

## Analysis of Covid-19 Pandemic's Impact on Physical and Psychological Health of Humans

Shaik Johny Basha<sup>1</sup>, Samineni Bhavani<sup>2</sup>, Venkata Srinivasu Veesam<sup>3</sup>, Rachna Behl<sup>4</sup>, Tamminina Ammannamma<sup>5</sup>

<sup>1</sup>Assistant Professor, Department of CSE, Lakireddy Bali Reddy College of Engineering (A), Mylavaram, Krishna (Dt.), Andhra Pradesh, India – 521230

<sup>2</sup>Assistant Professor, Department of CSE, Rajiv Gandhi University of Knowledge Technologies – Nuzvid, Mylavaram Road, Nuzvid, Krishna Dt., Andhra Pradesh, India – 521202

<sup>3</sup>Assistant Professor, Department of IT, RVR & JC College of Engineering (A), Chowdavaram, Guntur (Dt.), Andhra Pradesh, India – 522019

<sup>4</sup>Associate Professor, Department of CSE, Manav Rachna International Institute of Research and Studies, Faridabad, Haryana, India – 121004

<sup>5</sup>Assistant Professor, Department of IT, Sridevi Women's Engineering College, Vattinagulapally, Rangareddy Dt., Telangana, India – 500075

jbngt.smc@gmail.com<sup>1</sup>, saminenib923@gmail.com<sup>2</sup>, rejeti.vkk@gmail.com<sup>3</sup>, rachnabehl@gmail.com<sup>4</sup>, swapnasriram89@gmail.com<sup>5</sup>

**Article History:** Received: 10 January 2021; Revised: 12 February 2021; Accepted: 27 March 2021; Published online: 28 April 2021

**Abstract:** A severe and typical respiratory disease broke out in December 2019 named SARS-CoV-2, also known as Covid-19 (Corona Virus Disease 2019). The most problematic habituate with this disease is spreading from human-to-human through various ways such as split, food sharing, etc. Due to the fast-spreading and untouchability of this disease, it started spreading faster than the earlier conditions. It made the people sit in the home for an extended period, like a minimum of 3 months. This pandemic situation caused the various countries to lockdown their industries and informed their employees to work from home (based on the possibility). This pandemic situation significantly impacted the health status of the people affected by Covid-19 and ordinary people who were thinking continuously regarding this. In this paper, we have collected the data from various people and performed analysis on the features that caused the people to scare (who affected by Covid-19) and ordinary people (who thought of about affecting, job-related, etc.). Our analysis of affected and non-affected people realized that 80%-90% of the affected people thought about their family (including parents, spouse, children), jobs, not having physical exercises. The non-affected people thought about the financial constraints (including job, home needs, loans, etc.). We have analyzed the above features along with various features that impacted the human physical and mental status in this pandemic situation.

**Keywords:** Covid-19, lockdown, pandemic, health condition, analysis, physical and mental status

### 1. Introduction

Novel Coronavirus Disease (Covid-2019), a respiratory and transmission disease that outbreaked at the Hubei's Province of Republic of China in December 2019. Coronaviruses are not a new virus in this world, but the impact of this SARS-CoV-2 will be mostly on humans, but not on the animals like other SARS diseases. After the outbreak of this disease, it started spreading slowly throughout the world at a slower pace. But at the time in February 2020, the virus changed its naturalness of transmission and spread faster. This spreading continued in China and transmitted to the world's top countries like the USA, UK, European Countries, India, Dubai, etc. [1].

Pneumonia was the first clinical sign of the SARS-CoV-2 in middle-aged and older-aged people, whereas gastrointestinal and related asymptomatic symptoms have been found in the children [2]. But the nature of this disease is that it will spread through the saliva of humans, sharing of the food, kissing, etc., and the virus has a life span of a minimum of eight hours on any object and up to several days also [3]. As per the authors of [4, 5], their work suggests that the mean quarantine period is for five days for any person and a median quarantine period of 3 days (which ranges from 0 – 24 days).

