

Research

Community perception of the environmental and wellness impact of COVID-19 and its possible implications for elderly population

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Abstract

Background: Since the beginning of 2020, the COVID-19 pandemic has devastatingly affected people across the globe. However, some serendipitous beneficial changes have also been noticed. This survey aimed to explore the perceived paradoxical beneficial effects of the COVID-19 pandemic and to discuss about any possible implications for elderly population. **Methods:** An internet based survey was conducted using a 15-item semi-structured questionnaire, through *Google form*. The link of the same was circulated among the contacts of the investigators via WhatsApp and e-mails. Responses to the questionnaire were collected. A total of 453 responses were obtained. **Results:** Majority of participants reported that the level of air, noise pollution, and water pollution has come down. Close to 96% of the participants felt that the environmental cleanliness and sanitation have improved and about 88% believed that there is increased public awareness of health and hygiene. Other major responses included a decrease in crime rates and road traffic accidents. In addition, the majority of participants (76%) reported improved family relationships, increased interdependence and sharing of household responsibilities (79%) following lockdown which required people to stay at home. More than half of the participants had a sense that the situation has helped people towards spirituality. **Conclusion:** Along with the impact on life and economy, it appears COVID-19 pandemic may have some beneficial effects too, that have been perceived by the public, as observed in this survey. These positive effects may help decreasing the distress and accepting the challenges associated with the pandemic. Some of these effects may also help the aged, who are highly vulnerable to COVID-19.

Key words

Aged; Coronavirus disease; Pandemics; Environment

Introduction

Since the beginning of 2020, the COVID-19 pandemic has devastatingly affected the world, resulting in morbidity, mortality, financial losses owing to enduring lockdown state, emotional breakdowns, exhaustion of essential resources and scarcity of infrastructures to meet

the exponential growth of medical demands.¹ The COVID-19 infection is highly contagious thus has rapidly affected a large population globally.^{1,2} There is no specific treatment or vaccine for COVID-19 to date and thus, it has spread uncontrollably affecting 213 countries.¹ It has changed almost every domain of life affecting personal, emotional, societal, cultural, and even at the spiritual level. There are lots of evidences discussing the significant negative impacts of pandemics.³ All the government websites, international agencies, electronic and print media, and social media platforms continuously discuss the acute and anticipated long-term impacts of COVID-19. Nevertheless, the current COVID-19 pandemic has revealed few long-cherished changes in the environment. Electronic and printed media, globally reported about the beneficial and favourable changes in the environment in the form of a reduction in pollution, increase in creativity, kindness, and spirituality.⁴⁻⁸ Similarly, there have been media reports of a significant decline in crime rates, as well as general mortality rates, globally.⁹⁻¹² As per a latest report, there is the closure of the hole in the ozone layer in the arctic zone probably due to the drastic reduction of pollution; however, researchers claim that this change might not be due to COVID-19 related lock-down.¹³⁻¹⁶

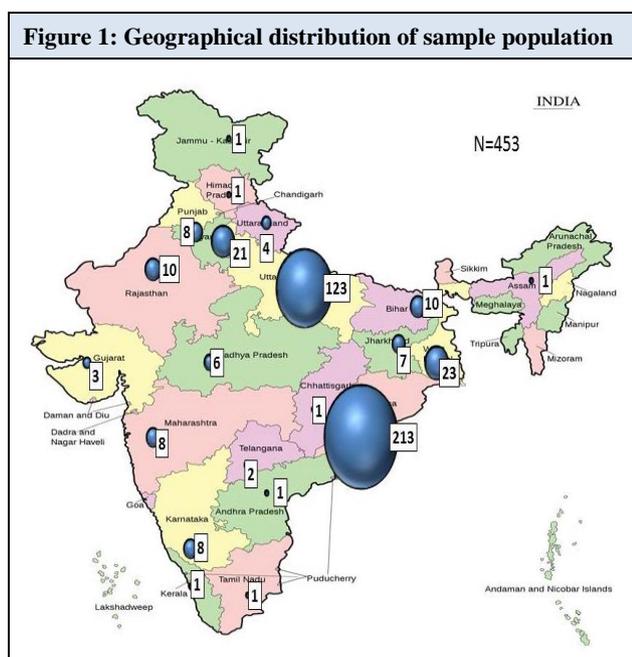
Several reports of electronic and print media unveiled that there is a fall in the levels of air, water, and noise pollution in locked down cities.^{17,18} The enduring lockdown has resulted in the reduction of air pollution in several metropolitan cities globally, which governments could not achieve in years of effort and by spending millions of dollars. Many of the traffic-congested cities were empty during the lockdown period. There is a significant reduction in road traffic accidents. At the individual levels, people have become more health-conscious which could be beneficial for them in the long run. People have more time to spend with their family members, and some are spending time in activities beyond their usual realm during this lockdown. Many have involved themselves in the altruistic activities such as helping others. These effects seen in the face of the COVID-19 pandemic can be considered as serendipitous, beneficial side effects.¹⁹

