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RESEARCH ARTICLE

Teachers' Distress Amid COVID-19: Examining the Effects of Job Satisfaction and Efficacy, Confidence in Protective Behaviors, and Virus Anxiety

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ABSTRACT

This study examines survey data collected from teachers during the COVID-19 pandemic to understand how they experienced non-specific psychological distress. This analysis focuses on the role of job satisfaction and efficacy, confidence in the use of protective behaviors such as masking, and levels of virus anxiety. In addition, we consider group differences or inequalities between different demographic subpopulations. Results suggest that levels of psychological distress were most highly related to teachers' levels of virus anxiety and to a lesser extent, their levels of job satisfaction and efficacy. While we find some weak support for differences in distress based on race and gender, and for confidence in protective behaviors, these effects are removed when controlling for virus anxiety and job satisfaction and efficacy. We discuss implications that identify possible solutions to mitigate teachers' distress levels.

Introduction

The COVID-19 pandemic created numerous challenges for teachers managing an increased workload,¹ severe student disengagement,² and elevated student, family, and workplace stress.³ Some teachers adapted to the new environment by using social supports from teacher-to-teacher networks and from school leadership to cope with and manage stress.⁴ The pandemic exacerbated existing inequalities in education where social supports, technology, and training varied significantly across schools based on resources and socioeconomic status.^{5,6} Teachers in under-resourced districts have cited a heavy workload, lack of support, inadequate technological training, and concerns about student mental health as their primary stressors.^{7,8,9} This was especially the case for teachers dealing with preexisting mental health problems.¹⁰ Teachers who were asked to pivot online faced challenges in creating engaging and interactive learning experiences, particularly for younger students.^{11,12} Many reported experiencing burnout from workload, role ambiguity, future uncertainty, and their own work-family conflict.^{9,13} In turn, burnout and stress combined to induce depression.¹⁴ Personality also played a role in shaping how individuals responded to the stresses of the pandemic. For instance, those high in neuroticism and low in conscientiousness were more likely to cope through avoidance.¹⁵ For individuals with heightened neuroticism, protective practices such as masking and social distancing may have been most important. For their part, students suffered from exposure to stressed, burned out, and depressed teachers, citing concerns with the quality of online education and lack of interaction with teachers and peers,^{17,18} especially when academic performance was negatively impacted.¹⁸ Evidence has emerged showing that adolescent suicide trends experienced a significant increase during the pandemic.⁹ Thus, understanding the precursors to teacher distress may have an additional benefit of enacting policies and practices that prevent student stress, depression, and suicide.

While current research is focused on stress, burnout, and depression among teachers, less is known about their overall level of non-specific psychological distress in the context of the COVID-19 pandemic. The purpose of the study was to look not only at the COVID-19 virus itself and the impact it had on teachers, but to also examine the other areas of a teacher's life that were touched by the pandemic to gain a broader understanding of the holistic impact. In doing this, it is possible to determine elements that may be controllable, such as items that determine job satisfaction, to reduce the distress felt by teachers in the midst of a situation that cannot be

controlled. We seek to examine this more comprehensive psychological condition to gain a fuller understanding of overall levels of distress among teachers, and to better isolate the contributing factors specific to COVID-19. For this reason, the scope of the study was to survey teachers in multiple districts in the Mohawk Valley Region of upstate New York. This allows a comprehensive viewpoint of teachers in various sized districts that serve a broad population of students. The survey questions asked teachers to reflect not only on the current moment but of the previous 30 days, which encompasses the broad spectrum of feelings and thoughts that can occur in the midst of an event such as the pandemic. Based on prior studies, we test ideas relevant to social inequities and job satisfaction and efficacy, as these are associated with conditions adjacent to non-specific distress independent of the pandemic. To examine the effects of the pandemic, we test the effects of engaging in protective behaviors such as masking and social distancing, and we examine a novel measure that captures levels of what we refer to as virus anxiety. By combining general contributing factors with those specific to the pandemic, we hope to create a more comprehensive understanding of the unique challenges teachers faced amid the COVID-19 pandemic.

Materials and Methods

- **SAMPLE:** Our analysis uses survey data collected from teachers working in 13 districts in the Mohawk Valley Region of upstate New York, in the United States. In addition, teachers enrolled in the Master Teachers Program were included, who are drawn from the broader state of New York. Surveys were sent via email through lists provided by the school districts in two waves collected in February 2021 and June 2021. There was n=640 teachers who responded to the survey with complete information out of 786 contacted, resulting in an 81.4% (640/786) response rate.
- **SURVEY:** During the COVID-19 pandemic, a Knowledge, Attitudes, Beliefs & Behaviors (KABB) Survey was created to understand risk factors associated with elevated psychological distress across several populations, including teachers. Teachers completed a version of the KABB that measures distress, related behaviors, and perceptions as discussed below in detail.
- **DEPENDENT VARIABLE, KESSLER 6- DISTRESS SCALE:** The Kessler-6 Distress Scale items started with the following phrase, "During the past 30 days how often did you feel..." to address the frequency in which respondents felt

the following six distress indicators, “nervous,” “hopeless,” “restless or fidgety,” “so depressed that nothing could cheer you up,” “that everything was an effort,” and “worthless.” Responses for these items use a 5-point Likert scale as follows, (0) never, (1) rarely, (2) sometimes, (3) often, and (4) almost always. Higher scores indicate higher levels of distress. The scale has proven itself to be valid in both American and international contexts.^{19,20}

