Original Article

Knowledge and perception of smog in families of employees of CMH Lahore, Pakistan

Tahira Ahsan, Muhammad Ashraf Chaudhry, Noor ul Huda, Neha Mukhtar, Rameesha Ahmad, Mariam Ali

CMH Lahore Medical College, Lahore, Pakistan

Objective: To find out the socio demographic factors of the citizens of Lahore, Pakistan and determine the level of knowledge and the preventive practices regarding smog.

Methodology: In this descriptive study, 300 citizens of Lahore were taken as respondents. Study time period was from November 1, to December 28, 2018. Convenient sampling technique was used. The data were analyzed using SPSS version20. Descriptive statistics for the qualitative data and chi-square test of significance was used to see any association between variables.

Results: Sixty eight percent respondents were dissatisfied with the air quality and 14% were satisfied. Eighty four percent were worried about the possible aggravation of smog. More than half of the respondent felt that the citizens were primarily responsible for the current situation. Sixty seven percent were taking protective measures inside the house, 59% did not use face masks while going outside.

Conclusion: Socio-demographic factors played an important part in the knowledge and perception of smog in citizens of Lahore. Majority of the respondents did not use face masks outdoors; however, they did adopt preventive measures indoors. (Rawal Med J 202;45:184-187).

Keywords: Smog, Haze, Air pollution, Health practices.

INTRODUCTION

Clean air is considered to be one of the most important requirements for a healthy life. Due to rapid industrialization, we are lacking a clean environment to breathe in. Air pollution continues to pose a serious threat to all citizens of the world. Rising levels of pollution and haze have serious physical and psychosocial health impact.[1] An increasing form of Air Pollution is Smog; which decreases visibility is combination of fog and smoke. It is photochemical which is formed when sunlight reacts with nitrogen oxides and volatile organic compound in the atmosphere, main sources of which is car exhaust and factory fumes. Volatile Organic Compounds (VOC) are released from gas pipelines, paints and cleaning solvents. When these come in contact with sun rays, smog is created.[2]

The effect of smog on mortality rate were studied in the United States and it was reported that air pollution causes around 200,000 deaths, most of the sources can be attributed to exhaust from motor vehicles and power generation, residential emissions from heating and cooking.[3] Smog is not new for England, and is associated with numerous health outcomes.[4] In USA, in spite of recent reduction in pollution, current levels are associated with health impacts and low life expectancy in areas with low socioeconomic status.[5] Levels of PM2.5 are many times higher than the level considered safe by the WHO and is leading cause of mortality and contributing towards burden of disease globally.[6] A study in our neighboring country China indicates positive association of pollution with lung cancer.[7] Lahore is the second largest city of Pakistan and heavily polluted with smog. Deleterious effects of smog have worsened recently.[8]

Lahore city experienced spells of smog over the last few years which has not only caused health related problems but has also caused a number of road traffic accidents due to poor visibility (The News, 2016). These problems include itchy eyes, respiratory difficulties, cough and wheezing aggravated asthma attacks. A study revealed that air pollution accelerated chronic obstructive pulmonary lung disease.[9] The rationale of this study was to have a deeper understanding of what the citizens of Lahore think about smog, their knowledge and preventive measures they have taken against its harmful effects.

METHODOLOGY

This cross sectional study was conducted on 300 subjects after their Informed consent. The study was approved by Institutional Ethical Review committee. Study was conducted in non-medical employees of CMH and Non- probability convenient sampling technique was used. Questionnaire comprised of close ended questions.

Statistical Analysis: The data were analyzed using SPSS version 20. Chi-square test of significance was used to examine association between education, gender, level of knowledge, attitude and practice. A p<0.05 was considered statistically significant.

RESULTS

Out of 300 subjects, 181(60%) were female and 119(40%) male. The mean age was 24.39$\pm$8.1 years (range 10-66). Out of total, 203(67%) had bachelor's degree (Table1). Out of all, 202(68%) were dissatisfied with the air quality, 55(18%) were satisfied, 43(14%) showed an average level of satisfaction. One hundred and fifty (84%) respondents were worried about the possible aggravation of haze, (Figure).

