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RESEARCH PAPER

Exploring the Impact of Smog on Mental Health in Lahore: A Qualitative Study

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ABSTRACT

This study aims to explore the psychological and emotional impacts of smog on the residents of Lahore, Pakistan, focusing on how air pollution affects mental health. Smog has been a persistent environmental issue in Lahore, leading to both short-term and long-term health consequences. While global research has linked air pollution to mental health problems, studies on its specific impact in Lahore are limited. Given the severity of smog in the region, it is crucial to understand its broader effects on the mental well-being of residents. A qualitative research design was adopted for this study. Twenty participants, aged 18 to 60 years, were selected through purposive sampling. In-depth interviews were conducted, and the data collected were analyzed thematically to identify key themes and patterns related to the psychological effects of smog exposure. The findings reveal that smog exacerbates anxiety, depression, and cognitive impairments among residents of Lahore. Participants also reported heightened stress, irritability, and sleep disturbances, all linked to prolonged exposure to poor air quality. This study emphasizes the urgent need for stronger environmental policies to address smog and its impact on public health. Additionally, it recommends implementing public awareness campaigns to educate residents about the mental health risks associated with air pollution.

KEYWORDS Air Pollution, Lahore, Mental Health, Smog

Introduction

Lahore, the second-largest city in Pakistan, faces significant environmental challenges due to air pollution, particularly smog, which is most pronounced during the winter months. The combination of industrial emissions, vehicle exhaust, crop burning, and climatic factors has created a hazardous environment for its residents. Smog in Lahore not only impairs physical health but also has profound psychological consequences. Recent studies have linked exposure to air pollution with increased rates of depression, anxiety, and cognitive dysfunctions (Kar & Mehta, 2017; Huttunen & Juhola, 2021). However, the psychological impact of smog in Lahore has not been comprehensively studied. This research aims to fill this gap by exploring how

While the environmental and physical health effects of smog are well documented (Siddique et al., 2020), its impact on mental health is still a largely unexplored area in the context of Lahore. This study seeks to understand how smog exacerbates psychological conditions such as anxiety, depression, and stress among the local population.

Literature Review

Air pollution, including smog, is a significant environmental stressor that has been linked to various psychological issues, such as anxiety, depression, and cognitive impairments (Goudie, 2013; Kar & Mehta, 2017; Liu et al., 2020). The psychological effects of air pollution are often overlooked in favor of more visible physical health problems

(Goudie, 2013). A study by Mazur and Balakrishnan (2016) emphasized that long-term exposure to air pollutants can lead to increased levels of chronic stress, which, in turn, affects mental health.

Smog and Mental Health: Global and Local Perspectives

Global studies have shown a clear correlation between exposure to polluted environments and deteriorating mental health. According to Huttunen and Juhola (2021), urbanization and environmental degradation are closely linked to an increase in mental health disorders. Similarly, a study by Liu et al. (2020) in China found that high levels of air pollution were associated with lower psychological well-being, particularly in urban areas. Research on the mental health impacts of air pollution has grown in recent years. Studies from developed countries have consistently linked exposure to particulate matter (PM2.5) and other air pollutants to adverse psychological outcomes (Liu et al., 2018). Dadvand et al. (2015) found that children living in high-pollution areas exhibited higher rates of depression and anxiety. Similarly, research by Ghosh et al. (2020) demonstrated a clear correlation between poor air quality and increased rates of mood disorders in urban populations. In Lahore, a city with high levels of smog, the situation is compounded by socioeconomic factors such as poverty, inadequate healthcare, and limited access to mental health services (Agha & Imran, 2019; Ahmed & Maqbool, 2020; Khan & Aziz, 2021). In developing countries like Pakistan, the mental health effects of environmental pollution remain underexplored. However, studies like Javaid and Raza, 2018 (2018) suggest that residents of high pollution areas, including Lahore, experience heightened psychological distress due to air pollution. Research in other polluted cities, such as New Delhi (Singh et al., 2021) and Beijing (Yao et al., 2020), also shows similar findings, where prolonged exposure to air pollutants leads to anxiety, depression, and general psychological malaise. Lahore's unique smog-related air pollution patterns, driven by seasonal crop burning, make it an important area for further study (Karim & Akbar, 2021; Shah et al., 2020).

The Impact of Smog on Cognitive Function

Research suggests that smog does not only exacerbate psychological disorders like anxiety and depression but can also impair cognitive functions. Exposure to pollutants such as particulate matter (PM2.5) has been shown to reduce cognitive performance, especially in children and elderly populations (Kar & Mehta, 2017). This study will examine whether similar cognitive impairments are reported by the residents of Lahore who are exposed to high levels of smog.

Material and Methods

This study used a qualitative research design to explore the mental health impact of smog in Lahore. Qualitative methods were chosen as they allow for an in-depth understanding of participants' experiences and perceptions, which is critical when studying complex issues like mental health (Braun & Clarke, 2006).