Suppose any person is affected by this Covid-19, which shows its symptoms after three days, consisting of fever, cough, nasal congestion, fatigue, and other signs of upper respiratory tract infections. Most affected people have shown nearly close to 75% of the patients [5] to pneumonia. If the affected period (after the person concerning Covid-19) goes more than five days, the infection can progress to acute disease with dyspnea and severe congestion in the chest, leading to death.

To stop the spread of disease among people of their country, most government-imposed lockdown in their country from March 2020. In this lockdown period, most companies/organizations directed their employees to work from home and asked them to work for more hours. Lockdown caused the people to go through the most

challenging time by working more than the regular time. During this lockdown period, some people have been infected with this Covid-19 disease, and some of them have undergone various stress or mental changes (might be financial, health, education, etc.) conditions and caused a severe impact on the physical and psychological health, leading them to commit suicide, heart strokes, health issues, fatigue, etc.

In this paper, we are going to discuss the survey that we conducted on people of various age groups, geographical locations, and then we are going to discuss the findings from what we have collected through the survey, such as what features caused the people to be tense in the pandemic period, how they felt at the time of affecting with infection, etc.

The paper's remaining parts are organized as follows: Section 2 gives the various authors' related work on different issues. Section 3 focuses on the data collection and analysis of the data to know which features affect physical and psychological health. Section 4 shows results, i.e., visual representation of research such as graphs, that have done on the data which processed at section 3, and finally, the conclusion has been discussed at the end of the paper.

## 2. Related Work

In this section, we discuss the various author's research work related to our work. Also, we will discuss the different methodologies used by themselves for their work and findings.

Cuiyan Wang et al. [6] have researched the impact of the Covid-19 pandemic on Asians, whose work focused primarily on the only seven middle-income countries of Asia. They have created a questionnaire and completed the online survey through various platforms such as SurveyStar', Changsha Ranxing Science and Technology in China, SurveyMonkey in the Philippines, and Google Forms in other countries. Their work showed the stress level scores, anxiety scores, depression scores at the pandemic period for various age groups and genders.

Nirmita Panchal et al. [7] have worked in the same field and collected people's anxiety disorders in January-June 2019 and in January 2021. Their results have shown the exponential rise in anxiety disorders from 11.0% to the 41.1%. Their work's research shows adults who have various symptoms such as Anxiety Disorder as 35.8%, Depressive Disorder as 28.4%, and both as 41.1% in the pandemic. Out of these, the people who felt the most anxiety or depression are 18-24.

As per the article written by Lori [8], the survey conducted by the Researchers at Louisiana State University's (LSU's) Pennington Biomedical Research Center, people staying in the home have undergone different problems such as a rise in the stress levels (which was associated with various sleeping patterns, consuming food number of times at different timings, gaining of weight, decrement in the physical activity, etc.). And 44% of the people reported that sleep quality had been worsened, and only 10% of people said better and improved sleep quality.

Xiangyu Kong et al. [9] have performed the analysis on 144 diagnosed patients infected with Covid-19. Out of those 144, he took the samples from 70 Male and 74 Female participants. Their study has considered the age group from 15 to 87, which resulted from an average of 50 years. The questionnaire used for analysis purposes reported that 34.72% of people showed anxiety symptoms, and 28.47% suffered from depression. Based on the anxiety levels as mild, moderate, and severe anxiety, they got 17.36%, 12.5%, and 4.86%. While the depression in people has mild, which is 13.89%, moderately depressed is 10.42%, and severely depressed is 4.17%. Their analysis has shown less social support, which was correlated more with anxiousness and depressiveness. Also, the friendly help and other support to them reported as negatively correlated regarding anxiety and depression. Their analysis showed that the patients who have lower oxygen levels had higher anxiety levels and less social support have higher depression levels.

