Awareness On Impact Of Quarantine Lockdown On Environment During Covid-19

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ABSTRACT: *The outbreak of COVID-19 has spread rapidly across the world. To control the rapid dispersion of the virus, many countries have imposed national lockdown policies to practise social distancing. This has led to reduced human activities and hence primary air pollutant emissions, which caused improvement of air quality as a side-product.A well structured questionnaire containing 16 questions was circulated among College students. The questionnaire has covered basic demographic data such as age, gender and about the awareness of change in the environment during lockdown. Results show that human activities were lowered significantly during the period. This reduction in human activities has played a significant role in the improvement of the environment. Although the lockdown has contributed to a positive impact on air quality, it is important to take into account the negative impacts on social aspects, considering the deaths caused by COVID-19 and also the dramatic economic effects. From this study we may conclude that there is awareness among college students and this helps in improving the environment during normal days.*

Keywords: Air quality, COVID 19, environmental changes, pandemic, quarantine.

1. INTRODUCTION

COVID-19 (coronavirus disease 2019) is an infectious disease caused by severe acute respiratory syndrome. Coronavirus 2 (SARS-CoV-2), previously known as the 2019 novel coronavirus (2019-nCoV), a strain of coronavirus. The first cases were seen in Wuhan, China, in late December 2019 before spreading globally. It was initially reported to the WHO on December 31, 2019 spread from person to person from respiratory droplets when an infected person coughs,sneezes or talks. Since there is no vaccine or medicine currently to prevent or cure the COVID-19 world health organization and government has requested people for practicing Social distance(Chen e t al., 2020). Hypertension, heart disease, breathing trouble and diabetes all of which increase complications in coronavirus patients. The virus also weakens the immune system and fuel

inflammation in the lungs and respiratory tract, adding to the risk both of getting COVID-19 and of having severe symptoms. Many countries decided to undergo a complete lockdown(Yunus, Masago and Hijioka, 2020). Due to lockdown flight, train, bus services has stopped (Hyafil and Morina, no date). During lockdown period major pollution from industries that affects aquatic ecosystems such as industrial waste water disposal , oil, heavy metals and plastic have completely stopped (Häder and Gao, 2018).Human health is strongly influenced by air quality According to 2019 state of Global Air report, air Pollution killed an estimated 5million peoples globally In 2017 and china topped the 10 countries.

Satellite picture data shows that significant drop in air Pollution concentration during lockdown shows effects of the quarantine due COVID-19, outbreak.The countries that have been under strict lockdown to stop the spread of coronavirus have experienced a benefit in environment(Muhammad, Long and Salman, 2020). Environment change is one of the biggest and most vital challenges of the 21st century(Baker e t al.,)(Menon, V and Gayathri, 2016). In spite of all their efforts to restore nature during the last few decades, humans could only move a few steps forward (Surapaneni and Jainu, 2014). But during the last few months, consequences of the pandemic have successfully recovered the environment to a large extent that should definitely set a positive impact on global climate change (Zhu et al., 2020). Whatever be the cause or origin, the occurrence of COVID-19 has emphasized to improve the mutually affective connection between humans and nature.

 Previous literature on metabolic disorders (Shukri e t al., 2016), nanoparticles (Ke e t al., 2019), insilico studies (Ponnulakshmi et al., 2019), cancer biology ((Wang e t al., 2019), (Mahato, Pal and Ghosh, 2020), (Bao and Zhang, 2020), (Gan e t al., 2019),)(Rengasamy , G. e t al. 2016) , natural products in health and disease ((Wu et al., 2019), (G e t al., 2018), (Jainu, Priya and

Mohan, 2018), (Chen e t al., 2019), (Ramasamy, S. and M.,), (Rengasamy e t al., 2018), (Castelvecchi, 2020), (Mahato, Pal and Ghosh, 2020)) (Jainu, Priya and Mohan, 2018) (Li et al. 2020) enriched my research knowledge and motivated me to take up epidemiological studies which is the need of the hour.The aim of study is to make awareness of the impact of quarantine lockdown on the environment during COVID- 19.

2. MATERIALS AND METHODS

 A well structured Questionnaire Containing 16 Questions was prepared and Circulated among college students through an online link. This was approved by the scientific Review of Saveetha dental college. The sample size of study is 100 between age groups 18-28 years. The questionnaire included the basic demographic data such as Age, gender etc. The sampling method used was a simple random sampling method. The statistics used to analyse the results was descriptive statistics and chi square test using SPSS software . The result output variables are represented through pie charts .

3. RESULTS AND DISCUSSION

The data were collected and statistically analysed. The majority of students are aware and have knowledge about the effect of quarantine lockdown on the environment during COVID 19.
 The study consist of the age groups of 18 to 25 years (figure 1).Among them,64% were male and 36% female (figure 2).87% of the participants identify the difference in environment during quarantine.when question asked about what type of difference seen before and after quarantine 33% of them responded less traffic,43% responded less air pollution,16% responded less noise pollution ,8% responded no difference (figure 4).32% of

population responded air pollution came from transports,43% responded industries,16% responded power plant,9% responded fire (figure 5).86% of population are affected by air pollution during normal days (figure 6).84% of population fells fresh air around them (figure 7).22% of population used car,37% used bike,31% used bus,10% used train during normal days (figure 8).51% of population went out during this quarantine (figure 9).84% of population thought quarantine is effective in bring down pollution (figure 10).

79% of population thought more quarantine per year will help to improve environment (figure 11).85% of population thought that reducing the effect of global warming is more important than restoring the social economy of the country during quarantine period (figure 12).21% of population planted more trees,41% of population reduced the use of vehicle,10% of population maintained cleanliness in their environment during the quarantine period (figure 13).78% of population environment is clean during the quarantine period (figure 14).55% of population thought that pollution can be controlled even after lock down (figure 15).90% of population thought that ozone layer heal due to less polluted environment of quarantine (figure 16).