On asking time required for air quality improvement, 147(49%) said 10 years, 121(40%) agreed 3-5 years, 32(11%) were expecting in near future (Table 2). 190(63%) respondents blamed themselves for current situation, 69(23%) government and 41(14%) said industries. Source of information was social media 208 (70%), books and newspapers 55(18%), expert lectures and friends 37(12%).
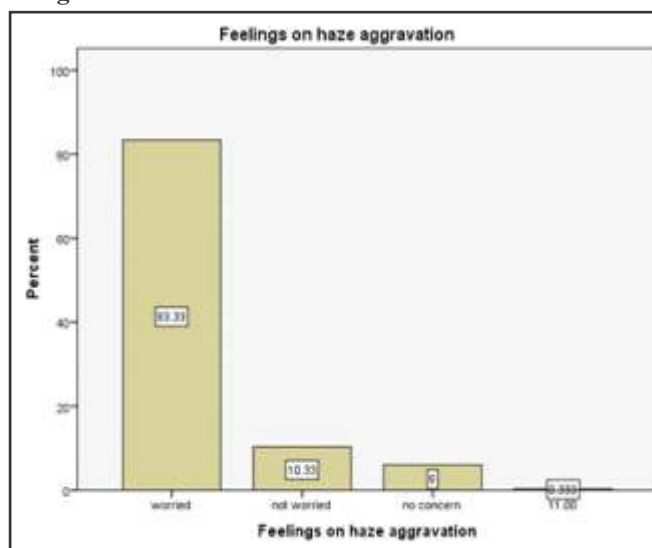
Table 1. Association between satisfaction with air quality and education.

		Satisfaction with air quality			Total	p value
		Yes	No	Maybe		
Educational status of respondents	Illiterate	1	1	0	2	0.01
	Primary Education	6	5	4	15	
	Matric	6	9	1	16	
	F Sc/A levels	11	8	10	29	
	Bachelor's Degree	25	154	24	203	
	Masters	6	25	4	35	
Total		55	202	43	300	

Table 2. Association between education and believed time frame for air quality improvement.

		Time for air quality to improve			Total	p value
		Short term	3-5 years	At least x10 years		0.01
Educational status of respondents	Illiterate	0(0%)	1(50%)	1(50%)	2	
	Primary Education	4(27%)	10(67%)	1(6%)	15	
	Matric	5(31%)	6(38%)	5(31%)	16	
	FSc/A levels	4(13%)	15(52%)	10(35%)	29	
	Bachelor's Degree	13(6%)	76(38%)	114(56%)	203	
	Masters	6(17%)	13(37%)	16(46%)	35	
Total		32(10%)	121(40%)	147(49%)	300	

Figure. Feelings of the respondents regarding increasing smog.

Out of total, 200(67%) were taking protective measures indoors and 76(38%) were putting green plants indoor. Majority 198(66%) had reduced outdoor exercise, 184(61%) cut down on weekend travel and 154 (51%) restricted window opening. Majority 176(59%) of respondents did not use face masks when going outside, out of the 124(41%) respondents that did use, half of them 62(50%) used cotton face masks. There was a statistically significant association between satisfaction with air quality and educational status of respondents (p<0.001) (Table 1). Association between the educational status of the respondents and the time they believed it would take for air quality to improve was statistically significant (p=0.001) (Table 2).

DISCUSSION

The air quality of Lahore became worst in November, 2016 when the poor visibility caused numerous road traffic accidents and the toxic fumes in air caused a multitude of health related problems like coughing, respiratory disorders and irritation in eyes.[9] Our study showed a majority of respondents (68%) were dissatisfied with the air quality and 84% were concerned about the worsening situation.

Lahore is now considered one of the worst cities in the world for smog.[10] This situation can only be rectified if the government and the masses both participate to control it. Majority (63%) felt that every citizen was at fault and played some role in the generation of smog. This shows that the residents are willing to contribute in resolving this issue. A study reported that in China respondents were more interested in personal protection instead of participating in smog control activities.[11] Only a few people were hopeful that the air quality will improve in short term (11%) while the majority thought that it will take somewhere between 3-5 years or up to 10 years.

Television and internet were preferred over information from traditional sources like newspapers, books and expert lectures. They offer a wider array of information with ease and accessibility. We found out that 70% respondents used internet and television as their primary source of information regarding smog while only 18% resorted to books and newspapers.

Exposure to smog can cause cough, respiratory tract irritation, triggering and worsening of asthma attacks and lung damage.[12] Our study revealed that 67% respondents took protective measures indoors while only 41% used face masks while going out. Still this awareness is not enough regarding protection. Face masks do not provide adequate protection against the environmental haze.[13]

The European Commission acknowledged that the current standards of air quality control are insufficient for the protection of public health, specifically in reference to the WHO Air Quality Guidelines.[14] Recent scenario is going to be worsened in the near future because of lack of any initiative for control on smog and its effects on health, a study in Karachi medical students revealed.[17] A Lahore based study in medical students revealed good knowledge regarding smog, and source of information in them was social media like in our study.[18]

CONCLUSION

Majority of respondents were dissatisfied with the air quality in Lahore. Expected deterioration of air quality in future and its effects on health had compelled the respondents to take protective measures such as reduced outdoor exercise, cutting back on weekend travel and reduced window opening duration; however, a minority made use of face masks.

