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Mental Health Analysis of Students During the Pandemic (2020-2021)

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Abstract: ***The COVID-19 pandemic is a phenomenon that the entire world is still witnessing, and the imposition of subsequent measures and the lockdown has made our experience even more record worthy and mystic. People from different walks of life experienced and weaved out a pandemic story, good or bad depending on the facts and feeling of their personal gains and losses, giving us no valid right to deem the lockdown as a boon or a bane. But, one sure thing that had taken a toll was mental health. It has fabricated new stressors including fear and worry for oneself or loved ones, constraints on physical movement and social activities due to quarantine, and sudden and radical lifestyle changes. This pandemic has brought into focus the mental health crisis of various affected populations. This research reports and addresses the rising concerns about mental health problems among students of higher secondary and above levels of education.***
Keywords: COVID-19, Mental Health, Depression, Lockdown in India, Pandemic after effects, Impact on Students.

I. INTRODUCTION

In recent years, mental health of students has remained an interesting topic but has always been underheard or neglected. Mental health refers to a sustainable and efficient working state of one's mind. When in a good mental state, people are ought to make right responses and have control over their inner potentials with integrity and coherence. Most mental health disorders have first onset by young adulthood and are more prevalent among the students. In addition, the COVID-19 global pandemic had an adverse impact on the mental health of students. With more than 93 million cases and 2 million deaths reported globally as of January 17, 2021, according to the statistics from the World Health Organization. This pandemic has led to a large impact among those on the front line combating the pandemic and the active student body who are staying at home due to social distancing mandates and have been displaced from the outer world and social contact. The uncertainty and fears associated with COVID-19 has contributed to an increase in mental health disorders.

Currently, the country is undergoing one of its worst recession fallout, and this is making the students stressed about what will happen to their future. Will they get a job? Will they be able to crack exams? Can they go back to school/college soon?. Fear, worry and stress are normal responses to be perceived on real threats, and at times when we are faced with uncertainty or the unknown. So it is understandable that people are experiencing fear in the context of the COVID-19 pandemic. Added to the fear of contracting the virus in a pandemic such as COVID-19 are the significant changes to our daily lives as our movements are restricted in support of efforts to contain and slow down the spread of the virus. Faced with new realities of working from home, temporary unemployment, home-schooling of children and lack of physical contact with other family members, friends and colleagues, it is important that we look after our mental, as well as our physical health.

Drawing on a survey done on the student body during the pandemic, we documented dramatic changes in physical activity, sleep, social media interaction, changes in appetite and eating habits which all lead to an impact on mental health. Our survey solely focused on the Impact of Lockdown on students. The Government at the center is doing many things but is not focused on the basic problem that is stressed students, their mental health and happiness. And a part of this is also because of the lack of understanding about the matter and studies related to the facts of the situation. Hence it is climacteric at this point in the day and age to understand what the sculptors of the future of the largest democracy in the world, its students went through and what they would need to inculcate in order to make difficult times like this Pandemic more surmountable.

Our lives these days are nothing but the aftermath of a period of great problems both physical and mental. Our tomorrow is directly related to our today, of which the maximum ground is covered by half a year of major setbacks. Coping with stress in a healthy way will make you, the people you care about, and your community stronger. Thus it is important to understand the impacts this lockdown has had on the lives of people, especially on the future generation of our country.

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II. EFFECTS ON MENTAL HEALTH DUE TO THE PANDEMIC:

The COVID-19 pandemic has meant living through multiple crises, including financial, Academic and disease-related ones, all at once. These crises have taken a toll on our mental and physical health. The quality and magnitude of impact on students is determined by many vulnerability factors like developmental age, educational status, pre-existing mental health condition, being economically underprivileged or being quarantined due to infection or fear of infection, uncertainty, anxiety etc.

Lockdown related school and college closures has been one of the most significant public health measures across the world. For students, this has been the first extended closure of schools in recent history and as such, its impact on their mental health and wellbeing is important to consider, particularly given the already contentious nature of the effectiveness of school closures on disease containment and the fact that educational institutions are often the first place that young people can and do seek support for their mental health and wellbeing through counselors, teachers, friends and an overall environment of camaraderie.