We have seen the association between age and aware of change in environment [Fig 17],aware of difference seen environment before and after quarantine [Fig 18],area of pollution [Fig 19],effect of pollution on breathing [Fig 20],aware air around the participants [Fig 21],mode of transport used by participants [Fig 22],number of participants stayed home [Fig 23],effect of quarantine in bringing down pollution [Fig 24],opinion of students about quarantine in bringing down pollution [Fig 25],importance of quarantine than country economy [Fig 26],steps taken by participants to change environment [Fig 27],maintenance of cleanliness in environment [Fig 28],aware of control of pollution after lockdown [Fig 29],awareness of ozone layer healing during quarantine [Fig 30]

Most of the participants answered quarantine causes decrease in pollution which is proved by study results done by (Wang e t al., 2020) 40 - 50% improvement in air quality. About 54%, 43%, 37%, 31%, reduction in NAQI have been observed in central, eastern, southern, west and north Part of mega city.Due to lockdown, many countries experienced a dramatic reduction in air pollution. 16% participants in our study realised less noise pollution in the environment which is shown by study (Gan e t al., 2019) due to private and public transportation has decreased and commercial activities have stopped. All these changes have caused the noise level to drop considerably in most cities in the world.43% participants answered industries are the main cause of pollution. A report showed that key industries in China were operating at much lower than normal levels during lockdown. Oil refining industries operation has been lowest since 2015.(Ma et al., 2019; Bao and Zhang, 2020). As a result, carbon dioxide emission was lower compared to 2019 (Mohan, Veeraraghavan and Jainu, 2020).

In the study 49% of participants stayed home and in the study among New York population shows that, there was 80% population stayed home due to lockdown and this was increased up to 90% in a few days (L. Li e t al., 2020). most of participants nearly 90% in the study answered ozone layer heals during quarantine this was proven by Sharma et al. (2020) report an increase of 17% in O3 concentration in India,(Sharma e t al., 2020) and Tobías et al. 2020 observed an increase of 57.7% in ozone concentration in Barcelona, Spain.Ozone concentration increases have been associated with the decrease of NO, which may cause a decrease in ozone consumption, thus leading to a higher ozone concentration(Tobías e t al., 2020).It is important to stress here that this survey has some limitations.The sampling size chosen was small, the responses were collected in short duration and the population selected were homogeneous.Further study may be carried out to make awareness on

impact of Quarantine Lockdown on the environment during COVID-19.

4. CONCLUSION

Overall the significance and impacts of lockdown are still not well understood and this quarantine has a significant role on restoration of air quality. Nationwide lockdown due COVID-19 pandemic provides a unique opportunity to change the environment.COVID-19 is pandemic but its consequences have successfully recovered the environment to a large extent that should definitely set positive impact on global climate changes.The COVID- 19 has proved that Nature has provided us with all the resources for leading a beautiful life. Indiscriminate development overexploitation of natural resources should be minimized at the level of sustainability. As a responsible human, it is our duty to protect our mother earth and nature and we must take the corona outbreak as a wake-up call.

AUTHOR CONTRIBUTIONS:

S.Ganesh: Literature search, data collection, analysis.
V. Vishnu priya: Data verification, manuscript drafting.
A. jothi priya: Data verification, manuscript drafting.
R. Gayathri: Data verification, manuscript drafting.

CONFLICT OF INTEREST:

No conflict of interest declared

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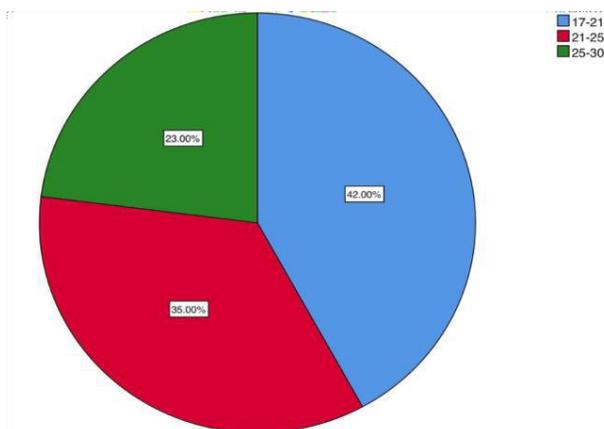
Figure 1: Pie chart represents the percentage distribution of age participants. 42% of participants belonged to the age group 17- 21 years (blue) ,35% of participants belonged to the age group of 21-25 years (red),23% of population belonged to the age group of 25-30 years(green).
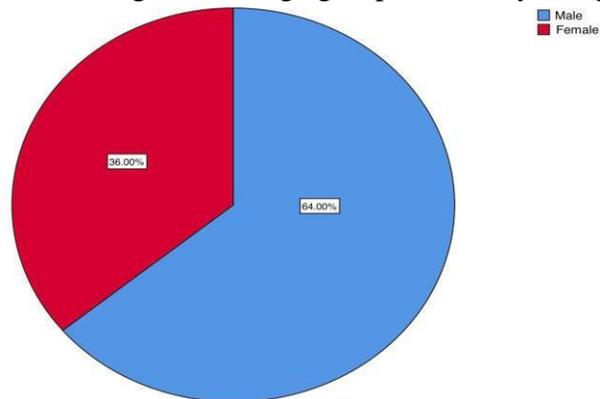
Figure 2 : Pie chart represents percentage distribution of responses on gender, 64% male (blue) and 36% females participated in the study (red).
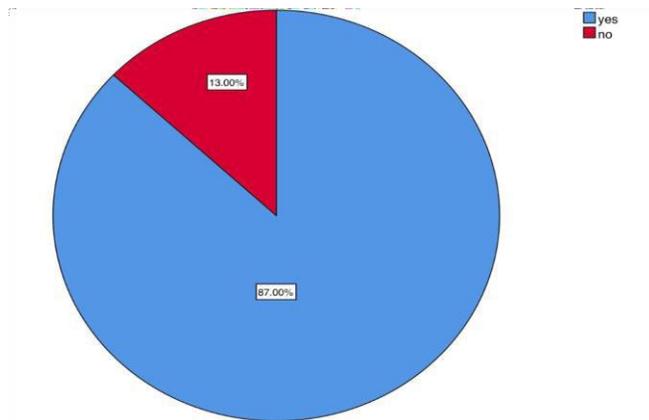

