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From Screens to Surveys: Exploring Pakistan's Smog Crisis through Media Analysis and Healthcare Perspectives

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ABSTRACT

Aim of the Study: This research aims to comprehensively understand the multifaceted impact of smog on public health and the role of media coverage in shaping public perception in the context of Pakistan's smog crisis.

Methodology: Utilizing framing theory and agenda-setting theory, this study employs content analysis of 69 news clips from three major news channels—City 42, SAMAA TV, and ARY News—to investigate their reporting patterns on smog-related issues. Additionally, 20 semi-structured interviews with medical professionals provide deeper insights into the medical perspective on smog's health impacts, diagnosis, treatment, and preventive measures.

Findings: The study reveals the significant impact of smog on public health, with media coverage playing a crucial role in shaping public perception. While government initiatives and academic seminars contribute to awareness, media coverage often lacks depth and accuracy, potentially biasing public understanding of smog-related risks.

Conclusion: The findings underscore the urgent need for comprehensive and accurate media coverage to address the smog crisis effectively. Recommendations include enhancing media literacy, fostering collaboration between media outlets and healthcare professionals, and promoting evidence-based reporting to raise public awareness and foster informed decision-making.

Keywords: Smog Crisis, Public Health, Media Coverage, Framing Theory, Agenda-Setting Theory, Content Analysis, Healthcare Perspectives.

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Introduction

Smog, a pervasive form of air pollution characterized by a dense haze that obscures visibility and poses grave risks to human health, stems from a complex amalgamation of particulate matter, ozone, sulfur and nitrogen oxides, volatile hydrocarbons, and other contaminants (World Health Organization, 2021). The term '*smog*' is a portmanteau of 'smoke' and 'fog' commonly denotes the air pollution emanating from

industrial or vehicular sources, often enveloping urban areas due to climate change in the South Asian region, pulse to Pakistan's climate (Mall, 2023).

The genesis of smog lies in an array of contaminants generated by diverse industrial processes and human activities, constituting formidable threats to human well-being and environmental integrity. Notably, vehicular emissions from cars, trucks, trains, boats, snowmobiles, and agricultural and construction equipment have significantly contributed to Asian atmospheric pollution (Singh, 2021) as an escalating number of registered vehicles, surpassing 7 million, with 40% of these vehicles exacerbating smog levels, underscores the urgency of addressing vehicular emissions (Mukhitdinov, et al., 2024).

Despite individual vehicles emitting relatively modest quantities of pollution, their cumulative impact accounts for up to half of the air pollution burden in certain regions (Sánchez-Triana, et al., 2014) along substantial establishments housing power plants and facilities with smokestacks as notable sources of smog. Stringent regulations such as the Clean Air Act have compelled these entities to curtail emissions significantly over time (Schmalensee & Stavins, 2019), albeit challenges persist in Pakistan (Ullah, et al., 2020; Anjum, et al., 2021).

Notably, residential wood burning is a substantial source of direct fine particle emissions accentuated during winter months Bailey et al. (2019) with many other anthropogenic activities to air pollution. Industrial processes, vehicular emissions, and agricultural activities release a complex mixture of sulfur oxides, nitrogen oxides, volatile organic compounds (VOCs), and particulate matter in smog formation (Soni, et al., 2024). These pollutants undergo intricate chemical reactions catalyzed by sunlight, giving rise to ground-level ozone and other hazardous compounds, thereby perpetuating the development of smog and exacerbating its detrimental impacts on public health and environmental integrity (Ullah, et al., 2020).

In essence, the multifaceted nature of smog necessitates comprehensive research endeavors and target interventions to mitigate its adverse effects. This study explores the intricate interplay between different sources of smog pollution, encompassing industrial, vehicular, and agricultural emissions, along with the health implications and environmental consequences thereof. Furthermore, it seeks to evaluate the efficacy of existing regulatory frameworks in curbing the proliferation of smog and advancing sustainable solutions, employing a multi-faceted approach encompassing media analysis of news bulletins and interviews with healthcare professionals. By delving into these complexities, this research endeavors to the broader discourse on mitigating air pollution and safeguarding public health and environmental well-being in Lahore, Pakistan.