Orgilés et al. [10] have done the analysis on the youth of Italy and Spain. Their work has shown the impact of quarantine on the youth in emotional state and behavior. They have gathered the observations from 980 parents from Italy and Spain to know the emotions of their children in a pandemic situation. From the responses of the parents, they have given a conclusion that 76.6% of the children were not focused or determined towards any work or study. 52% of the youth felt that they were much bored and 39% of them are more irritable than the normal working days. Some of the youth started playing video or online games and started sleeping late at night and caused them the restless for 38.8%. And 38% of the parents have noticed more nervousness among their children, and 31.3% of the parents have noticed the loneliness among the children due to no meetings, physical

games, outdoor activities, etc. As per the reports from the parents, not only the above-said difficulties, but the youth have also faced different problems such as uneasiness, worrying, reluctance, anxiety, anger, and sad moods with an average of 25%. Parents also reported that their children lacked physical activity, and that also caused them to get mood swings. So, the pandemic is not only shown its effect on the industries or organizations but also on the physical and psychological effects on the human.

### 3. Methodology

We have conducted a cross-section study to find the physical and psychological health conditions of humans in this pandemic period. To reduce the spread of the virus among people, we have adopted the respondent-driven sampling strategy to collect the data on their health status. In this regard, we have created an online questionnaire and have forwarded it to the people living in various countries and have collected the data through Google Forms. And the questionnaire has been created based on the three major criteria as Student/Research Scholar, Working Professional, and Business Professional. All the respondents have responded over the internet and the survey platform called "Google Form."

The questionnaire was designed and developed by us at Lakireddy Bali Reddy College of Engineering (A), Mylavaram consists of 6 sections based on the three major criteria. Student / Research Scholar is Criteria 1, consisting of 2 sessions named Student/Research Scholar Infected with Covid-19 and Student/Research Scholar Not Infected with Covid-19. Working Professional is Criteria 2 consists of the following sections: Working Professional Infected with Covid-19 and Working Professional Not Infected with Covid-19. Business Professional is Criteria 3 with two sections named: Business Professional Infected with Covid-19 and Business Professional Not Infected with Covid-19 (our questionnaire was available at [11]). Every section in the criteria 1, 2, and 3 has various questions, which we give in Table 1, 2 and 3.

**Table 1: Questions asked for Student / Research Scholar**

Category	Status of Infected with Covid-19	Questions asked in the Survey
Student / ResearchScholar	Student / Research Scholar Infected with Covid-19	After knowing that you are infected with Covid-19, whom do you think of?
		Did you get in your mind that you are going to die?
		Have you felt any Anxiety Disorder?
		Have you felt any Depression Disorder?
		Have you gone through Stress at that period?
		While coming to the Education, what you got into mind?
		Have you lost your physical strength after infecting with Covid-19?
		After infecting with Covid-19, What about your weight?
		Do you have the habit of doing Exercise/Yoga/Gym Workout?
		Did you get any thought like you will not be fit for Sports or Games after infecting with Covid-19?
		After recovering from Covid-19, How many days it took to get back to your old physical strength?
		At the period of Lockdown, which of the following you missed much?
		After the lockdown has announced, have you felt happy?
		Have you felt Anxiety Disorder after watching News Channels or Social Media Posts?
		After knowing that you are infected with Covid-19, whom do you think of?
	Student / Research Scholar Not Infected with Covid-19	Have you felt Depressive Disorder after watching News Channels or Social Media Posts?
		Have you felt Stress in this period?
		Have you thought of that the classes will be conducted online?
		Have you worried about Job / Campus Placement?
		Did you get any thought that you will not get job due to this Pandemic Situation?

