Communities may be empowered to fight for environmental justice and hold polluters accountable via education and awareness-raising efforts. Furthermore, giving people and communities access to psychological support services and mental health treatments might help them become more resilient and manage the stresses brought on by environmental pollution.

## 2. Objectives

- To identify the relationship between environmental pollution and mental health.



- To identify key mediating and moderating factors.
- To assess the cumulative and interactive effects of multiple pollutants.
- To explore differential vulnerabilities across population groups.
- To inform evidence-based interventions and policy recommendations.

### 3. Relationship between Environmental Pollution and Mental Health

Comprehending the correlation between mental health outcomes and environmental pollution is an essential field of study with extensive consequences for public health and overall well-being. This link includes the intricate interactions between the prevalence and severity of mental health conditions including anxiety, depression, and cognitive impairment, and exposure to different pollutants such those found in air, water, and soil.

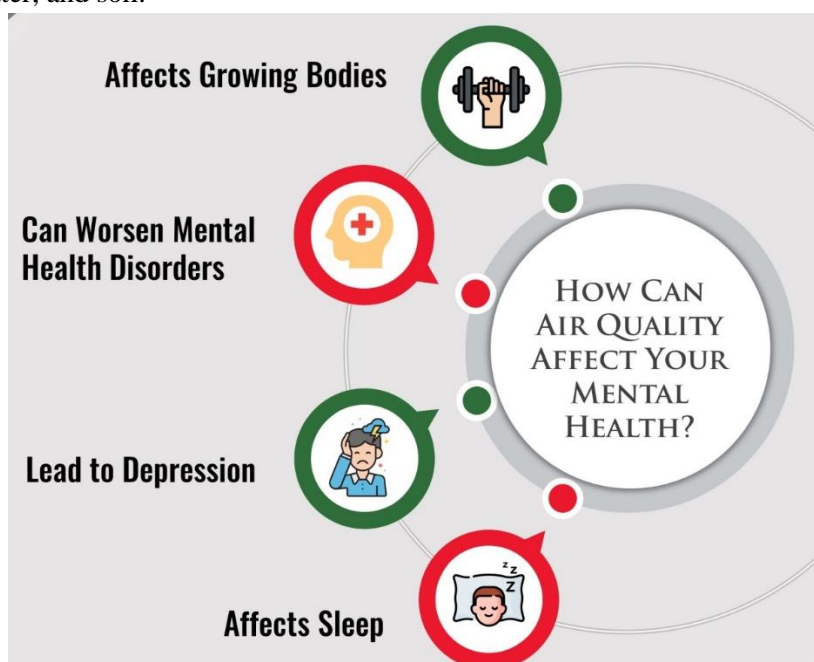


Figure: How can air quality affect your mental health (Source: <https://nachvac.com/>)

To quantify this relationship, rigorous statistical analyses are essential. By employing advanced statistical techniques, researchers can systematically analyze large datasets to elucidate patterns and trends in the data. These analyses allow researchers to quantify the extent to which exposure to environmental pollutants correlates with mental health outcomes, providing valuable insights into the dose-response relationships between pollution exposure and psychiatric disorders.

Central to this analysis is the consideration of pollutant concentration levels. Different pollutants exhibit varying degrees of toxicity, and their concentrations in the environment can fluctuate over time and space. By examining pollutant concentration levels in relation to mental health outcomes, researchers can assess the impact of varying levels of pollution on psychological well-being. This analysis helps to identify threshold levels beyond which pollutant exposure poses a significant risk to mental health.

Duration of exposure is another crucial factor to consider in understanding the relationship between environmental pollution and mental health outcomes. Prolonged or repeated exposure to pollutants may have cumulative effects on mental health, exacerbating symptoms of psychiatric disorders over time. By examining the duration of exposure—whether short-term, long-term, or chronic—researchers can assess how cumulative exposure contributes to the development and progression of mental health disorders.

Demographic variables play a significant role in shaping vulnerability to the mental health effects of environmental pollution. Certain population groups may be disproportionately affected by pollution exposure due to factors such as age, socio-economic status, and geographic location. For example, children, the elderly, and individuals from low-income communities may be more susceptible to the adverse effects of pollution on mental health. By considering demographic variables in statistical analyses, researchers can identify vulnerable populations most at risk and tailor interventions accordingly.

Through rigorous statistical analyses that integrate pollutant concentration levels, duration of exposure, and demographic variables, researchers aim to elucidate dose-response relationships between environmental pollution and mental health outcomes. By quantifying these relationships, researchers can provide empirical evidence to support the development of targeted interventions and policies aimed at mitigating the mental health effects of pollution exposure.