There is a paucity of research exploring the paradoxical beneficial aspects of pandemics. Therefore, it was aimed

to study the perceived beneficial effects of the COVID-19 pandemic. It is known that elderly are most vulnerable in the COVID-19 pandemic. While most research discuss about the negative impact of COVID-19 in the elderly population, it was intended to explore the beneficial effects of COVID-19 if any for the elderly population in this survey.

Materials and methods

This cross-sectional web-based survey was conducted in India. A semi-structured questionnaire was developed. Questions were prepared using *Google form* and a link was generated to access them online. The consent form was attached to the questionnaire. The link of the questionnaire was circulated among the contacts of the investigators via WhatsApp and E-mails. The participants were requested simultaneously to circulate the same link among their contacts. Thus, many people were able to access the questionnaire via the link. On clicking the link, the participants were automatically directed to the survey. After filling in the consent form they were directed to enter their demographic details.



As it was an online survey, people who had access to the internet and had necessary internet skills could participate in the survey. The data collection was initiated on 5th April 2020 at 4 PM IST and closed on 20th April 2020 at 4 PM IST. Data was collected from different states of India. The sociodemographic details that were collected from patients included age, gender, marital status, occupation, highest qualification, employment status, whether working from home during the ongoing pandemic and type of family residing in. There were 15 questions developed by the investigators, which were on the perceived positive effects of COVID-19 pandemic. All questions had four options (yes, no, maybe, and can't say). The questionnaires intended to explore about the personal perception regarding: change in environmental pollution (air, noise, and water), traffic situation (traffic in

the air, water, road, as well as road traffic accidents), health aspects (health awareness, personal hygiene, sanitation, health infrastructure) and psycho-social well-being (creativity, spirituality, interpersonal relationships, family harmony, self-regulation (controlling the non-essential moving around, shopping, etc.), sharing household responsibilities, substance use, crime rate, etc.

Data was analysed mostly by descriptive statistics (in terms of percentages). Comparison of the responses among genders was done by Chi-Square test. For statistical significance p value was considered to be less than 0.05. Missing values were excluded the from analysis.

Result

An online survey regarding the perceived positive effects of the COVID-19 pandemic was undertaken among the Indian residents. A total of 453 responses were obtained from different states of India (Figure 1). Participant's ages ranged from 17-71 years with the mean age of the participants being 27.5±8.8 years and median of 23 years.

Table 1: Sociodemographic details

Variable	Categories	%
Gender	Male	57.8
	Female	41.9
	Prefer not to say	0.3
Education	High school	1.3
	Intermediate	7.9
	Graduation	54.5
	Post-Graduation	19.2
	Professional	17.0
Family type	Nuclear	66.2
	Joint	30.2
	Lives alone	3.6
Marital Status	Married	33.0
	Single	62.4
	In a relationship	4.2
	Separated	0.2
	Employment	Employed
	Unemployed	6.2
	Student	53.4
	Housewife	1.8
	Self employed	3.0
Working from home	Yes	40.0
	No	60.0

More than half of the participants (54.5%) were graduates. About 19% and 17% of the participants were post-graduates and professionals respectively. Most of the participants (97.6%) were ≤ 50 years of age. Among the respondents 58% were males and the majority (62.4%) were unmarried individuals. Considering the current work, more than half (53.4%) of the participants were students; about 35% were employed, 40% were working from home during this period. Maximum responses were obtained from the state of Odisha followed by Uttar Pradesh (Table 1).

The responses regarding various changes following lockdown is given in Table 2. There was no significant

difference in the perceived of beneficial effects of COVID-19 between males and females, except the health awareness and hygiene, perception about interpersonal relationship, substance use and road traffic accidents, where males had significantly higher agreement with the beneficial effect than females (Table 3).

