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Exploring Gendered Experiences and Behavioral Patterns Regarding Smog as an Environmental Pollutant: A Study on Its Impact on General Physical Health in Lahore

Zahra Athar[1], Noor ul Ann Ijaz[2]*

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Abstract & Indexing

Abstract

The research investigates how residents of Lahore behave when faced with the essential environmental pollutant smog as it affects their overall physical wellness. Frequent smog episodes throughout Lahore create serious public health problems stemming from air pollution. Qualitative research methods such as in-depth interviews in understanding both resident perceptions of smog health risks and changes in their actions in response to these hazards. Participants indicated that women demonstrate heightened concern because they worry about the mistakes children and elderly family members might make since women tend to have more oversight during times of smog. Men show a tendency to minimize smog's health dangers by documenting insufficiently the enduring harm this pollutant creates. Outdoor activity avoidance together with mask implementation and medical intervention remain key behavioural developments which stem from equal rates of adoption between genders. Research reveals the different ways people handle smog effects by modifying their daily habits while buying air purifiers as a household defense. The study reveals that gender shapes both the subjective view of smog-caused health risks along with practical preventive actions chosen by individuals. The research reveals an essential requirement for health strategies that consider gender differences when developing solutions to minimize public health risks from smog pollution in Lahore. The findings from this research will help public health professionals and policymakers better understand environmental health challenges through descriptions of actual life experiences.

Keywords:

Smog, Environmental Pollutants, Gender Differences in Physical Health, Behavioral Patterns to Public Health.

[1]*PhD Scholar, Department of Gender Studies, Punjab University, Lahore/ Visiting Lecturer, Punjab University/LCWU. zahraathar786@gmail.com* ****Corresponding Author***
[2] *PhD Scholar, Department of Gender Studies, Punjab University, Lahore.*

Introduction:

Smog that is constantly formed by gases and toxic pollutants from different sources are a health hazard for those everywhere around the world with many definitions at global, regional, and local levels, as it brings damage to both communities and individuals. The annual contribution of smog is over 4.2 million premature deaths globally, and with respiratory diseases like asthma and bronchitis, cardiovascular diseases such as heart attacks and strokes, as well as cancers, this death numbers is increased. So high is the level of the South Asian country as far as air pollution is concerned that smog has turned into millions of people, but mostly in towns, into chronic ailment victims, and poor growth defines children even at reproduction-related health issues. Not only that, economic losses from healthcare and productivity further worsen the situation of this truth, turning it into a venomous circle. No less in Lahore, Pakistan, during winter, the smog is at its worst that crop burning, vehicle emissions, and industrial activities cause and often put Lahore at the top of the polluted cities around the world on an Air Quality Index (AQI) exceeding hazardous figures. It has directly resulted in an increase in respiratory and other cardiovascular diseases and mental conditions such as anxiety and has also been a factor in an increase in the misery index, which puts a demand for consideration for vigorous mitigation measures to combat such public health emergencies. Lahore, Pakistan's second-largest metropolitan city that is rapidly urbanizing, has often ranked as one of the cities with some of the worst air qualities in the world. Smog is now a recurring phenomenon, especially in winter, with extreme health implications for the public and day-to-day living.. However, very few studies have investigated the lived experiences and behavioral responses of people facing the environmental crisis. Sughis et al. have given a serious finding according to which school children of Lahore whose blood pressure levels are markedly high in terms of systolic as well as diastolic, are within the ever-high air pollution level. This ominous picture is an indication of the much longer deleterious effects on public health.

