Coping Strategies Utilized by Emergency Department Providers During the COVID-19 Pandemic

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ABSTRACT

Introduction: COVID-19 has exposed health care workers to new stressors; emergency department providers are at risk of increased stress. It is unknown how coping strategies are utilized by this group during a pandemic.

Methods: A cross-sectional survey incorporating the Brief COPE inventory was deployed to residents, fellows, faculty, and physician assistants at a single US academic emergency department in the spring (April 2020 - May 2020) and winter (December 2020 - January 2021). Scores for 14 individual coping strategies, as well as approach (positive) and avoidant (negative) coping categories, were measured, and utilization of these coping strategies was compared with respect to the provider's role, sex, number of people living at home, presence of pets and/or children at home, and stress level.

Results: The response rate was 58/103 (56.3%) and 50/109 (45.9%) for the spring and winter distributions, respectively. In the spring, 70.6% of responders reported increased stress vs 66% in the winter. Overall utilization of coping strategies increased slightly between spring and winter for approach coping (32.22 to 32.64) and avoidant coping (20.95 to 21.73). Resident physicians utilized less approach coping and more avoidant coping when compared to faculty/fellows. Substance use overall had a relatively low score, which increased slightly between spring and winter distributions (2.93 to 3.04).

Conclusions: Approach coping was frequently utilized among ED providers during the COVID-19 pandemic study period. Resident physicians had higher utilization of avoidant coping strategies compared to faculty/fellows and could benefit from targeted wellness interventions during times of increased stress.

INTRODUCTION

The SARS-CoV-2 virus that caused the COVID-19 pandemic has brought massive changes to emergency departments (ED) around the world, as new policies and protocols were implemented in response to new data. Increased stress, anxiety, depression, and burnout in health care workers is widespread as hospitals struggle to continue to provide care during one of the most severe global health crises in history.[1,2] As the pandemic has continued, ED providers have dealt with unprecedented work-related stressors, including fluctuating ED volumes and hospital overcrowding.[3] Emotional exhaustion and burnout among ED physicians, as well as increased stress both at home and at work, have significantly increased since the pandemic began in early 2020.[4] In addition, many aspects of daily life have yet to return to normal, severely decreasing the availability of protective factors against burnout over a prolonged period, including access to ED providers' extended family and friends, participation in hobbies or interests, and opportunities for community engagement.[4] Finally, though the vast majority of US physicians have now been able to receive COVID-19 vaccines,[5] they must still deal with whether their families (some of whom may not be vaccinated) will contract the virus, the uncertainty of when their previous work routines can return, and the potential for decreased job security that has come from reduced utilization of emergency departments.[3,6]

In times of stress, individuals will respond differently by employing coping strategies to overcome stressors. Positive coping

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strategies (also known as approach coping) help individuals experiencing stress deal with it in a productive manner; these include acceptance, reframing, and planning (Table 1).[7] However, physicians are known to be an at-risk group for negative coping mechanisms (also known as avoidant coping) that may exacerbate stress, such as substance use, venting, and denial.[8] An understanding of provider coping strategies—especially during times of increased departmental stress (eg, fluctuating volumes, staffing changes)—is essential in order to develop appropriate infrastructure to support providers during these difficult times. While there are multiple measures of coping strategies, there is validity evidence for the Brief COPE inventory in multiple populations—including patients and medical professionals—as an efficient and effective means of measuring both approach and avoidant coping strategies.[9-11] More recently, the Brief COPE has been utilized in the general population living in lockdown, as well as with those struggling with chronic comorbidities during the COVID-19 pandemic. These studies have revealed an association between use of negative coping strategies (eg, denial, substance use, and venting) during the pandemic and increased stress and rates of mental illness (eg, anxiety and depression).[12,13]

The utilization of coping strategies in emergency physicians in areas outside the US has been described in prior research. These studies utilized different scales of coping—including the Ways of Coping Questionnaire and the Jalowiec Coping Scale Part A (JCS-A)—and revealed an overall high use of positive adaptive strategies, particularly planning and eliciting emotional support from others.[14-16] Additional work has revealed increased distress of the ED workforce in the context of the severe acute respiratory syndrome (SARS).[17] However, these studies are dated, and coping strategy utilization may be significantly altered in the setting of the global pandemic.