It takes a thorough, interdisciplinary strategy that incorporates epidemiological, environmental, and psychiatric viewpoints to comprehend the connection between environmental contamination and mental health consequences. Through the implementation of meticulous statistical analyses and the consideration of crucial variables like pollutant concentration levels, exposure length, and demographics, researchers may contribute to the advancement of our knowledge regarding the impact of pollution on mental health and provide guidance for preventative and intervention measures.

#### **4. Key Mediating and Moderating Factors**

To effectively mitigate the negative impacts of environmental pollution on mental health, policies and treatments must take into account the mediating and moderating elements that determine the impact of pollution. These variables, which include a wide variety of psychosocial and individual-level characteristics, interact with pollution exposure to influence the outcomes related to mental health.

Socio-economic status (SES) is a significant mediating factor that influences the relationship between environmental pollution and mental health. Individuals from lower socio-economic backgrounds often face greater exposure to pollutants due to factors such as living in areas with poor air quality or proximity to industrial facilities. Additionally, lower SES is associated with limited access to healthcare services and resources for coping with pollution-related stressors. As a result, individuals with lower SES may be more vulnerable to the mental health effects of pollution, experiencing higher levels of anxiety, depression, and other psychiatric symptoms.

Community cohesion, or the strength of social bonds within a community, plays a moderating role in mitigating the impact of environmental pollution on mental health. Communities characterized by high levels of social cohesion may provide greater social support networks and resources for coping with pollution-related stressors. Strong community ties can buffer the negative effects of pollution exposure on mental health by fostering resilience and enhancing adaptive coping strategies. Conversely, communities with low levels of cohesion may lack the social support necessary to mitigate the psychological toll of pollution, resulting in heightened vulnerability to mental health problems.

Access to healthcare services is another important mediating factor that influences the relationship between environmental pollution and mental health outcomes. Individuals with limited access to healthcare may face barriers to seeking treatment for pollution-related health concerns, exacerbating the impact of pollution on mental well-being. Moreover, disparities in access to mental health services can perpetuate existing inequalities in mental health outcomes, particularly among vulnerable populations. By examining the role of healthcare access in mediating the relationship between pollution exposure and mental health, researchers can identify opportunities for improving mental health care delivery and reducing disparities in access to services.



Individual-level factors such as genetic predispositions and coping mechanisms also play a significant role in shaping vulnerability to the mental health effects of environmental pollution. Genetic factors may influence an individual's susceptibility to pollution-related stressors and their ability to cope with environmental challenges. Additionally, coping mechanisms, such as problem-solving skills, social support seeking, and emotion regulation strategies, can buffer the impact of pollution exposure on mental health outcomes. By investigating these individual-level factors within the context of environmental exposure, researchers can uncover potential mechanisms through which pollution affects mental health and identify protective factors that mitigate its adverse effects.

A multifaceted approach integrating psychological, environmental, and individual-level views is necessary to comprehend the mediating and moderating elements that effect the impact of environmental pollution on mental health. Through the examination of several factors including socioeconomic level, community cohesiveness, healthcare service accessibility, genetic predispositions, and coping strategies, scientists can clarify the intricate relationship between exposure to pollution and mental health consequences. This information can help design focused treatments and policies that lessen the negative effects of environmental pollution on mental health while strengthening the resilience of impacted communities.

### **5. Cumulative and Interactive Effects of Multiple Pollutants**

Environmental pollution is a complex problem that frequently involves exposure to numerous pollutants at once, but there aren't many research looking at how these pollutants combine and accumulate to affect mental health. Comprehending the ways in which exposure to various pollutants, either in parallel or consecutively, influences mental health outcomes is essential for formulating all-encompassing methods to alleviate the detrimental impacts of pollution on psychological health.

To assess the cumulative and interactive effects of multiple pollutants on mental health, sophisticated modeling techniques are essential. These techniques allow researchers to analyze complex datasets and quantify the combined impact of various environmental stressors on mental well-being. By integrating data on pollutant concentrations, exposure pathways, and demographic variables, researchers can identify patterns and trends in the data that provide insights into the synergistic effects of different pollutants.

One approach to assessing the cumulative and interactive effects of multiple pollutants is through the use of statistical modeling techniques, such as multivariate regression analysis or structural equation modeling. These techniques enable researchers to simultaneously analyze the relationships between multiple pollutants and mental health outcomes while controlling for confounding variables. By examining how exposure to different pollutants influences the prevalence and severity of mental health disorders, researchers can elucidate the complex interplay between various environmental stressors and their combined impact on psychological well-being.