Table 2: Perceived beneficial effects of COVID-19 related measures	
Effects	*Positive perception
Reduction in air pollution	93.2
Reduction in noise pollution	95.8
Reduction in water pollution	79.4
Reduction in the traffic on the road, waterways and airways	96.0
Positive effect on environmental cleanliness and sanitation	95.8
Development in the health care infrastructure	65.3
Awareness of health and hygiene measures among public	88.3
Increase in self-regulation	83.7
Development in spirituality among people	51.2
Increased creativity	66.7
Positive development of family relationships and increased interdependence.	75.9
Positive development in sharing household responsibilities	78.8
Control in unnecessary expenditure	86.7
Decrease in use of addictive substances (e.g. tobacco, alcohol, cannabis)	67.5
Decrease in crime rates and road traffic accidents	87.2
*Positive perception refers to the YES response to the question. Figures are in percentages	

Discussion

It is acknowledged that there is massive damage to mankind due to the COVID-19 pandemic, which are covered aptly by many researches. The focus of the paper, however, was to explore the beneficial effects of the pandemic, which are usually discussed less or ignored. The data for this research was collected through a web-based survey in India.

There have been many learning points from past pandemics. The preparedness of the government, community, and the nation at large increases after facing a pandemic, which is beneficial for the society.²⁰ This pandemic has continued for months and is expected to last for many more. Over this long period, various life-style related changes and socio-environmental changes are happening, which might have some beneficial effects.

COVID-19 pandemic has resulted in the closing down of industries, transports, and other organizations that contribute to environmental pollution, as a result of which

there is the global reduction of noise, air as well as water pollution.²¹ Gradually, some countries have started opening their industries and over a few months, their functioning will be optimal. This short period of time-out may not cause a sustained change in the green-house effect, but the change that is happening currently is obvious and positive.²¹ In our survey, more than 90% of participants appreciated the reduction in air and noise pollution, whereas approximately 80% perceived the reduction in water pollution. As per a recent report, there is a significant decline in the pollution of river Ganga in India.²² The change in pollution level is a global phenomenon; just like the spread of COVID-19 across the globe. Nitrogen dioxide (NO₂) concentration in air is considered a sensitive indicator of pollution, which has reduced drastically in European countries, China, the United States as well as other countries.²¹ However, a study from China predicted that the reduction in pollution in Chinese cities will not be affected significantly by this lockdown, considering the current severity of pollution in China.²³ Globally all forms of environmental pollutions result in significant morbidity and mortality.²⁴ Though people are dying due to COVID-19, mortality due to pollution, road traffic accidents, and crimes are possibly less these days.

Across the globe, the tourist spots are often found dirty due to garbage, plastic wastes and other pollutants; however, during this pandemic, these places look much cleaner.²¹ People are in their homes during lockdown, this has limited the waste production outside. At the same time, the government and other agencies are working on hygiene and sanitation, which has led to cleaner roads, streets, markets, and religious places. This has been also reported in our survey participants, as approximately 96% of participants perceived this noticeable benefit.

During the COVID 19 pandemic, it has been reported that people waste less food, eat their leftover foods, and control their purchasing behavior.²⁵ Approximately, 84% of participants, in our survey perceived to have better self-regulation. Similarly, approximately 87% of participants believed that unnecessary expenditures are curtailed during this lockdown period. These findings indicate a positive perceived change in self-regulation.

There are reports that people during lockdown periods have enough time to spend on innovative and creative activities. Globally, people do a lot of creative works.^{7,8} Similarly, many people respond kindly towards their fellow members and poor.⁵ Several agencies and organizations are donating money for the benefit of mankind and helping the poor and homeless people. In our survey, more than half of the respondents had reported their inclination towards spirituality. Similarly, approximately two-thirds of the participants appreciated the development of creativity during the lockdown phase of the COVID-19 pandemic.

During this time, governments are investing a lot in the development of health infrastructures and medical research. Nearly, two-thirds of the participants in our survey acknowledged the improvement in health infrastructures in the country.

Table 3: Perceived beneficial effects of COVID-19 related measures							
Perceived beneficial effects	Male (n=262)			Female (n=190)			P
	Yes	No	Maybe	Yes	No	Maybe	
Reduction in air pollution	93.9	1.9	4.2	92.6	0.5	6.9	0.217
Reduction in noise pollution	95.4	1.1	3.5	96.3	1.0	2.7	0.884
Reduction in water pollution	80.8	3.8	15.4	77.9	3.2	18.9	0.572
Reduction in the traffic (road, waterways and airways)	96.6	1.9	1.5	95.3	2.1	2.6	0.699
Positive effect on environment (cleanliness and sanitation)	96.9	1.1	2.0	94.8	1.0	4.2	0.351
Development in the health care infrastructure	68.2	9.2	22.6	61.6	10.5	27.9	0.337
Awareness of health and hygiene measures among public	90.8	0.8	8.4	84.7	3.7	11.6	0.042
Increase in self-regulation	84.3	5.7	10.0	82.6	3.7	13.7	0.311
Development in spirituality among people	55.0	10.7	34.3	46.3	9.5	44.2	0.103
Increased use of creativity	65.3	8.0	26.7	68.9	4.2	26.8	0.258
Positive development of family relationships and increased interdependence	80.1	6.5	13.4	70.5	4.2	25.3	0.004
Positive development in sharing household responsibilities	80.1	6.1	13.8	76.8	4.7	18.5	0.356
Control in unnecessary expenditure	87.4	3.4	9.2	85.8	4.7	9.5	0.780
Decrease in use of addictive substances (e.g. Tobacco, alcohol, cannabis)	73.6	7.7	18.7	59.4	8.4	32.2	0.003
Decrease in crime rates and road traffic accidents	90.8	1.5	7.7	82.6	3.7	13.7	0.033