Literature Review

Smog, a prevalent issue in Pakistan, particularly in cities like Lahore, has garnered attention from various sectors (Ali & Athar, 2010; Ashraf, et al., 2013; Sidra, et al., 2015; Ali, et al., 2015; Abbas, et al., 2015; Gulshan, et al., 2015; Raza, et al., 2021)., including the media, due to its significant environmental and public health implications (Usman, et al., 2019; Bilal et al., 2022; Li, et al., 2024). The media serves as a vital conduit for raising awareness about the health risks associated with prolonged exposure to polluted air, highlighting the urgent need for governmental action to address the causes of air pollution and smog formation (Colbeck, et al., 2019; Parveen & Ahmad, 2020). Through news coverage, documentaries, and investigative journalism, the media informs the public about the causes and effects of pollution, advocating for policy changes, stricter regulations, and long-term solutions to mitigate its adverse impacts (Cumming & Johnson, 2019; Register, 2019; Sachsman & Valenti, 2020; Pringle, 2024; Wei, et al., 2024).

In the backdrop of Lahore, Pakistan's severe smog crisis in 2023, a convergence of research endeavors and media initiatives shed light on the multifaceted environmental activism (Sun & Huang, 2022); "Art Education" (Papavasileiou et al., 2021), "Media Influence" (Seelig, 2019) "Campaign Efficacy" (Subašić et al., 2024), "Indian Context" (Aarya, 2024), "Mass Media Approach" (Borah et al., 2024), "Artistic

Activism" (Landau and Toland, 2022) and "Propaganda and Governance" (Xu and Sun, 2021) exploring creative and governance responses to smog crises for diverse pathways to address Lahore's urgent smog challenges.

Media plays a pivotal role in promoting environmentally friendly practices and driving behavioral change, mobilizing support for clean air initiatives and holding authorities accountable for combating smog pollution. In Lahore, where dense fog episodes exacerbate smog pollution during winter, severe health hazards like bronchitis, asthma exacerbations, and COPD prevail (Bilal et al., 2022). Exposure to smog pollutants heightens the risk of cardiovascular issues, immune system impairment, and adverse pregnancy outcomes (Jones, 2021), necessitating urgent measures to mitigate pollution and safeguard public health (Mocatta, 2024). Chronic exposure to smog is linked to chronic illnesses such as lung cancer, underscoring the need for immediate action.

During Lahore's severe smog crisis in 2023, Pakistani news channels like Geo News, ARY News, Dunya News, Express News, and Samaa TV played a crucial role in disseminating information about the environmental emergency. Particularly during the winter season, when smog pollution reached its peak density, these channels provided extensive coverage, highlighting the severity of the situation and its detrimental effects on public health. For instance, on November 12th, Geo News aired special bulletins addressing the alarming rise in air pollution levels in Lahore (Geo News, 2023), while ARY News provided in-depth analysis on November 19th regarding the government's response to the crisis (ARY News, 2023). Additionally, Dunya News reported on November 21st about the health hazards posed by smog pollution, urging authorities to take immediate action (Dunya News, 2023) to control the air quality index (Khan, et al., 2023). Express News and SAMAA TV also dedicated significant airtime to discussing smog-related issues and promoting awareness of 'Smog Definition', 'Air Pollution', 'Smog Formation', 'Chemical Reactions', 'Smog Diseases', 'Respiratory Issues', and 'Public Carelessness and Policy Neglect' (Tariq, et al., 2023; Nazir & Shah, 2023), among the public (SAMAA TV, 2023; Express TV, 2023; Geo News, 2023). This collaborative effort by Pakistani news channels contributed to raising awareness, fostering behavioral change, and mobilizing support for clean air initiatives amidst Lahore's most pressing environmental challenge (Nawaz, et al., 2023; Abdul Jabbar, et al., 2022; Tabinda, et al., 2020). Moreover, despite being the country's second-largest city, Lahore consistently ranks among the most polluted cities globally, with smog season exacerbating health-related concerns and prompting government interventions such as market closures (Lemery & Auerbach, 2017; Akhtar & Shahkhan, 2018; Mehmood, et al., 2021).