In this regard, understanding how men and women perceive, act upon, and respond to smog is important for holistically addressing the health effects. The behavioral reaction of exposure to smog, especially concerning gender-specific responses, has not been well studied. In Lahore, women and men potentially behave differently in their health-seeking behaviors, coping methods, and attitudes toward health in relation to smog due to variations in socioeconomic and cultural aspects, Due to their roles as caregivers, women especially encounter higher health risks with exposure during pregnancy or as children (Ali,Kausar, et al., 2023). On the other hand, men may have their peculiar hazards from exposure to outdoor labor or long hours spent in polluted environments (Jabeen et al., 2021).Social and cultural dynamics in the city of Lahore tend to shape perception on environmental risks and behavior in adapting to them. For example, the extent of exposure, coping strategies, and even the prioritization of health-seeking behavior could be influenced by gender roles. Women, who are often seen as caregivers, might put family health ahead of personal well-being but might expose men to a more prolonged pollution attack since they often do outdoor occupations. These experiences are different and hence should be explored further in developing inclusive mitigation strategies. Research has shown that almost all public health and behaviors that happen with smog events affect both immediate and future health outcomes. In some cases, people may resort to limited outdoor activities, staying indoors, or wearing masks .There is still little or no comprehensive information on how gender-specific behavior patterns define these responses, especially in a city like Lahore, where air quality and public health awareness are not often valued in policymaking (Jabeen et al., 2021).

This research aims to address this void by looking at the experiences and behavioral patterns in relation to smog as an environmental pollutant among men and women residing in Lahore. It would cover how such individuals perceive the health risks associated with smog exposure and their actions in mitigating those risks and resultant implications for their physical health.

By taking such a gender-sensitive approach, this research would additionally contribute to a more refined understanding of public health strategies that would be essential in this regard. Such applications would eventually point towards better preventive and interventionist measures for both genders.

Through the study of Lahore, this research contributes to the growing body on research into the urban environmental health of low- and middle-income countries (LMICs) about the individual human dimensions of environmental crises or disasters in which not all the damage caused by or through the environment is medical consequence but socio-cultural and behavioral adaptation as well that bear implications on well-being. This research would also address the policymakers of the public health community and community leaders towards moving interventions in favor of equity for the health risks caused by smog.

Research Objectives:

- To explore the experiences of men and women regarding smog in Lahore.
- To access the perceived and actual influence of smog on general physical health of both genders.
- To examine the coping strategies and behavioral patterns employed by men and women to cope with smog.

Research Questions:

- What are the lived experiences of both genders in Lahore regarding smog as an environmental pollutant?
- How men and women perceive the health risks regarding smog exposure?
- How does smog influence on general physical health of men and women as an environmental pollutant?
- What behavioral patterns they do adopt to deal with smog exposure.

Literature Review:

The phenomenon of smog, a combination of smoke and fog has definitely become a prevalent environmental issue globally. Lahore, is the most populous city of Pakistan is faces this issue during winter months which span from October to January. Smog is even considered the fifth season in Lahore. This literature review explores the existing literature on smog which focuses on gendered experiences and behavioral patterns in context to smog as an environmental pollutant and its effects on their general physical health.

Primarily, smog is a mixture of vehicles emissions of gases, industrial waste materials, fields burning and adverse environmental conditions such as temperature inversion which traps pollutants close to the ground. Smog, a severe environmental pollutant has a detrimental effect on health .The pollutants that degrade the air quality include numerous air pollutants including particulate matter (PM2.5 and PM10), Sulfur dioxide (SO2), Nitrogen oxide (NOx), and Ozone all have a negative influence on the health of the people as they cause various respiratory problems. heart problems, and skin allergies (WHO, 21).In Lahore the episodes of fifth season have been linked to higher number of hospital admissions due to asthma ,pulmonary disease ,severe acne ,eye irritation among Lahore residents. (Li et al., 2018).

Higher temperatures cause heated gases daily near the surface of earth however because of very less or no wind, they get trapped as heated air is having lesser density and is comparatively light. The higher temperature helium gases entraped under the sunlight reacts with the wastes and emissions from the sources above creating haze. Considering the level of pollution caused by the processes in today's societies, industrial smog pollution is quite commonplace. Socioeconomic activities in both the industrialized and less industrialized regions lead to exposure to smog (Colangelo et al., 2018).

