

Perceptions, Coping Strategies, and Mental Health of Residents during COVID-19

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Objectives: Since the inception of the coronavirus disease 2019 (COVID-19) pandemic, the United States has been the leader in cases and deaths. Healthcare workers treating these severely ill patients are at risk of many deleterious consequences. Residents, in particular, may be affected by physical as well as psychological consequences. Because data are sparse on perceptions, coping strategies, and the mental health of residents during COVID-19, we explored these issues in survey data from a community-based academic program in the southeastern United States.

Methods: In May 2020, when US deaths from COVID-19 reached 100,000, we administered multiple-choice online anonymous surveys to assess resident perceptions, coping strategies, and self-reported levels of depression, anxiety, and stress. We used the COPE inventory to assess coping strategies and the Depression, Anxiety, and Stress Scale-21 questionnaire.

Results: A total of 59 (41.3%) of 143 eligible residents completed the survey, 52 (88.1%) of whom believed that they were likely or very likely to become infected with COVID-19. If infected, 17 (28.8%) believed that their illness would be serious or very serious. The top three strategies to cope with COVID-19 included acceptance, self-distraction, and use of emotional support. With respect to depression, anxiety, and stress, all of the mean scores were in the normal range.

Conclusions: During COVID-19, residents in a southern community-based program with an academic affiliation reported effective coping strategies, predominantly acceptance, self-distraction, and use of emotional support. They reported concerns about becoming infected and, if they did, that their illness would likely be serious. Finally, they have not experienced depression, anxiety, or reported stress. The findings may be restricted

in generalizability to a southern community-based program with an academic affiliation.

Key Words: coping strategies, COVID-19, mental health, residents

Since the inception of the coronavirus disease 2019 (COVID-19) pandemic, the United States has been the leader in cases and deaths.¹ Healthcare workers treating these severely ill patients are at risk of many deleterious consequences. Depressive symptoms, anxiety, and stress have been reported by healthcare workers.^{2,3} Residents, in particular, may be affected by physical as well as psychological consequences.^{4,5} Because data are sparse on perceptions, coping strategies, and the mental health of residents during COVID-19, we explored these issues in survey data from a southern community-based program with an academic affiliation.

Residency is a major step in the lifelong journey of physicians as they become educated and trained to serve the best interests of their patients and communities. Residency also can be a time of intense stress, leading to burnout, emotional exhaustion, and feelings of depersonalization, with rates of burnout as high as 60%.⁶⁻⁸ Although the major goals of residency are to expand medical knowledge and learn the necessary skills to practice independently, the Accreditation Council for Graduate Medical Education has intensified its focus on the well-being of residents. Specifically, the common program requirements mandate that programs and sponsoring institutions place emphasis on resident well-being, including workplace safety, mental health, fatigue mitigation, and coverage during illness or personal emergency.⁹ Given that residents often are on the front lines of care, including with respect to COVID-19, the mental health of residents is a major priority. During the early phases of the US COVID-19

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Key Points

- During the coronavirus disease 2019 pandemic, residents in a southern community-based program with an academic affiliation reported effective coping strategies, predominantly acceptance, self-distraction, and use of emotional support.
- Residents are concerned about being infected by coronavirus disease 2019.
- Residents believe that, if infected, their illness would likely be serious.
- Residents have not experienced depression or anxiety or reported stress.

pandemic, data were sparse about perceptions, coping strategies, and the mental health of residents. We explored these issues by administering multiple-choice online anonymous surveys to all of the residents in a southern community-based program with an academic affiliation.

Methods

This research was approved by the institutional review board of Florida Atlantic University. The Schmidt College of Medicine established the Florida Atlantic University Consortium for Graduate Medical Education, in partnership with Baptist Health's Boca Raton Regional Hospital and Bethesda Hospital East, and Tenet HealthCare system's Delray Medical Center, St. Mary's Medical Center, and West Boca Medical Center. Florida Atlantic University's Consortium consists of a growing number of fully accredited residencies and fellowships committed to excellence in education and patient care. During the 2019–2020 academic year, the number of residents across all specialties totaled 143, with the largest being in Internal Medicine (75, 52.4%) and Surgery (42, 29.3%), and the other two residency programs include Emergency Medicine (18 trainees, 12.6%) and Psychiatry (8 trainees, 5.6%).