In addition to statistical modeling techniques, researchers can employ mechanistic models to simulate the biological pathways through which multiple pollutants interact to affect mental health. These models integrate data on pollutant toxicities, physiological responses, and genetic susceptibilities to predict the combined effects of exposure to multiple pollutants on mental well-being. By simulating the complex interactions between pollutants at the molecular and cellular levels, researchers can gain insights into the underlying mechanisms driving the synergistic effects of pollution on mental health.

Consideration of the synergistic effects of different pollutants is essential for understanding the cumulative impact of environmental pollution on mental well-being. Certain pollutants may act synergistically to exacerbate the adverse effects of each other, leading to greater psychological distress than would be expected based on the individual effects of each pollutant alone. For example, exposure





to both air pollutants and heavy metals may lead to oxidative stress and neuroinflammation, which are associated with an increased risk of psychiatric disorders such as depression and anxiety.

Moreover, the combined impact of multiple pollutants on mental health may be influenced by individual-level factors such as genetic predispositions and pre-existing health conditions. Certain individuals may be more susceptible to the synergistic effects of pollution due to genetic variations that affect their ability to detoxify pollutants or regulate inflammatory responses. Additionally, individuals with underlying health conditions such as asthma or cardiovascular disease may be at greater risk of experiencing adverse mental health effects from exposure to multiple pollutants.

Through the consideration of individual-level characteristics and the synergistic effects of many contaminants, researchers may offer a more thorough understanding of the ways in which environmental pollution impacts mental health. This information is crucial for guiding the creation of focused initiatives and regulations meant to lessen the damaging impacts of pollution on mental health. Researchers may support initiatives to support mental well-being in the face of escalating environmental difficulties by using advanced modeling approaches and taking into account the intricate interactions between diverse environmental stressors.

### **6. Differential Vulnerabilities across Population Groups**

As mentioned in a newsletter **'Indiaspend'**, the inability of the economically weak to access adequate housing intensifies harsh impacts of extreme climatic conditions and hinders the ability of communities to adapt to escalating temperatures. In spite of efforts of Delhi Urban Shelter Improvement Board, around 92% of the vulnerable population are still homeless in the city. Also they do not fulfil eligibility requirements of the government's housing schemes. So they are left with no choice but to live on the streets and face the misery due to erratic weather conditions.

Research has shown that higher rates of mental disorders are associated with social disadvantages like low income, limited education, lack of social support, and being homeless. These factors are strongly associated with mental health problems. Such people are more vulnerable to hate, crime and discrimination which further lead to mental health problems. Poverty and poor mental health make a vicious circle as one leads to the other.

Due to the diverse range of demographic, socioeconomic, and geographic factors that influence people and communities, environmental pollution is not a danger that is felt equally by all. Comprehending the variations in susceptibility is crucial in formulating focused measures and regulations intended to mitigate health inequalities linked to the psychological impacts of pollution.

One key aspect of exploring vulnerability to pollution-related mental health effects is examining disparities in exposure levels across different population groups. Certain communities, particularly those in low-income or minority neighborhoods, are disproportionately exposed to environmental pollutants due to factors such as proximity to industrial facilities, transportation corridors, or waste disposal sites. These disparities in exposure can exacerbate existing health inequities, as residents in heavily polluted areas may face greater risks of developing mental health disorders such as anxiety, depression, and cognitive decline.

Moreover, susceptibility to pollution-related stressors varies across different demographic and socio-economic groups. Vulnerable populations, such as children, the elderly, and individuals with pre-existing health conditions, may be more susceptible to the mental health effects of pollution due to factors such as physiological vulnerability, compromised immune function, or limited coping resources. Additionally, socio-economic factors such as access to healthcare, education, and social support



networks can influence individuals' ability to cope with pollution-related stressors and mitigate their mental health effects.

Geographic factors also play a significant role in shaping vulnerability to pollution-related mental health effects. Rural communities, for example, may face unique challenges related to pollution exposure, such as limited access to healthcare services, inadequate infrastructure for environmental monitoring and remediation, and reliance on natural resources for livelihoods. Moreover, marginalized populations living in urban areas may experience higher levels of pollution due to factors such as residential segregation, lack of green spaces, and poor urban planning practices. These geographic disparities in pollution exposure can contribute to disparities in mental health outcomes, with residents of highly polluted areas facing greater risks of psychological distress and psychiatric disorders.

Identifying vulnerable populations and underlying determinants of vulnerability is essential for informing targeted interventions and policy interventions aimed at reducing health inequities associated with pollution-related mental health effects. By understanding the socio-economic, demographic, and geographic factors that contribute to differential vulnerability, policymakers and public health officials can develop strategies to address these disparities and promote mental well-being among affected populations.