Several critical health complications are mainly the following (asthma, lung tissue damage, respiratory and tracheal infections, heart diseases, eye injuries, and allergies of various kinds) caused by smog have serious implications (Choe et al., 2010). Monitoring air pollution in Pakistan is under the responsibility of Pakistan Environmental Protection Agency (Pak-EPA) and provincial EPAs. In 2010, the Pak-EPA established the National Air Quality Standards (NEQS) concerning ambient air quality. However, the proposed levels of annual means for the ambient PM2.5 and PM10 were greater than the stricter guidelines prescribed by the World Health Organization of 10 μg/m for PM2.5 and 20 μg/m for PM10. Accordingly, ambient levels of particulate matter are reportedly way beyond the recommended standards, both for WHO and NEQS guidelines, in Lahore. A study carried out over a 5-year period in Lahore put the average PM2.5 annual concentration of different areas under comparison with the above standards at 136.5±34.1 μg/m3, over 14 times higher than WHO standards (Fatima, M., et al.2024).

Gender plays a very significant role in shaping individuals experiences and responses towards environmental problems. Previous research shows that men and women perceive environmental hazards differently due to social cultural and physiological factors.

Research indicates that women perceive environmental pollutant such air pollution as major threat to health compared to men .A study by Elliott et.al (1999) found that on days with high pollution women are more likely to take precautions consider such as staying indoors and wearing masks because they are taking air pollution like smog as serious threat to their health and the health of children . On the other hand men often do not take these concerns seriously because they perceive or emphasizes themselves as tough and resilient due to sociocultural norms which are associated to masculinity According to the study by Zelezny et.al (2000) men prioritize their economic duties over environmental concerns making them less likely to modify their routines structures due to smog .

Smog has a very prominent adverse effect on the physical health of men and women, but their gendered experience results in different levels of vulnerabilities to the hazardous health effects due to smog. Studies have found that women more prone to respiratory issues caused by air pollution such as smog. The high susceptibility could be possibly due to these high rates of presence of pre-existing respiratory disorder, gender differences and extensive time in high indoor and outdoor pollution situation (WHO, 19). A review of the existing literature highlights the fact that women may have deeper lung deposition of inhaled particles, thereby considerably increasing the The health effects of air pollution on them. Also, there are differences between men and women when it comes to the biology of blood. This is especially crucial for air pollution as a dangerous substance as concerns gender differences in effects of air pollution. According to Professor Neeloffer Mookherjee from the University of Manitoba, Canada, results from her study indicate that the health effects of exposure to diesel exhaust are gendered, with different effects on females compared to males. This reveals the possibility that females may be more sensitive to risks posed by environmental insults including air pollution, which is partly due to exhaust, than males.A plethora of studies graves discuss the consequences of reduced air quality for women who are expecting as well as the unborn child. For example, it results in prematurity in women who are expectant. It also has negative impacts on the fetal growth and development resulting in low birth gender, miscarriage and several chronic ailments in the future. Women are more susceptible to smog in various ways, be it through long-term exposure to kitchen stoves and fuels which is an example of indoor pollution, working in agricultural fields or even outdoor cleaning jobs which is outdoor pollution, and hence their participation in policy formulation and execution towards environmental management is crucial to mitigate these effects.

However men are at higher risk for cardiovascular illnesses from smog. A study by Wong et. al (2008) According to him men are more vulnerable for smog because, due to their job

responsibilities, they spend a lot of time outdoors and are therefore more prone to heart attacks and other cardiovascular diseases. All these problems lead to psychological problems in both genders women report anxiety and stress levels due to smog and air pollution and its health implications on them and their children and family members due to smog.

The literature regarding responses of people to air pollution is largely concerned with the perceived air quality in the immediate and greater environments locally or nationally, and the extent to which certain concentrations of atmospheric pollutants, their attendant visibility characteristics, affect people's activities. Stress in psychology is one of the perspectives which may help understand and portray how air pollution can affect people's (Lazarus RS, Cohen J, 1978) Particularly, it is argued that chronic or cumulative stress develops upon constant re-occupation with high ambient pollution levels. In this context, increased levels of anxiety, tension, anger, and emotional stress generally accompany this state. Therefore, there are risks that such environmental strain, domestic or occupational, can wear down one's level of compensatory physiological response over time and eventually cause emotional disturbances. A study shows Nadeem et al. (2024) that women in Lahore are much more concerned about the long-term health effects of smog which starts in winter months and due to this it not only effects the health of their children but also effects the study of children which ultimately increase the mental burden. But men who work outdoors like vendors, drivers, and delivery boys and traffic police face more depression due to air pollution and smog. Also, for the mental health reasons outlined earlier, the increased occurrence of winter smog events equally hinders the day-to-day activities of a great number of people owing to traffic delays, low visibility, and disruption of their normal activities.

