

# Smog awareness and knowledge of precautionary measures among general population

By Batch 13

Kashaf Sanaullah, Khadija Batool, Khush Bakht, Mahnoor Naeem, Mahrukh Chaudhry, Minhaal Chaudhry, Mashal Amin, Waqas Danish, Hamza Abbas, Muhammad Aadil

Supervisor: Dr Saira Tariq

Co-Supervisor: Dr. Fatmee

## INTRODUCTION:

Smog, which is a kind of air pollution, is formed when smoke and fog are mixed under certain conditions that affect the visibility of the surrounding area. Smog has two types; photochemical smog and industrial smog. Photochemical smog develops in urban areas with heavy vehicular traffic which is a potential source of NO, hydrocarbons, and volatile organic compounds with enough sunlight and little movement of air (hot, dry climate). It is caused by a free-radical chain mechanism that converts NO to NO<sub>2</sub> which further reacts to produce ozone, nitric acid, and peroxy nitrates. (1) Ozone is the primary pollutant for the photochemical smog. Industrial smog occurs in foggy, cool weather. Industrialization and extensive use of vehicles has increased the incidence of occurring of smog. Industrial smog contains particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, and sometimes ozone. (2)

Exposure to air pollutants has short-term and long-term health complications. Short-term health complications include irritation of the skin, eyes, nose, throat, wheezing, breathing difficulties, dizziness, headache, and nausea. The long-term complications include respiratory disorders, cardiovascular dysfunction, neurological disorders, and cancer. (3) Children and women are more prone to the hazards of smog. (4) According to a study there was a 60% increase in the number of patients reported with ocular surface diseases such as eye infections, corneal diseases, and conjunctival diseases due to smog. (5) According to NIH, pollution exposure in early pregnancy is linked to miscarriage. (6) Smog can also decrease visibility which can lead to road traffic accidents.

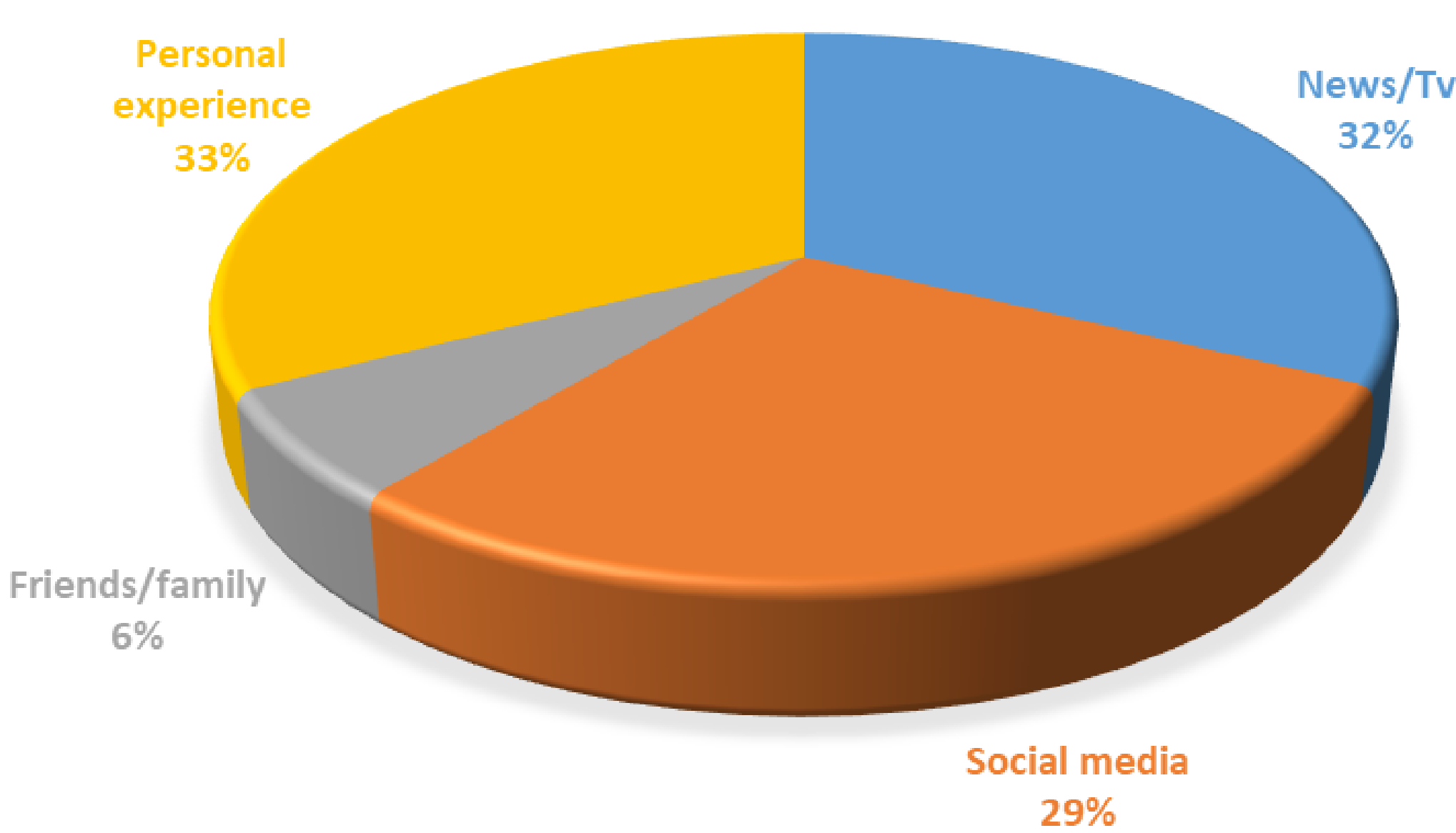
Among the general population of Pakistan, individuals having science qualifications have greater knowledge of smog as compared to those with arts qualifications. People with better socioeconomic status follow several preventive measures to avoid interaction with smog pollution. (7) Most people have heard of smog from media/news and think that human activities are the main causes of heavy smog. (8) Smog pollution has been a significant issue since 2013 in Lahore, the second-largest city in Pakistan. (9)

