



GLOBAL JOURNAL OF MEDICAL RESEARCH: A
NEUROLOGY & NERVOUS SYSTEM
Volume 22 Issue 3 Version 1.0 Year 2022
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Distressed: An Assessment of Emotional State of Young Adults during a COVID Wave

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Methods: A survey instrument was developed using well validated Depression Anxiety Stress Scales-21 (DASS-21) along with other questions related to demographics, impact of COVID and methods used for obtaining advice. The survey was electronically shared with the target population in the Detroit Metro area with the help of Centiment, a market research company.

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GJMR-A Classification: DDC Code: 614.5 LCC Code: RA644.S17



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Distressed: An Assessment of Emotional State of Young Adults during a COVID Wave

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Results: The data analyses show that the target population in the Detroit Metro area suffered from high levels of depression, anxiety, and stress. This was significantly higher for people who identified their gender as other than male or female. Females also had a higher level of stress than males. It was found the COVID lockdown correlated with higher levels of depression and stress. Further, statistically significant high levels of worry and aggressive behaviors were reported as manifestation of the COVID lockdown. Finally, the target population turned to the internet portals and friends and health professionals at a statistically significant level to seek advice.

Conclusion: The Jan-Feb 2022 COVID lockdown had significant impact on the emotional state of young adults in the Detroit Metro area. Also, the study identified common manifestations of distressed emotional state in people aged 18 to 25 years.

Keywords: depression, anxiety, stress, pandemic, social impact, modes for seeking advice, covid-19 lockdown.

I. INTRODUCTION

The outbreak of the novel coronavirus, officially known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was declared a Public Health Emergency of International Concern by the World Health Organisation (WHO) in January

2020. (World Health Organization, 2022; Hotez, 2020; Kenny & Mallon 2021) The disease associated with SARS-CoV-2 is called COVID-19. In March 2020, WHO declared COVID-19 a global pandemic. (Cucinotta & Vanelli, 2020) As of June 17, 2022, over 535 million confirmed cases of COVID-19, including over 6 million deaths have been reported. (World Health Organization, 2022) Typical symptoms include fever, cough and tiredness. Other symptoms can include, but are not limited to, loss of taste or smell, headaches, and nausea. (Mayo Foundation, 2022)

Besides the direct health effects, COVID-19 has affected human well-being in many other ways. Several virus variants have resulted in waves that have been typically accompanied with lockdowns. (Fisayo & Tsukagoshi, 2021; Zhang et al, 2021) The lockdowns in particular and the pandemic in general have had a severe impact on the world economy and triggered the largest global economic crisis in more than a century. (World Bank Group, 2022) The median global GDP dropped by 3.9% from 2019 to 2020. (Oum, 2022) Social distancing has been one of the main ways in which communities around the world tried to slow down the spread of the disease. (Qian & Jiang, 2020) Disruption of normal social connections along with economic disruptions plausibly have had detrimental and diverse psychological effects on various segments of the public. (Singh & Singh, 2020; Ruben & Wessely, 2020) Little is known about the psychological effects. (Canet-Juric et al, 2020; Schelhorn et al, 2022) Studies have been conducted to assess these effects on pregnant women, people with preexisting mental health conditions, incarcerated individuals, migrant workers, international students, children and young adults. (Fakari & Simbar, 2020; Li & Zhang, 2020; Cloud et al, 2020; Liem et al, 2020; Zhai & Du 2020; Buheji et al 2020; Shanahan et al 2022) More studies are still needed to fully understand the mental and emotional effects of COVID-19 on various segments of the public across all geographical areas. (Cipolletta et al, 2022; Liu et al, 2020; Yildirim et al, 2021) This study addresses the dearth of research in assessing the emotional state of young adults during a COVID-19 wave in the Detroit Metro area.