- **INDEPENDENT VARIABLE, JOB SATISFACTION AND EFFICACY:** The job satisfaction measure utilized the nine item Utrecht Work Engagement Scale,²¹ which asked respondents to reflect on their current job satisfaction. The nine items are as follows: “At my work, I feel bursting with energy,” “At my job, I feel strong and vigorous,” “I am enthusiastic about my job,” “My job inspires me,” “When I get up in the morning, I feel like going to work,” “I feel happy when I am working intensely,” “I am proud of the work that I do,” “I am immersed in my work,” and “I get carried away when I’m working.” The Cronbach’s Alpha score was .881, which illustrates high reliability between items. Responses for this question included (0) never, (1) almost never (a few times a year or less), (2) rarely (once a month or less), (3) sometimes (a few times a month), (4) often (once a week), (5) very often (a few times a week), and (6) always (every day). Thus, higher response scores indicate higher levels of job satisfaction. We added a tenth measure of efficacy that asked about the level of confidence respondents had in their work habits. Responses were on the same scale as the previous nine measures.
- **INDEPENDENT VARIABLE, VIRUS ANXIETY:** The survey asked several original questions that measured how anxious respondents were when thinking about COVID-19. These were based on the COVID Stress Scale developed in 2020.²² Items included: “During the past 30 days, I had trouble concentrating because I kept thinking about the virus,” “During the past 30 days, disturbing mental images about the virus popped into my mind against my will,” “During the past 30 days, I had trouble sleeping because I worried about the virus,” “During the past 30 days, I thought about the virus when I didn’t mean to,” “During the past 30 days, reminders of the virus caused me to have physical reactions, such as sweating or a pounding heart,” “During the past 30 days I had bad dreams about the virus,” and “During the past 30 days, I worried about my ability to structure my day and manage my time in order to succeed in my work.” The responses to these

items include (1) Never, (2) Rarely, (3) Sometimes, (4) Often, and (5) Almost Always.

- **INDEPENDENT VARIABLE, COVID PROTECTIVE BEHAVIORS:** Questions were used to determine the confidence levels respondents had in the behaviors used to protect them from exposure to COVID-19. Protective behaviors refer to social distancing, masking, and other behavioral components developed in the COVID Stress Scale.²² The questions asked respondents to evaluate how confident they were their own ability, the ability of their colleagues, and the ability of administrators to protect them from COVID-19.
- **INDEPENDENT VARIABLES, DEMOGRAPHICS:** We included several demographic items relevant to prior research and in accordance with our own interest in studying urban-rural differences. Race was measured dichotomously as white/non-white, due to having a small non-stratified sample. Gender was also measured dichotomously as male/female. We also wanted to examine urban-rural differences, so we included two variables. The first asked about whether respondents grew up in a rural area, and the other asked if they identify as a country or city person. This allowed us to separate the effects of rural identity from rural residential experience.
- **HYPOTHESES:** This study’s hypotheses build on and extends prior research testing factors associated with teacher distress:
 - We expect job satisfaction and efficacy to be associated with lower distress.
 - We expect to observe gender, racial, and urban-rural differences in distress levels, with women, non-white minorities, and rural/country residents expressing higher levels of distress due to a lower level of support.
 - We expect virus anxiety to increase overall levels of distress.
 - We expect all forms of confidence (self, colleagues, administrators) in the use of protective behaviors to be associated with a lower level of distress.

Analysis and Results

To test our research questions and hypotheses, we perform a series of Ordinary Least Squares regression analyses—a technique appropriate for modeling the relationship between one dependent variable and one or more independent variables. OLS regression is effective for delivering interpretability, evaluating predictive power,

interpreting inferences through statistical significance tests, and drawing conclusions about hypotheses based on standardized and unstandardized coefficients.

Our regression model equation can be represented as $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \varepsilon$

Where:

- Y is the dependent variable, the Kessler-6 Distress Scale.
- X_1, X_2, \dots, X_n are independent variables (a complete list is shown in table 1 with descriptive statistics, and also shown in specific model arrangements in regression tables 3a-3e).
- $\beta_0, \beta_1, \beta_2, \dots, \beta_n$ are the regression coefficients, representing the relationship between the independent and dependent variables. We interpret these to evaluate our hypotheses. We interpret the associated tests of significance to draw inferences from our sample to the population.
- ε represents the error term, accounting for unexplained variation, corresponding to the coefficient of non-determination, $1-r^2$.
- For each model, we interpret the resulting coefficient of determination, r^2 , to draw conclusions about the overall predictive power of the model.
- We examine each regression model for potential issues of multicollinearity by interpreting the Variance Inflation Factors (VIF) and Tolerance statistics for each independent variable. We did not identify any issues with multicollinearity in the models reported below.