**Table 2: Questions asked for Working Professional**

Category	Status of Infected with Covid-19	Questions asked in the Survey
Working Professional	Working Professional Infected with Covid-19	Whom do you thought of after knowing that you are infected with Covid-19?
		Did you get in your mind that you will die?
		Have you felt any Anxiety Disorder after knowing that you have infected with Covid-19?
		Have you felt any Depressive Disorder?
		Did you undergone any Stress in this period?
		Have you lost your Physical Strength?
		Did you gain weight or lost weight in this period?
		Did you get any thought like you will not be fit for Sports or Games after infecting with Covid-19?
		After recovering from Covid-19, How many days it took to get back to your old physical strength?
		Have you got thought like you are going to lose your job?
		Did you undergo any stress with your Financial Status?
		Have you satisfied with the needs available to you in that period?
	Have you felt Anxiety Disorder after watching News Channels or Social Media Posts?	
	Working Professional Not Infected with Covid-19	Have you felt Anxiety Disorder after watching News Channels or Social Media Posts?
		Have you felt Depressive Disorder after watching News Channels or Social Media Posts?
		Have you felt Stress in this period?
Which caused you the most stress?		

Table 3: Questions asked for Business Professional

Category	Status of Infected with Covid-19	Questions asked in the Survey
Business Professional	Business Professional Infected with Covid-19	Whom do you thought of after knowing that you are infected with Covid-19?
		Did you get in your mind that you will die?
		Have you recovered easily or took lot of time?
		Have you felt any Anxiety Disorder after knowing that you have infected with Covid-19?
		Have you felt any Depressive Disorder?
		Did you undergone any Stress in this period?
		Have you thought that your business is going to be shut down completely?
		Have you lost your Physical Strength?
		After recovering from Covid-19, How many days it took to get back to your old physical strength?
		Have you got thought like you are going to losing credibility in the market?
		Did you undergo any stress with your Financial Status?
		Have you satisfied with the needs available to you in that period?
	Business Professional Not Infected with Covid-19	At the period of Lockdown, which of the following you missed much?
		Have you felt Anxiety Disorder after watching News Channels or Social Media Posts?
		Have you felt Depressive Disorder after watching News Channels or Social Media Posts?
		Have you felt Stress in this period?
Which caused you the most stress?		

#### 4.Statistical Analysis & Findings

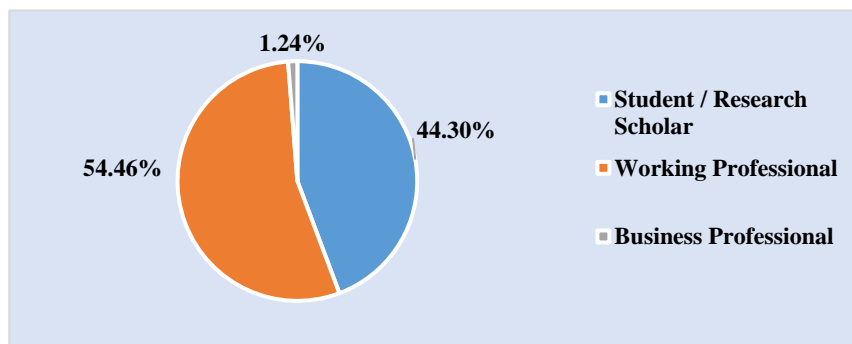
Various demographic features such as health condition whether a person is infected or not, feelings, physical activity, job-related, anxiety, and depressive disorders. Etc. were used for comparison. Instead of comparing the individual criteria defined in section 3, we have compared some inter-criteria features also—various age ranges and type of people also used for performing the analysis.

We have conducted this survey through an online platform and collected the responses to the above questionnaire. We collected the data from the 3876 people from various parts of the world irrespective of finding out the country name. Then that dataset has been used for finding the correlation among the various features of the questionnaire, such as the physical and psychological health status of the humans in the pandemic period. Gender-wise categorization of responses has discussed in Table 4, and Age wise categorization has been shown in Table 5. The summary of responses has been shown in figure 1.