Emerging researches from the COVID-19 pandemic also suggests several other factors influencing the mental health and wellbeing of young people including: worries and concerns around their education, missing school, transitions and being away from school, academic pressures, their career, and uncertainties about the future. It has been observed that lack of contact with others, boredom, not being able to attend school, financial worries and general uncertainty about the future are key factors impacting mental state.

The COVID Pandemic has resulted in increased loneliness, stress, anxiety, and depression among students. It is well understood that college students are especially prone to feelings of stress, anxiety and loneliness and they experience higher rates of depression and mental health illness compared to the general population. During this period of isolation, uncertainty and abrupt transitions, they are prone to further worsening of these feelings. Removal from their social support system and extracurricular activities at their school can cause students to feel less connected with their friends, organizations, and hobbies. In addition, they are facing uncertainty about their future, their own health, and the health of their friends and loved ones. The situation they are living through is stressful and anxiety provoking, as there is a constant fear of the unknown in addition to a loss of control, making them especially vulnerable to developing mental health concerns. As lockdown measures begin to ease, we require an understanding of what students and young people have been experiencing during the lockdown period as well as how they can be best supported to resume normal life, or the 'new normal', over the coming months and years. This understanding can inform responses to recovery implemented at the policy level and by those working directly with students. Such responses are beginning to be formalized in other countries. For example, the New Zealand Government has published a national psychosocial and wellbeing recovery framework with a focus on prevention and early intervention upheld through the principles of collectivity, empowerment, community solutions, assets-focus, and support for community and specialist services.

III. OUR SURVEY

A structured questionnaire form was designed with the purpose of assessing the impact on mental health of students both quantitatively and qualitatively. An anonymous, self-administered survey was done through various social media platforms (example - Facebook, Instagram) over a period of 2 crucial months of the pandemic (August-September, 2020) to reach out to the Students' community.

A. Participants and Procedure

The COVID-19 pandemic had a different impact on people from different walks of life and so the only feasible and structured way for us to have coherent data was to subject a particular category of people. Thus our survey aims to study and comprehend the impacts of the lockdown on the mental health of students. Participants included students of higher and secondary classes, undergraduates and postgraduates. A survey questionnaire was circulated to the students through social media platforms which contained questions about their feelings, eating habits, physical and emotional health. They were asked to fill the questionnaire with full honesty and voluntarily. Anonymity and confidentiality were ensured throughout the conduct of the survey.

B. Questionnaire

The questionnaire was designed purely for the purpose of studying the impact of the ongoing COVID-19 pandemic and the aftermath of the nationwide lockdown on the overall wellbeing of the student community. The questionnaire consisted of 25 questions (<5 minutes) related to basic information (gender, current level of education etc), personal experience and feelings, productivity (social media usage, sleeping pattern changes etc), physical health (loss of appetite, change in eating habits etc) and emotional mental health (relationship with family and friends, suffered any mental illness in past, experience of any tragic loss etc).

Link to the questionnaire - https://docs.google.com/forms/d/11J7nlrX63M00PUDkygjeq8EgieLww7aI2ZCZvDde1WM/edit?chromeless=1

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C. Dataset

A structured dataset was created after receiving the responses from the students through the questionnaire form. A total of 1000+ participants filled out the questionnaire, out of which 528 responses (51%) were male and 503 responses (49%) were female. Once the data was collected, it was then curated in MS excel in the background, which was later used to analyze and recognize patterns.

D. Scaling

We assessed the impacts on mental health, including stress, depression and anxiety on a Scale range of 1-5 with the help of a professional psychiatrist on our side. The questionnaire consisted of 25 questions that covered domains like - Feelings, Sleep cycle, Eating habits, Outlook on life, Tragic loss, Productivity, Physical health and Relationships. The level of each domain was interpreted as Normal or No depression (1), Mild depression (2), Moderate depression (3), Moderately Severe depression (4), Severe depression (5).