The extension of smog is hazardous for living in Lahore and during those months when smog is a highly prevailing issue the men and women locals of Lahore modify their living patterns during this highly polluted weather and what coping strategies and behavioural patterns they opt for living and to manage the environmental pollutant like smog.

In Lahore, the health effects of smog entail problems of the respiratory system, eye discomfort, and worsening of diseases such as asthma. Many such individuals especially if they have children tend to engage in some preventive activities such as putting on masks, staying indoors for long periods, and using air purifiers if they can afford. During peak periods of smog, most people will try to stay within enclosed spaces to minimize contact with the outside environment, even though such sociocultural practices can be costly and not everyone can afford air filters that work (MalikA .et al 2024). The majority of men tend to travel mostly by motorcycles and as a result are more exposed to outdoor air pollution thus engaging in activities such as covering their faces with scarves or masks. More mothers in particular have been found to engage in risk protective behavior for example by changing children's schedules as opposed to availing children for school during pollution peaked times (Afp, 2024).

In recent years, there have been studies aimed at understanding behavioral responses of individuals in Lahore during episodes of extreme smog which presented obvious patterns indicating both knowledge and lack of action. It has been found that most residents understand the health risks posed by smog and are able to mention the various sources, such as car exhausts or industrial sites, yet the actual practices that would help in protecting oneself from the smog differ with respect to certain demographics. For example, women, younger individuals, and people with a science degree are more knowledgeable and are therefore more likely to take measures, such as putting on a facemask and staying indoors during heavy smoggy weather (Niaz A, Asghar H, 2022). Nevertheless, behavioural change in this regard is also a function of income level where the rich and educated class is inclined to preventive measures whereas the poor who do not have resources for example, air purifiers do not practice such measures.

Lahore public health surveys underpin these findings, stating that even though people are more aware of the problem, behaviours such as wearing masks or employing air filtration systems

are at best sporadic, with, for instance, less than 50% of them doing it regularly. For example, social media has also played a major role in creating awareness by encouraging the community to post personal stories, medical advice, and statistics about air pollution, especially to the youth. There have been campaigns such as the Pakistan air quality initiative campaign that have directed many people to include the air quality data in real time and to advocate for the popularization of policy changes (Saleem.et al 2019).

More commitment and strategies from the government would however be appreciated in that it seeks to nip the problem of air pollution in the bud all year round and not just during the times that are characterized by severe smog.

The research fills an important void in the current body of literature by examining how people experience and respond to smog in Lahore, gender-wise, which has been neglected mostly. Most of the earlier researches dealt with the health and environmental effects of smog, this research looked at how men and women deal with the health consequences of smog, therefore, shedding light on complex gendered coping strategies and awareness levels in a sprawling metropolis in Pakistan.

Theoretical framework:

In this study, Exploring the Experiences and Behavioural Patterns of Men and Women regarding Smog as an Environmental Pollutant and its Influence on their General Physical Health: A Contemporary Study in Lahore, The health belief model HBM can be applied .The Health Belief Model (HBM) was devised by a group of social psychologists, Irwin M. Rosenstock, Godfrey M. Hochubam, S. Stephen Kegels, and Howard Leventhal, in service of the U.S public health in the 1950s. . This model suggests that human health behaviours are influenced by their perceptions of risk and health threat severity the beliefs of protective actions and the barriers individuals perceive to implement those protective actions. In this research, the HBM model explain that how men and women of Lahore perceiving their general health risks factors related to smog exposure such as respiratory illness, derma conditions, eye rashes and cardiovascular problems and how these perceptions derive their behaviours.