**Table 4: Summary of Responses Categorized based on Gender**

Criteria	Total Responses	Male Responses	Female Responses
Student / Research Scholar Infected with Covid-19	271	131	140
Student / Research Scholar Not Infected with Covid-19	1446	670	776
Working Professional Infected with Covid-19	429	429	0
Working Professional Not Infected with Covid-19	1682	1240	442
Business Professional Not Infected with Covid-19	48	48	0

**Figure 1: Summary of Responses Received**



**Table 5: Summary of Responses Categorized based on Age**

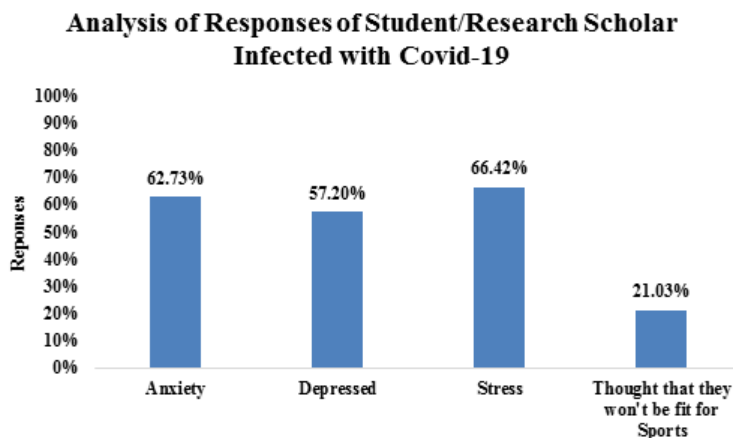
Gender	Total Responses	Age	Responses
Male	2518	11-20	94
		21-30	1419
		31-40	856
		41-50	148
		51-60	1
		61-70	0
		>70	0
Female	1358	11-20	221
		21-30	933
		31-40	137
		41-50	67
		51-60	0
		61-70	0

Gender	TotalResponses	Age	Responses
		>70	0

**5. Results**

We have used Python Programming (using Pandas) for processing of our data. After processing the data received from the people, we have used it for various comparisons what we have discussed in the earlier section. From that analysis, we came to know that students/research scholars who have infected with Covid-19 have undergone 62.73% of them raised their anxiety levels, 57.2% of them have shown that they are under depression, 66.46% of them have felt much stress and 21.04% have thought that they will not fit for the physical games or sports in the future which has shown in the figure 2.

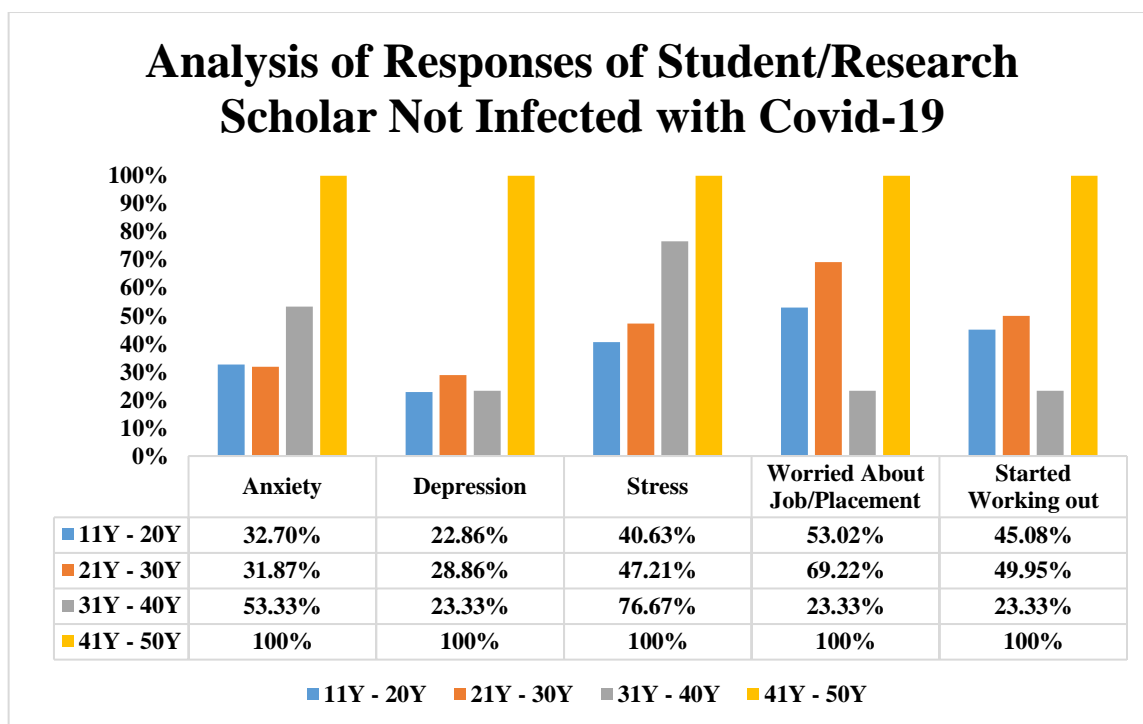
**Figure 2: Analysis of Reponses of Student/Research Scholar Infected with Covid-19**