Note: Figures are percentages representing the proportion in each gender.

Globally, there is a decline in crime rates and death rates. There is a 42% decline in drug-related crime in Chicago,¹¹ 40% fall in the crime rates in New York City and a huge 84% fall in crime rates in Peru.¹¹ Thefts, robbery, murders, traffic rule violations in the intoxicated state have also come down drastically; however, there are reports of an increase in domestic violence.¹⁰ In India, there is an 80% fall in crime rates in national capital New Delhi, during this lockdown period.⁹ The responses in our survey are similar to the above observations. More than 87% of participants in our survey perceived that there is a substantial decline in crime rates and road traffic accidents following the lockdown due to COVID-19 pandemic.

Due to the lockdown phase of the COVID-19 pandemic, most people are confined to the home settings and have poor access to addictive substances and including tobacco and alcohol, which may result in reduced use of these substances. In our survey, more than two-thirds of participants believed that this pandemic will cause a reduction in substance consumption. There are reports that highlight the challenges faced by individuals with substance use disorder due to the non-availability of addictive substances.^{26,27} Health authorities have alerted the medical services for management of withdrawal symptoms of patients with substances dependence during the lockdown.

Relevance of the findings for the elderly

The findings of the survey have various implications for the general population irrespective of age. Although the survey participants were mostly younger adults, it was attempted to reflect the relevance and applicability of the findings in the context of elderly population.

The changes that happened during COVID-19 lockdown, may have several beneficial effects for the elderly.

Reduction of air pollution is beneficial for the elderly with chronic respiratory illnesses. Improvement of cleanliness and sanitation is generally helpful for the health. Due to restrictions, people are spending more time at home with families which may help the elderly to combat loneliness. The elderly, who are dependent on others for their care, medication intake, and other activities of daily living, may get more attention and care due to availability of family members. However, such benefit may be only available to the elderly people, whose family members are staying with them due to lockdown and are supportive. On the other hand, elderly may get deprived from the attention of their family members, who could not remain with them due to lockdown.²⁸

In some ways, the care of the elderly may have been improved during the lockdown period. However, older adults, who are living alone and have little access to health care facilities or support may have struggled. In addition, there are reports of domestic violence and abuse,²⁹ highlighting the vulnerabilities of the aged.

Limitations

As it was an online survey the participants were those who had access to the internet and were skilled enough to participate in the survey. More numbers of young and educated participants in the survey may be perceived as a strength, as they have more information and access for appreciating the environmental changes; however, at the same time their view may not represent the whole population. The respondents were mostly from two states of India. Based on above factors, the generalisability of the findings is limited. Our survey evaluated the subjective perceptions of the population regarding the positive global effects of the COVID-19 pandemic, which may be biased; while there is objective confirmation of for some of the reported perceptions, more robust evidence are required through studies. The perception of

people may change as the pandemic progresses, so there is a need to evaluate the changing perceptions of the public from time to time. Responses to certain questions (used in the survey questionnaire) are interdependent. Perception about reduction in traffics may influence the perception about road traffic accidents. Similarly, perception about sharing of household responsibility is likely to influence the perception about “positive development of family relationships and increased interdependence”. The questionnaire was not standardised.

A specific limitation of the survey is that the respondents were mostly young adults, whose perception about the COVID-19 lockdown related benefits may be different from elderly population. Evaluating the perceptions of elderly people exclusively, may give better insight to the issue discussed in the article.

Conclusion

The COVID-19 pandemic is having a mixed impact on society. The devastating effect of the COVID 19 pandemic is well known; however, there are several perceived beneficial effects too, as observed through the responses in this survey. These have been appreciated by various other agencies. While the damage due to COVID-19 is being estimated by many public health professionals, economists and sociologists; the benefits however small, are not being systematically evaluated. The positive effects of a pandemic may be helpful in decreasing distress and accepting the challenge. The elderly population who are highly vulnerable to COVID-19 may benefit in the process in some areas, but more a focused study is essential.

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