Before statistical modeling, we engaged in a careful screening of our data to ensure there were

no problems with outliers or missing data, using the data exploration tools available in the IBM SPSS Statistical software package. We did not detect problems requiring correction following the data screening. For our analysis, we examined all cases for which there was complete data on the dependent variable.

After screening the data, we examined each individual variables' descriptive statistics, as reported in Table 1. The results for our dependent variable reveal that most teachers scored relatively low on the Kessler-6 Psychological Distress Scale, averaging a little more than 2 on a 6-point scale. This means the average teacher is not dealing with extreme forms of distress. Among our independent variables, job satisfaction and efficacy indicators, range from 3.89 to 5.02 on a 7-point scale, suggesting moderate levels of job satisfaction for the typical teacher. Virus anxiety indicators range from 1.38 to 2.86 on a 5-point scale, suggesting that most teachers experienced low to moderate levels of anxiety specific to the COVID-19 virus. Finally, indicators of confidence in protective behavior were measured on a 7-point scale and show a very high level of confidence in one's own ability to engage in protective behaviors (6.31), while confidence in colleagues (5.07) or administrators (5.16) was comparatively lower. The demographic profile of our sample is predominantly white (96.59%), female (77.44%), employed full time (96.61%), having a rural upbringing (60.23%), but most teachers did not identify as being a country person (39.2%) suggesting a difference between rural context and identity.

Table 1. Descriptive Statistics

<u>Variable Name</u>	<u>Statistics</u>
V1. Kessler-6 Distress (range: 1-6)	$\bar{X}=2.28, SD=0.90$
V2. Job Satisfaction and Efficacy:	
V2.1 Bursting with Energy at Work (range: 1-7)	$\bar{X}=3.89, SD=1.31$
V2.2 Strong and Vigorous at Work (range: 1-7)	$\bar{X}=3.96, SD=1.30$
V2.3 Enthusiastic about Job (range: 1-7)	$\bar{X}=4.48, SD=1.25$
V2.4 Job Inspires Me (range: 1-7)	$\bar{X}=4.39, SD=1.36$
V2.5 When I Get Up, Feel Like Going to Work (range: 1-7)	$\bar{X}=4.22, SD=1.51$
V2.6 Happy When Work Intensely (range: 1-7)	$\bar{X}=4.56, SD=1.25$
V2.7 Proud of Work (range: 1-7)	$\bar{X}=5.02, SD=1.10$
V2.8 Immersed in My Work (range: 1-7)	$\bar{X}=4.75, SD=1.20$
V2.9 Get Carried Away When Working (range: 1-7)	$\bar{X}=4.17, SD=1.44$
V2.10 Efficacy: Confident About Work Habits (range: 1-7)	$\bar{X}=4.48, SD=0.67$
V3. Virus Anxiety:	
V3.1 Trouble Concentrating Because of Virus (range: 1-5)	$\bar{X}=2.25, SD=1.04$
V3.2 Disturbing Mental Images of Virus (range: 1-5)	$\bar{X}=1.71, SD=0.95$
V3.3 Trouble Sleeping Because of Virus (range: 1-5)	$\bar{X}=1.80, SD=1.02$
V3.4 Thought About Virus (range: 1-5)	$\bar{X}=2.25, SD=1.07$
V3.5 Physical Reaction, Thinking About Virus (range: 1-5)	$\bar{X}=1.55, SD=0.91$

Variable Name	Statistics
V3.6 Bad Dreams of Virus (range: 1-5)	$\bar{X}=1.38, SD=0.74$
V3.7 Worry About Managing Day and Time (range: 1-5)	$\bar{X}=2.40, SD=1.31$
V3.8 Worried about Catching Virus (range: 1-5)	$\bar{X}=2.86, SD=1.15$
V4. Protective Behaviors:	
V4.1 Confident in My Abilities/Skills (range: 1-7)	$\bar{X}=6.31, SD=0.93$
V4.2 Confident in Colleagues Abilities/Skill (range: 1-7)	$\bar{X}=5.07, SD=1.48$
V4.3 Confident in Administrators Abilities/Skills (range: 1-7)	$\bar{X}=5.16, SD=1.66$
V5. Demographic Variables:	
V5.1 Race (=White)	96.59%
V5.2 Gender (=Female)	77.44%
V5.3 Work Status (=Full Time)	96.61%
V5.4 Grew Up (=Rural)	60.23%
V5.5 Identity (=Country)	39.20%

Following our descriptive analysis, we created a bivariate correlation matrix in IBM SPSS Statistics. Reviewing the zero-order bivariate correlations (Table 2), we find that the Kessler-6 Distress Scale had moderate negative association with nearly all the job satisfaction and efficacy indicators. This suggests that teachers who are more satisfied with their work were less likely to be experiencing distress. Meanwhile, nearly all the virus anxiety indicators had moderate to strong associations with distress, suggesting that those who worried the most about COVID-19 were likely to experience

generalized distress. Finally, the protective behavior indicators each had negative but weak associations with distress. This suggests that those who were more confident in being protected from COVID-19 were less likely to suffer from generalized distress. We did not find many demographic associations that were statistically significant. The exception is gender, which indicates females were slightly more likely to be experiencing distress than other members of the sample.