Students/research scholars who have not infected with Covid-19 has been divided based on their age and done the analysis on their depression level, anxiety level, stress level, future, etc. From the responses, we came to know that the anxiety levels are 32.7%, 31.87%, 53.33% and 100% for the age group of 11Y-20Y, 21Y-30Y, 31Y-40Y,41Y-50Y. Out of them, the students or research scholars who are studying at the late age have shown the more anxiety while compared to the lower age. Similarly, the depression levels are 22.86%, 28.86%, 23.33%, 100% for the above said age criteria and the stress levels are 40.63%, 47.21%, 76.67%, 100%.

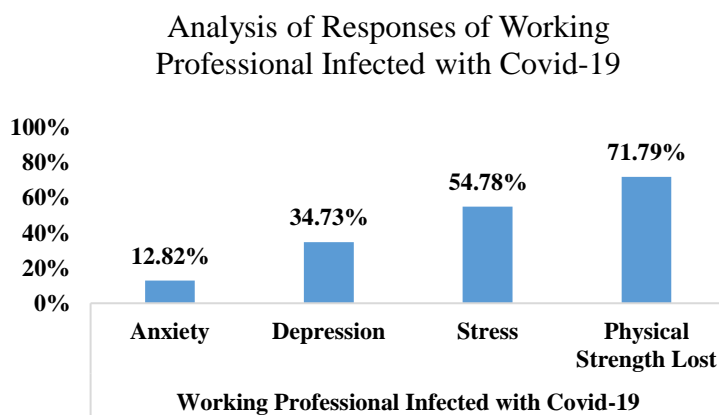
Students who are aged between 21Y-30Y have shown that they are much worried about the with a 69.22% and the people aged above 40Y have shown that they are very depressed, felt anxious, undergone much stress with 100% which was shown in figure 3.

**Figure 3: Analysis of Reponses of Student/Research Scholar Not Infected with Covid-19**



While coming to the Working Professional criteria, the working professionals who infected with Covid-19 have faced the anxiety, depression, stress, and physical strength loss are as 12.82%, 34.73%, 54.78% and 71.79%. Out of the above features, most of the professionals have felt stress under the pandemic situation and, they have lost their physical strength which have shown in figure 4. Figure 5 gives the time took for working professionals to retain back to their old physical strength.