IV. ANALYSIS THROUGH OUR SURVEY

For the initiation, we took demographic details as the basis for the analysis, since it is the least diverse. A total of 1034 Participants filled out the questionnaire. The number of male participants (528, 51.1%) was almost equal to the number of female participants (503, 48.6%) (Fig 1). Among this, their general distribution of gender over their level of education was - out of a total of 528 male candidates, 77% were Undergraduates, out of a total of 503 female candidates, 66% are Undergraduates and a total of 77 post graduate students participated in this study (Fig 2). For the baseline assessment we also visualized the distribution of genders over their place of isolation during this pandemic, that is almost 95.5% students were at home with their family members (Fig 3).

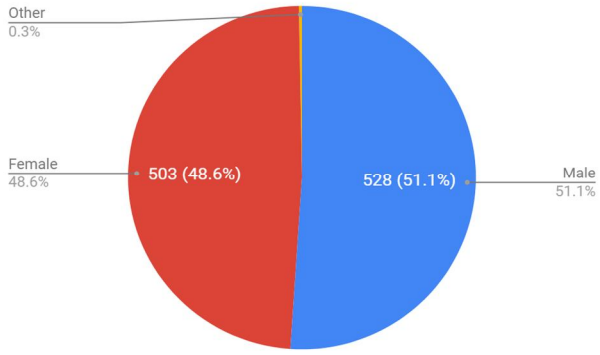


Fig. 1

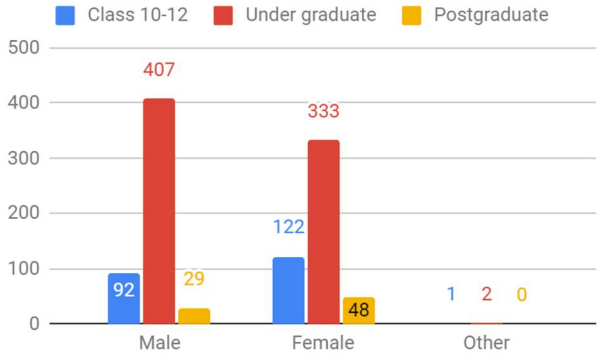


Fig. 2

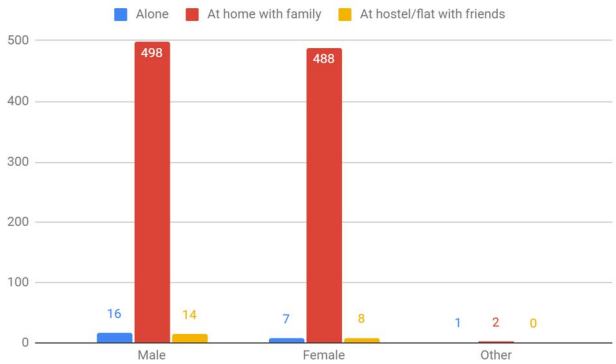


Fig. 3

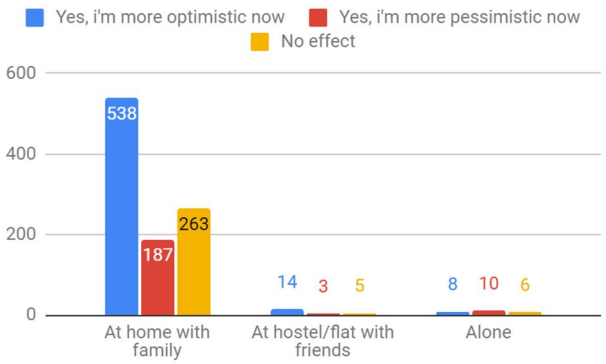


Fig. 4

We drew out the inference that most people who were with family felt optimistic and almost 25% people felt no change, also nearly 18% felt pessimistic (Fig 4), viewing this inference in reference to the impacts on physical health, it was seen that almost 55% people had an impact on their physical health (Fig 5) which leads to analyze their eating habits, body weight changes, appetite changes and exercise routine. It is proven that poor physical health can lead to an increased risk of developing mental health problems.