Problem Statement

Climate rationality ensures informed decision-making, efficient resource allocation, and long-term planning, fostering effective climate action. It builds public trust, supports global cooperation, promotes economic stability, and upholds ethical responsibilities for future generations which is much needed in countries like Pakistan (Johnston, 2021).

This study aims to comprehensively understand the multifaceted impact of smog on public health and the role of media coverage in shaping public perception. Given the prevalent environmental issue of smog in the Pakistani Subcontinent, particularly in Pakistan, there's a pressing need to address its significant health risks. By investigating how smog affects public health (Q1), the role of media coverage in shaping public perception of smog (Q2), and the extent to which media contributes to raising awareness of smog-related health risks (Q3), this research endeavors to shed light on crucial aspects.

Analyzing content from three major news channels—City 42, SAMAA TV, and ARY News—we aim to uncover their reporting patterns, strengths, weaknesses, and potential areas for improvement in addressing smog-related issues. This understanding is pivotal for promoting climate rationality and fostering initiatives to mitigate the adverse effects of smog on public health and well-being. Additionally, conducting semi-structured interviews with medical professionals supplements our analysis, offering deeper insights into the medical perspective on smog's health impacts, diagnosis, treatment, and

preventive measures. By incorporating the expertise of medical doctors, our study aims to enrich its findings, ensuring a comprehensive understanding of the complexities surrounding smog-related health risks.

Study Objectives

1. To examine the effects of smog on public health.
2. To explore the influence of media coverage on public perception of smog.
3. To assess the effectiveness of media in raising awareness about smog-related health risks.

Research Questions

1. How does smog affect public health?
2. What is the role of media coverage in shaping public perception of smog?
3. To what extent does media contribute to raising awareness of smog-related health risks?

Theoretical Framework

Agenda-setting theory by Maxwell McCombs and Donald Shaw posits that media influences the salience of issues in the public's consciousness by determining which topics receive attention and how they are portrayed (McCombs & Shaw, 1972). This theory suggests that the more frequently and prominently an issue is covered in the media, the more likely it is to be perceived as important by the audience. The theory is based on the premise that the media does not tell people 'what to think', but rather 'what to think about' (McCombs, et al., 2013). Research has demonstrated the agenda-setting effect across various media platforms, including newspapers, television, and digital media (Soroka & Wlezien, 2022).

Framing theory has also been adopted, developed by Erving Goffman; expanded by scholars like Robert Entman, examining how media frames shape individuals' understanding and interpretation of events and issues (Goffman, 1974; Entman, 1993; Jacobsen & Smith, 2022). Frames are cognitive structures that organize information and provide meaning to events, guiding individuals' perceptions and attitudes toward those events emphasizing certain aspects of an issue while downplaying or ignoring others, influencing the audience (Güran & Özarslan, 2022). In the present study, framing theory illuminates how media shapes public perception of smog by framing its causes and consequences simultaneously, agenda-setting theory elucidates how media coverage determines which aspects of smog are prioritized influencing public awareness and environmental concerns.

Methodology

Research Design

This study adopts a qualitative research approach to investigate the medical impact of smog in rich and detailed descriptions for a deeper understanding of social issues (Creswell & Creswell, 2017; Patton, 2014). This study also employs a content analysis method to examine how smog and related health issues are portrayed in news reports to understand media texts and the framing of smog issues (Denzin, 2017; Krippendorff, 2018).

