Volume : I

2021-22

Special Issue : Global Pandemic

SPECTRUM

PEER REVIEWED MULTIDISCIPLINARY BILINGUAL JOURNAL

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SPECIAL ISSUE : GLOBAL PANDEMIC
VOLUME : I
AUGUST 2021

SPECTRUM
PEER REVIEWED
MULTIDISCIPLINARY
BILINGUAL JOURNAL

HUMAN OPINION REGARDING THE ENVIRONMENTAL EFFECTS DUE TO COVID-19 LOCKDOWN

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Abstract

The COVID-19 pandemic situation arises due to a new variety of corona virus, known as SARS-CoV-2 (Severe acute respiratory syndrome corona virus 2) across the globe in 2020. The virus is quickly spreading around the world causing severe economical, mental and environmental challenges. In the present research paper constructed by the survey work using cross-sectional design with a questionnaire about the opinion on environmental effects due to COVID-19 lockdown in India. A web-based platform is used for the survey work. Different socio-demographic variables are considered for the survey work. Significant difference shown in gender based students and household members' opinion. Most of the male participants in both categories have positive opinion i.e., the lockdown has good effects for environment as pollution level decreases during this period.

Keywords: *COVID-19, environmental effects, lockdown, socio-demographic.*

1. Introduction

Since the last 2nd World war, the COVID-19 pandemic is the most critical global health disaster of the century that has challenges to world public health security. An infectious disease causing by corona virus family was identified on December 2019 at Wuhan city, China and named as COVID-19 (Chakraborty and Maity, 2020). The name COVID-19 signified 'CO' stands for 'corona', 'VI' for 'virus', 'D' for disease, and 19 represents the year of its occurrence. The virus has been spreading over the 210 countries to exhibit some symptoms like fever, dry cough, tiredness and difficulties in breathing etc. Mild symptom and asymptomatic cases are also observed but all can infect the healthy people (Paital, 2020).

WHO announced COVID-19 outbreak as a pandemic on 11 March 2020(Wang and Su, 2020). In India, the first corona virus infection and death cases were reported on 30th January and 13th March, 2020 respectively. The Govt. of India has taken some preventive measure like maintain social distance, frequently washing hands, use masks and hand sanitizers, avoid contact with sick people, always cover mouth when cough and sneeze etc. Some general recommendations circulated through

social media to control the spread of the virus. But situation become worst day by day. So the Indian government takes decision to strict nationwide lockdown of 1.3 billion citizens to reduce the spread of the COVID-19 corona virus over the whole country. The first phase of lockdown was declared on 25th March to 14th April, 2020. As per report of WHO(WHO, 2020), the total number of confirmed and death cases were 606 and 10respectively till the first day of the 1st phase lockdown. The total confirmed case was 11439 while the death increased to 377 in the very 1st day on 2nd phase of lockdown (15th April to 3rd May, 2020). In the beginning of 3rd phase lockdown (4th May to 17th May, 2020) the number of confirmed and death cases were increased to 42533 and 1373 respectively. The fourth and final phase lockdown was 18th May to 31st May, 2020. The total number of confirmed and death cases were 96169 and respectively in the first day of the last phase lockdown. In the final day of the last phase lockdown, the confirmed case was doubled (182143) and death case was 5164 as per the report of WHO.

The number of confirmed cases and death rates are climbed daily. No specific vaccine discovered for the treatment of COVID-19and constant 68 days lockdown affects the people mentally and economically. But this lockdown is not only curse for human population but also blessing for environment in few cases. It decreases the industrial activity as well as transportation that results the significant reduction of energy consumption and lowering of fuel demand. This change creates a positive impact on environment. 96% air travels were dropped in this pandemic lockdown situation which is lowest by last 75 years (CNN,2020).The respiratory diseases such as bronchitis, asthma, other lung disease found to be reduced by the improvement of air quality significantly (Watts, 2020). Noise free environment and free movement of wild animals in the street also observed during this situation(Paital, 2020).

The aim of the study is to provide an overview of the research findings on the opinion of students and household members on the COVID-19 lockdown effects on environment.

2. Materials and methods

2.1 Participants

A cross- sectional design was used for this research work. The survey was conducted during the 4th phase lockdown period in India. A total of 1000 individuals participated in the study from West Bengal, India. Both the 50% individuals were students and household members those are again subdivided as

i. Male student – Age between 15 to 25 years

ii. Female student – Age between 15 to 25 years

iii. Male household member – Age between 26 to 65 years

iv. Female house member – Age between 26 to 65 years

2.2 Tool and Techniques

A questionnaire was constructed containing socio-demographic of the individuals followed by 10 questions related to the opinion on environmental effects due to COVID-19 lockdown. It also includes as hort explanation about the objective of this study and the instructions, how to fill up the questionnaire. This is a closed ended questionnaire where every question had three options i.e. Yes, No & May be. The individuals are asked to choose the option against which they felt appropriate for them. It was made to clear them that it wasn't an examination & there were no right and wrong answers. They were assured that their identity would not be disclosed. This questionnaire was circulated through web-based mode. There was no time limit and need not to answer without any hurry. However they did not take more than 3 days. About 96.6 % & 89.4% response received from students and house hold members respectively.