II. MATERIAL AND METHODS

Detroit residents between the ages of 18 and 25 self-reported their conditions via a survey instrument hosted on Centiment. Co, an online survey platform that

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helps to target specific demographics for researchers. (Centiment, 2022) Data were collected between January 19, 2022, and February 7, 2022. The Detroit Metro area was experiencing a COVID wave during the same time. (State of Michigan, 2022) 522 people from the target population responded to the survey. 412 people completed the survey. There are approximately 600,000 people between the ages of 18 and 25 that reside in the Detroit Metro area. (Detroit Regional Chamber, 2022) 384 samples would be needed to achieve 95% confidence level with a 5% margin of error for statistical analysis. (Australian Bureau of Statistics, 2022) The collected responses are greater than the sample size target.

The survey instrument has 4 sections. The first section covered responder demographics. The second section is adapted from the Depression, Anxiety and Stress Scales (DASS-21). The DASS-21 "is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable / over-reactive and impatient". Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items. (Motor Accident Insurance Commission, Australia, 2016; Lovibond & Lovibond, 1996) DASS-21

responses are summarized as extremely severe, severe, moderate, mild, and normal.

The third section is based on the Pew Research Center's Teen Survey. (Jiang, 2020) The questions in this section cover the usage of electronic devices by the sampled population. The fourth section was derived from C.S. Mott Children's Hospital National Poll on Children's Health. (Freed, n.d.) This survey measures effects of COVID-19 restrictions on teens, who rely on their peer and social connections for emotional support. In total, the survey instrument had 46 multiple choice questions.

Descriptive analysis of the data collected was performed to better understand the demographics of the participants. Descriptive analysis also included breakdown of responses per question. Analysis of variance (ANOVA) was used to explore whether there are any statistically significant differences between various groups. Further, ANOVA was used to investigate the relationships between depression, anxiety, stress, and self-reported impact of COVID-19 on social interactions. Finally, ANOVA was used to investigate how young adults in the Detroit Metro area tried to deal with problems related to their emotional states.

III. RESULTS

49% of the respondents identified as female, 46% identified as male. 54% of the respondents self-reported themselves as white or Caucasian, 35% as black or African American, 9% as Latino or Hispanic, 7% as Asian, 3% as Native American or Alaskan Native and 1% as Native Hawaiian or Pacific Islander. A breakdown of respondent by age is shown in table 1.

Table 1: Breakdown of Respondent by Age in Years

Age	Frequency	Percent
18	82	16%
19	50	10%
20	65	12%
21	88	17%
22	58	11%
23	45	9%
24	58	11%
25	68	13%
Other/Undisclosed	8	2%

In response to DASS-21 portion of the survey, most respondents reported their levels as normal. Specifically, 38.8% reported normal depression levels, 37.4% reported normal anxiety levels and 47.6% reported normal stress levels. On the other hand, 26.9% of respondents reported their depression as extremely severe or severe, 36.2% of respondents reported their anxiety as extremely severe or severe and 18.9% of respondents reported their stress as extremely severe or severe. Additionally, it can be concluded that largest

number of people reported higher than normal levels of depression, anxiety, and stress. A complete breakdown of the relevant responses is included in table 2. A Pearson correlation analysis for the three emotional states was performed. The states demonstrate a high degree of correlation. The correlation analysis is shown in table 3. Furthermore, moderate degree of statistically significant correlation, with coefficients between 0.24 and 0.39, were found between the levels of emotional states and various detrimental behaviors reported by the

respondents. Results of the associated Pearson correlation analysis are also shown in table 3.

Table 2: Descriptive Analysis for Emotional States

Level	Depression		Anxiety		Stress	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Extremely Severe	57	13.8%	99	24.0%	9	2.2%
Severe	54	13.1%	50	12.1%	69	16.7%
<i>Subtotal</i>	111	26.9%	149	36.2%	78	18.9%
Moderate	102	24.8%	82	19.9%	81	19.7%
Mild	39	9.5%	27	6.6%	57	13.8%
Normal	160	38.8%	154	37.4%	196	47.6%
Grand Total	412					

Table 3: Pearson Correlation Analysis for Emotional States and Detrimental Behaviors