Awareness is a way of educating people regarding certain events that are taking place and affecting the lives of the people. If people are properly educated, changes in their behavior can be seen. Our study is to know about the awareness of smog among the general population and to know whether people take necessary precautionary measures to protect themselves from smog. We evaluated the knowledge of general population about smog and its harmful effects.

The precautionary measures that people take in order to keep themselves safe from smog. We assessed the effectiveness of existing awareness campaigns about the hazardous effects of smog.



## KNOWLEDGE ABOUT SMOG



## MATERIAL AND METHODS:

STUDY DESIGN: Cross sectional study

SETTING: Lahore

STUDY POPULATION: General population

STUDY DURATION: may-november 2022

SAMPLE SIZE: 377 calculated using online sample calculator Raosoft (<http://www.raosoft.com/samplesize.html>) by keeping 95% confidence interval, 5% margin of error and 50% response distribution.

SAMPLING TECHNIQUE: Convenience sampling

SAMPLE SELECTION:

Inclusion Criteria: The study included general population of Lahore aged 18-45 years having at least basic education and understanding of English.

Exclusion Criteria: The study excluded immigrants from other countries, people suspected of any cognitive or psychiatric impairment and those who were illiterate.

## DATA ANALYSIS PROCEDURE:

Data was analyzed using IBM SPSS version 25.0. mean and standard deviations were calculated for quantitative variables. For categorical variables, proportions and percentages were calculated.

## OUTCOME & UTILIZATION:

The study is to know about how well the people are aware of smog and its hazardous effects and to evaluate how efficiently people follow precautionary measures. This study will help the policy makers in determining the shortcomings of existing policies, causes of lack of positive attitude of the people towards following the policies and providing the data for making more effective policies for improved management of tackling with the smog related problems.