2.3 Analysis

Percentage of positive (Yes), negative (No) and controversial (May be) response from each question are calculated. After scoring the responses & computing the total score for each individual, the different statistical parameters such as mean, SD and t-valueare calculated. The "t" tests are calculated to find out any differences between the level of significance of students and household members on the opinion on environmental effects due to COVID-19 pandemic.

3. Results and discussion

The opinion on the environmental effects due to COVID-19 lockdown period were received from total 930 individuals by their response through web-based mode.

3.1 Opinion on the environmental effects

Ten general questions were used to receive the opinion on students and household members about the environmental effects. The first one related to the general information regarding the COVID-19. About 80.12% male students give the positive response. Next two opinions are most controversial i.e. COVID-19 is natural mutant or bio-engineered in laboratory for bio-weapon. Maximum 28.05% household female members believed that it was naturally mutant where as 36.84% female student think it is bio-engineered.Forth one related to the mortality rate due COVID-19 transmission to the human body. Only 10.52% female student assumed that 100% mortality due to this disease. Next two opinions were interrelated that the lockdown period decrease of pollution level & Asthma, COPD or other kind of breathing problems. Almost 100% female student give their positive response regarding the decrease of pollution level and 76.13% of female household members are more concerned about asthma, COPD and other breathing related diseases. Use of mask is essential to prevent the COVID-19 transmission from human to human. So the next query was the significance of N95 maskin the pandemic situation and 55% male students give the positive response. Weather conditions i.e. COVID-19 transmission related to weather or temperature was the eighth query. About 28% female household members believed the transmission depends on the

condition of weather. The last two opinions had the most important environmental significance i.e lockdown increases the bio-diversity and decreases the global warming. Male student were conscious regarding the environmental pollution by responding 20.23% and 9.60% positive response.

Different research agency and scientist reported the decreasing global pollution level in the environment during the COVID-19 lockdown period. European Space Agency releases (ESA, 2020), different satellite images of the change of air pollutant concentration over the globe. Nitrogen dioxide that is emitted from power plants, industrial facilities and vehicles etc. may causes the respiratory problems. The satellite image of ESA (Fig. 1) indicates the significant reduction of averaged nitrogen dioxide concentrations over the major cities of India from January 1 to March 24, 2020 and March 25 (First day of the lockdown) to April 20, 2020(2nd phase of lockdown). Literature also reported that NO_2 concentration decreased at least 40-50% in the same major cities of India such as Mumbai, Pune and Ahmedabad by March 2020 than March 2019 (Wright, 2020).

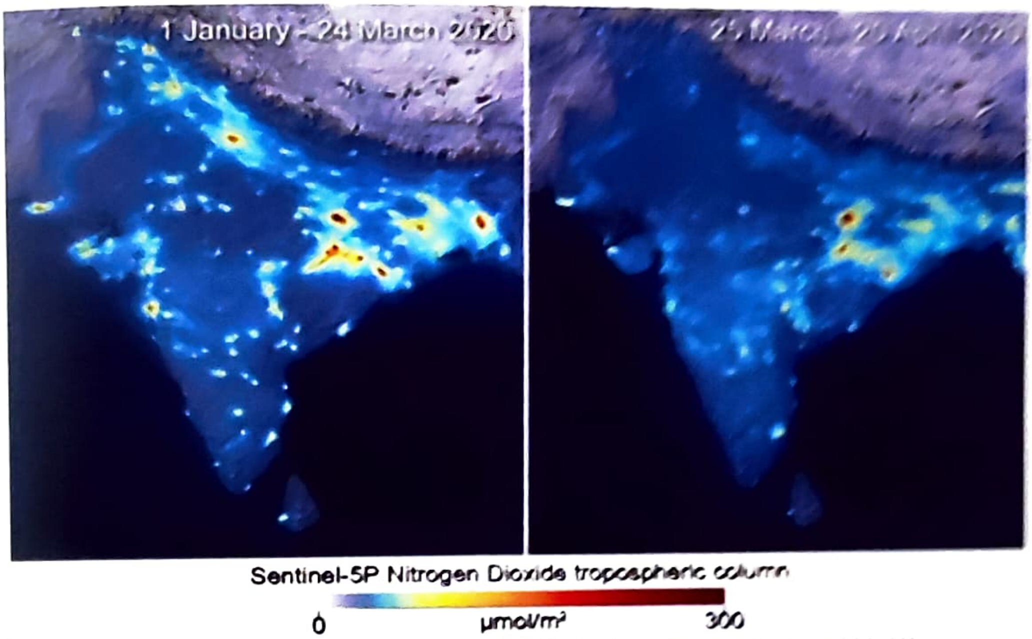

Fig.1. NO_2 emissions in India before and during lockdown due to COVID-19 outbreak (ESA, 2020).