Table 2. Correlations: Distress and Virus Anxiety

Variable Name	V1.	V2.1	V2.2	V2.3	V2.4	V2.5	V2.6
V1. Kessler-6 Distress	-						
V2. Job Satisfaction and Efficacy:	-						
V2.1 Bursting with Energy at Work	-.369**	-					
V2.2 Strong and Vigorous at Work	-.432**	.801**	-				
V2.3 Enthusiastic About Job	-.330**	.603**	.669**	-			
V2.4 Job Inspires Me	-.230**	.542**	.604**	.777**	-		
V2.5 When I Get Up, Feel Like Going to Work	-.319**	.523**	.555**	.563**	.542**	-	
V2.6 Happy When Work Intensely	-.288**	.434**	.503**	.534**	.527**	.475**	-
V2.7 Proud of Work	-.292**	.378**	.473**	.604**	.583**	.432**	.565**
V2.8 Immersed in My Work	-.158**	.359**	.411**	.492**	.492**	.411**	.406**
V2.9 Get Carried Away When Working	-.076	.338**	.348**	.435**	.412**	.314**	.347**
V2.10 Efficacy: Confident About Work	-.299**	.279**	.302**	.256**	.226**	.219**	.285**
Habit							
V3. Virus Anxiety:							
V3.1 Trouble Concentrating Because of Virus	.568**	-.234**	-.253**	-.224**	-.117**	-.180**	-.147**
V3.2 Disturbing Mental Images of Virus	.520**	-.186**	-.186*	-.145**	-.073	-.092*	-.044
V3.3 Trouble Sleeping Because of Virus	.562**	-.242**	-.226**	-.216**	-.117**	-.184**	-.133**
V3.4 Thoughts About Virus	.536**	-.216**	-.241**	-.206**	-.127**	-.176**	-.098*
V3.5 Physical Reaction, Thinking About Virus	.547**	-.207**	-.216**	-.198**	-.107**	-.134**	-.126**
V3.6 Bad Dreams of Virus	.463**	-.192**	-.181**	-.206**	-.124**	-.134**	-.175**
V3.7 Worry About Managing Day and Time	.577**	-.279**	-.316**	-.219**	-.186**	-.190**	-.250**
V3.8 Worried About Catching Virus	.459**	-.243**	-.233**	-.178**	-.105**	-.139**	-.080*
V4. Protective Behaviors							
V4.1 Confident in my Abilities/ Skills	-.142**	.189**	.188**	.112**	.097*	.175**	.163**

Variable Name	V1.	V2.1	V2.2	V2.3	V2.4	V2.5	V2.6
V4.2 Confident in Colleagues Abilities/Skills	-.248**	.258**	.261**	.262**	.208**	.216**	.095*
V4.3 Confident in Administrators Abilities/Skills	-.262**	.264**	.281**	.265**	.272**	.243**	.118**
V5. Demographic Variables							
V5.1 Race (=White)	-.065	.033	-.040	-.022	-.050	.010	-.050
V5.2 Gender (=Female)	.132**	-.074	-.078	-.046	.008	-.023	-.017
V5.3 Work Status (=Full Time)	.025	-.036	-.026	.014	.060	-.037	.012
V5.4 Grew Up (=Rural)	.031	-.002	.020	.060	.031	.034	-.030
V5.5 Identity (=Country)	-.010	.007	-.027	-.005	-.040	.003	.028

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 2b. Correlations: Distress and Virus Anxiety (Continued)