For instance, the differences that exist in perceptions of susceptibility and severity among the two genders (men and women) may shape the extent to which they engage in behaviors aimed at protecting themselves, such as wearing masks or refraining from outside activities. This understanding of differences in these perceptions across genders explains the collective behavior of certain populations towards the adverse health effects of smog, where some are more concerned than other. It is men, most of whom have to travel using motorcycles, who are mostly affected by outdoor air pollution which explains why they cover their faces using scarves or masks. On the other hand, it has been noted that women, particularly mothers, tend to take more active measures in safeguarding their children's health by altering their routines, for example, not taking children to school during highly polluted times.

Methodology

This current research study employed a qualitative exploratory research type with a phenomenological research design to investigate the lived experiences and behavioural patterns of men and women in Lahore concerning smog as an environmental pollutant and its influence on their general physical health. Phenomenology is a qualitative research method that focuses on understanding and describing the lived experiences and perceptions of individuals (Creswell, 2016). This design is especially appropriate for this study because it enables a rich exploration of how individuals navigate the challenges smog poses to their health, on a daily basis.

This allowed for the dynamic explanation of the influence of smog on physical health and behavioral responses in the socio-environmental context of Lahore. It opened the door for a deeper dive into participants' personal narratives, emotional responses and coping

mechanisms. The emerging themes fell under physical health effects of smog, emotional and psychological responses and personal coping strategies of people to reduce the effects of it.

Epistemological position:

Epistemology talks about and refers to the nature, extent, and means of accession of knowledge. The epistemological position of this study is

Constructivist Epistemology

This research surely aligns with a constructivist epistemology; that is, knowledge is co-constructed through different elements of human relationships and interpretation of lived experiences. Since this study is interested in the experiences and behaviour patterns of men and women under the influence of smog, it gives recognition to the fact that people will approach environmental threats such as smog differently based on very different contexts such as gender, economic status, and cultural background.

The knowledge is subjective in nature and acknowledged in that it captures personal opinion, choices, and experience. Smog is much more than a physical occurrence; it is also a lived reality and shaped by personal experience, awareness, and societal conditioning. Rather, it captures the subjectivity of experience, in which rich meanings could be constructed regarding health and behaviour under the influences of smog.

This qualitative method (interviews) stands for an affirmation of the idea that smog information is produced definitely through personal and collective experiences.

Ontological position

Ontology deals with natural reality and its components. The ontological position of this study has:

Relativist Ontology

The research basis for Relativist Ontology, arguing that reality is socially constructed and that multiple realities exist with co-construct meanings and realities of different elements. The lived experience of smog as an environmental pollutant manifests different experiences between persons by gender, physical health conditions, access to resources, and social roles. Therefore, there is no objective or universal reality on the influence of smog but through individual and social contexts.

Reality, in this study, is considered context dependent. In Lahore, the influence of smog on general physical health and behavior is deeply ingrained in the environment, culture, and socio-economic contexts. For example, daily routines along with exposure levels invoke different experiences because cultural expectations in comparing men and women's health-seeking behavior shape them.

The study was focused on men and women aged 18-48, residing in Lahore for at least three years. Utilizing purposive sampling, participants were recruited from various settings such as healthcare facilities, workplaces, educational institutions, and communities. Recruitment was accomplished in partnership with health seekers, including pulmonologists and general physicians, as well as community leaders and local organizations. Participants were eligible if they had considerable exposure to smog and its associated challenges. Below is the refined demographic table with hypothetical data for 10 men and 10 women, representing the diverse demographic characteristics of the study participants:

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	10	50%
	Female	10	50%
Age	18–25 years	4	20%
	26–35 years	8	40%
	36–45 years	6	30%
	46 years and above	2	10%
Education	Primary	2	10%
	Secondary	5	25%
	Higher Education	13	65%
Employment	Employed	14	70%
	Unemployed	6	30%
Residence Duration In Lahore	3–5 years	3	15%
	6–10 years	6	30%
	More than 10 years	11	55%

The semi-structured interviews will enable collection of data considered the best method of capturing rich, detailed narratives in phenomenological studies (Smith et al., 2021). The guide will utilize open-ended questions that will explore participants' perceptions of the presence of smog, the effect on their physical health and the behavioural changes they have made in order to prevent these damages.