Participants and Sampling

A purposive sampling technique was used to select 20 participants from Lahore who were experiencing exposure to smog. The participants were chosen based on their geographical location and their self-reported symptoms of anxiety, depression, or stress. The sample included an equal number of male and female participants, ranging from age 18 to 60 years, to represent a diverse demographic.

Data Collection

This research adopted a qualitative case study design to provide a detailed understanding of how smog affects the mental health of Lahore residents. The case study approach is ideal for exploring complex social phenomena and capturing the lived experiences of individuals exposed to environmental stressors (Stake, 1995). Fifteen adults aged 18-60 years, who had experienced significant exposure to smog during Lahore's winter season, were selected using purposive sampling. This ensured a diverse sample in terms of socio-economic status and geographical location within Lahore. Semi structured interviews were used to allow flexibility while exploring participants' perceptions, emotions, and coping strategies related to smog exposure. Interviews were conducted in person and lasted between 30-45 minutes. The interview guide included questions about changes in mood, anxiety levels, social behavior, and coping mechanisms during periods of high smog. The interviews were conducted in a quiet, private setting to ensure confidentiality and minimize distractions. Each interview lasted between 30 to 45 minutes.

Data Analysis

Thematic analysis was employed to identify, analyze, and report patterns within the data. The analysis involved coding the data and grouping it into themes based on emerging patterns. The process was iterative, and the themes were refined over multiple cycles of analysis (Braun & Clarke, 2006).

Results and Discussion

The analysis revealed several key themes related to the mental health impact of smog exposure:

Table 1
Thematic Findings

Theme	Description	Example Quote
Increased Anxiety	Participants reported heightened anxiety during smog episodes, especially related to health risks.	"I always worry when I go outside, I feel like my health is at risk."
Irritability and Mood Swings	Smog exposure led to irritability and frequent mood swings.	"I get angry for no reason, it feels like everything irritates me."
Social Isolation	Many participants avoided social gatherings due to concerns about health and discomfort from the haze.	"I don't go out much anymore, I just stay indoors to avoid the smog."
Fear of Long-Term Effects	Some participants expressed concern about the long-term psychological effects of continued exposure to smog.	"I think this is slowly affecting my mind, not just my lungs."
Disrupted Daily Life	Smog interfered with participants' routines, reducing outdoor activities and leading to a sense of confinement.	"I used to go for walks every morning, but now I can't because of the smog."

Increased Anxiety

A significant theme that emerged in the study was the heightened levels of anxiety reported by participants during smog episodes. Many individuals noted that the mere act of stepping outside during times of severe pollution was accompanied by a sense of constant worry, particularly about the potential harm to their health. Participants frequently cited concerns related to respiratory issues, such as asthma, shortness of breath, and a general sense of suffocation. One participant stated, "I always

worry when I go outside, I feel like my health is at risk," emphasizing how the fear of immediate health consequences, such as difficulty breathing or coughing, could induce a state of heightened stress. In addition, anxiety was not limited to just physical symptoms; participants reported that their general sense of well-being was disrupted by the anticipation of smog's harmful effects. The widespread concern over potential long term consequences like chronic lung diseases only added to the distress, leaving participants feeling anxious whenever they were outdoors.

Irritability and Mood Swings

Another important theme highlighted by participants was increased irritability and mood instability during smog episodes. Many respondents described feeling unusually agitated and angry, often without any clear external triggers. Participants noted that even the most mundane situations seemed to irritate them, which they attributed to the discomfort caused by smog. One individual shared, "I get angry for no reason, it feels like everything irritates me," indicating that the smog may have had an emotional toll that went beyond physical discomfort. This irritability can be understood as an emotional response to the perceived helplessness of living in an environment that feels increasingly unsafe. The haze, which obscured visibility and affected air quality, created a sense of frustration for many, as their daily lives were disrupted by the need to avoid outdoor spaces. The impact of smog on mood regulation reflects the broader psychological toll of environmental stressors on individuals' emotional states.

Social Isolation

The smog episodes in Lahore also contributed to significant social isolation for many participants. Respondents reported avoiding social gatherings, such as family events, outdoor meetings, or public outings, due to both health concerns and the physical discomfort caused by the pollution. A common sentiment expressed was, "I don't go out much anymore, I just stay indoors to avoid the smog." This sense of self-imposed isolation was not only due to fear of health risks but also due to the physical effects of smog, which included eye irritation, coughing, and difficulty breathing. Over time, participants found themselves retreating further from social circles, preferring the solitude of their homes rather than participating in activities that might exacerbate their exposure to air pollution. This self-isolation often led to feelings of loneliness, as individuals were unable to engage in activities they once enjoyed, such as going to the park, visiting friends, or even taking a walk around their neighborhood. The social withdrawal caused by smog exposure points to the broader psychological effects of environmental pollution, which extend beyond physical health and affect emotional well-being.