Data Selection

The data for this study comprises news content from three major Pakistani news channels: City 42, SAMAA TV, and ARY News. City 42 is a Lahore-based news channel that primarily focuses on local news, events, and issues affecting the residents of Lahore, known for its in-depth coverage of urban matters, including traffic updates, city management, and regional politics. SAMAA TV is a leading Pakistani news channel providing comprehensive coverage of national and international news, popular for its timely and accurate news reports, talk shows, and investigative journalism, aiming to keep the public informed on a wide range of topics including politics, economy, health, and social issues. ARY News is a

prominent 24-hour news channel in Pakistan that is part of the ARY Digital Network, offering extensive news coverage, breaking news alerts, and in-depth analyses of current affairs, both within Pakistan and globally. ARY News is known for its robust reporting, exclusive stories, and a wide array of programs addressing various facets of society.

The selection includes 69 videos (Videos: ARY News - 24, City 42 - 19, SAMAA TV - 26) covering bulletins, headlines, news alerts, and news reports related to smog. Additionally, semi-structured interviews with 20 medical professionals and health officials were conducted to gain deeper insights into its health impacts.

Population

The population for this study includes Content from the news channels City 42, SAMAA TV, and ARY News; Governmental departments under the Caretaker Punjab Chief Minister, such as the *Environment Protection Department* (EPD); *Primary & Secondary Health Care Department* (PSHD); *Punjab Disaster Management Authority* (PDMA), *Punjab Transport Department*, and Local Government Departments. Major hospitals and health institutions include Lahore *General Hospital*, *Jinnah Hospital, Lahore – Allama Iqbal Medical College*, *Mayo Hospital Lahore*, *SIMS* (Services Hospital), *Sir Ganga Ram Hospital – Fatima Jinnah Medical University, Lahore*. Moreover, officials from the Lahore High Court, Punjab Health Department, and the office of the Secretary Health.

Sampling Technique

A purposive sampling technique was used to select news videos that specifically address smog-related issues and to select medical professionals and health officials from the aforementioned hospitals and institutions, ensuring that those with relevant expertise and experience were included.

Data Collection Technique

The data collection involved two main techniques: Content Analysis with systematic coding and analysis of 69 news videos from the three selected news channels along with semi-structured Interviews of 20 medical professionals and health officials to gather qualitative data on the health impacts of smog and the effectiveness of public health measures (Denzin & Lincoln, 2011).

Interview Procedure

The semi-structured interviews were conducted either in person or via telecommunication methods, depending on the availability and convenience of the participants. Each interview followed a pre-determined guide but allowed flexibility for participants to elaborate on their responses (Vanover, et al., 2021). The interviews were recorded with consent and transcribed for analysis.

Operationalization of Key Concepts

Smog: Defined as a type of air pollution characterized by a mixture of smoke and fog, primarily caused by industrial emissions, vehicular pollution, and the burning of crop residue.

Public Health: Encompasses the health outcomes of populations as influenced by environmental factors like air quality. This includes respiratory issues, cardiovascular problems, and other health conditions exacerbated by smog.

Media Coverage: Refers to the reporting and dissemination of information related to smog by news channels. This includes the frequency, tone, and framing of news reports.

Public Perception: The general public's understanding and awareness of smog and its health impacts, influenced by media coverage.

Awareness: The extent to which the public is informed about the health risks associated with smog and the measures to mitigate these risks, as disseminated by the media and health officials.

Qualitative insights from semi-structured interviews with healthcare professionals and media experts, along with the analysis of news bulletin video clips, have been integrated to develop a comprehensive understanding of the research questions and objectives. By triangulating qualitative data from different sources (Denzin, 1970; Vanover, et al., 2021) the study aims to provide a nuanced exploration of the impact of smog on public health and the influence of media coverage on public perception in Lahore, Pakistan.