The experience of the state of Wisconsin with the COVID-19 pandemic paralleled the experience of much of the US: while spring 2020 brought the most rapid and acute changes in the form of lockdowns and school closures, fall and winter brought the largest surge of cases after months of pandemic fatigue. This study aimed to investigate the degree of coping strategy utilization among ED providers during the SARS-CoV-2 pandemic, as well as any differences that arose at different phases of the pandemic.

Table 1. Coping Strategies Assessed by the Brief COPE, by Category[a]

Coping Strategy	Description
Approach	
Acceptance	Learning to accept that the problem exists
Active coping	Taking actions to correct the problem
Positive reframing	Attempting to reassess the problem in a positive light
Use of emotional support	Seeking empathy from others
Planning	Devising a plan to overcome the problem
Use of instrumental support	Seeking advice on correcting the problem from other sources
Avoidant	
Self-distraction	Focusing on other activities to take one's thoughts off the problem
Venting	Expressing negative emotions concerning the problem
Self-blame	Blaming or criticizing one's self for the problem
Substance use	Using alcohol or other drugs as a means of dealing with the problem
Behavioral disengagement	Giving up taking actions to solve the problem
Denial	Refusing to accept the problem exists
Uncharacterized	
Humor	Making fun of the situation
Religion	Turning to religious beliefs (new or old) as a means of support

[a]Adapted from Litman.[19]

METHODS

Study Design, Setting, and Population

A cross-sectional survey was administered to all residents, fellows, faculty, and physician assistants (PA) who worked at least part time in a single academic emergency department in the Midwest during April 2020–May 2020 of the COVID-19 pandemic ("spring") and December 2020–January 2021 ("winter"). All providers in this group were eligible for participation. In our ED, fellows treat patients independently of staff residents and PAs. Participants were contacted via email using departmental listservs. There were 103 eligible providers during the first survey distribution and 109 in the second distribution due to changes in active staff roster. The study institution is associated with a 3-year emergency medicine (EM) program that has 12 residents per class. The authors were excluded from participation as they were involved with study design.

Study Protocol

The survey was deployed to all participants on April 30, 2020 and December 31, 2020. Three preplanned reminder emails were sent out at approximately 1-week intervals to enhance the response rate. Both surveys were closed 4 weeks after they were deployed. In-person reminders also were presented to participants at weekly departmental didactic conferences and the monthly departmental faculty meeting. The survey was administered anonymously online using Qualtrics (Provo, Utah). Overall response rate was calculated using the second definition of response rate as defined by the American Association for Public Opinion Research (AAPOR).[18] The authors had no means of determining the identity of who had filled out the survey, and responding was explicitly stated to be voluntary in the recruitment emails. No inducements for survey completion were implied or offered, and no compensation was provided to respondents. The data were compared between survey distributions to determine if the utilization of coping strategies by ED physicians changed between the spring and winter phases of the pandemic. The study design was submitted to the study site's institutional review board and was determined to be exempt from formal review.

Table 2. Baseline Characteristics of Survey Respondents

Demographics	Spring Responders (%)	Winter Responders (%)
Staff role		
Residents	19 (32.7)	17 (34.0)
Faculty/Fellows	29 (50.0)	27 (54.0)
Advance Practice Providers	10 (17.2)	6 (12.0)
Sex		
Male	33 (56.9)	30 (60.0)
Female	24 (41.4)	20 (40.0)
No. other people living in home		
0	7 (12.1)	11 (22.0)
1+	51 (87.9)	39 (78.0)
Children living at home (at least part-time)		
Yes	30 (51.7)	21 (42.0)
No	28 (48.3)	29 (58.0)
Pets living in the home		
Yes	40 (69.0)	35 (70.0)
No	18 (31.0)	15 (30.0)
Average stress level over last 2 months		
Above average	41 (70.7)	33 (66.0)
Average/below average	17 (29.3)	17 (34.0)