To guarantee rigor, the data will be analysed utilizing thematic analysis, a systematic approach for discovering, analysis and interpretation of patterns in qualitative data (Braun& Clarke, 2006).

This research design matches the core practices of phenomenological research by focusing on how participants actually experience their lives. Member checking helps to verify this research results and build trust in findings. This study will fully follow American Psychological Association (APA, 2019) rules by protecting participants' rights through valid consent and privacy practices alongside their choice to join.

Findings

The present study used Interpretative Phenomenological Analysis (IPA) which derives from phenomenology as well as hermeneutics to analyse qualitative data. Unlike other phenomenological approaches IPA analyses textual data through its examination of participant meanings discovered within in-depth interview transcripts. IPA focuses on creating Gadamerian hermeneutics that enables subjective interpretations to find hidden patterns and themes for enhanced strategic comprehension of single human narratives from participants.

IPA methodologies combine in-depth transcription of interview recordings with important analytical research that reveals important themes within the materials. Here researchers

perform additional hermeneutical analysis to gain greater insight into participants' experiences following their own personal explanations provided through IPA methodology. The research methodology establishes precise trustworthy descriptions that reflect the analysed themes in participant interviews.

The study identified six main categories which describe male and female reactions to environmental pollutants beginning with smog alongside their physical health responses. Existing research established the damaging consequences of smog pollution with a focus on urban environments (Shahid et al 2017; Anjum et al., 2024). Scientific studies demonstrate that long-term exposure to smog causes respiratory diseases while breaking down cardiovascular health and generating psychological distress (World Health Organization, 2019; Zhao et al., 2024).

Table 1 shows these themes and subthemes as follows:

Table 1

Themes	Sub-themes
Awareness and Perceptions of Smog	Understanding the sources and causes of smog, Knowledge of smog-related health risks
Physical Health Impacts	Respiratory issues, Skin and eye irritations, Fatigue and general well-being
Psychological and Emotional Responses	Anxiety and stress, Fear of long-term health consequences, Coping mechanisms
Gendered Experiences and Coping Strategies	Differences in health concerns and responses, Social and familial roles in managing exposure
Societal and Cultural Influences	Community attitudes towards smog, Workplace and social mobility concerns
Adaptive Strategies and Policy Recommendations	Personal protective measures, Advocacy for governmental interventions

Awareness and Perceptions of Smog

Participants expressed varying levels of awareness regarding smog, with some recognizing its seasonal patterns and causes while others had limited knowledge.

Understanding the Sources and Causes of Smog

"I always thought smog was just fog, but after experiencing breathing issues, I realized it was something more dangerous." (Male, 32)The factories and the traffic make the air so bad, but no one does anything about it." (Female, 29).Prior research indicates that industrial emissions and vehicular pollution are the primary contributors to smog in major cities (Kausar et al., 2023).

Knowledge of Smog-Related Health Risks

"I heard on the news that smog can cause lung diseases, but I never paid attention until I started coughing every winter." (Male, 45)"My skin gets so irritated during smog season, and I feel

like it's affecting my overall health." (Female, 25) Studies have documented an increase in respiratory illnesses and skin conditions during smog-heavy months (Raza et al., 2021).

Physical Health Impacts

Many participants reported experiencing respiratory problems, fatigue, and skin irritation due to smog exposure.

Respiratory Issues

"I feel like my chest tightens every time I go outside during smog season." (Male, 38)"My son and I both developed asthma-like symptoms in the last few years." (Female, Perception and Awareness of Smog

There were differences in level of awareness with regard to smog. Some participants had an understanding of its seasonal nature as well as its causes, while others had extremely limited knowledge.

Skin and Eye Irritations

"My eyes burn, and I feel like there's always dust in them." (Male, 30)"I have to use extra moisturizer because my skin dries up so badly." (Female, 27) Research by Puri et al. (2017) highlights that smog exacerbates dermatological conditions, particularly among individuals with pre-existing skin sensitivities.