National Aeronautics and Space Administration (NASA) satellite sensors observed the change in aerosol levels by the measurement of aerosol optical depth (AOD)from last few years to 2020 in the COVID-19 pandemic situation. As aerosols generated from anthropogenic activities, dust storms, volcanic eruptions, forest fires etc. can damage the human lungs and heart. Some aerosols have natural sources, such as dust storms, volcanic eruptions, and forest fires. Fig. 2shows the decrease of aerosol in India during this pandemic situation. The first five maps of Fig. 2 indicates the aerosol

optical depth over India same during March 31 to April 5 period for each year from 2016 through 2020 and sixth map (anomaly) shows how AOD in 2020 compared to the average for 2016-2019. The aerosol optical depth data were recovered by Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Terra satellite(NASA,2020).Several researchers also reported the beneficial effects of Covid -19 outbreak on the environment (Eroğlu, 2020; Chu et al., 2021).

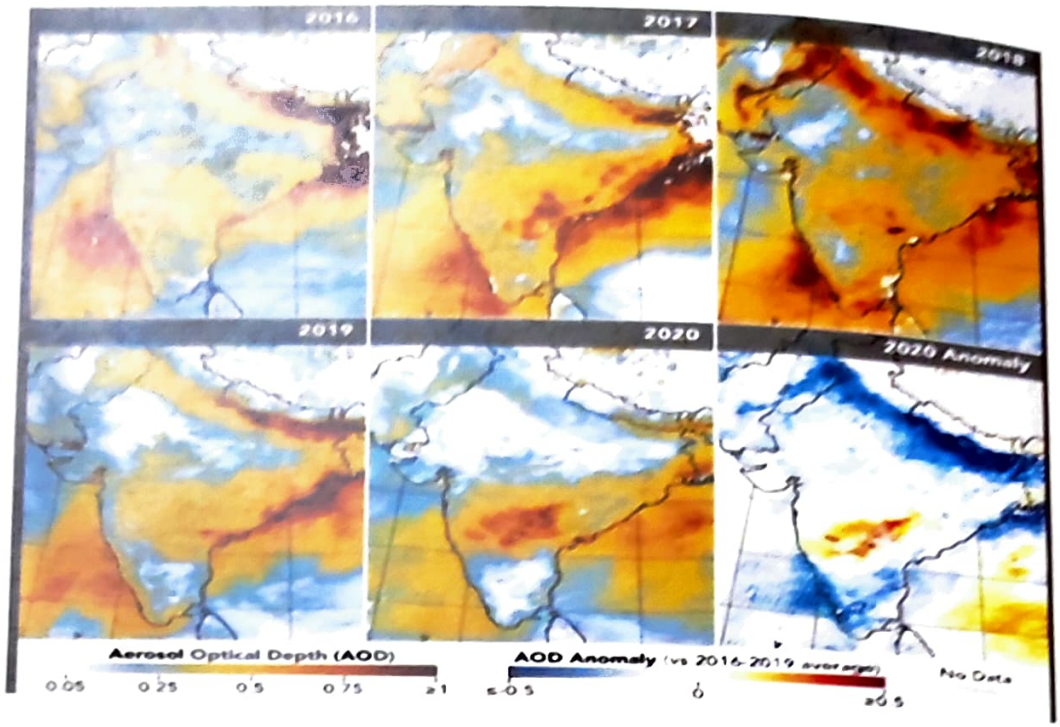

Fig.2. Aerosol levels in India before and beginning of lockdown due to COVID-19 outbreak (NASA, 2020).

3.2 Statistical analysis

Different statistical parameters such as mean, SD and t-valueare calculated. From the statistical analysis with respect to the opinion on the effects of COVID-19 lockdown on environment, the mean score of male and female students are 24.60 and 21.29 respectively. The t-valueis calculated to find out the significant opinion difference between male and female students. The value is 2.81 which is significant at $p<0.05$ level. The mean score of male students is high than the female students. So, male students have the positive opinion regarding the environmental awareness.

Statistical analysis also carried out for household members of age between 26 to 65 years. The mean score are 24.40 and 22.68 for male and female household members respectively. The t-value is 2.59 which is significant at $p<0.05$ level. So, male household members are more conscious about the positive impacts on environment due to COVID-19 lockdown pandemic outbreak.

4. Conclusion

The present web-based research work related to a cross-sectional design with a questionnaire containing ten questions related to the opinion on environmental effects due to COVID-19 lockdown in India. It is not only a serious threat to global human health but it is also considered some blessing of environment by reducing the pollution level. Both students and house hold members believed the positive impact of environment though it may be temporary. The blessing may be continued for long term basis by learning from this lockdown on how to reduce the pollution level in the environment. If we conscious about our environment then it will be the great outcome from the "curse" COVID-19 pandemic.

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