For example, targeted interventions may include efforts to improve access to healthcare services in underserved communities, enhance environmental monitoring and remediation efforts in heavily polluted areas, and implement policies to reduce emissions from sources that disproportionately affect vulnerable populations. Additionally, community-based initiatives that engage residents in pollution prevention and advocacy efforts can empower affected communities to address environmental injustices and promote social and environmental justice.

Additionally, funding education and communication initiatives that seek to increase public knowledge of the connection between environmental contamination and mental health might encourage people to take proactive steps to safeguard their mental health. Policymakers and public health officials can work toward reducing health disparities associated with pollution-related mental health effects and creating healthier and more equitable communities for all by addressing the underlying determinants of vulnerability and promoting resilience-building strategies.

## **7. Evidence-Based Interventions and Policy Recommendations**

To reduce the negative effects of environmental pollution on mental health, a thorough strategy that incorporates stakeholder viewpoints, current knowledge, and empirical data must be developed. Through the integration of various inputs, scholars can discern auspicious approaches for mitigating pollution, restoring the environment, and advancing mental wellness. Additionally, this process guarantees that the results are converted into significant policy measures and interventions that accord equal weight to environmental preservation and psychological welfare.

Empirical findings from research studies provide valuable insights into the link between environmental pollution and mental health outcomes. By synthesizing these findings with existing knowledge from scientific literature, researchers can identify key pathways through which pollution affects mental well-being and pinpoint effective interventions to mitigate its adverse effects. For example, studies may reveal the association between air pollution exposure and increased rates of depression and anxiety, highlighting the need for targeted interventions to reduce emissions from sources such as traffic and industrial facilities.

In addition to empirical evidence, stakeholder perspectives play a crucial role in informing interventions and policy recommendations aimed at addressing the mental health impacts of environmental pollution. By engaging with policymakers, advocacy groups, and community stakeholders throughout the research



process, researchers can gain valuable insights into the lived experiences of affected individuals and communities, as well as the social, economic, and political factors that shape vulnerability to pollution-related mental health effects. These perspectives can inform the development of contextually relevant and culturally sensitive interventions that address the needs and priorities of diverse stakeholders.

Synthesizing empirical findings with existing knowledge and stakeholder perspectives can identify promising strategies for pollution prevention, environmental remediation, and mental health promotion. For example, evidence-based interventions aimed at reducing air pollution, such as the implementation of clean air policies, the promotion of renewable energy sources, and the adoption of sustainable transportation practices, can help mitigate the mental health impacts of pollution by reducing exposure to harmful pollutants. Similarly, environmental remediation efforts, such as the cleanup of contaminated sites and the restoration of natural habitats, can improve environmental quality and promote mental well-being among affected communities.

Furthermore, mental health promotion strategies can complement pollution prevention and environmental remediation efforts by enhancing resilience and coping mechanisms among affected populations. For example, community-based mental health programs that provide education, support, and resources for coping with pollution-related stressors can help build resilience and promote mental well-being in communities affected by environmental pollution. Similarly, green space initiatives that increase access to nature and outdoor recreational opportunities can provide psychological benefits and mitigate the negative effects of pollution on mental health.

Engaging with policymakers, advocacy groups, and community stakeholders throughout the research process is essential for translating findings into meaningful policy actions and interventions that prioritize both environmental protection and mental well-being. By involving stakeholders in the design, implementation, and evaluation of interventions, researchers can ensure that interventions are contextually appropriate, culturally sensitive, and responsive to the needs and priorities of affected communities. Moreover, collaboration with policymakers and advocacy groups can facilitate the adoption of evidence-based policies and initiatives aimed at addressing the mental health impacts of environmental pollution.

For example, researchers may work with policymakers to develop and implement legislation that strengthens environmental regulations, reduces pollution emissions, and promotes sustainable development practices. Likewise, collaboration with advocacy groups can support efforts to raise awareness about the link between environmental pollution and mental health, mobilize community support for pollution prevention and environmental remediation initiatives, and advocate for policy changes that prioritize both environmental protection and mental well-being.

Developing practical solutions to lessen the negative effects of environmental pollution on mental health necessitates a cooperative, interdisciplinary approach that incorporates stakeholder viewpoints, current knowledge, and empirical data. Through the integration of various inputs, scholars can discern auspicious approaches for mitigating pollution, restoring the environment, and advancing mental wellness. Additionally, this process guarantees that the results are converted into significant policy measures and interventions that accord equal weight to environmental preservation and psychological welfare. Researcher collaboration with legislators, advocacy organizations, and community stakeholders can help build stronger, more resilient communities that are better able to handle the mental health risks associated with environmental pollution.