	Depression	Anxiety	Stress	Sleep issues	Worry	Sadness	Changes in appetite	Aggressive behavior	Withdrawing from family
Depression		0.67	0.68	0.30	0.39	0.39	0.24	0.37	0.30
Anxiety	0.67		0.73	0.32	0.35	0.30	0.24	0.36	0.21
Stress	0.68	0.73		0.30	0.38	0.36	0.25	0.39	0.24
Sleep issues	0.30	0.32	0.30		0.40	0.41	0.39	0.31	0.23
Worry	0.39	0.35	0.38	0.40		0.55	0.28	0.24	0.27
Sadness	0.39	0.30	0.36	0.41	0.55		0.38	0.29	0.37
Changes in appetite	0.24	0.24	0.25	0.39	0.28	0.38		0.25	0.34
Aggressive behavior	0.37	0.36	0.39	0.31	0.24	0.29	0.25		0.30
Withdrawing from family	0.30	0.21	0.24	0.23	0.27	0.37	0.34	0.30	

p values < 0.05 in all cases

Over 62% of the respondents reported that the COVID-19 wave that was prevalent during the data collection phase has very negative or somewhat negative impact on their social interactions. A complete breakdown of the responses is included in table 4. Respondents used various modes of communication to interact with their family members, friends or loved ones. Most common modes of communications reported were phone calls, social media, gaming platforms and in-person interactions. A complete breakdown of the responses is included in table 5. During the COVID-19 wave prevalent during the data collection phase 53.6%

respondents reported experiencing sleep issues, 56.8% respondents reported experiencing worry, 53.2% respondents reported experiencing sadness, 38.6% respondents reported experiencing changes in appetite, 24.8% respondents reported experiencing aggressive behavior and 32.3% respondents reported withdrawing from family. Further, to seek emotional support 57.8% of respondents looked for information on internet portals, 32% used mobile applications, 37.6% looked for professional help and 68.4% talked to people in the family and/or friends.

Table 4: Responses for the Survey Question "How would You Rate the Impact of the Current/Latest COVID-19 Wave on your Social Interactions?"

	Frequency	Percent
Very Negative	127	30.8%
Somewhat Negative	132	32.0%
<i>Subtotal</i>	259	62.9%
No Impact	114	27.7%
Somewhat Positive	27	6.6%
Very Positive	12	2.9%
Grand Total	412	

Table 5: Descriptive Analysis for Communication Modes with Family Members, Friends or Loved Ones

	Text		Phone Call		Social Media	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Every day or almost every day	18	4%	32	8%	40	10%
A few times a week	44	11%	85	21%	63	15%
A few times a month or less	131	32%	145	35%	116	28%
Never	219	53%	150	36%	193	47%
Total	412					
	Gaming Platforms		In-Person (Indoor and/or Outdoor)			
	Frequency	Percent	Frequency		Percent	
Every day or almost every day	113	27%	16		4%	
A few times a week	91	22%	107		26%	
A few times a month or less	87	21%	127		31%	
Never	121	29%	162		39%	
Total	412					

ANOVA was performed to assess whether levels of depression, anxiety and stress varied by gender. It was found that the p-values of the F-tests were less than 0.05, hence it can be concluded that there are statistically significant differences between the means from one level of gender to another at the 95.0% confidence level. The multiple range tests showed that the levels varied significantly between the following groups. People who self-reported their gender as other had statistically significant higher levels of depression

and anxiety when compared to people who self-reported their gender as male or female. People who self-reported their gender as female or other had statistically significant higher levels of stress when compared to people who self-reported their gender as male. Results of the ANOVA are shown in tables 6, 7, 8. Multiple Ranges tests are shown in tables 9, 10, 11. The results of ANOVA didn't show any statistically significant differences related to respondents' race.

Table 6: ANOVA Table for Anxiety by Gender

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	30.21	3	10.07	3.95	0.0085
Within groups	1040.42	408	2.55		

Table 7: ANOVA Table for Depression by Gender

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	20.54	3	6.85	3.28	0.0210
Within groups	851.91	408	2.09		

Table 8: ANOVA Table for Stress by Gender

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	25.87	3	8.62	5.84	0.0006
Within groups	602.06	408	1.48		

Table 9: Multiple Range Tests for Anxiety by

Contrast	Sig.	Difference	+/- Limits
Female - Male		-0.28	0.32
Female - Other	*	1.22	0.97
Female - Prefer Not to Say		0.63	1.30
Male - Other	*	1.50	0.97
Male - Prefer Not to Say		0.90	1.30
Other - Prefer Not to Say		-0.59	1.59

* denotes a statistically significant difference.