Figure 3: Pie charts represent percentage distribution of responses on differences in change in environment during quarantine, 87% of the participants identify the difference in environment during quarantine and 13% of participants cannot identify differences in environment (red).
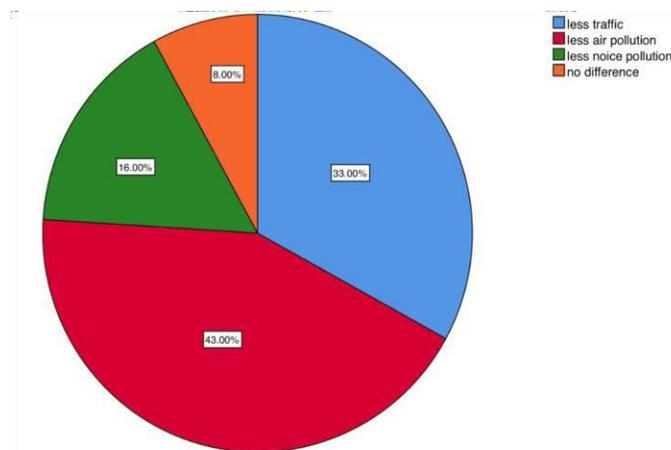
Figure 4 : Pie chart represent percentage distribution of responses on environment before and after quarantine. 33% of participants responded less traffic (blue),43% (red) responded less air pollution,16% (green) responded less noise pollution ,8% (orange) responded no difference
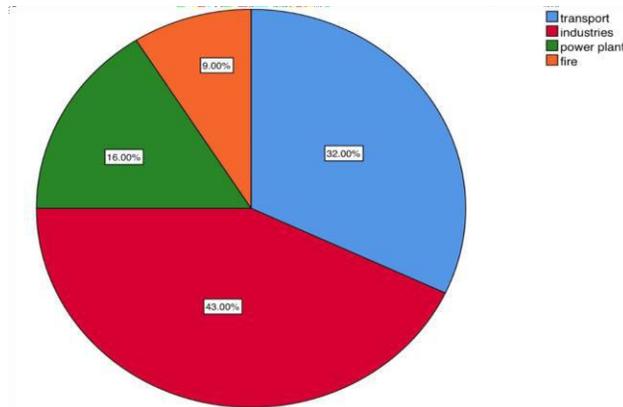
Figure 5: Pie charts represent percentage distribution of responses on causes of air pollution. 32% of the population answered that vehicles cause air pollution (blue) ,43% answered industries,16% answered power plants, 9% answered fire.
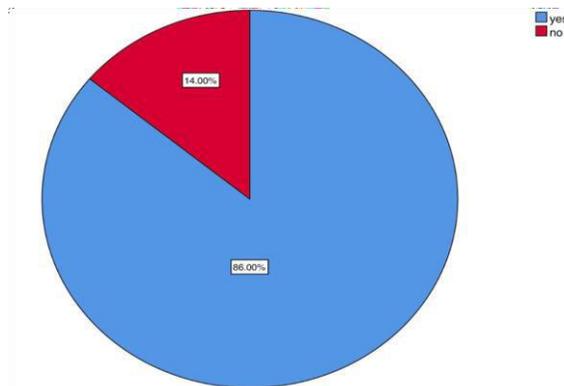
Figure 6 : Pie charts represent the percentage distribution of responses on the number of students affected by pollution during normal days, 86% of participants are affected by air pollution during normal days (blue) and 14% participants are not affected by air pollution (red).
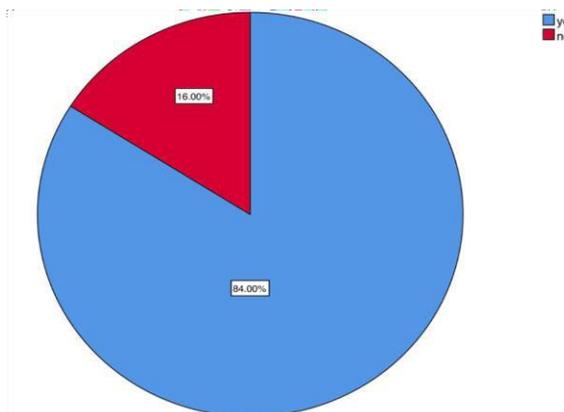
Figure 7 : Pie charts represent percentage distribution of responses on quality of air in the atmosphere. 84% of participants feel the fresh air around them (blue) and 16% of participants don't feel fresh air around them (red).
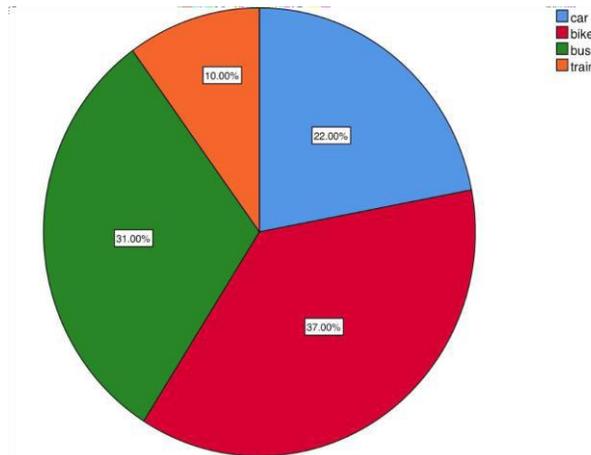
Figure 8: Pie charts represent percentage distribution of responses on the type of transport used by students during normal days, 22% of participants used cars (blue),37% (red) used bikes,31% (green) used buses,10% (orange) used trains during normal days.
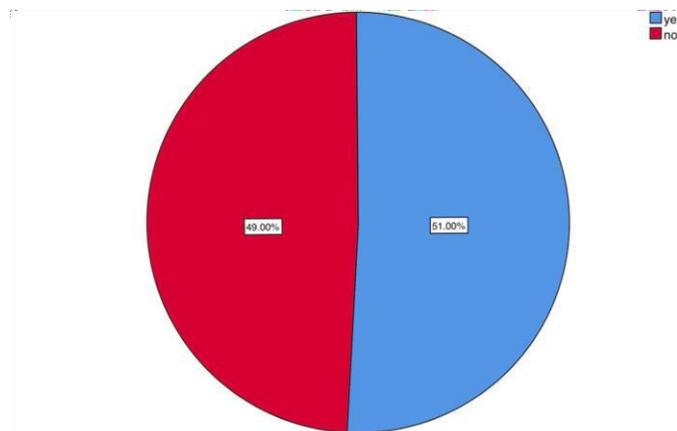
Figure 9: Pie charts represent the percentage distribution of responses on students staying at home during quarantine. 51% of participants went out during this quarantine (blue) and 49% of participants stayed home during quarantine (red).
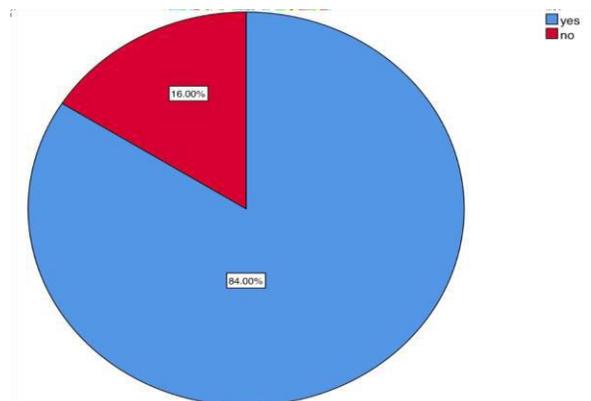
Figure 10: Pie chart represents percentage distribution of responses on effect of quarantine on bringing down pollution, 84% (blue) of participants thought quarantine is effective in bringing down pollution and 16% of participants thought quarantine is not effective in bring down pollution (red).