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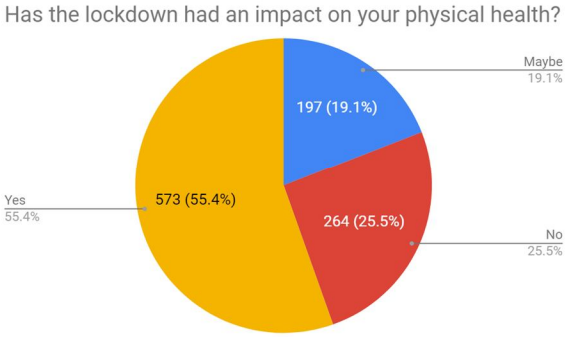


Fig. 5

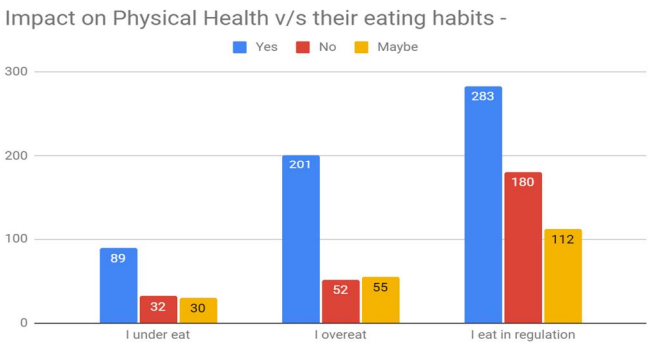


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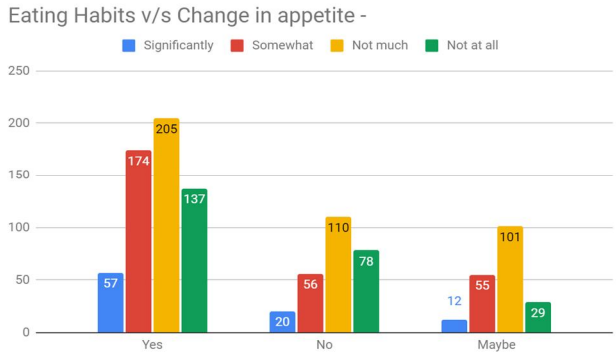


Fig. 7

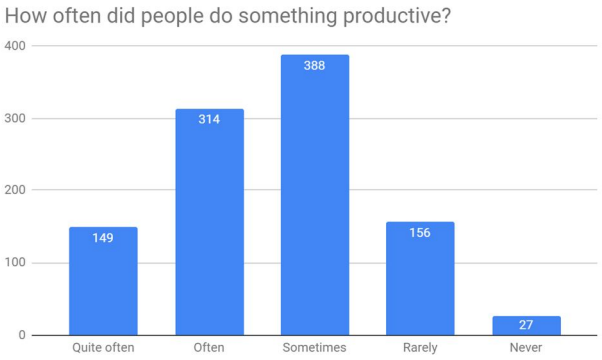


Fig. 8

We analyzed the relation between change in eating habits and a change in appetite since a significant increase or decrease in either of the factors can contribute to overeating or undereating which are key symptoms in understanding mental health. People who showed changes in eating habits also showed a significant change in their appetite (Fig 6 and Fig 7).

A person's productivity or its lack thereof is a leading sign of their mental state as it is attributed to factors like optimism, enthusiasm etc. Anhedonia is defined as the inability to perform tasks that a person used to enjoy. A deeper look at productivity depicts that 44% of people were productive only sometimes and about 17% lacked the will to do anything they enjoyed (Fig 8).