Table 3. Mean Scores for Individual Coping Strategies

Coping Strategy	Spring Mean Score (95% CI)	Winter Mean Score (95% CI)
Approach	**32.22 (30.76-33.67)**	**32.64 (31.06-34.22)**
Acceptance	6.55 (6.23-6.86)	6.70 (6.33-7.08)
Use of emotional support	5.38 (4.95-5.80)	5.55 (5.09-6.00)
Active coping	5.36 (4.98-5.75)	5.21 (4.73-5.69)
Positive reframing	5.29 (4.90-5.69)	5.34 (4.89-5.79)
Planning	5.20 (4.85-5.55)	5.05 (4.63-5.47)
Use of instrumental support	4.42 (4.06-4.78)	4.75 (4.37-5.13)
Avoidant	**20.95 (19.90-21.99)**	**21.73 (20.38-23.08)**
Self-distraction	5.36 (4.97-5.75)	5.14 (4.68-5.59)
Venting	4.47 (4.07-4.87)	4.64 (4.26-5.01)
Self-blame	3.29 (2.93-3.65)	3.75 (3.32-4.18)
Substance use	2.93 (2.57-3.29)	3.04 (2.61-3.48)
Behavioral disengagement	2.54 (2.30-2.77)	2.68 (2.41-2.95)
Denial	2.38 (2.19-2.57)	2.47 (2.19-2.75)
Uncharacterized		
Humor	5.00 (4.56-5.44)	5.57 (5.09-6.05)
Religion	3.13 (2.69-3.56)	3.18 (2.72-3.64)

Survey Development

The survey instrument consisted of multiple demographic questions as well as the Brief COPE inventory (Appendix).[9] The Brief COPE inventory consists of 28 total questions, with 2 questions corresponding to each of 14 coping strategies. These coping strategies are listed in Table 1. The frequency of an individual's use of these strategies results in the summation of two 4-point scales (with 1 corresponding to "I have not been doing this at all" and 4 corresponding to "I have been doing this a lot"), creating an overall score of 2 to 8. Though not recommended as a part of the original Inventory by its creator, prior work has found validity evidence that these 14 coping strategies can be further grouped into 2 larger subscales of 6 known as "approach" (positive) and "avoidant" (negative) coping. (The remaining 2 strategies, humor and religion, are not easily characterized by either the approach or avoidant category.)[10,20] Scores for these 2 subscales were calculated as the sum of each of the 12 questions corresponding to the 6 included coping strategies, resulting in an overall score of 12 to 48, with higher scores indicating higher utilization of these coping strategies. The survey was reviewed and edited with input from the Emergency Medicine Research Committee at the study site prior to deployment.

Statistical Analysis

Descriptive statistics were calculated for the approach and avoidant categories for the overall study population. Subgroups were generated based on role (residents, faculty/fellows, PAs), sex (male or female), whether the responder lived alone or with others, whether or not children lived in the home (yes or no), whether or not pets lived in the home (yes or no), and self-reported average stress level over the past 2 months (below average/average or above average). The average scores on the approach and avoidant categories were calculated, along with 95% confidence intervals. If a respondent did not answer one or both questions referring to a particular coping strategy, their score for that coping strategy was excluded from final analysis. Respondents who did not answer enough questions from the Brief COPE to meet at least the minimum score for approach or avoidant coping (12/48) were excluded from the final analysis to avoid negatively skewing the results. The subgroups were compared using 2-sample Wilcoxon rank sum tests. Results from the survey were analyzed in the same manner for both the spring and winter data. Overall sample scores also were compared between the current sample and the data collected from spring using Wilcoxon rank-sum tests. The authors utilized an alpha-level of 0.05 to determine whether differences were statistically significant. A wave analysis was conducted to assess for nonresponse bias using the data from responders within the last week of the survey as a proxy for those who did not respond based on the average scores on the approach and avoidant categories of the Brief COPE. This was calculated separately for the spring and winter data. Statistical calculations were made using STATA v 15 (College Station, Texas), except for the wave analysis, which used Microsoft Excel (Redmond, WA).