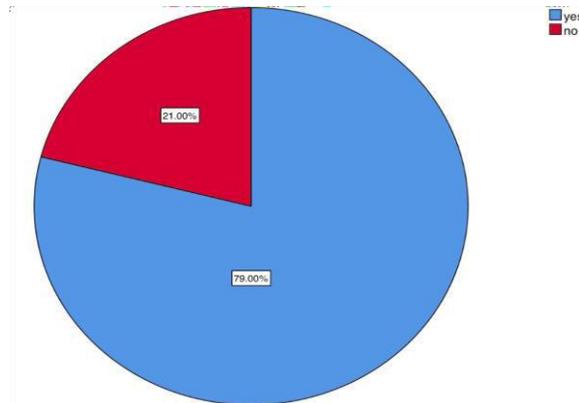
Figure 11: Pie charts represent percentage distribution of responses on opinion of students about quarantine every year will reduce pollution, 79% of participants thought more quarantine every year will help to improve the environment (blue) and 21% participants thought that quarantine will not help in improving the environment (red).
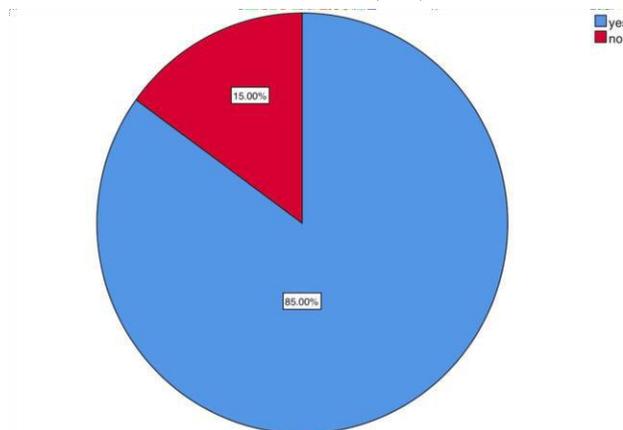
Figure 12: Pie chart represent percentage distribution of responses on importance of quarantine in economy of a country, 85% of participants thought that reducing the effect of global warming is more important than restoring the social economy of the country during quarantine period (blue) and 15% thought restoring the social economy of the country is more important than reducing global warming (red).
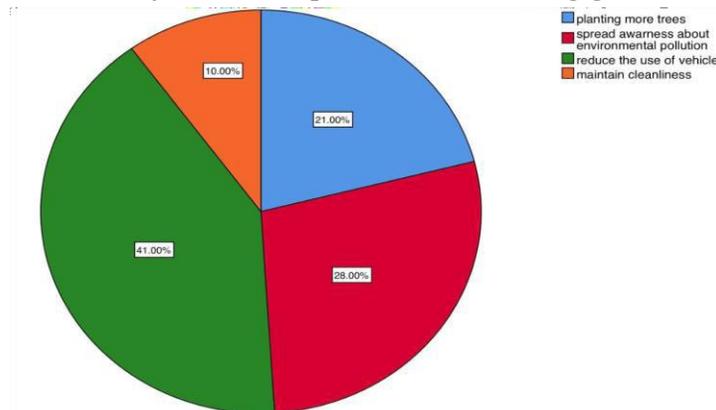
Figure 13 :Pie chart represent percentage distribution of responses on efforts taken by students during quarantine to change environment, 21% of participants planted more trees (blue),41% of participants reduced the use of vehicle (green),10% of participants maintained cleanliness in their environment during the quarantine period (orange),28% of participants answered spread awareness about environmental pollution (red).
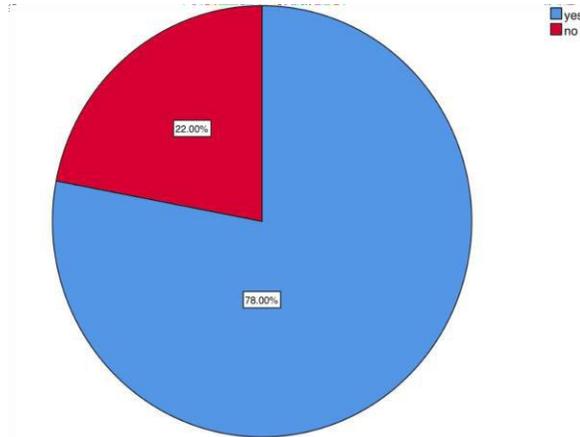
Figure 14: Pie chart represents percentage distribution of responses on maintenance of cleanliness in the environment, 78% of participants' environment is clean during the quarantine period (blue) and 22% of participants environment is not clean during this quarantine (red).
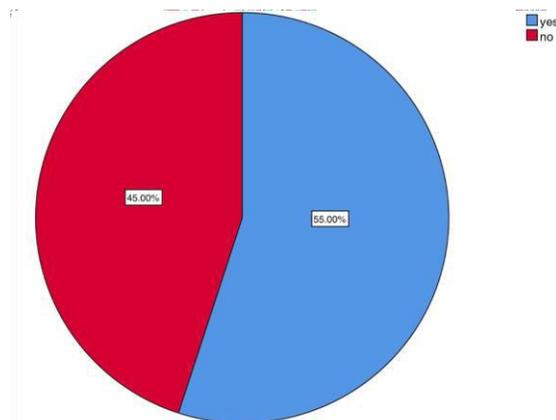
Figure 15: Pie chart represents percentage distribution of responses on controlling pollution after lockdown, 55% of participants thought that pollution can be controlled even after lock down (blue) and 45% of participants thought pollution cannot be controlled even after lockdown (red).
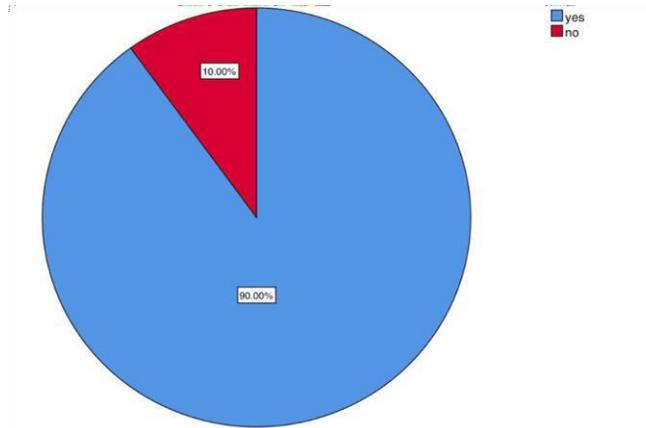
Figure 16 :Pie chart represents percentage distribution of responses on healing of ozone layer due to quarantine ,90% of population thought that ozone layer would heal due to less polluted environment of quarantine (blue) and 10% answered ozone layer doesn't heal due to quarantine (red).
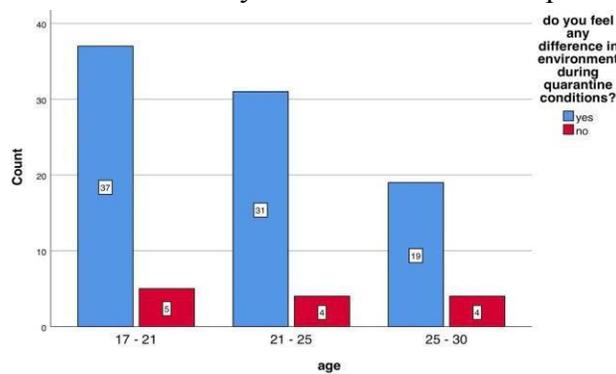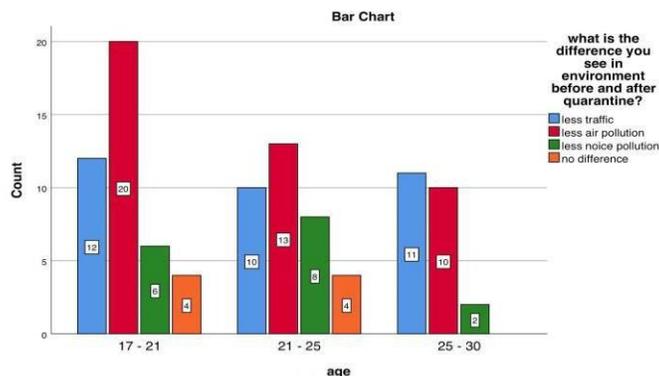