Author Contributions:
Conception and design: Tahira Ahsan, Muhammad Ashraf Chaudhry
Collection and assembly of data: Rameesha Ahmad, Mariam Ali
Analysis and interpretation of the data: Muhammad Ashraf Chaudhry, Rameesha Ahmad
Drafting of the article: Tahira Ahsan, Noor ul Huda, Neha Mukhtar
Critical revision of the article for important intellectual content: Tahira Ahsan, Muhammad Ashraf Chaudhry
Statistical expertise: Noor ul Huda, Mariam Ali
Final approval and guarantor of the article: Tahira Ahsan
Corresponding author email: Tahira Ahsan: tahiraraza@hotmail.com
Conflict of Interest: None declared
Rec. Date: Dec 12, 2019 Revision Rec. Date: Dec 31, 2019 Accept Date: Jan 3, 2020

REFERENCES

1. Rajper SA, Ullah S, Li Z. Exposure to air pollution and self-reported effects on Chinese students: A case study of 13 megacities. PloS one 2018;13:e0194364.
2. Mohammadi H, Cohen D, Babazadeh M, Rokni L. The effects of atmospheric processes on Tehran smog forming. Iranian J Public Health 2012;41:1-4.
3. Azimi P, Stephens B. A framework for estimating the US mortality burden of fine particulate matter exposure attributable to indoor and outdoor microenvironments. J Exposure Sci Environ Epidemiol 2018:1:3-6.
4. Kelly FJ, Fussell JC. Air pollution and public health: emerging hazards and improved understanding of risk. Environ Geochem Health 2015;37:631-49.
5. Bennett JE, Tamura-Wicks H, Parks RM, Burnett RT, Pope III CA, Bechle MJ, et al. Particulate matter air pollution and national and county life expectancy loss in the USA: A spatiotemporal analysis. PLoS Med 2019;16(7).
6. Anenberg SC, Achakulwisut P, Brauer M, Moran D, Apte JS, Henze DK. Particulate matter-attributable mortality and relationships with carbon dioxide in 250 urban areas worldwide. Scientific Rep 2019;9:1-6.

7.   Cao Q, Rui G, Liang Y. Study on PM2. 5 pollution and the mortality due to lung cancer in China based on geographic weighted regression model. BMC Public Health 2018;18(1):925.

8.   Riaz R, Hamid K. Existing Smog in Lahore, Pakistan: An Alarming Public Health Concern. Cureus 2018;10(1).

9.   Wang M, Aaron CP, Madrigano J, Hoffman EA, Angelini E, Yang J, et al. Association between long-term exposure to ambient air pollution and change in quantitatively assessed emphysema and lung function. JAMA 2019;322:546-56.

10.   Khan R. Lahore Smog: It's Not a Natural Phenomenon. Dawn.com/news/1159190.

11.   Polluted Smog Covers Pakistani City Of Lahore - Times Of India. The Times of India. htt p://phys.org/news/2017-11schools-toxicsmog-delhihtml.

12.   Top 10 Worst Cities for Smog | All Media Content | DW | 03.03.2014".dw.com/en /top-10-worst cities for smog/g-1746.9135.

13.   Wang Y, Sun M, Yang X, Yuan X. Public awareness and willingness to pay for tackling smog pollution in China: a case study. J Cleaner Production 2016;112:1627-34.

14.   Mukhtar F. The Rising Menace of Smog: Time to Act Now. J Ayub Med Coll Abbottabad 2017;30:1-2.

15.   Bałazy A, Toivola M, Adhikari A, Sivasubramani SK, Reponen T, Grinshpun SA. Do N95 respirators provide 95% protection level against airborne viruses, and how adequate are surgical masks? Am J Infect Control 2006;34:51-7.

16.   Héroux M-E, Anderson HR, Atkinson R, Brunekreef B, Cohen A, Forastiere F, et al. Quantifying the health impacts of ambient air pollutants: recommendations of a WHO/Europe project. Int J Public Health 2015;60:619-27.

17.   Zhao M, Zhang M, Ying J, Wang S, Shi Y, Li H, et al. Knowledge, attitudes, practices and information demand in relation to haze in China: a cross-sectional study. BMC Public Health 2019;19(1):1396.

18.   Butt M, Waseef R, Ahmed H. Perception about the Factors Associated with Smog among Medical Students. Biomedica 2018;34:264.