RESULTS

The overall response rate of those who responded at least partially was 58/103 (56.3%) and 50/109 (45.9%) for the spring and winter distributions, respectively. Three respondents with partial filled-out surveys were excluded (5.17%) from the spring distribution and 6 were excluded from the winter distribution (12%). The baseline characteristics of responders are shown in Table 2.

ED staff utilized all 14 coping strategies to varying degrees.

Overall, responders tended to use approach coping rather than avoidant coping. The mean score for approach coping was 32.22 (95% CI, 30.8-33.7) in the spring and 32.64 (95% CI, 31.1-34.2) in the winter. For avoidant coping, the mean score was 21.0 (95% CI, 19.9-22.0) in the spring and 21.7 (95% CI, 20.4-23.1) in winter. The most frequently employed overall coping strategy was "acceptance;" the least likely coping strategy to be employed was "denial." Table 3 shows the mean scores of all responders for each of the 14 individual coping strategies.

In the spring, females utilized significantly more approach coping strategies when compared to male responders (average 32.55 vs 30.24; $P=0.037$). Those living alone utilized significantly more avoidant coping versus those living with at least 1 other person (23.64 vs 21.34; $P=0.0408$). Additionally, residents also utilized significantly more avoidant coping than faculty or fellows (22.47 vs 19.48; $P=0.0117$). Those reporting above average stress utilized significantly less avoidant coping than those reporting average or below average stress levels during the pandemic (20.00 vs 22.13; $P=0.0201$). Table 4 shows approach and avoidant coping across various subgroups during the spring and winter distributions.

During the winter, there were no significant differences between male and female respondents in approach or avoidant coping strategies used. Resident physicians utilized significantly less approach coping than faculty or fellows (29.25 vs 34.35; $P<0.05$), a change from the spring. Resident physicians continued to utilize more avoidant coping than faculty or fellows in the winter, but this was not significant (23.67 vs 20.77; $P=0.057$). Finally, those without children showed significantly more avoidant coping than those with children (23.46 vs 19.65; $P<0.05$).

There were no significant differences in approach or avoidant coping between spring and winter distributions (Table 4).

ED providers largely self-reported they were experiencing above average stress during the pandemic, with the proportion decreasing slightly in the winter of the pandemic (70.7% to 60.0%). PAs reported the highest rates of above average stress in both survey distributions (100% and 83.3% for early and late pandemic, respectively).

The wave analysis did not show a significant degree of nonresponse bias for the analyzed variables. Test statistics for the wave analysis can be seen in Table 5.