Figure 17: Bar chart represents the association between age of participants and responses on change in environment. X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered yes but on analysis there was no statistical significance between age group and awareness on change in environment. Blue denotes yes and red denotes no. Chi square value 0.513, p value = 0.774 (p>0.05 statistically not significant)

Figure 18: Bar chart represents the association between age of participants and responses on changes seen in the environment before and after quarantine. X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered less air pollution but on analysis there was no statistical significance between age group and responses on changes seen in the environment before and after quarantine.Blue denotes less traffic,red denotes less air pollution,green denotes less noise pollution,orange denotes no difference. Chi square value 6.827, p value = 0.337 (p>0.05 statistically not significant).
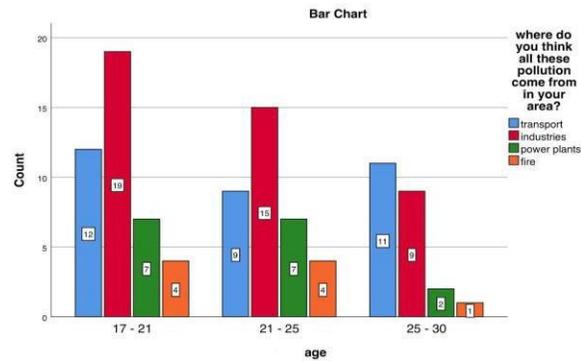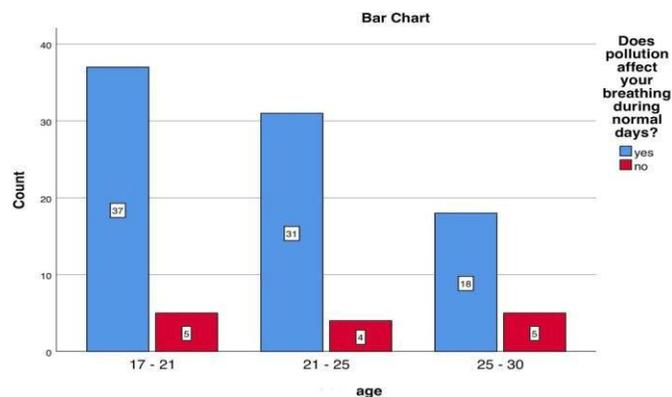
Figure 19: Bar chart represents the association between age of participants and responses on polluted areas. X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered industries but on analysis there was no statistical significance between age group and responses on polluted areas. Blue denotes transport, red denotes industries, green denotes power plants, orange denotes fire. Chi square value 4.440, p value =0.617 (p>0.05 statistically not significant).