**Figure 4: Analysis of Responses of Working Professional Infected with Covid-19**



**Figure 5: Analysis of Period took for Working Professionals retaining to the Old Physical Strength**

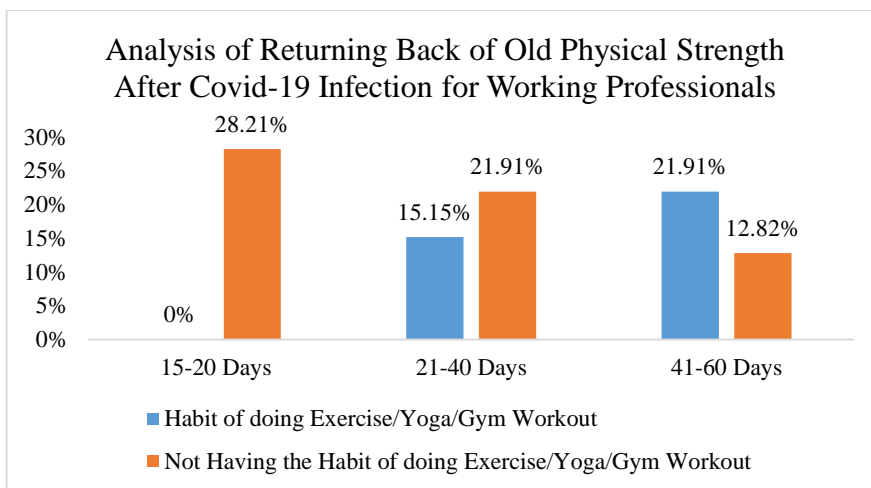
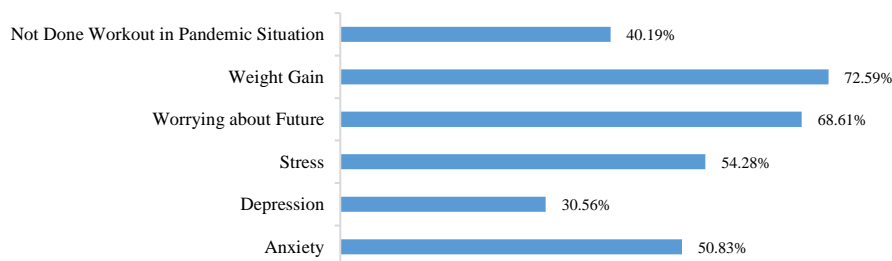


Figure 6 and figure 7 shows the analysis of working professionals who have not infected with Covid-19 but have faced the issues like anxiety, depression, stress, worrying about future, weight gain, no physical exercise, etc. In figure 7, we have shown the analysis of stress caused to the working professionals based on the features like thinking about financial issues, thinking of losing their job, thinking about physical health, and working from home without having workspace like an office.

**Figure 6: Analysis of Responses of Working Professional not infected with Covid-19**

Analysis of Responses of Working Professional Not Infected with Covid-19



**Figure 7: Analysis of Stress Caused to Working Professionals who not infected with Covid-19**

Stress caused for Working Professional Not Infected with Covid-19

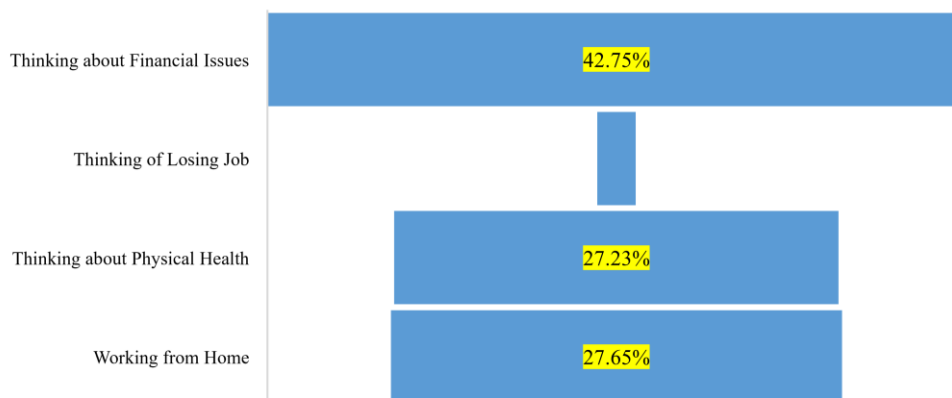


Figure 8 shows the analysis of Business Professionals who have faced the anxiety, stress, depression, future business, and physical health. And the causes for stress have been shown in the figure 9.