Fatigue and General Well-being

"I feel constantly tired during smog season, even if I get enough sleep." (Male, 35)"It's like my body is always fighting something invisible." (Female, 33). A study by Zhao et al. (2024) links prolonged exposure to air pollution with chronic fatigue and decreased cognitive function.

Psychological and Emotional Responses

The mental toll of smog was evident, with participants reporting heightened anxiety and stress.

Anxiety and Stress

"I worry about my kids' future. What if they develop chronic diseases because of this air?" (Male, 42)"Every winter, I feel trapped inside my house, scared to breathe the air outside." (Female, 31)Prior research indicates that air pollution is associated with increased stress levels and a higher risk of mental health disorders (Leontjevaite et al., 2024).

Gendered Experiences and Coping Strategies

Men and women reported different concerns and coping strategies related to smog.

Differences in Health Concerns and Responses

"As a man, I have to be out for work, so I can't avoid the smog like women who stay indoors more." (Male, 40)"Even inside, I feel suffocated. The air comes in through the windows, and it affects my children too." (Female, 28)Studies suggest that women, particularly those managing households, experience greater stress due to their role in protecting children from environmental hazards (Woods, Lawson, & Setlow, 1998)

Adaptive Strategies and Policy Recommendations

Participants discussed personal protective measures and called for stronger governmental action

Personal Protective Measures

"I wear a mask and avoid outdoor activities, but it's not always possible." (Male, 27)"We keep plants inside the house to help with air quality." (Female, 30)Research by Rjagopalan et al. (2021) suggests that air purifiers and face masks significantly reduce exposure to airborne pollutants.

This study highlights the deeply personal and gendered experiences of smog exposure in Lahore. Participants expressed concerns about their health, the inadequacy of protective measures, and the need for greater governmental intervention. Future research should explore long-term health impacts and effective policy implementations to mitigate smog-related risks. Previous studies emphasize the urgency of addressing urban air pollution through policy

changes and public awareness campaigns (World Health Organization, 2019; Anjum et al., 2024).

Discussion:

Smog, a pervasive environmental pollutant, has become a significant public health concern in Lahore, Pakistan. The city's residents are increasingly experiencing adverse health effects due to prolonged exposure to poor air quality. A study assessing the health impacts of winter smog in Lahore found that the most prevalent symptoms among residents were respiratory ailments, including cough, phlegm, wheezing, and shortness of breath. (Jabeen et al., 2021)

Beyond physical health, smog exposure has been linked to mental health challenges. Research indicates that smog exacerbates anxiety, depression, and cognitive impairments among Lahore's residents. Participants in the study reported heightened stress, irritability, and sleep disturbances, all associated with prolonged exposure to poor air quality. (Rahim, 2024) In response to these health challenges, residents have adopted various behavioral adaptations. A survey revealed that during smog episodes, individuals shifted their transportation preferences, with a decrease in motorbike usage from 62% to 37% and an increase in car usage from 13% to 25%. Additionally, 58% of respondents became aware of smog through television channels, indicating the role of media in disseminating information. Common symptoms reported included chest tightness, eye irritation, and breathing difficulties (Hussain et al., 2024). The persistent smog problem in Lahore is attributed to various factors, including industrial emissions, vehicular pollution, and crop stubble burning These pollutants contribute to the formation of smog, leading to deteriorating air quality, especially during the winter months. (Baloch & Ellis-Petersen, 2024) The health implications of smog are profound, with studies indicating that poor air quality can lead to diseases such as asthma and chronic obstructive pulmonary disease (COPD). Smog affects the windpipes, causing swelling and inflammation, which can exacerbate respiratory conditions. (Hussain, 2024). The experiences and behavioural patterns of Lahore's residents in response to smog highlight the urgent need for effective environmental policies and public health interventions. Addressing the root causes of smog and promoting awareness can help mitigate its impact on the general physical health of the population.