Table 4. Approach vs Avoidant Coping Utilization Between Subgroups

	Subgroup/ Category	Mean (95% CI)	*P* value[a]
Spring			
Sex	Male	Female	
Approach	**30.24 (28.61 - 31.87)**	**32.55 (30.93 - 34.17)**	**0.0370**
Avoidant	20.60 (19.32 - 21.87)	22.23 (21.04 - 23.43)	0.1163
Role	Resident	Faculty/Fellows	
Approach	31.10 (28.60 - 33.61)	32.70 (30.54 - 34.87)	0.2449
Avoidant	**22.47 (20.59 - 24.36)**	**19.48 (18.04 - 20.92)**	**0.0117**
Lives alone	Yes	No	
Approach	33.00 (30.16 - 35.84)	31.32 (30.01 - 32.63)	0.4165
Avoidant	**23.64 (21.49 - 25.80)**	**21.34 (20.39 - 22.28)**	**0.0408**
Children	Yes	No	
Approach	30.87 (29.14 - 32.61)	32.11 (30.41 - 33.82)	0.2975
Avoidant	20.78 (19.53 - 22.04)	22.06 (20.95 - 23.18)	0.0909
Pets	Yes	No	
Approach	31.30 (29.84 - 32.77)	32.00 (29.86 - 34.14)	0.6735
Avoidant	21.77 (20.63 - 22.91)	21.25 (19.96 - 22.54)	0.7096
Stress level	Above average	Average/below average	
Approach	30.03 (27.50 - 32.57)	32.00 (30.64 - 33.36)	0.2733
Avoidant	**20.00 (17.95 - 22.05)**	**22.13 (21.19 - 23.08)**	**0.0201**
Winter			
Sex	Male	Female	
Approach	33.36 (31.27 - 35.45)	31.68 (29.10 - 34.27)	0.1577
Avoidant	21.32 (19.53 - 23.11)	22.26 (20.03 - 24.50)	0.5121
Role	Resident	Faculty/Fellows	
Approach	**29.25 (26.78 - 31.72)**	**34.35 (32.15 - 36.55)**	**0.0078**
Avoidant	23.67 (20.62 - 26.71)	20.77 (18.97 - 22.57)	0.0579
Lives alone	Yes	No	
Approach	30.50 (27.11 - 33.89)	33.18 (31.31 - 35.05)	0.2375
Avoidant	22.3 (20.42 - 24.18)	21.45 (19.71 - 23.19)	0.3185
Children	Yes	No	
Approach	33.70 (31.22 - 36.18)	31.75 (29.62 - 33.88)	0.2149
Avoidant	**19.65 (17.85 - 21.45)**	**23.46 (21.68 - 25.24)**	**0.0018**
Pets	Yes	No	
Approach	32.90 (31.06 - 34.74)	3207 (28.67 - 35.47)	0.6586
Avoidant	21.63 (19.91 - 23.36)	21.93 (19.51 - 24.35)	0.7999
Stress level	Above average	Average/below average	
Approach	31.27 (28.14 - 34.40)	33.34 (31.48 - 35.21)	0.1270
Avoidant	20.60 (18.65 - 22.55)	22.31 (20.48 - 24.14)	0.3130
Timing of survey	Spring	Winter	
Approach	32.22 (30.76-33.67)	32.64 (31.06-34.22)	0.7887
Avoidant	20.95 (19.90-21.99)	21.73 (20.38-23.08)	0.5018

[a]*P* values of < 0.05 considered statistically significant.
Bolded values represent significant results.

DISCUSSION

Our study assessed coping strategies utilized by physicians and PAs during a pandemic in an academic emergency medicine department with a yearly volume of approximately 60,000 patients. As a whole, department staff demonstrated a tendency towards approach versus avoidant coping.

Resident physicians engaged in a higher proportion of avoidant coping strategies when compared to faculty or fellows in the spring of the pandemic. However, as the pandemic went on, it seems that this difference did not persist; instead, residents were noted to use significantly less approach coping when compared to fellows or faculty. This is concordant with prior data that indicate residency as a time of greater mental health risk and potentially use of less constructive coping strategies, such as self-blame.[18] Because of this, EM resident physicians previously have been targeted for wellness interventions, including targeting adaptive coping skills such as use of emotional support.[21] The results from this study suggest that these efforts may need to be redoubled during times of stress.

The lack of significant differences between faculty, residents, and PAs in their utilization of approach and avoidant coping suggests

Table 5. Wave Analysis for Approach, Avoidant, Humor, and Religion Coping

	Proportion of NR	Mean Early Responders	Mean Late Responders	Mean Early-Mean Late	Nonresponse Bias (Max)
Early					
Approach	0.436893	32.878	35.000	2.122	0.927 (48)
Avoidant	0.436893	22.780	23.500	0.72	0.315 (48)
Humor	0.436893	5.073	6.500	1.427	0.623 (8)
Religion	0.436893	3.098	3.750	0.652	0.285 (8)
Late					
Approach	0.541284	33.000	28.800	4.190	2.27 (48)
Avoidant	0.541284	21.500	21.476	0.0238	0.0129 (48)
Humor	0.541284	5.170	5.670	0.500	0.271 (8)
Religion	0.541284	3.060	3.330	0.278	0.150 (8)

Abbreviation: NR, nonresponders.

that ED providers tend to employ similar types of coping strategies whether they operate in a learner or supervisory role. Previous work has found that ED staff tend to employ coping strategies similarly regardless of department size,[15] although a study examining distress levels and coping strategies during the 2002-2003 Severe Acute Respiratory Syndrome (SARS) pandemic in China found that employees with different departmental roles experienced varying levels of distress, though this study also included other ED staff such as nursing and nursing assistants not captured in the current study.[17] Our study suggests coping strategy-based wellness interventions can be targeted at all providers and do not need to be broken up by departmental role.