Table 10: Multiple Range Tests for Depression by Gender

Contrast	Sig.	Difference	+/- Limits
Female - Male		-0.26	0.29
Female - Other	*	1.01	0.88
Female - Prefer Not to Say		0.04	1.18
Male - Other	*	1.27	0.88
Male - Prefer Not to Say		0.30	1.18
Other - Prefer Not to Say		-0.97	1.44

* denotes a statistically significant difference.

Table 11: Multiple Range Tests for Stress by Gender

Contrast	Sig.	Difference	+/- Limits
Female - Male	*	-0.39	0.24
Female - Other		0.72	0.74
Female - Prefer Not to Say		0.39	0.99
Male - Other	*	1.12	0.74
Male - Prefer Not to Say		0.78	0.99
Other - Prefer Not to Say		-0.33	1.21

ANOVA did not highlight any statistically significant differences between levels of depression, anxiety, stress, and self-reported impact of COVID-19 on social interactions. All p-values were greater than 0.05. Similarly, the analysis did not demonstrate any

statistically significant difference in the impact of COVID-19 based on gender or race. Tables 12, 13, 14 show that respondents turned to internet portals and professionals for help with their emotional states at statistically significant levels.

Table 12: Analysis of Variance for Depression - Type III Sums of Squares

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
MAIN EFFECTS					
A:Advice from internet	23.35	1	23.35	11.71	0.0007
B:Help from app	1.01	1	1.01	0.51	0.4775
C:Helpfrm professional	12.61	1	12.61	6.32	0.0123
D:Helpfrmfam_friend	4.92	1	4.92	2.47	0.1169

All F-ratios are based on the residual mean square error.

Table 13: Analysis of Variance for Anxiety - Type III Sums of Squares

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
MAIN EFFECTS					
A:Advice from internet	48.13	1	48.13	20.62	0.0002
B:Help from app	7.10	1	7.10	3.04	0.0819
C:Helpfrm professional	13.97	1	13.97	5.99	0.0148
D:Helpfrmfam_friend	0.82	1	0.82	0.35	0.5536

All F-ratios are based on the residual mean square error.

Table 14: Analysis of Variance for Stress - Type III Sums of Squares

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
MAIN EFFECTS					
A:Advice from internet	20.64	1	20.64	14.22	0.0002
B:Help from app	0.02	1	0.02	0.01	0.9085
C:Helpfrm professional	4.25	1	4.25	2.93	0.0879
D:Helpfrmfam_friend	0.004	1	0.004	0.00	0.9608

All F-ratios are based on the residual mean square error.

IV. DISCUSSION

The analyses show that emotional states of young adults in the Detroit Metro area were concerning. The emotional states were worse for genders other than male. The COVID-19 wave, and the associated lockdown also seems to have coincided with several detrimental behaviors. The young adults used various modes of communication to keep their social interactions active. They turned to various avenues to seek help for their emotional states.

V. CONCLUSION

Public health administrators could use the findings of this study to develop effective remedial programs. At individual level, young adults should keep channels of communications open via various modes with loved ones and professionals to help elevate their emotional states. The study is the first of its kind for the Detroit Metro area. Additional studies should be conducted in other geographical areas to develop a comprehensive understanding of the emotional states of young people in general and during pandemic lockdowns in specific. Further longitudinal studies will also help deepen the depth of knowledge. Regardless, of the COVID-19 related lockdown the emotional states of young people in the Detroit Metro area were found to be distressed.

ACKNOWLEDGMENTS

The authors acknowledge the support of their family in completing this research study.

Disclosure

The authors report no conflicts of interest in this work.

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Abbreviations: Df: Degrees of Freedom