Figure 20: Bar chart represents the association between age of participants and responses on effect of pollution on respiration. X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered yes but on analysis there was no statistical significance between age group and effect of pollution on breathing.Blue denotes yes and red denotes no. Chi square value 1.490, p value =0.475 (p>0.05 statistically not significant).
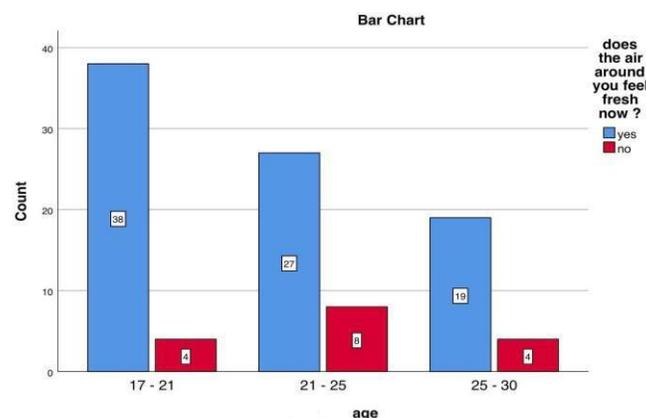

Figure 21: Bar chart represents the association between age of participants and responses on fresh air in the atmosphere. X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered yes but on analysis there was no statistical significance between age group and

air around the participants . Blue denotes yes and red denotes no. Chi square value 2.568, p value =0.277 (p>0.05 statistically not significant).
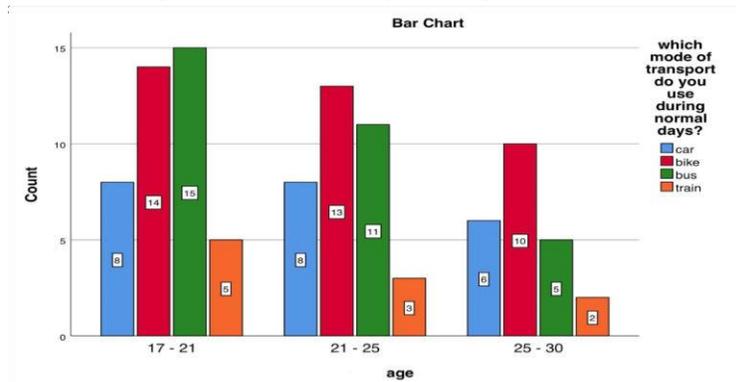

