

Generalized Anxiety Disorder and Sleep Quality during the COVID-19 Outbreak in Adolescents & Parents: A Web-Based Cross-Sectional Survey

Kaylin Spinelli¹*, Stephen J. Sullivan¹

¹Sacred Heart Academy, Hempstead, NY USA

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Abstract

Many previous studies have shown that one's anxiety is often heightened during disease pandemics. The present study found evidence that essential workers and their families are at an increased risk for anxiety, stress and sleep disruption. 160 female adolescents and 75 of their parents completed surveys measuring anxiety and sleep quality during the COVID-19 pandemic. The two samples, although drawn from the same community, were not linked. All adolescents attend an all-girls academy in suburban New York. T-tests and regression analyses suggest that essential workers and their families are at elevated risk for mental illness.

Keywords: Anxiety, Mental health, COVID-19, Frontline workers, Sleep quality

1. Introduction

The stress levels of countless people throughout the world have grown exponentially during the COVID-19 pandemic. Numerous studies show that one's anxiety is often heightened during disease outbreaks (Tausczik, et al., 2012; Grover, et al., 2020). Studies also show that lack of mental health help during disease outbreaks can play a role in the spread of the disease and in the emotional stress during and after the outbreak. (Cullen, et al., 2020). Every individual copes with stress and anxiety differently, they are brought on in a variety of ways for people at different times. Some individuals cope with anxiety and stress by sleeping more, while others find it difficult to fall asleep at all during stressful or anxious times. The severity of the COVID-19 pandemic has certainly increased anxiety more significantly in more people, than most other diseases. Another reason is because people have been confined to their homes for extended periods of time

(Pfefferbaum & North, 2020). This pandemic was especially stressful because it was particularly hard to control things in larger cities. (The Lancet, 2020; Ciotti, et al., 2020). "Implementing public health measures is difficult in places with overcrowded living conditions and inadequate hygiene and sanitation." (The Lancet, 2020) After almost two years after "patient zero" positive tests and quarantines remain too common.

Teens are developmentally prone to high anxiety levels (Henker, et al., 2002). At their age, it is most common to worry about peer acceptance and academic performance (Henker, et al., 2002). Now teens feel they have additional anxiety brought on by a once-in-a-century pandemic. Gupta, et al., (2020) found that during the lockdown phase of the pandemic, many individuals reduced their hours of nighttime sleep-in favor of taking more mid-day naps. This pattern slowly undermined mental health (Gupta, et al., 2020). Lee, et al., (2020) found that the two most common mental health disorders to come

* Corresponding Author
kkspinelli164@gmail.com

Advisor: Stephen J. Sullivan (Ph.D.)
sully49@gmail.com

from a pandemic are post- traumatic stress disorder and anxiety.

A study of healthcare workers in Sudan found heightened anxiety during the COVID-19 pandemic (Elamin, 2020). This raises the question of the extent to which the heightened anxiety levels of healthcare workers might affect their families. El-Hage, *et al.*, (2020) states that many healthcare workers have suffered from mental health issues during the pandemic. Resources to promote mental well-being in health care professionals needs to be a standard part of disease outbreak protocol (El-Hage, *et al.*, 2020). The present study examines not only the anxiety levels and sleep quality of individuals who self-identify as essential workers, but also those individuals who self-identify as the child of an essential worker. Essential workers were classified people who worked on the front lines during the pandemic and could not work from home. A few examples are Doctors, nurses, paramedics, etc. Did these two groups report significantly higher COVID-19 related anxiety or more significantly disrupted sleep than peers from a non-essential worker family?

Our study is a cross-sectional, web-based survey testing generalized anxiety disorder and sleep quality during the COVID-19 pandemic in adolescents and their parents. A similar study of adult workers - frontline and non-frontline - was conducted in China in March 2020 at the height of the pandemic. We intentionally followed similar research protocols to better compare our February 2021 results in New York with the February 2020 data collected by Chinese scholars. Huang & Zhao (2020) found that younger female people and essential workers were at highest risk of mental illness due to the COVID-19 outbreak. The present research tests whether the mid-pandemic anxiety levels and sleep quality of essential workers and their children differed from that of their peers using the *Generalized Anxiety Disorder Survey (GAD-7)* and the *Pittsburgh Sleep Quality Index questionnaire (PSQI)*. The *GAD-7* is a valid and efficient tool for screening for Generalized Anxiety Disorder and assessing its severity in clinical practice as well as in research.