The most heavily used coping strategy overall was "acceptance" during both spring and winter. The approach coping strategies of "active coping" and "use of emotional support" were also employed as often or more frequently than any avoidant strategies. This is consistent with prior research done in China during the initial SARS pandemic in which these coping strategies were also noted to be used heavily, as well as other studies specifically looking at the coping strategies used by ED physicians.[14-17] It is unclear whether or not an inherent characteristic of the pandemic lends itself more towards "acceptance" or "active coping" as compared to other stressors placed on health care providers. For example, it has been popularly noted that the pandemic caused a beneficial increase in family time and a decrease in in-person work meeting obligations for some.[22]

There was an increase in the number of providers who utilized "substance use" heavily (score > 6) as the pandemic went on (5% in the early pandemic to 12% in the late pandemic). This is consistent with prior research indicating ED physicians have relatively high rates of substance use.[8,23] Importantly, rates of substance use reported here initially were lower than what has been reported elsewhere, but, as the pandemic went on, increased to previously reported levels for physician substance use.[24] However, the previous baseline within our study population is unknown, and whether this represents a sampling issue or a behavior change early in the pandemic is unclear. Those most likely to report substance use as a coping strategy were those who reported increased stress versus those who did not. This fits with prior literature indicating a relationship between acute stress and alcohol intake, although the directionality of this relationship in our study is unclear.[25] Future research may be directed towards identifying and supporting this subgroup.

Participants who reported living alone did not differ significantly from those living with others in their utilization of approach coping at either time point. However, these participants were noted to be more likely to engage in avoidant strategies in the spring, suggesting that living alone may be associated with important differences in one's coping strategies. Social isolation previously has been identified as a risk factor for an impaired response to stress and an independent risk factor for mortality.[26,27] While professional social isolation has been described n the literature,[28] to our knowledge, this is the first study to look at providers from the perspective of their home lives and deserves future study. However, by winter, this effect was no longer seen, perhaps suggesting that those who live alone were able to identify more productive coping mechanisms on their own. Given the possible detrimental health effects of social isolation, individuals reporting high levels of avoidant coping may benefit substantially from targeted interventions creating increased opportunity for social interaction.

Taken in aggregate, there were no overall differences in approach and avoidant coping as the pandemic continued. However, resident physicians were found to have increased avoidant and decreased approach coping. Additionally, those without children and those living alone were found to have increased utilization of avoidant coping. Therefore, these groups may be the highest yield for departmental support initiatives.

Limitations

The survey was only deployed to a single academic hospital emergency department. Therefore, the results may not be generalizable to other regions or other ED environments. Our response rate for both surveys was relatively low, which could have led to potential nonresponse bias. However, this is a common problem with survey studies, especially those assessing health care populations.[29] Our response rates were similar to what has been reported previously in this population, and the wave analysis did not show a considerable amount of calculated nonresponse bias in the selected questions (indicating that nonresponders likely did not differ significantly from responders to the survey). In addition, it is possible that differences between our sample and the previously collected data are due to differences in sampling given the response rate in both

survey distributions. Given that the survey was distributed using departmental listservs and answers were anonymous, the survey did not exclude any providers who began or ended employment at our institution during the time between survey distributions. This likely led to the discrepancy in the sample sizes between the 2 survey distributions.

Because the surveys dealt with sensitive topics like substance use and maladaptive coping, it is possible that social desirability bias may have affected participants' willingness to honestly report problematic behaviors. Furthermore, it is possible that the high frequency use of negative coping strategies reported by residents may be due to inherent stress experienced during the demands of residency training and unrelated to the current pandemic. This latter possibility represents a potential avenue for future research.

CONCLUSIONS

Positive approach coping strategies continue to be widely used by ED providers, suggesting that most have developed a variety of successful strategies for dealing with the stress of being on the front lines of the current pandemic. While there were no overall differences in coping utilization as the pandemic continued, several groups appeared to be at higher risk for less adaptive avoidant coping strategies. These groups included resident physicians, staff who live alone, and those who do not have children. Therefore, these groups may gain the most benefit from future targeted interventions during times of crisis.

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