Variable Name	V2.7	V2.8	V2.9	V2.10	V3.1	V3.2	V3.3
V1. Kessler-6 Distress							
V2. Job Satisfaction and Efficacy:							
V2.1 Bursting with Energy at Work							
V2.2 Strong and Vigorous at Work							
V2.3 Enthusiastic About Job							
V2.4 Job Inspires Me							
V2.5 When I Get Up, Feel Like Going to Work							
V2.6 Happy When Work Intensely							
V2.7 Proud of Work	-						
V2.8 Immersed in My Work	.504**	-					
V2.9 Get Carried Away When Working	.354**	.593**	-				
V2.10 Efficacy: Confident About Work	.313**	.147**	.058	-			
Habit							
V3. Virus Anxiety:							
V3.1 Trouble Concentrating Because of Virus	-.127**	-.069	.011	-.154**			
V3.2 Disturbing Mental Images of Virus	-.107**	-.070	.000	-.074	.694**	-	
V3.3 Trouble Sleeping Because of Virus	-.119**	-.040	-.041	-.150**	.749**	.706**	-
V3.4 Thoughts About Virus	-.137**	-.073	-.006	-.139**	.734**	.654**	.716**
V3.5 Physical Reaction, Thinking About Virus	-.140**	-.061	-.050	-.141**	.621**	.629**	.712**
V3.6 Bad Dreams of Virus	-.156**	-.004	.000	-.138**	.538**	.566**	.654**
V3.7 Worry About Managing Day and Time	-.216**	-.032	.015	-.360**	.425**	.307**	.399**
V3.8 Worried About Catching Virus	-.128**	-.032	.016	-.127**	.635**	.493**	.570**
V4. Protective Behaviors							
V4.1 Confident in my Abilities/ Skills	.155**	.171**	.118**	.291**	-.075	-.072	-.100**
V4.2 Confident in Colleagues Abilities/Skills	.158**	.081*	.079*	.219**	-	-	-.328**
V4.3 Confident in Administrators Abilities/Skills	.198**	.112**	.087*	.245**	-.327**	.232**	-.296**
V5. Demographic Variables							
V5.1 Race (=White)	-.029	-.022	-.016	.040	-.023	-.060	-.036
V5.2 Gender (=Female)	.003	.010	-.013	-.010	.174**	.162**	.202**
V5.3 Work Status (=Full Time)	-.005	.057	.095*	.001	-.030	-.012	-.027
V5.4 Grew Up (=Rural)	-.010	-.030	.050	-.019	-.006	.032	.009
V5.5 Identity (=Country)	-.041	-.001	.016	-.050	-.002	-.036	.024

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 2c. Correlations: Distress and Virus Anxiety (Continued)

Variable Name	V3.4	V3.5	V3.6	V3.7	V3.8	V4.1
V1. Kessler-6 Distress						
V2. Job Satisfaction and Efficacy:						
V2.1 Bursting with Energy at Work						
V2.2 Strong and Vigorous at Work						
V2.3 Enthusiastic About Job						
V2.4 Job Inspires Me						
V2.5 When I Get Up, Feel Like Going to Work						
V2.6 Happy When Work Intensely						
V2.7 Proud of Work						
V2.8 Immersed in My Work						
V2.9 Get Carried Away When Working						
V2.10 Efficacy: Confident About Work Habit						
V3. Virus Anxiety:						
V3.1 Trouble Concentrating Because of Virus						
V3.2 Disturbing Mental Images of Virus						
V3.3 Trouble Sleeping Because of Virus						
V3.4 Thoughts About Virus	-					
V3.5 Physical Reaction, Thinking About Virus	.626**	-				
V3.6 Bad Dreams of Virus	.537**	.642**	-			
V3.7 Worry About Managing Day and Time	.429**	.384**	.327**	-		
V3.8 Worried About Catching Virus	.602**	.470**	.399**	.302**	-	
V4. Protective Behaviors						
V4.1 Confident in my Abilities/ Skills	-.093*	-.103**	-.104**	-.093*	-.176**	-
V4.2 Confident in Colleagues Abilities/Skills	-.311**	-.270**	-.264**	-.199**	-.410**	.297**
V4.3 Confident in Administrators Abilities/Skills	-.272**	-.226**	-.248**	-.240**	-.359**	.279**
V5. Demographic Variables						
V5.1 Race (=White)	-.058	-.047	-.054	-.023	-.032	-.003
V5.2 Gender (=Female)	.202**	.172**	.130**	.057	.108**	-.025
V5.3 Work Status (=Full Time)	-.032	-.008	.005	.095*	-.070	.087*
V5.4 Grew Up (=Rural)	-.020	.001	.034	.009	.001	-.103*
V5.5 Identity (=Country)	-.033	.012	-.014	.038	-.047	-.056

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 2d. Correlations: Distress and Virus Anxiety (Continued)

Variable Name	V4.2	V4.3	V5.1	V5.2	V5.3	V5.4	V5.5
V1. Kessler-6 Distress							
V2. Job Satisfaction and Efficacy:							
V2.1 Bursting with Energy at Work							
V2.2 Strong and Vigorous at Work							
V2.3 Enthusiastic About Job							
V2.4 Job Inspires Me							
V2.5 When I Get Up, Feel Like Going to Work							
V2.6 Happy When Work Intensely							
V2.7 Proud of Work							
V2.8 Immersed in My Work							
V2.9 Get Carried Away When Working							
V2.10 Efficacy: Confident About Work Habit							
V3. Virus Anxiety:							
V3.1 Trouble Concentrating Because of Virus							
V3.2 Disturbing Mental Images of Virus							
V3.3 Trouble Sleeping Because of Virus							
V3.4 Thoughts About Virus							
V3.5 Physical Reaction, Thinking About Virus							