The aim of this study is to (1) gain a better understanding of the effects of a global pandemic on

adolescents and their parents and, (2) to uncover the impact essential workers have on the anxiety levels and sleep quality of their families during a pandemic - present or future. It is hypothesized that essential workers and their family members will be at higher risk for anxiety and suffer from poorer sleep quality. It is also hypothesized that adolescents will report greater anxiety levels (higher *GAD-7* scores) and poorer sleep quality (as per *PSQI*) compared to adults.

2. Methods and Materials

2.1 Participants

We recruited 160 female adolescents from an all-girls Catholic academy in a suburb of New York City and 75 of their parents. However, students' and parents' respective surveys were not linked. We observed both parents and children but did not look for direct comparison between parents and their own child(ren). We sought to survey adults and teens from the same community, not necessarily test for specific parental influence on individual girls. The participants were told that the project involved "sleep quality and anxiety levels during the COVID-19 pandemic." The sample was reasonably representative of the racial/ethnic makeup of the school. The school, although "increasingly diverse," is more Euro-American in makeup than the surrounding county (see Table 1).

2.2 Procedure

After informed consent was received from the adolescent subjects and one custodial parent/guardian (study 1) or from adult subjects (study 2). Participants completed the survey electronically via Google Forms. Students were identified by their school-issued ID numbers', parents were identified by the last four digits of their phone number and their birth month. Although all responses were kept anonymous, researchers sought to discreetly identify subjects in case respondents requested that their information be removed from the study at a later date. Each subject completed demographic information, questions about parents/guardians' schooling and

profession (or their own schooling and profession if adults were the subjects). Subjects next took the Generalized Anxiety Disorder-7 (*GAD-7*) survey, and the Pittsburgh Sleep Quality Index (*PSQ*) questionnaire. The *GAD-7* has been proven to be one of the most effective methods of measuring anxiety (Spitzer, *et al.* 2006). Parents were classified as

essential or non-essential workers. Thus, two measures of “essential worker” were used - the respondent’s and New York States’. From there we were able to test how the jobs of parents might affect the anxiety levels and the sleep quality of their children.

Table 1: High School Ethnicity Statistics

Ethnicity*	High School Population**	Nassau County ⁺	United States ⁺	Sample % for adolescents	Sample % for parents
White	74%	58.5%	60.1%	70.2%	64.3%
Black	10%	13.1%	13.4%	12.9%	14.3%
Asian	11%	10.9%	5.9%	5.6%	3.6%
Hispanic	4%	17.5%	18.5%	11.3%	17.9%
Other	-	2.6%	4.3%	1.6%	0%

* Totals may not equal 100 due to those who reported themselves as multiracial.

**2018-19 data provided by Sacred Heart Academy Annual 2019 Report to NYSED

+ 2019 U.S. Census Estimate

Table 2: Sample Gender Statistics

Gender*	Sample % for adolescents	Sample % for parents
Male	0%	38%
Female	100%	62%

* The high school population studied was drawn from an all-girls academy.

Table 2.5: Sample Age Statistics

Age*	High school population	Sample % for adolescents
13	1.0%	0%
14	25.7%	16.1%
15	22.8%	25.8%
16	31.7%	27.4%
17	13.9%	25.8%
18	4.9%	4.8%

*This sample consists of 120 high school students from an increasingly diverse Catholic all-girls high school

Table 4: Anxiety and Sleep Quality Scales

Title	Author(s) / Date	Purpose / Sample Questions
Generalized Anxiety Disorder 7-Item (<i>GAD-7</i>) Scale	Spitzer, <i>et al.</i> (2006)	Over the last 2 weeks, how often have you been bothered by the following problems? (Likert scale of 0 to 3) #1 Feeling nervous, anxious, or on edge. #2 Not being able to stop or control worrying. #3 Worrying too much about different things.
Pittsburgh Sleep Quality Index (<i>PSQI</i>)	Buysse, <i>et al.</i> (2010)	#1 During the past month, what time have you usually gone to bed at night? #2 During the past month, how long (in minutes) has it usually taken you to fall asleep each night? #3 During the past month, what time have you usually gotten up in the morning?