Figure 22: Bar chart represents the association between age of participants and awareness on mode of transport during normal days. X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered bike but on analysis there was no statistical significance between age group and awareness on mode of transport during normal days. Blue colour denotes car,red denotes bike,green denotes bus,orange denotes train. Chi square value 1.968, p value =0.923 (p>0.05 statistically not significant).
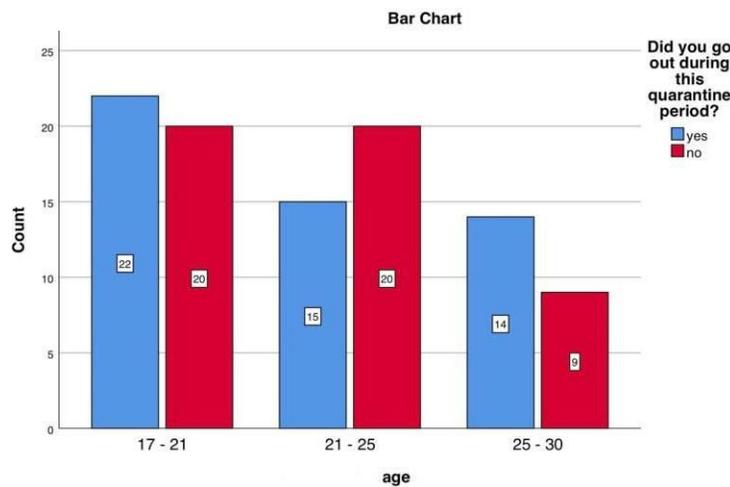

Figure 23: Bar chart represents the association between age of participants and responses on staying home during the pandemic. X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered yes but on analysis there was no statistical significance between age group and responses on staying home during the pandemic.Blue denotes yes and red denotes no. Chi square value 1.857, p value =0.395 (p>0.05 statistically not significant).
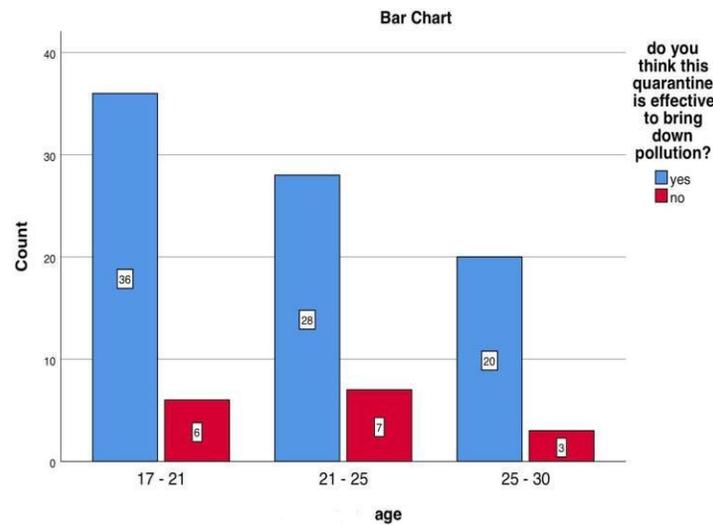
Figure 24: Bar chart represents the association between age of participants and responses on effect of quarantine in bringing down pollution. X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered yes but on analysis there was no statistical significance between age group and effect of quarantine in bringing down pollution.Blue denotes yes and red denotes no. Chi square value 0.658, p value =0.720 (p>0.05 statistically not significant).
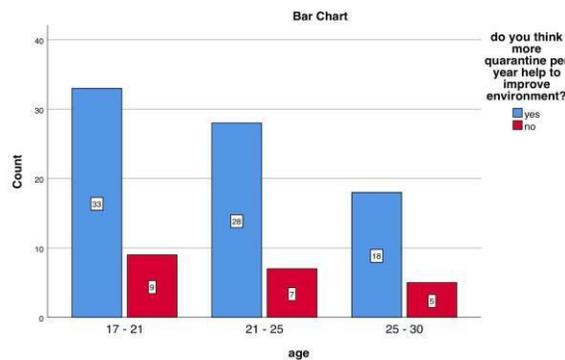

Figure 25: Bar chart represents the association between age of participants and responses on opinion of students about quarantine in bringing down pollution. X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered yes but on analysis there was no statistical significance between age group and opinion of students about quarantine in bringing down pollution .Blue denotes yes and red denotes no. Chi square value 0.033, p value =0.983 (p>0.05 statistically not significant).
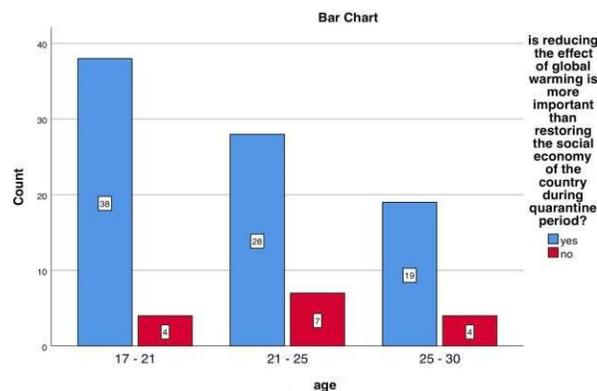
Figure 26: Bar chart represents the association between age of participants and responses on importance of quarantine on the economy of a country. X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered yes but on analysis there was no statistical significance between age group and importance of quarantine than country economy. Blue denotes yes and red denotes no. Chi square value 1.777, p value =0.411 (p>0.05 statistically not significant).
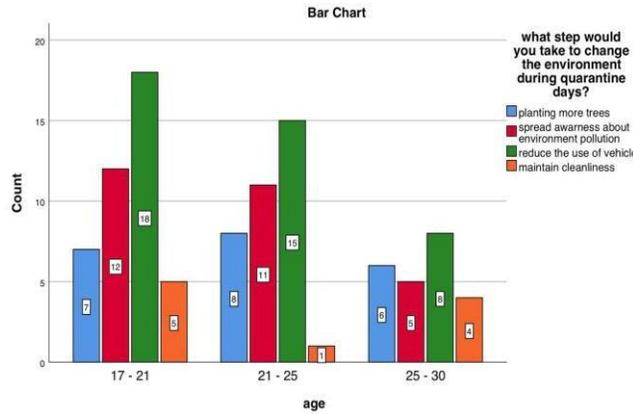