Variable Name	V4.2	V4.3	V5.1	V5.2	V5.3	V5.4	V5.5
V3.6 Bad Dreams of Virus							
V3.7 Worry About Managing Day and Time							
V3.8 Worried About Catching Virus							
V4. Protective Behaviors							
V4.1 Confident in my Abilities/ Skills							
V4.2 Confident in Colleagues Abilities/Skills	-						
V4.3 Confident in Administrators Abilities/Skills	.698**	-					
V5. Demographic Variables							
V5.1 Race (=White)	.026	.030	-				
V5.2 Gender (=Female)	-.019	.020	.039	-			
V5.3 Work Status (=Full Time)	.052	.053	-.034	-.059	-		
V5.4 Grew Up (=Rural)	-.046	-.045	.021	-.036	-.025	-	
V5.5 Identity (=Country)	-.034	.003	.001	-.033	-.046	.383**	-

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

To better understand the effects of our independent variables, net of controls, we used Ordinary Least Squares regression predicting the Kessler-6 Psychological Distress Scale. The first stage of our analysis is broken down into the main content areas of virus anxiety (Table 3a), protective behaviors (Table 3b), job satisfaction and efficacy (Table 3c), and demographics (Table 3d). The second stage combines the variables into a full model, which is then trimmed to retain only statistically significant effects (Table 3e).

To begin, we find in the virus anxiety model a significant f-statistic that we interpret to mean the model is a good fit to the data. The explained variation, indicated by the R² value, suggests that more than half of the distress is explained by the virus anxiety model. We observe that five of the eight indicators are statistically significant. The strength of the effects shown by the standardized betas was generally low. The strongest effect was for the indicator that asked about whether virus anxiety harmed the ability of the respondent to structure their day and manage their time.

Table 3a. OLS Regression Results – Virus Anxiety

Coefficients ^a	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
During the past 30 days...							
...I had trouble concentrating because I kept thinking about the virus.	.660	.259	.128	2.553	.011	.306	3.265
...disturbing mental images about the virus popped into my mind against my will.	.763	.243	.136	3.145	.002	.411	2.432
...I had trouble sleeping because I worried about the virus.	.197	.274	.038	.719	.472	.277	3.610
...I thought about the virus when I didn't mean to.	-.064	.237	-.013	-.270	.787	.345	2.898
...reminders of the virus caused me to have physical reactions, such as sweating or a pounding heart.	.905	.253	.155	3.581	<.001	.407	2.458
...I had bad dreams about the virus.	.309	.278	.044	1.110	.267	.495	2.021
...I worried about my ability to structure my day and manage my time in order to succeed in my work.	1.570	.130	.377	12.031	<.001	.779	1.283
I am worried about catching the virus.	.436	.176	.093	2.479	.013	.549	1.822
(Constant)	3.690	.461		7.998	<.001		
Model Results:	R ² : .514			F-statistic: 98.86***			

^a Dependent Variable: Kessler 6 Distress Scale

*** Correlation is significant at the 0.001 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

The next model, examining confidence in protective behaviors, had a significant f-statistic, suggesting a good fit to the data, but a relatively small amount of explained variation indicated by the R² value (.076). Two of the three indicators were statistically

significant, but with weak negative effects shown by the standardized betas. Confidence in administrators' protective behaviors had the strongest effect, suggesting such confidence is associated with lower distress.

Table 3b. Results – COVID-19 Protective Behaviors

Coefficients ^a							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
I have confidence in my own skills and abilities to develop and sustain successful COVID-19 protective behaviors.	-.297	.243	-.049	-1.222	.222	.884	1.131
I have confidence in the skills and abilities of my colleagues at school to develop and sustain successful COVID-19 protective behaviors.	-.413	.198	-.113	-2.089	.037	.498	2.008
I have confidence in the skills and abilities of the school administration and staff to develop, implement and sustain successful COVID-19 protective behaviors.	-.553	.174	-.171	-3.175	.002	.502	1.990
(Constant)	20.496	1.481		13.843	<.001		
Model Results:	R ² : .076			F-statistic: 18.375***			

^a Dependent Variable: Kessler 6 Distress Scale
 *** Correlation is significant at the 0.001 level (2-tailed).
 ** Correlation is significant at the 0.01 level (2-tailed).
 * Correlation is significant at the 0.05 level (2-tailed).

The third content area addresses job satisfaction and efficacy. This is a significant model, as indicated by the f-statistic, and it explains roughly a quarter of the variation in distress, per the R² value. Of the ten indicators, seven were statistically

significant with generally weak effects observed in the standardized beta coefficients. The strongest effect was reported by those who said that they felt strong and vigorous at their jobs, who were less likely to experience generalized distress.