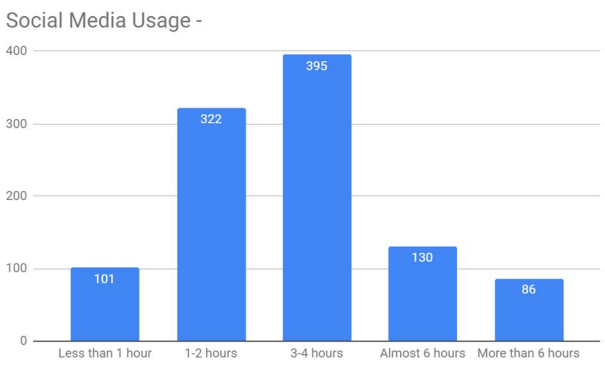


Fig. 9

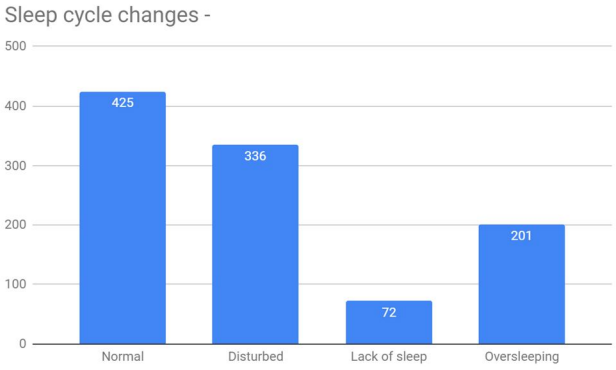


Fig. 10

It is proven that when we are clinically depressed, there's a very strong urge to pull away from others and to shut down. It turns out to be the exact opposite of what we need. In depression, social isolation typically serves to worsen the illness and how we feel. Social withdrawal amplifies the brain's stress response. Social contact helps put the brakes on it.

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It is proven that when we are clinically depressed, there's a very strong urge to pull away from others and to shut down. It turns out to be the exact opposite of what we need. In depression, social isolation typically serves to worsen the illness and how we feel. Social withdrawal amplifies the brain's stress response. Social contact helps put the brakes on it. Social withdrawal can be attributed to less than 30 minutes a day of social media interaction. Almost 10% of the people fell under this category. And only 69% were under the healthy usage zone (1-2 hrs and 3-4 hrs), almost 20% fell under the over-usage zone which indicated over indulgence due to lack of productivity and external validation (Fig 9).

The physical and mental exhaustion that comes with depression may also affect our sleep patterns. Changes in sleep can show up in a number of ways. Sometimes this looks like sleeping throughout the day, using sleep as a way to pass the time or preferring sleep to other daily activities. Sleeping habits are a contributing factor in determination of mental state as disorders like Insomnia, Hypersomnia and Anxiety contribute to disturbed, Lack of sleep and Oversleeping. Around 39.4% people were having factors of Disturbed & Lack of sleep that is Insomnia and almost 19.4% people were having factors of Oversleeping - Hypersomnia and EDS (Excessive Daytime Sleepiness) (Fig 10).

V. GENERATION OF SCORE

Machine Learning (ML) has played a pivotal role in efficiently analyzing the quality of data in various areas including healthcare sectors. Research in predicting the scale of mental illness using ML techniques were carefully reviewed. Three traditional ML algorithms - Linear Regression, Decision Tree classification and Random Forest Regression were systematically organized and summarized. A Machine learning model was used to predict the scale of mental illness from level 1 to level 5 where level 1 means Normal or No depression, level 2 means Mild depression, level 3 means Moderate depression, level 4 means Moderately Severe depression and level 5 means Severe depression.

VI. IMPLEMENTATION

Machine Learning algorithms learn from data. They find relationships, develop understanding, make decisions, and evaluate their confidence from the training data they're given. And the better the training data is, the better the model performs. Thus the data to be used for training usually needs to be enriched or labeled. The goal of data training is to prepare the data to be used to train machine learning algorithms. After studying the data, and getting it tagged by the psychologists, we had to train it using the appropriate machine learning model. The model to onboard will be chosen based on its features such as classification or regression, accuracy, relevance, output etc. There were some of the important features that we considered while choosing the right algorithms - size of the training data, accuracy of the output, speed or training time, number of features.

To generate the score for the depression screening, we needed a model that would give us accuracy above 80%, and knowing our data to be Categorical - Ordinal and Structured, we tested out dataset using 3 traditional ML models - Linear Regression, Decision Tree classification and Random Forest Regression suitable for our project and compared their accuracy.

A. Linear Regression

This is a basic and commonly used type of predictive analysis. Linear regression estimates are used to explain the relationship between one dependent variable and one or more independent variables. In linear regression we divided our data into training and testing data in the ratio 7:3 and was implemented using the LinearRegression() function available in the SkLearn package. The accuracy obtained was 62.42%.