Figure 27: Bar chart represents the association between age of participants and responses on steps taken to change the environment. X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered reduce the use of vehicles but on analysis there was no statistical significance between age group and responses on steps taken to change the environment.Blue colour denoted planting more trees,red colour denoted spread awareness about environment pollution, green denoted reduce the use of vehicles, orange denotes maintain cleanliness. Chi square value 4.667,p value =0.587 (p>0.05 statistically not significant.
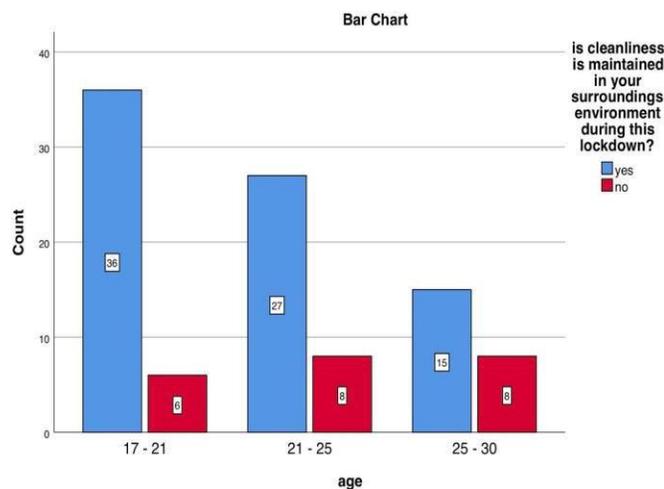

Figure 28: Bar chart represents the association between age of participants and responses on maintenance of cleanliness in the environment .X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered yes but on analysis there was no statistical significance between age group and maintenance of cleanliness in the environment.Blue denotes yes and red denotes no. Chi square value 3.662, p value =0.160 (p>0.05 statistically not significant).
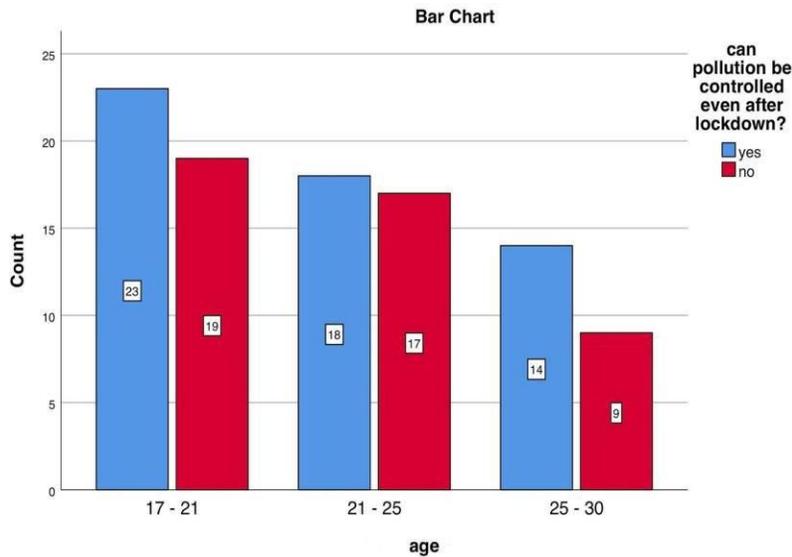
Figure 29: Bar chart represents the association between age of participants and responses on controlling pollution after lockdown.X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered yes but on analysis there was no statistical significance between age group and control of pollution after lockdown. Blue denotes yes and red denotes no. Chi square value 0.501,p value =0.778 (p>0.05 statistically not significant)
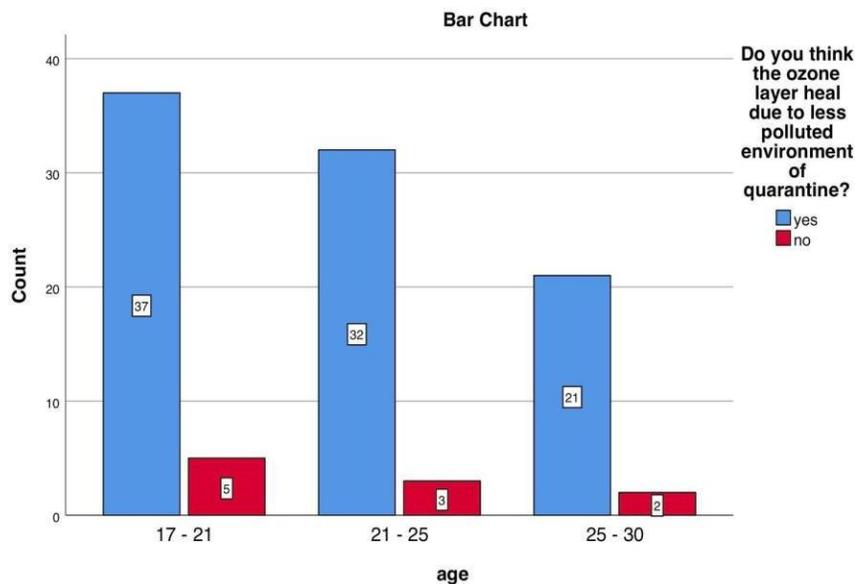

Figure 30: Bar chart represents the association between age of participants and responses about awareness on healing of ozone layer during quarantine. X axis represents the age of participants and Y axis represents number of responses.Majority of all age groups have answered yes but on analysis there was no statistical significance between age group and awareness of ozone layer healing during quarantine.Blue denotes yes and red denotes no. Chi square value 0.292,p value =0.864 (p>0.05 statistically not significant).