Table 3c. Results – Job Satisfaction and Efficacy

Coefficients ^a							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
At my work, I feel bursting with energy.	-.223	.252	-.054	-.886	.376	.338	2.955
At my job, I feel strong and vigorous.	-1.224	.276	-.291	-4.438	<.001	.287	3.479
I am enthusiastic about my job.	-.547	.288	-.124	-1.895	.059	.288	3.474
My job inspires me.	.808	.248	.201	3.256	.001	.324	3.085
When I get up in the morning, I feel like going to work.	-.409	.169	-.113	-2.413	.016	.570	1.755
I feel happy when I am working intensely.	-.231	.205	-.053	-1.129	.259	.570	1.754
I am proud of the work that I do.	-.493	.250	-.099	-1.972	.049	.491	2.035
I am immersed in my work.	.130	.225	.028	.577	.564	.528	1.896
I get carried away when I am working.	.355	.171	.093	2.080	.038	.619	1.614
I am confident about my work habits to succeed with my daily work of my job.	-1.174	.317	-.142	-3.705	<.001	.842	1.188
(Constant)	26.767	1.484		18.039	<.001		
Model Results:	R ² : .223			F-statistic: 20.661***			

^a Dependent Variable: Kessler 6 Distress Scale
 *** Correlation is significant at the 0.001 level (2-tailed).
 ** Correlation is significant at the 0.01 level (2-tailed).
 * Correlation is significant at the 0.05 level (2-tailed).

The fourth model shows the result of the demographic variables. It has a significant f-statistic but a very low amount of explained variation, according to the R² value, of only 2 percent. The only significant effects were found for race and gender, with white respondents generally reporting

lower distress and female respondents reporting higher distress. We note that the effect of race was not apparent in the zero-order correlations, but significant in the regression model. We found no urban-rural differences.

Table 3d. Results – Demographics

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
White	-2.735	1.288	-.086	-2.124	.034	.997	1.003
Female	1.897	.530	.145	3.580	<.001	.993	1.007
Full Time	.912	1.198	.031	.762	.447	.993	1.007
Rural (Grew Up)	.642	.485	.058	1.324	.186	.855	1.170
Country Identity	-.221	.607	-.016	-.364	.716	.855	1.170
(Constant)	13.790	1.871		7.369	<.001		
Model Results:	R ² : .022		F-statistic: 3.729**				

^a Dependent Variable: Kessler 6 Distress Scale

*** Correlation is significant at the 0.001 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Finally, the combined and trimmed model, presented in Table 3e, includes only statistically significant effects that remain following the analysis of a saturated model that included all variables. The final model is statistically significant, per the f-statistic, and explains about 56 percent of the variation in distress. Among the significant effects are five virus anxiety indicators and two job satisfaction indicators. None of the demographic

indicators were significant net of the other variables in the model, and so were not retained. Of the individual effects, the ones most associated with higher distress were for teachers struggling to structure their week and manage their time or who had physical reactions to thoughts about COVID-19. However, those who felt strong and vigorous at work or who felt like going to work in the morning had lower levels of distress.

Table 3e. Results – Final Model – Virus Anxiety & Job Satisfaction

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
During the past 30 days...							
...I had trouble concentrating because I kept thinking about the virus.	.536	.227	.103	2.357	.019	.371	2.698
...disturbing mental images about the virus popped into my mind against my will.	.931	.221	.165	4.224	<.001	.467	2.142
...reminders of the virus caused me to have physical reactions, such as sweating or a pounding heart.	1.054	.214	.179	4.925	<.001	.539	1.857
...I worried about my ability to structure my day and manage my time in order to succeed in my work.	1.387	.127	.330	10.884	<.001	.770	1.298
I am worried about catching the virus.	.360	.166	.076	2.165	.031	.573	1.745
At my job, I feel strong and vigorous.	-.680	.140	-.163	-4.866	<.001	.632	1.582
When I get up in the morning, I feel like going to work.	-.343	.117	-.095	-2.942	.003	.684	1.462
(Constant)	8.962	.779		11.458	<.001		
Model Results:	R ² : .562		F-statistic: 114.311***				

^a Dependent Variable: Kessler 6 Distress Scale

*** Correlation is significant at the 0.001 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Discussion

While it is likely that many of the negative effects of the pandemic will be overcome by a return to normal social and economic conditions,²⁰ the lessons learned here and in past studies suggest the need for improved preparation. Providing resources to enhance the levels of job satisfaction and self-efficacy of teachers can create resiliency to help carry teachers through crises such as the pandemic. However, even controlling for job satisfaction, some individuals suffer high levels of anxiety specific to the pandemic. We do not have data that explains why some teachers developed an extreme anxiety reaction to COVID-19 while others did not and believe this would be a valuable question to pursue in future research. We did find that virus anxiety was a strong contributing factor to non-specific distress.

The findings suggest that teachers with high job satisfaction weathered the crisis better than those with lower job satisfaction. This finding underlines the importance of creating adequate remuneration and working conditions for teachers, each of which are related to job satisfaction across professions. The confidence in school administration is an important aspect of job satisfaction, and as such the importance of administrators setting up transparent and sympathetic systems for teacher support is also important for reducing distress. Further, the time and the technological supports to help teachers structure their daily tasks can also reduce distress.