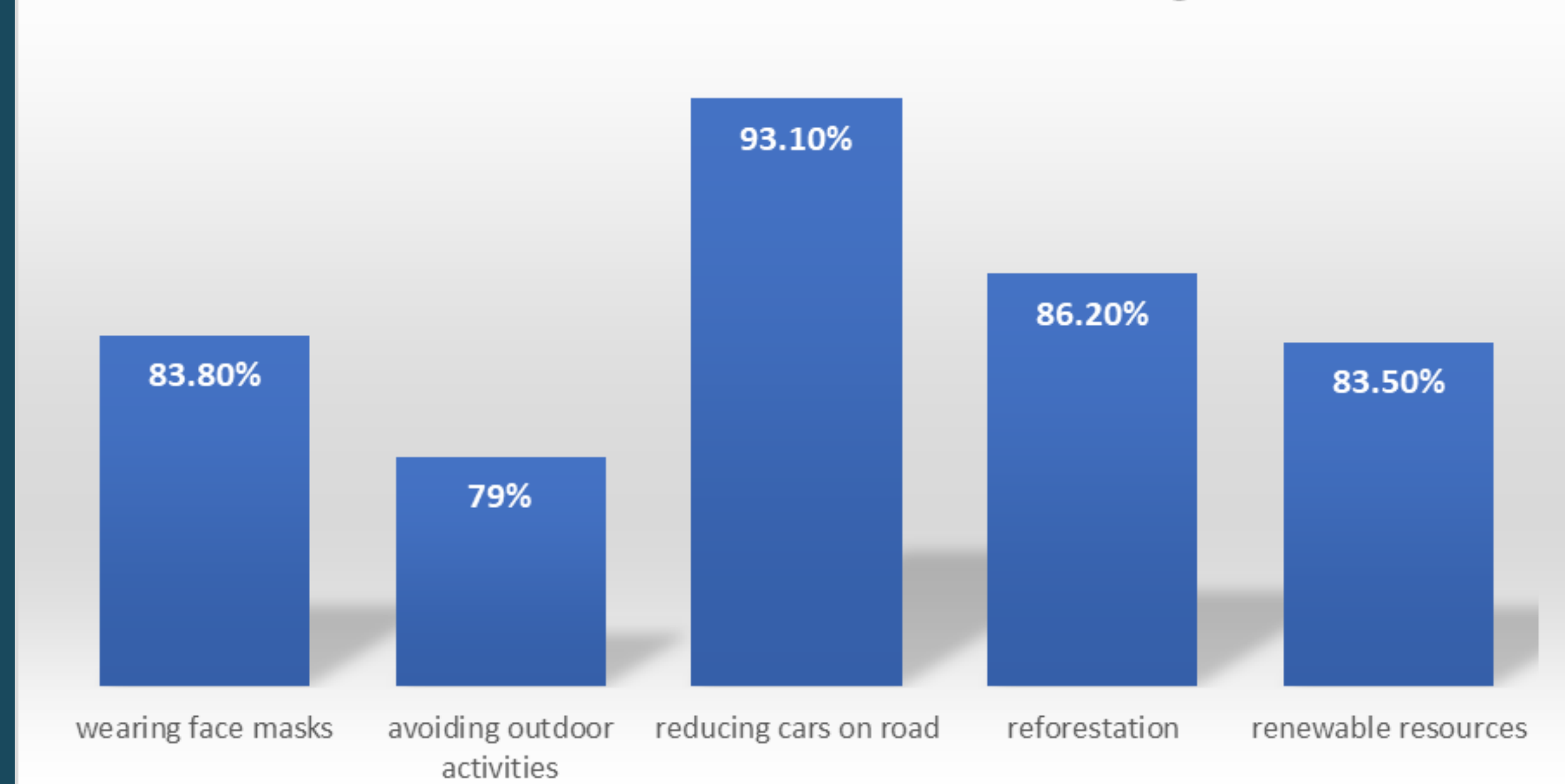
## RESULTS:

Skin allergies, gastritis and asthma were the major health problems encountered by the participants. The major information medium was personal experience (37.6% for males and 28.4% for females). News/TV also was a major information medium (26% for males and 37.7% for females). Social media also played a huge role in providing information (27.7% males and 29.4% females).

Majority of the participants had knowledge about the preventive measures regarding smog. Females ranked higher in the acknowledgment of the preventive measures. Overall knowledge of all the preventive measures included in the study was high across the board.

76.9% males and 89.7% females said that wearing face masks helped with protection from smog. 70.5% males and 86.3% females said that avoiding outdoor activities limited the exposure to smog. Reducing cars on the roads (89.6% males and 96.1% females), reforestation (85% males and 87.3% females) and renewable sources (76.9% males and 89.2% females) were deemed as the possible ways to reduce smog. Major mediums used for the dissemination of the health education regarding smog were awareness campaigns, newspapers and social media.