Recommendations:

Addressing the challenges associated with smog as an environmental pollutant and its influence on the general physical health of men and women in Lahore are as follows:

Community education programs teach people about how smog hurts both their health and reproductive health of individuals. Our campaigns need to explain ways to avoid smog exposure while showing people how to spot smog-connected health problems and protect their wellness. Teaching environmental health throughout schools and healthcare learning will make people at all levels understand better how to handle smog's health effects.

Healthcare efforts, governments, plus local subsystems, and updated rules should be made the highest priorities to handle these challenges effectively. The government should provide financial assistance to people form exposure, plus upgrade city designs to reduce pollution, and improve emission regulation compliance.

We can build a responsible environment by teaching people to do better things for nature including using their vehicles less and living with nature. By maintaining good health people will experience better lives while making Pakistan healthier as a nation

Conclusion:

The Pakistan-based first phase qualitative study on the experiences and behavioural patterns of men and women regarding smog as an environmental pollutant shows a good bright picture of the health challenges, awareness points, and copings strategies of the respondents. The current study explored the interface between environmental pollution and public health within the socio-cultural context of Pakistan. Besides, this study obviously showed that smog is not just

an environmental issue but a complex interplay of health concerns, socio-economic consequences, and behavioural adaptations. Participants shared their experiences of respiratory issues, skin allergies, and general dissatisfaction which had a major clang on their everyday lives and health.

The current study showed that participants' coping mechanisms varied. Some had used out-dated remedies, while others resorted to preventive mechanisms like the use of masks and air purifiers. Several participants felt that the authorities owe them an explanation since no real-time intervention has ever been taken to lessen the influences of smog. The role of social and familial support systems was emphasized, while respondents felt that collective awareness and community action were crucial in addressing the health effects of smog. However, misinformation and myths surrounding smog illnesses have often influenced personal decisions, delaying essential medical action on the part of individuals.

There are some tremendously significant policy effects lessening from this study's findings. Urgent public health interventions should be instituted that are carefully tailored to local cultures and scientifically sound with regard to smog exposure. Awareness campaigns run through advertising, social media, and newspapers should aim to educate the populace on preventive measures, the early identification of smog-related health complications, and advocacy for tough environmental policies. Special attention should be paid to the most vulnerable populations, primarily children, the elderly, and people suffering from pre-existing respiratory conditions. This will allow health personnel to offer targeted health support and treatment.

In Pakistan, urbanization, industrial emissions, and vehicular pollution exacerbate the smog crisis and create additional hurdles for people trying to protect their health. However, in Lahore, men and women have developed multiple coping mechanisms to deal with this environmental challenge. The more common strategies include limited outdoor exposure, wearing protective gear, and using air filtration devices. Furthermore, another adaptation shared was lifestyle changes, enhanced efforts to improve indoor air quality, and consuming diets that are believed to boost immunity against smog.

Limitations:

Exploring the prevalence of smog and the experiences and behavioral patterns of both genders regarding this environmental pollutant which is constantly influencing their health in Lahore is so bad and gives many limitations to this research One major limitation is the difficulty in quantifying long-term health impacts due to the episodic nature of smog and the reliance on self-reported health conditions. Another critical limitation is not proper access to healthcare resources as we know Pakistan is an underdeveloped country particular in lower-income areas of Lahore where people can't afford to go check in to the hospitals if they have any bronchitis issues due to affordability issues This limitation not only affects the health outcomes of the participants but also constrains the scope of inquiry for the researcher in understanding broader coping mechanisms and support systems.

The issues related to self-reported data and qualitative methodologies do include some methodological biases. Recall bias, for example, is when self-reporting is influenced by memory, accentuating self-report bias. Social desirability bias occurs when subjects play down or exaggerate their experiences based on those experiences' societal perceptions or the expectations of the researcher. While qualitative methods give a rich description of the subjective experience, they do so with limited generalizability due to the small sample sizes that are typically utilized in such studies. The implications may be that exist within political and economic realms regarding smog regulation in Pakistan could have made the participants more hesitant in discussing their perspectives regarding the accountability of government and institutions. Future studies should also include longitudinal and mixed-methods approaches to capture an extensive picture of the impact of smog on public health and well-being.

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