Overall, the findings presented here align with prior studies of teachers as well as other public-facing “helping” professions. In other fields, the threat of the disease, poor health, and economic uncertainty elevated distress,^{23,24} which was more pronounced among women.²⁵ In the child care sector, two studies found that about half of care providers reported elevated levels of stress as a result of the pandemic.^{26,27} Similarly, workers in public health experienced extreme distress as a result of relaying health information and government mandates to an often-skeptical and even aggressive members of the public.²⁸ Distress was often mitigated by a supportive social network, both among college students^{29,30,31} and for those living in marginalized communities.^{32,33} Perhaps virus anxiety can be mitigated by a supportive social network—another important question for future research. We found weak evidence of inequality by gender and race—effects that were removed when virus anxiety levels were included in the analysis. This implies that women and racial minorities may be more inclined to suffer from virus anxiety. Such an indirect effect could be the focus on a future study.

As noted earlier, prior research suggests the need for enhanced training in coping strategies, such as the practice of mindfulness³⁴ and self-care,³⁵ while taking measures to improve connections with colleagues^{36,37,38} and with family and friends.³⁹ Online mental health services may serve as an essential tool for the mental health care response to pandemics.⁴⁰ Beyond psychological and social supports, physical exercise has been shown to be beneficial for teachers coping with general stress and anxiety.⁴¹ Similarly, school leadership can benefit from the same social and mental health supports as teachers, thereby making them a better source of support,^{42,43} while fostering a more supportive school climate.⁴⁴

Since instructional self-efficacy has been found to be more important than emotional regulation in minimizing anxiety during the pandemic,⁴⁵ findings suggest that teacher training programs should incorporate a significant technology component that better prepares teachers for distance education.⁴⁶ Teachers with higher levels of job satisfaction and self-efficacy were in a better position to cope with technological challenges,^{12,47,48,49} therefore, teachers need support in the forms of professional and technological skill development.¹¹ While the pandemic was involuntary and carried significant difficulties, over the long term, it created novel distance education technologies and pedagogical innovations.⁵⁰ Teachers benefitted from flexibility, the possibility of creating new teaching methods, and the opportunity to learn new skills while teaching online.¹¹ Educators might benefit from adopting a blended approach that combines online and face-to-face learning to overcome the limitations of purely online learning and provide a more effective and engaging learning experience.^{51,53} Such training will enhance job satisfaction and self-efficacy for teachers.

Conclusions

Overall, social inequalities along racial and gender dimensions were observed to result in differences in levels of distress among teachers. However, these differences were no longer present when controlling for virus anxiety, job satisfaction, and confidence in protective behaviors. Job satisfaction was partially implicated in mitigating distress among teachers, but it is also a factor that can be mitigated whether there is an ongoing pandemic or not. In contrast, virus anxiety specific to COVID-19 was the biggest risk factor in elevating distress among teachers but is, of course, specific to the pandemic itself. To address virus anxiety, it should be noted that confidence in the use of protective behaviors had

some effect in reducing teacher distress when isolated, but no significant effect when the other factors were simultaneously considered. Our findings are limited by the parameters of the population we sought to study in upstate New York, and a limitation of our results is thus broader generalizability.

SUMMARY: Our findings align with and extend previous research. The implications suggest policies and practices aimed at building resiliency among teachers through a focus on training and the building of social supports that enhance job satisfaction and self-efficacy. While protective behaviors are important for preventing the spread of disease in a pandemic, such behaviors did little to diminish distress levels among teachers. For those who had virus-specific anxiety, confidence in protective behaviors helped to modestly improve general distress levels. However, we believe it valuable for future studies to uncover some of the precursors to virus anxiety. Prior research suggests that distress is mitigated by strong social capital and cohesion. Organizations in education, child care, and public health should foster stronger social support for employees and their families. This includes relationships between families and those caring for and educating their children, among employees working together in the same industry and between employees and their supervisors while also supporting the relationships between workers and their families to establish a health work-life balance. The bureaucratic nature of organizations

often runs counter to such goals, as noted by Max Weber a century ago.⁵⁴ Hierarchical bureaucratic organization lends itself to impersonal social relationships both within the organization and with outside actors, and little if any research in subsequent years has falsified Weber's observations. Schools are often exemplary of the most impersonal qualities of bureaucracies, but finding ways to improve social connections and supports will help create resilience for the next pandemic.

Declarations

CONFLICT OF INTEREST STATEMENT: The authors declare no potential conflicts of interest or competing interests.

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ETHICS APPROVAL: The original survey data collected for the project were approved by the Institutional Review Board through SUNY Oneonta, STUDY00002542: KABB Faculty Staff. This survey was approved as a modification designed specifically for public school employees (MOD00001483).

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