In May 2020, we invited via e-mail all 143 residents to participate in anonymous surveys about COVID-19. The surveys included questions on perceptions, coping strategies, and self-reported levels of depression, anxiety, and stress. Questions about perception focused on beliefs regarding the likelihood of becoming infected with COVID-19, potential severity of illness if infected, and financial hardship as a result of the pandemic. We used the Brief COPE questionnaire to assess coping strategies.^{10,11} We used the Depression, Anxiety, and Stress Scale-21 (DASS-21) questionnaire to assess depression, anxiety, and stress.^{12,13}

The Brief COPE questionnaire consists of 28 items and is a valid and reliable instrument for identifying coping strategies. The questionnaire includes items such as “I've been getting emotional support from others” and “I've been using alcohol or other drugs to help me get through it.” The four response options range from “I haven't been doing this at all” (one point) to “I've been doing this a lot” (four points). The results of specific items are aggregated to generate overall scores for 14 coping strategies. Higher scores indicate that the strategy is being used more frequently than lower scored strategies.^{10,11}

The DASS-21 is a valid measure of the dimensions of depression, anxiety, and stress. The 21-item self-report questionnaire asks respondents to indicate how much a statement applied to them during the past week. Sample items include “I found it hard to wind down” and “I couldn't seem to experience any positive feelings.” Response options range from “Did not apply to me at all” (zero points) to “Applied to me very much or most of the time” (three points). Each of the three subscales include seven items, and the results of specific items are summed to generate scores for depression, anxiety, and stress. Scores can range from 0 to 21, and higher scores suggest greater severity levels ranging

from normal to extreme.^{12,13} Internal consistency for the DASS subscales was assessed by Cronbach alpha.¹⁴ The alphas were 0.898 for depression, 0.802 for anxiety and 0.878 for stress, indicating high internal consistency.

For significance testing, we used *t* tests for interval scale variables and χ^2 tests for nominal variables. For likelihood of reporting symptoms and severity, the data were measured on an ordinal scale,¹⁵ so we calculated a Spearman rank order correlation coefficient to measure the magnitude of any relationship of likelihood of reporting symptoms and severity. To test for the significance of any relationship of year with either likelihood or severity, we conducted Kruskal-Wallis H tests. In addition, the data contain self-reports from residents in Internal Medicine, Surgery, Emergency Medicine, and Psychiatry. To test for the significance of any differences by program regarding self-reports of depression, anxiety, and stress, we used analyses of variance. Finally, to test for the significance of any relationship of sex with either likelihood or severity, we used Mann-Whitney *U* tests.¹⁵

Results

Baseline Characteristics

A total of 59 (41.3%) of 143 eligible residents completed the surveys, with an average completion time of 5.39 minutes (standard deviation [SD] 1.85). Among the respondents, 41 (69.5%) were women. Among respondents by specialty, 24 (40.7%) were Internal Medicine, 17 (28.8%) were Surgery, 13 (22%) were Emergency Medicine, and 5 (8.5%) were Psychiatry residents. With respect to postgraduate year (PGY), 22 (37.3%) were PGY-1, 16 (27.1%) were PGY-2, 14 (23.7%) were PGY-3, 5 (8.5%) were PGY-4, and 2 (3.4%) were PGY-5. There were no modifications of the observed effects in subgroup analyses by sex, type of residency, or postgraduate year.

Perceptions

When asked whether they believed they would be infected with COVID-19, 52 (88.1%) residents believed they were likely or very likely to become infected with COVID-19. Furthermore, none of the residents reported that they were very unlikely to be infected, and seven (11.9%) residents reported they were unlikely to be infected. In response to the potential severity if infected, 46 (78%) reported severity would be serious, whereas 13 (22%) residents reported severity would be not at all serious. Of those believing that their infection would be serious, 29 (49.2%) reported somewhat and 2 (3.4%) believed it would be very serious. For financial hardship from COVID-19, 48 (81%) reported none to mild, 9 (15.3%) reported moderate, 1 (1.7%) reported severe hardship, and 1 (1.7%) did not respond to this question.