Results and Discussion

Table 1: *Content Analysis of News Bulletin Videos (Total News Clips= 69)*

Key Insight Themes	Frequency (News)	Percentage (News)	No. of Patients	Health Institutions	Air Quality Index (AQI)	Precautionary Measures	Contributing Factors
Severity of Smog	14	20.29%	N/A	N/A	AQI ranges from 205 to 577	N/A	N/A
Health Impacts	6	8.70%	12,000+	General Hospital, Jinnah Hospital, Mayo Hospital, Services Hospital, Sir Gangaram Hospital	N/A	Use masks to combat smog	N/A
Government and Institutional Responses	14	20.29%	N/A	Lahore High Court, Punjab Health Department, Secretary Health, Caretaker Punjab Chief Minister	N/A	Mandatory mask-wearing, establishment of smog counters	Proactive measures, cleanliness drives, sealing factories
Public Reactions and Precautionary Measures	15	21.74%	N/A	N/A	N/A	Wearing masks, use of sunglasses, avoidance of outdoor activities	N/A
External Factors and Contributing Causes	11	15.94%	N/A	N/A	N/A	N/A	Non-standard burning of fuel, crop residue burning, industrial emissions, vehicular pollution
Role of Media in Public Health Awareness	2	2.90%	N/A	N/A	N/A	N/A	N/A
Miscellaneous	8	11.59%	N/A	N/A	N/A	N/A	N/A

The analysis reveals several key findings as presented in Table 1, regarding the impact of smog on public health and the role of media coverage in shaping public perception. Firstly, the findings indicate that smog has significant adverse effects on public health. With 24 videos dedicated to highlighting the severity of smog, particularly in Lahore, it's evident that smog poses a considerable threat to public well-being. The identified health impacts include respiratory issues, exacerbated allergies, and increased susceptibility to respiratory infections. The high frequency of videos discussing the severity of smog underscores the urgency of addressing this environmental issue to safeguard public health (Q1).

Secondly, media coverage plays a crucial role in shaping public perception of smog. The substantial number of videos from all three channels underscores the media's role as a primary source of information regarding environmental issues like smog. However, the nature of coverage varies across channels, with ARY News, City 42, and SAMAA TV each offering unique perspectives. While ARY News appears to dominate in terms of quantity, City 42 and SAMAA TV also contribute significantly to the discourse. The media's portrayal of smog can influence public awareness, attitudes, and behaviors, making it a powerful tool for advocacy and action (Q2).

Lastly, the analysis suggests that media coverage contributes to raising awareness of smog-related health risks to a significant extent. The frequency of videos discussing health impacts, precautionary measures, and government responses indicates a concerted effort by media outlets to educate the public about the health risks associated with smog. By disseminating information about the severity of smog and its potential consequences, the media plays a vital role in empowering individuals to take proactive measures to protect their health, such as wearing masks, limiting outdoor activities, and advocating for policy changes to address the root causes of smog (Q3).

Table 2: *Frequency of Response (Total respondents= 20)*

Questions Categories	Response	Frequency	Percentage (%)
Regularly treat respiratory issues due to smog	Yes	16	80%
	No	4	20%
Increase in the number of patients during smog	Yes	20	100%
	No	0	0%
Smog causes other diseases	Yes	17	85%
	No	3	15%
Encountered cancer due to smog	Yes	0	0%
	No	20	100%
Common symptoms of smog-related diseases	Respiratory symptoms (cough, SOB)	20	100%
	Eye infection/irritation	13	65%
	Skin issues	6	30%
	Cardiovascular issues	3	15%
Media information accuracy	Yes	13	65%
	Yes, but not always accurate	5	25%
	No	2	10%
Specific respiratory symptoms in severe smog	Shortness of breath	20	100%

Questions Categories	Response	Frequency	Percentage (%)
	Cough	12	60%
	Chest tightness/pain	5	25%
Media sensationalizing smog information	Yes	13	65%
	No	7	35%
Precautionary advice to patients	Wear mask	20	100%
	Avoid going outside	11	55%
	Stay hydrated	6	30%
	Use glasses	5	25%

The findings from Table 2 shed light on the perceptions and experiences of individuals regarding smog exposure and its health impacts. Firstly, the majority of respondents expressed a heightened awareness of the health risks associated with smog, with 80% reporting regular treatment for respiratory issues attributed to smog (Q1). Moreover, all respondents unanimously reported an increase in the number of patients seeking medical attention during periods of heavy smog, underlining a shared understanding of the exacerbated health risks during such conditions. Additionally, a significant proportion (85%) believed that smog is responsible for causing diseases beyond respiratory issues, indicating a comprehensive recognition of the diverse health implications of smog exposure.