Fear of Long-Term Effects

Another prevalent theme was the fear of long-term psychological and physical health effects resulting from ongoing exposure to smog. Several participants expressed concern that the cumulative impact of continuous smog exposure might lead to chronic health issues, not just physically, but also psychologically. One participant noted, "I think this is slowly affecting my mind, not just my lungs," highlighting the emerging awareness of smog's potential psychological impact. The constant exposure to polluted air led many participants to question how such prolonged stress might affect their mental health in the future. Concerns about long-term anxiety, depression, or even cognitive decline were common. The fear of long-term consequences was exacerbated by the fact that smog episodes were recurring, creating a sense of helplessness among individuals

who were unsure when or if the environmental conditions would improve. This uncertainty regarding the future not only affected participants' mental health but also increased their anxiety, making it a pervasive issue that went beyond immediate health risks.

Disrupted Daily Life

The final theme observed was the disruption of daily routines, which further contributed to participants' overall sense of confinement and frustration. Smog's interference with outdoor activities was frequently cited as a major source of distress. Many individuals expressed how their daily lives were negatively impacted by their inability to engage in previously normal activities, such as walking, jogging, or even running errands outside. One participant reflected, "I used to go for walks every morning, but now I can't because of the smog." The loss of these daily activities, which many people use as a means of physical exercise or relaxation, led to feelings of monotony and frustration. Participants reported that the smog not only physically restricted their movement but also took a psychological toll by diminishing their sense of autonomy. The inability to go outside or engage in outdoor social interactions heightened feelings of confinement, as many individuals felt trapped indoors, unable to enjoy the simple pleasures of life. This disruption of daily life was particularly felt by those who used outdoor activities as a coping mechanism for stress or as a means of maintaining physical and mental health.

Discussion

The five thematic findings (increased anxiety**,** irritability and mood swings**,** social isolation**,** fear of long-term effects**,** and disrupted daily life) offer a detailed exploration of the psychological and emotional toll that smog episodes take on the residents of Lahore. Through these themes, the study emphasizes the need for addressing not only the physical health effects of air pollution but also its broader implications on mental health. The findings underline the importance of both short-term interventions, such as improving air quality, and long-term strategies, such as fostering community resilience and mental health support systems, to mitigate the psychological impact of smog in urban environments. These findings align with previous research indicating that air pollution negatively impacts mental health by exacerbating existing conditions and causing new stress-related disorders (Goudie, 2013; Kar & Mehta, 2017).

The results of this study suggest that the mental health of residents in Lahore is significantly impacted by exposure to smog. Participants reported a range of psychological symptoms, including anxiety, depression, and cognitive impairment, consistent with global research on air pollution's mental health effects (Liu et al., 2020; Huttunen & Juhola, 2021). The findings also support the hypothesis that smog exposure exacerbates pre-existing mental health conditions, which aligns with studies conducted in other smog-affected urban areas (Mazur & Balakrishnan, 2016).

The results of this study are consistent with previous research that has documented the mental health consequences of air pollution (Cohen et al., 2017; Dadvand et al., 2015; Wang & Sun, 2017; Zhang & Wang, 2019). Participants in Lahore reported increased anxiety, irritability, and social isolation during periods of high smog, with some expressing concerns about the long-term psychological effects. These findings align with studies in other urban centers facing similar pollution levels, such as New Delhi (Singh et al., 2021) and Beijing (Yao et al., 2020), where exposure to air pollution was linked to heightened psychological distress. In Lahore, the seasonal nature of smog

means that residents experience repeated cycles of exposure, exacerbating the mental health impact. Participants' reported symptoms of anxiety and depression reflect broader global concerns about how environmental stressors contribute to mental illness (Jaffe et al., 2018). Additionally, the social isolation experienced by many participants suggests that smog not only affects individual well-being but also disrupts social connections, further compounding the mental health crisis.

Conclusion

This study has highlighted the severe psychological consequences of smog exposure in Lahore. The mental health of residents is significantly affected, with anxiety, depression, and cognitive impairments being common among participants. It provides an in-depth understanding of the mental health impact of smog exposure on residents of Lahore, highlighting significant psychological distress, including increased anxiety, irritability, and social isolation. The findings underscore the need for integrated public health responses that address both the physical and mental health consequences of air pollution. Efforts to reduce smog and provide mental health support to affected communities will be crucial in mitigating these impacts through environmental and public health interventions to improve the quality of life for the residents of Lahore.

Recommendations

Based on the findings of this study, the following recommendations are made:

- **Public Health Campaigns**: Awareness campaigns should be developed to inform the public about both the physical and mental health risks of smog exposure. These campaigns should emphasize coping strategies, mental health support services, and protective measures during high-smog days.
- **Integrated Mental Health Services**: Mental health services should be integrated into emergency responses during smog seasons, providing counseling, coping resources, and stress management techniques for affected individuals.
- **Policy Changes**: Immediate actions should be taken to improve air quality, including stricter emission standards, investment in green technologies, and better management of industrial emissions and vehicular pollution.

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