With respect to the likelihood of reporting symptoms and severity, the Spearman correlation coefficient of 0.147 was not statistically significant ($P = 0.267$). To address the relationship of year with likelihood of reporting symptoms and severity, the sample sizes were so low that the groups of PGY-4 ($n = 5$), and PGY-5 ($n = 2$) were combined. There were no significant

Table 1. Reported scores of likelihood of getting COVID-19 or severity of symptoms by residency year, program, and sex

Variable	Sample size, n	Likelihood		Severity	
		Mean	SD	Mean	SD
PGY year					
1	22	2.91	0.610	2.00	0.756
2	16	3.19	0.544	2.00	0.816
3	14	3.29	0.611	2.29	0.611
4 and 5	7	3.14	0.378	2.29	0.611
Program					
Emergency Medicine	13	3.15	0.689	1.92	0.641
Internal Medicine	24	3.08	0.504	2.17	0.816
Psychiatry	5	2.80	0.837	1.80	0.837
Surgery	17	3.18	0.529	2.24	0.831
Sex					
Female	41	3.00	0.485	2.11	0.758
Male	18	3.15	0.615	2.10	0.800
Total	59	3.10	0.578	2.10	0.781

COVID-19, coronavirus disease 2019; PGY, postgraduate year.

differences between year and either likelihood ($\chi^2(3) = 4.149$, $P = 0.246$), or severity ($\chi^2(3) = 1.936$, $P = 0.586$). In addition, there were no significant differences between sex and either likelihood ($z = -0.945$, $P = 0.345$) or severity ($z = 0.214$, $P = 0.831$; Table 1).

Coping Strategies

With respect to coping with the COVID-19 pandemic, the residents reported three major strategies. The first was acceptance, the second was self-distraction, and the third was use of emotional support. The three least used strategies were behavioral disengagement, substance use, and denial.

Emotional Status

The mean scores for self-reports of depression, anxiety, and stress were within the normal range. Specifically, the mean scores were 8.20 (SD 4.47), with a range of 0 to 21 for depression; 5.16 (SD 3.21), with a range of 0 to 17 for anxiety; and

Table 2. Reported scores of depression, anxiety, and stress by residency year

PGY year	Sample size (n)	Depression		Anxiety		Stress	
		Mean	SD	Mean	SD	Mean	SD
1	22	3.55	3.50	2.32	1.89	4.27	3.76
2	16	3.44	2.85	2.81	3.45	6.06	3.82
3	14	4.36	4.99	2.42	2.84	5.79	4.53
4 and 5	7	6.86	8.05	3.14	6.18	7.71	7.11
Total	59	4.10	4.47	2.58	3.21	5.53	4.47

PGY, postgraduate year; SD, standard deviation.

Table 3. Reported scores of depression, anxiety, and stress by residency program

Program	Sample size, n	Depression		Anxiety		Stress	
		Mean	SD	Mean	SD	Mean	SD
Emergency Medicine	13	4.46	3.48	1.92	2.18	5.92	3.73
Internal Medicine	24	2.75	2.63	2.35	3.05	4.58	4.13
Psychiatry	5	2.40	1.67	3.60	2.51	5.80	1.64
Surgery	17	6.47	5.86	3.12	4.26	6.47	5.86
Total	59	5.52	4.47	2.58	3.21	5.53	4.47

SD, standard deviation.

11.05 (SD 4.47), with a range of 0 to 20 for stress. The Pearson product moment correlations were high and highly statistically significant.

To test whether there were significant differences in self-reports of depression, anxiety, and stress by year, because of the small samples, we combined the two groups of PGY-4 ($n = 5$) and PGY-5 ($n = 2$). There were no significant differences by year with self-reports of depression ($P = 0.341$), anxiety ($P = 0.928$), or stress ($P = 0.303$; Table 2).

For depression, there were higher levels reported by residents in Emergency Medicine and Surgery. The differences were significant for self-reports of depression ($P = 0.044$), but not anxiety ($P = 0.663$) or stress ($P = 0.594$; Table 3).

There were four scores for depression in the moderate to severe range, two scores for anxiety in the moderate to severe range, and one score in the moderate range for stress. In this anonymous survey, only one resident scored in the severe range for depression and anxiety and in the moderate range for stress. In our initial request to participate, we pointed out that we would provide resources and availability of counseling to all residents. There were no significant differences between men and women for depression ($P = 0.804$), anxiety ($P = 0.754$), or stress ($P = 0.470$; Table 4).