## Preventive measures for smog

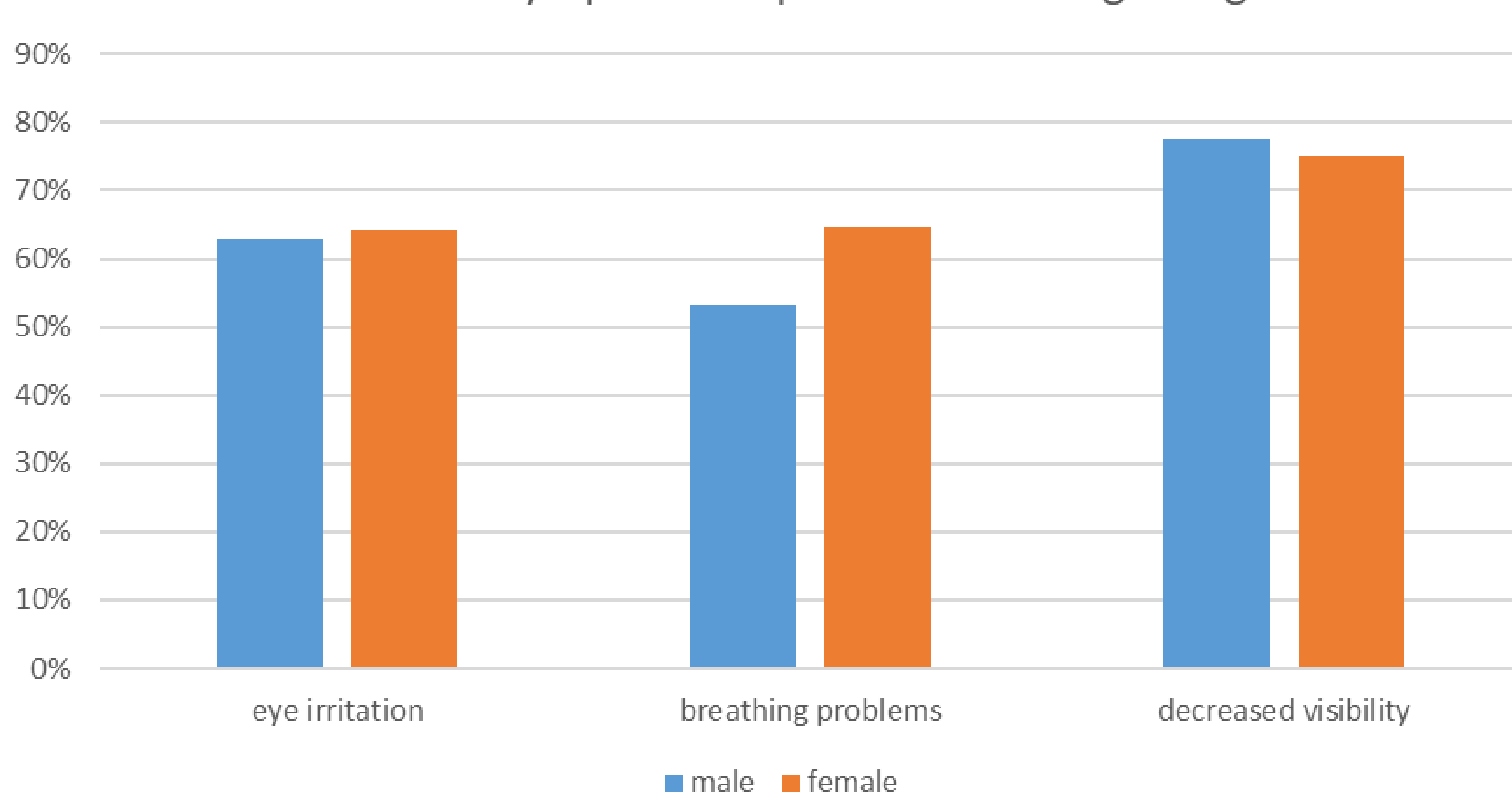


## Discussion

Smog is a rising environmental health issue world wide. In Pakistan, smog flare has been seen since last couple of years due to abrupt rise in air pollution levels.

According to our study, majority of people gained knowledge of smog from TV or newspaper as said by 26% Males and 37.7% females. Majority of people faced decreased visibility during times of smog that hindered their travelling activities and made them home bound. It was experienced by 75% males and 77.5% females. Eye irritation was the 2nd most common issue faced by population including redness, itching, lacrimation, experienced by 64.2% males and 63% females. Breathing problems was the 3rd most common concern of people. It includes cough and chest discomfort, experienced by 64.7% males and 53.2% females. Nausea, vomiting, headache, rash and itchy skin were symptoms experienced by some.

## Common symptoms experienced during smog



Majority people including 76.9% males and 89.7% females believed that wearing masks could significantly prevent from getting smog related health effects. Some people believed that reducing outdoor activities, reducing cars on roads, reforestation and increasing renewable energy resources can be effective tools for preventing smog.

## Conclusion

It is concluded that the results of study provided information that the general public is aware of the smog, its health effects and preventive measures. Social media and educational campaigns in institutions could be most effective medium for spreading awareness about smog to the general public.