B. Random Forest Regression

Random forest is an ensemble of decision trees. This is to say that many trees, constructed in a certain "random" way form a Random Forest. Each tree is created from a different sample of rows and at each node, a different sample of features is selected for splitting. Each of the trees makes its own individual prediction. These predictions are then averaged to produce a single result. In Random Forest Regression we divided our data into training and testing data in the ratio 7:3 and was implemented using the RandomForestRegressor() function available in the SkLearn package. The accuracy obtained was 65.36%.

C. Decision Tree Classification

A decision tree is a flowchart-like tree structure where an internal node represents a feature(or attribute), the branch represents a decision rule, and each leaf node represents the outcome. The topmost node in a decision tree is known as the root node. It learns to partition on the basis of the attribute value. In Decision Tree Classification we divided our data into training and testing data in the ratio 7:3 and was implemented using the DecisionTreeClassifier() function available in the SkLearn package. The accuracy obtained was 82.05%.

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VII. COMPARISON OF MODELS

The 3 models mentioned above are all suited for our dataset, but in machine learning and health related concepts, accuracy plays a pivotal role, thus, after training our model using the 3 algorithms, we move on to assess the accuracy of each one of them and then choosing the model we will finally use.

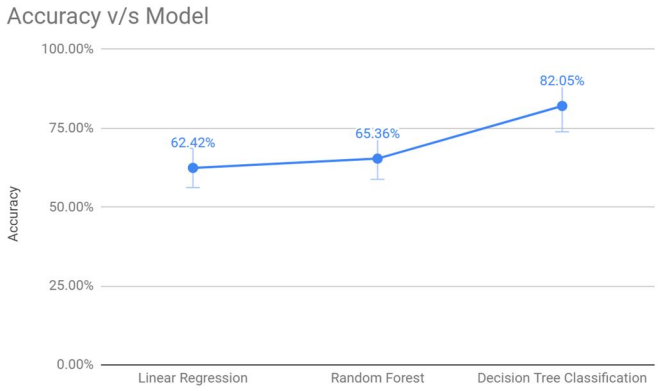


Fig. 11

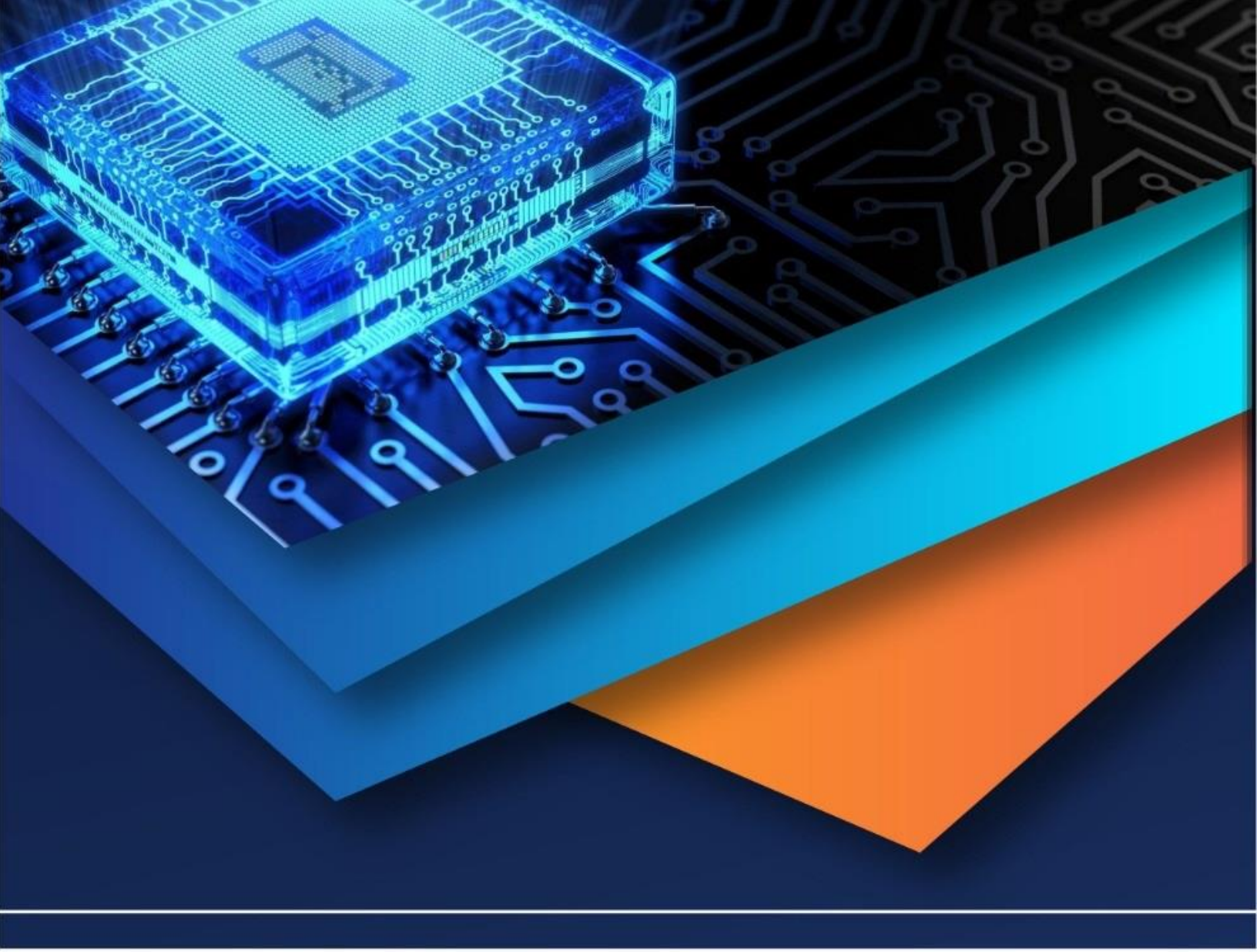
We analyzed that the models follow an upward trend for the same volume of dataset (1034) and same ratio of training to testing data. In regards to the increasing accuracy - Linear regression (62.42%), Random forest (65.36%) and Decision Tree Classification (82.05%) (Fig. 11). Decision tree classification handles collinearity efficiently and also gives the highest accuracy compared to other two models and therefore we chose Decision Tree Classification for our model.