**Figure 8: Analysis of Responses of Business Professional not infected with Covid-19**



### Analysis of Responses of Business Professional Not Infected with Covid-19



**Figure 9: Analysis of Causes for Stress of Business Professional not infected with Covid-19**

### Causes of Stress for Business Professional Not Infected with Covid-19



## 6. Conclusion

In this paper, we have done the research and analysis on various problems that caused the physical and psychological health issues in this Covid-19 Pandemic situation. We finally came to know that the students/research scholars who have infected with Covid-19 are more anxious and depressed while compared with the students who have not infected. While considering the working professionals, the anxiety levels are more in people who have not infected with Covid-19 while compared to the infected people. And the working people who have not infected have been in stress for the various reasons like thinking about financial issues, losing their job, physical health, and working from home. As a part of Business Personal, they have mostly depressed while compared to the Students or Working Professionals. They are depressed much and gained weight in this pandemic situation.

## Acknowledgements

We, authors of this research article whole heartedly thank Head of the Department, Department of CSE, Lakireddy Bali Reddy College of Engineering (A), Mylavaram and “Research Center of LBRCE”, recognized by JNTUK, Kakinada for providing us the infrastructure facilities during the progress of work.

## References (APA)

1. Coronavirus 2019 - nCoV, CSSE. Coronavirus 2019 - nCoV Global Cases by Johns Hopkins CSSE. (Available from: <https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>)
2. Chan JF, Yuan S, Kok KH et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person - to - person transmission: a study of a family cluster. *Lancet* 2020. S0140-6736(20) 30154-9. 10.1016/S0140-6736(20)30154-9
3. WebMD Medical Reference, Reviewed by Brunilda Nazario, MD on February 03, 2021 (Available from: <https://www.webmd.com/lung/how-long-covid-19-lives-on-surfaces>)
4. Li Q, Guan X, Wu P et al. Early transmission dynamics in Wuhan, China, of novel coronavirus - infected pneumonia. *N Engl J Med* 2020. 10.1056/NEJMoa2001316.
5. Guan W, Ni Z, Yu H, et al. Clinical characteristics of 2019 novel coronavirus infection in China. medRxiv preprint posted online on Feb. 9, 2020; 10.1101/2020.02.06.20020974.
6. Wang C, Tee M, Roy AE, Fardin MA, Srichokchatchawan W, Habib HA, et al. (2021) The impact of COVID-19 pandemic on physical and mental health of Asians: A study of seven middle-income countries in Asia. *PLoS ONE* 16(2): e0246824. <https://doi.org/10.1371/journal.pone.0246824>.

7. Nirmita Panchal et al. The Implications of COVID-19 for Mental Health and Substance Use, February 2021 (Accessed from: <https://www.kff.org/coronavirus-covid-19/issue-brief/the-implications-of-covid-19-for-mental-health-and-substance-use/>)
8. Lori Uildriks, Pandemic measures had a strong impact on mental and physical health, October 2020 (Accessed from: <https://www.medicalnewstoday.com/articles/pandemic-measures-had-a-strong-impact-on-mental-and-physical-health>)
9. Xiangyu Kong, Kailian Zheng, et al. Prevalence and Factors Associated with Depression and Anxiety of Hospitalized Patients with COVID-19, medRxiv 2020.03.24.20043075; doi: <https://doi.org/10.1101/2020.03.24.20043075>
10. Orgilés M., Morales A., Delveccio E., Mazzeschi C., Espada J. P. (2020) Immediate psychological effects of COVID - 19 quarantine in youth from Italy and Spain.
11. Survey on Pandemic's Impact on Physical and Psychological Health of Humans in Covid-19 Period, <https://forms.gle/yoYQnemGNSzN96cx7>, January 2021.
12. R. Sathish, R. Manikandan, S. Silvia Priscila, B. V. Sara and R. Mahaveerakannan, "A Report on the Impact of Information Technology and Social Media on Covid-19," 2020 3rd International Conference on Intelligent Sustainable Systems (ICISS), Thoothukudi, India, 2020, pp. 224-230, doi: 10.1109/ICISS49785.2020.9316046