## **8. Conclusion**

Environmental pollution's effects on mental health necessitate a comprehensive, team-based strategy that incorporates policy interventions, stakeholder viewpoints, and scientific data. By amalgamating





scientific discoveries with current understanding and collaborating with politicians, advocacy organizations, and community stakeholders, feasible perspectives may be produced to alleviate the detrimental impacts of pollution on psychological health while giving precedence to ecological preservation. As we look ahead, a number of crucial factors and potential paths for the fight against this urgent public health issue become apparent.

First and foremost, future studies have to concentrate on deepening our comprehension of the intricate relationship between environmental contamination and mental health consequences. This entails delving further into the processes by which pollution impacts mental health in addition to examining disparities in vulnerability across different demographic, socioeconomic, and geographic groups. Through the identification of the fundamental factors that contribute to vulnerability and resilience, scholars may create more focused interventions and policies that cater to the unique requirements and goals of impacted communities.

Longitudinal studies that look at the long-term impacts of pollution exposure on mental health outcomes throughout time are also necessary. Insights into the cumulative and long-lasting effects of pollution on mental health may be gained via longitudinal study, which can also pinpoint vulnerable times across the lifespan. Furthermore, longitudinal research can provide light on the course of mental health recovery after pollution exposure and assist develop preventative and early intervention techniques. The creation and use of evidence-based therapies that support mental health in the setting of environmental contamination should also be given top priority in future endeavors. This covers programs designed to lessen pollution emissions, enhance coping strategies and resilience in impacted communities, and improve environmental quality. Community-based programs that include locals in advocacy, mental health promotion, and pollution avoidance may be extremely effective in promoting social cohesiveness, empowering people, and addressing the root causes of vulnerability.

The incorporation of mental health concerns into environmental laws and regulations must be given top priority by legislators and government organizations. This entails bolstering environmental regulations, making sure pollution control measures are followed, and providing funding for pollution monitoring and cleanup initiatives. It is imperative that policymakers acknowledge the significance of tackling environmental injustices and inequities in pollution exposure, especially with regard to vulnerable and disadvantaged people.

Promoting multidisciplinary collaboration and cross-sector information sharing is a crucial component of future endeavors. Through the integration of specialists from several disciplines, including environmental science, public health, psychology, and sociology, researchers may use a range of viewpoints and proficiencies to devise inventive resolutions for the intricate problems presented by environmental contamination. The translation of research results into practical policies and treatments that support environmental sustainability and mental health can be facilitated by cooperative collaborations between academic institutions, governmental bodies, non-profit organizations, and industrial players.

The necessity of implementing a "One Health" strategy in public health practice, which takes into account the connections between human, animal, and environmental health, is becoming increasingly apparent. The significance of addressing environmental concerns, such as pollution, that affect the well-being of humans and ecosystems is emphasized by this integrated approach. Public health professionals may create comprehensive plans for safeguarding and advancing mental health in the face of environmental difficulties by embracing a One Health viewpoint.



**9. Bibliography**

- Attademo, L., Bernardini, F., Garinella, R., & Compton, M. T. (2017). Environmental pollution and risk of psychotic disorders: A review of the science to date. *Schizophrenia research*, 181, 55-59.
- Demeneix, B. (2014). *Losing our minds: how environmental pollution impairs human intelligence and mental health*. Oxford University Press, USA.
- Gu, H., Yan, W., Elahi, E., & Cao, Y. (2020). Air pollution risks human mental health: an implication of two-stages least squares estimation of interaction effects. *Environmental Science and Pollution Research*, 27(2), 2036-2043.
- Marazziti, D., Cianconi, P., Mucci, F., Foresi, L., Chiarantini, I., & Della Vecchia, A. (2021). Climate change, environment pollution, COVID-19 pandemic and mental health. *Science of the total environment*, 773, 145182.
- Signoretta, P. E., Buffel, V., & Bracke, P. (2019). Mental wellbeing, air pollution and the ecological state. *Health & place*, 57, 82-91
- Ventriglio, A., Bellomo, A., di Gioia, I., Di Sabatino, D., Favale, D., De Berardis, D., & Cianconi, P. (2021). Environmental pollution and mental health: a narrative review of literature. *CNS spectrums*, 26(1), 51-61.
- Wang, L. (2020). Impacts of environmental pollution behaviors on mental health emotions and relevant countermeasures. *Revista Argentina de Clínica Psicológica*, 29(1), 701.
- Website: <https://nachvac.com/how-can-air-quality-affect-your-mental-health/>