VIII. CONCLUSION

Through this study, we have provided graphical representation regarding the impacts of the COVID-19 pandemic and lockdown on the student body. Students are the future of a nation and their well being should be addressed sensitively and be dealt with responsibly. This analysis helped to achieve a lucid understanding of students mental health which will help them in upcoming hardships of life such as this pandemic, to tackle it better and to spread awareness about mental health - why it is important, how to take care, and how to help those around us in dire times of need and otherwise. The uncertainty and drastic change triggered substantial distress in students, which was greater than we had assumed. Even after the pandemic is under control, there are long-lasting consequences that may continue to contribute to the mental illness among students and therefore there is a need for immediate attention to and support for students and other vulnerable groups who might be facing mental health issues.

REFERENCES

[1] Cho G, Yim J, Choi Y, Ko J, Lee SH. Review of Machine Learning Algorithms for Diagnosing Mental Illness. Psychiatry Investig. 2019;16(4):262-269. doi:10.30773/pi.2018.12.21.2
[2] Shatte, A., Hutchinson, D., & Teague, S. (2019). Machine learning in mental health: A scoping review of methods and applications. Psychological Medicine, 49(9), 1426-1448. doi:10.1017/S0033291719000151
[3] https://www.mdcalc.com/hamilton-depression-rating-scale-ham-d
[4] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1495268/
[5] https://www.mhanational.org/issues/asian-americanpacific-islander-communities-and-mental-health
[6] https://www.who.int/westernpacific/activities/promoting-mental-health
[7] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5479084/
[8] https://mental.jmir.org/2020/12/e24815?utm_source=TrendMD&utm_medium=cpc&utm_campaign=JMIR_TrendMD_0s



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