Discussion

These data indicate that at a time when US deaths from COVID-19 were exceeding 100,000, these residents reported effective coping strategies, predominantly acceptance, self-distraction, and use

Table 4. Reported scores of depression, anxiety, and stress by sex

Sex	Sample size, n	Depression		Anxiety		Stress	
		Mean	SD	Mean	SD	Mean	SD
Female	18	4.38	3.47	2.79	2.39	6.17	4.67
Male	41	4.07	4.84	2.49	3.55	5.24	4.01
Total	59	4.10	4.47	2.58	3.21	5.53	4.47

SD, standard deviation.

of emotional support. In addition, they reported concerns about becoming infected with COVID-19 and believed that, if infected, their illness would likely be serious. Finally, these residents were not reporting depression, anxiety, or stress. These data from residents in a southern community-based program with an academic affiliation should be viewed in the context of other reported findings in the United States and abroad.

In the United States, in May 2020, surveys sent to 200 residency programs that included a wide variety of specialties showed that 77% had concerns about their own health and safety, 74% were concerned they would be a carrier of COVID-19, and 63% were worried about the availability of personal protective equipment.¹⁶ In addition, wellness and resiliency scores were inversely correlated with case rates in the area of training. In another study administered during April/May 2020 to residents from various specialties at a single institution in Pittsburgh, Pennsylvania, 50% of their trainees believed that the pandemic was negatively affecting their training.¹⁷ Junior residents were more likely to be anxious as compared with senior residents. Potential lack of personal protective equipment was the largest source of stress/anxiety in those respondents.

Outside the United States, a survey of residents in Qatar conducted during April/May 2020 showed low mean scores for depression, anxiety, and stress on the DASS-21 questionnaire (mean scores: depression 4.8 ± 4.5 , anxiety 3.6 ± 3.3 , stress 6.1 ± 4.2).¹⁸ Finally, among healthcare workers in China, the pooled prevalence of depression was 21.7% (95% confidence interval [CI] 18.3%–25.2%), anxiety 22.1% (95% CI 18.2%–26.3%), and posttraumatic stress disorder 21.5% (95% CI 10.5%–34.9%).¹⁹

The reports by these residents of effective coping strategies and paucity of experiencing depression, anxiety, or reported stress with COVID-19 are compatible to their perceived emotional well-being. It also is tempting to speculate that supportive program leadership and their concerns and actions to maximize the safety and well-being of residents during the pandemic may have played a role. Specifically, the program directors of these residencies responded in a coordinated manner using a variety of ways to address any stated concerns of the residents about COVID-19. For example, programs revised resident work schedules (eg, 7 days on/7 days off), implemented telemedicine for outpatient clinics, offered confidential counseling sessions, facilitated online group support sessions, purchased and distributed all of the necessary personal protective equipment, and used videoconferencing for education. These data also suggest that graduate medical education training programs need to be aware of these new realities consequent to COVID-19. They also contribute to the formulation of the hypothesis that the relatively young ages of residents and their general good health may have contributed to the observed findings.

In the United States, data are sparse about the concerns of residents regarding being infected with COVID-19, both in likelihood and severity. Further research is needed to better understand concerns of residents. Such findings would assist

programs to proactively address those concerns in a caring and thoughtful manner.

There are several limitations to validity and generalizability that should be mentioned. The present data are descriptive and therefore useful only to formulate but not test hypotheses. Analytic epidemiologic research is needed to test the many hypotheses formulated from these descriptive data.^{15,20} Such research may elucidate the important determinants of the observed effective coping strategies and low rates of reported depression, anxiety, or stress. In addition, the 41.3% response rate from an anonymous survey may have led to selection bias. Furthermore, the generalizability of findings may be limited based on residents working at five community-based hospitals in southeast Florida.^{19,20} Finally, this survey was done in May 2020, at the time when US deaths surpassed 100,000. In Florida the first peak was in July 2020, the second peak was January 2021, and the third and highest peak was August 2021.²¹ As such, it is plausible that the responses would have been different had the residents been surveyed at a later time during the past 18 months.

Conclusions

Despite these and other possible limitations, we believe the most plausible interpretation of the data to be that during the US experience of the COVID-19 pandemic, these residents possessed effective coping strategies, predominantly acceptance, self-distraction, and use of emotional support. They are concerned about being infected with COVID-19, and believe that, if infected, their illness would likely be serious. In addition, the majority have not experienced depression, anxiety, or reported stress. It seems important and timely to continue to explore the perceptions, coping strategies, and mental health of residents as they serve an essential role in serving patients and communities and are the pipeline of future physicians for the US healthcare workforce. Such information may be helpful for future residents while they continue to face other challenging circumstances as they serve on the front lines of health care.

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