Findings reveal the prevalent symptoms and diseases experienced by individuals exposed to smog. Respiratory symptoms, including cough and shortness of breath, were reported by all respondents, highlighting the pervasive impact of smog on respiratory health (Q2). Eye irritation emerged as another commonly experienced symptom, reported by 65% of respondents, while skin and cardiovascular issues were less frequently reported. This suggests that while respiratory symptoms are predominant, other health effects such as eye irritation are also notable among individuals exposed to smog.

Furthermore, the results provide insights into how individuals perceive media coverage and the accuracy of information related to smog. While the majority of respondents acknowledged the accuracy of media information about smog-related issues, a significant proportion expressed reservations, noting that the information may not always be reliable (Q3). Additionally, there was a prevailing perception among respondents that the media sensationalizes smog-related information, indicating a skepticism toward exaggerated reporting. Despite consistent advice to wear masks during smog, other precautionary measures such as avoiding outdoor activities or staying hydrated were less commonly emphasized in media coverage, suggesting potential gaps in public health messaging regarding protective measures against smog exposure.

Conclusion

In essence, this study delves into the intricate relationship between media portrayal, public perception, and policy responses regarding smog and its health ramifications. The analysis reveals a stark depiction of smog's severe health impacts, particularly evident in urban regions like Lahore. Respiratory issues and exacerbated allergies underscore the urgent need for comprehensive strategies to combat smog pollution. Additionally, the study highlights the influential role of media coverage in shaping public awareness and policy discourse on smog. While media outlets serve as primary conduits of information, the variation in coverage underscores the complexity of public discourse on environmental issues. By fostering awareness and advocating for policy changes, media outlets play a pivotal role in empowering individuals to address the root causes of smog pollution and safeguard public health.

Limitations and Recommendations

While the study effectively examined smog issues in Lahore, its narrow focus on this region may limit insights into the broader smog situation in Punjab. Moreover, the reliance on televised news data from government departments and mainstream channels may overlook alternative perspectives on the issue. Despite the limitations, the comparative analysis provided valuable insights into the diversity of efforts aimed at addressing the smog issue in Lahore. By highlighting the major contributions of various stakeholders, including government agencies, academic institutions, and healthcare providers the study underscored the multifaceted nature of the smog problem and the collaborative efforts required for effective mitigation.

Such as the Environmental Protection Agency (EPA) released a video on Facebook in April 2024, available on YouTube, discussing smog-related issues (EPA, 2024); The Environment Protection Department (EPD) implemented the Constitution of Special SMOG Squads in 2024, aimed at addressing smog-related challenges (*Constitution of Special SMOG Squads (2024) | Environment Protection Department*; Fatima Jinnah Medical University (FJMU) organized an Awareness Seminar on Smog in November 2023 (*AWARENESS SEMINAR ON SMOG)* and conducted a pre-conference workshop on "Smog Effects" as part of the FJMU Annual Scientific Conference in December 2023 (*FJMU Annual Scientific Conference-2023* *Pre-Conference Workshop On "Smog And Its Impact On Quality Of Life – Fatima Jinnah Medical University, Lahore*). Additionally, Lahore General Hospital organized a Smog Informative Walk to raise awareness about smog-related health impacts (*Smog Informative Walk | Lahore General Hospital*) but a gap is still scored through this research to handle climate disasters in Pakistan. Hence this comparative approach facilitates a nuanced understanding of the strengths and weaknesses of different initiatives, informing recommendations for future research and policy development in the ongoing battle against smog pollution.

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