Table 5: Variables

Independent (x)	Dependent (y)	Covariates
Essential worker - vs. - Nonessential worker	<i>GAD-7</i> score	Age, race/ethnicity, SES, previous mental health condition
Child of essential worker - vs. - Child of nonessential worker	<i>PSQI</i> sleep hours subscore	

3. Results

Teens reported a significantly higher prevalence of anxiety symptoms (*GAD-7*) than older people. However, adults did not report achieving significantly more sleep, measured in hours. Occupationally, workers self-identifying as essential workers and teens who self-identified themselves as the children of essential workers were significantly more likely to report poor sleep quality (all p 's < .05), and to report higher anxiety levels (p 's < .05). A series of multiple regressions demonstrated that age group (teen vs. adult) and occupational status were predictive of both generalized anxiety (*GAD-7*) and poor sleep quality (*PSQI*); all p 's < .05. However, age group dropped out of the multiple regression model (both p 's > .05); occupational status and the subsequent perceived risk was the only direct predictor of both anxiety and poor sleep (both p 's < .05). As hypothesized, essential workers and their family members were proven to be at higher risk for anxiety; essential workers and their adolescent family members were also found to have poorer sleep quality. The adolescents proved to have greater anxiety levels (higher *GAD-7* scores) and poorer sleep quality (as per *PSQI*) compared to adults. These findings can also be found below in Tables 6 and 7.

Table 6: T-tests - Means & Standard Deviations

	<i>GAD-7</i> *	hrs/sleep*
Teens	10.75 ^a (1.39)	6.90 ^a (1.47)
Adults	9.44 ^b (1.29)	6.50 ^b (1.38)

*Means with differing superscripts differ at the 95% confidence level.

Sample Regressions for *GAD-7* scale

$$r^2_{\text{teen} \times \text{adult}} = .072 \mid 7.2\% \text{ of the variance in anxiety}$$

could be accounted for by age group alone.

$$r^2_{\text{FW} \times \text{N-FW}} = .169 \mid 16.9\% \text{ of the variance in anxiety could be accounted for by occupational status (essential worker/child of vs. non-essential worker/child of)}$$

Sample Regressions for *PSQI* sleep scale

$$r^2_{\text{teen} \times \text{adult}} = .039 \mid 3.9\% \text{ of the variance in sleep hours could be accounted for by age group alone.}$$

$$r^2_{\text{FW} \times \text{N-FW}} = .199 \mid 19.9\% \text{ of the variance in sleep hours could be accounted for by occupational status (essential worker/child of vs. non-essential worker/child of)}$$

Table 7: T-tests - Means & Standard Deviations

	<i>GAD-7</i> *	hrs/sleep*
Teens _{FWparent}	11.10 ^a (1.31)	7.33 ^a (1.08)
Teens _{N-FWparent}	9.35 ^b (1.43)	6.45 ^b (1.34)
Adult _{FW}	6.84 ^a (1.25)	6.95 ^a (1.12)
Adult _{N-FW}	6.02 ^b (1.34)	6.08 ^b (1.12)

*Means with differing superscripts differ at the 95% confidence level.

4. Discussion and Limitations

Our study identified a significant behavioral health burden on the American public nine months into the COVID-19 outbreak. 1) Younger people and 2) essential workers and their adolescent family members appear to be at elevated risk for mental illness, and may be in need of behavioral intervention. Our results were in line with those of Tausczik, *et al.* (2012), in that we both found that one's anxiety level often becomes heightened during disease outbreaks. Ongoing surveillance of the psychological consequences of disease outbreaks must become a standard part of preparedness

protocols in the United States and worldwide. Our results also supported the findings of Pfefferbaum and North, (2020); both studies found that the pandemic increased anxiety. Our results were in line with those of the study conducted in China back in March of 2020 (Huang & Zhao, 2020). One of the limitations of our study is that thus far we have only examined self-reported essential worker status. These results were also entirely quantitative in nature. To extend this research, it might be wise to include a qualitative study involving focus groups of a subsample of our survey respondents. Discussion would revolve around the reasons behind their anxiety - specific triggers, preferred coping strategies, etc. This would create a more comprehensive mixed-method study that could answer additional questions. Another limitation of this study is the sample size. Our sample of parents remains smaller than that of our adolescent participants. Mid-pandemic, recruiting parents to take even an online survey was difficult because we lacked any in-person connections to the parents. Standard mother-daughter, father-daughter, and parent-teacher events at school were canceled or moved to virtual platforms. Lastly, another limitation of this study is that there are many other factors that may have impacted worsened anxiety and sleep quality during the pandemic such as transition to online school or differences in lifestyle and routine. In sum, this study has generally supported my hypotheses, but also brings to light new questions worthy of study in further research.

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