# Assessing Emotional Well-Being as a Result of Quarantining During the COVID-19 Pandemic

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## *Abstract*

**Results:** indicate that quarantining had a negative effect on respondents' emotional well-being. Activites and outings, suggested by the CDC, could potentially decrease the negative impacts of quarantine.

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# Original Manuscript

## Original Paper

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# Assessing Emotional Well-Being as a Result of Quarantining During the COVID-19 Pandemic

## Abstract

**Background:** Emotional well-being can be negatively impacted by lack of social interaction.
**Objective:** This study examined the effects of social isolation on emotional well-being.
**Methods:** Respondents filled out a weekly survey for a period of 10 weeks, reporting their positive and negative affect (PANAS-X) and the effects of quarantine on their emotional well-being.
**Results:** Results indicate that quarantining had a negative effect on respondents' emotional well-being.

**Keywords:** Emotional well-being; PANAS-X; effects of quarantine; COVID-19

## Introduction

The majority of United States citizens have never experienced the societal effects of a pandemic. They have never personally endured the effects of a pandemic like what has been ubiquitously experienced during the COVID-19 pandemic of 2020. In efforts to prevent the contracting or spread of the virus, many have minimized their social contact with others for a period of 6 months or more. The extent of such social isolation varies, including social distancing, voluntarily changing work and social habits, self-quarantining, and mandatory quarantine.

Many injunctions to society as a whole were put into effect to prevent the spread of the potentially deadly virus. Many businesses were shut down or mandated to introduce work-from-home policies. Events were cancelled, gatherings of more than 10 people were made unlawful, and restaurants, parks, and other public settings where people typically gather were shut down. Outings were discouraged, unless necessary for obtaining supplies, food, or other necessities. Many citizens did not leave their homes in months.

As of August 2020, the COVID-19 pandemic has infected over 21 million people worldwide, with over 775,000 deaths [1]. In the United States, 5.3 million have been infected with over 169,000 deaths.

While containment and quarantine measures are needed to reduce the spread of the virus, it is important to understand the impact of these measures on society, including the psychological and emotional consequences. To examine these effects we can look to research conducted during the SARS outbreak in 2003. The WHO noted that no treatment was available and containment measures, such as isolation of probable cases and quarantine of those in contact with an infected individual, were the most effective at preventing the spread of SARS [2,3]. To prevent the spread of that deadly virus, the WHO and CDC placed travel restrictions on particular areas of the world where the outbreak was prevalent. In Canada, more than 15,000 people were instructed to remain in voluntary quarantine due to possible contact with an infected individual [4]. Likewise in Taiwan, a 10-14 day quarantine was used to contain the spread of the SARS outbreak, enforcing these measures with the threat of fines and jail times [5].

Hawryluck [4] examined the psychological effects of quarantine in Canada during the 2003 SARS

outbreak. They found that many that had quarantined were distressed and exhibited higher levels of anxiety or PTSD-like symptoms.

According to Brooks [6], many factors affect an individual's emotional well-being during quarantine, including the duration of the quarantine, the presence or absence of adequate information, and finally, boredom and monotony of the quarantine experience. Each of these factors played a key role in the unfolding of the COVID-19 pandemic. First, for many Americans, the duration of quarantine was ambiguous, so people did not know how long they would be enduring these difficult times, psychologically and financially. In many cases, quarantine measures were state-mandated, so people were not allowed to choose quarantine measures for themselves. The uncertainty and loss of autonomy in the quarantine experience may contribute to increased levels of distress or anxiety. Second, fear of infection and lack of adequate information from authorities can influence emotional well-being. During the COVID-19 pandemic, Americans have been confronted with conflicting views from the media, medical, and governmental authorities related to contagiousness, symptoms, severity, methods of prevention, and proposed plans for containment and mitigation of the deadly virus, potentially causing increased levels of confusion and fear among citizens. Finally, the boredom and monotony of a confined lifestyle can cause distress in individuals who are accustomed to participating in a vibrant and busy society.

Data from a study completed in June of 2020 suggest that circumstances surrounding the pandemic have indeed exacted a heavy toll on the American psyche. Czeisler [7] found that 10.7% of participants reported suicidal ideation, which is a significant increase from normative data reported in 2018, when 4.7% of people reported suicidal ideation. 10% of participants in their study also reported the start of, or an increase in, the use of illicit substances during the COVID-19 pandemic.

The current research investigates the connection between emotional well-being and quarantine status and duration. Emotional well-being can be measured utilizing the Positive Affect and Negative Affect Schedule (PANAS). The PANAS was developed by Watson, Clark, and Tellegen to evaluate how respondents' positive and negative emotional states change over time using a 20-item survey [8]. In 1999, Watson and Clark expanded the PANAS to include 60 emotional terms and evaluate 11 affects, called the PANAS-X.

Research during a pandemic has been limited in the United States, simply because the United States has never experienced a crisis directly affecting Americans to the magnitude as seen during the COVID-19 pandemic. In this particular study, researchers evaluated the effects of self-reported quarantine measures on the emotional well-being of respondents over a period of ten weeks utilizing the PANAS-X. Researchers hypothesized that being in quarantine would negatively impact the respondent's PANAS-X scores (i.e., increase the negative affect scores and decrease the positive affect scores) over the ten week surveying period.

## Methods

## Recruitment

Respondents were recruited from End to End User Research's research participant database. To be eligible, respondents had to be 18 years of age or older and live in the United States.

The study consisted of a web-based survey filled out weekly over 10 weeks. Time to complete the survey was 10-15 minutes. The first survey was sent out on Friday, March 20, 2020; responses were collected until the following Wednesday. Each week, respondents had 5 full days to fill out the survey. To continue to be eligible, respondents were required to fill out the survey each subsequent week. If they failed to participate one week, they did not receive the following week's survey and thus were ineligible for the remaining surveys. Attrition was high; 680 participants completed the Week 1 survey, but only 179 completed all 10 weeks.

Compensation for participating was entry into a raffle that increased each subsequent week. The first

week's compensation was USD$20; the final week's compensation was USD$100.

## Questionnaires

## Demographics

104 respondents were female and 75 respondents were male. Table 1 shows age ranges, race, and employment status.

Table 1. Participant demographics from the study are displayed below.

| **Age Range** | | # of respondents | Percentage |
|---|---|---|---|
| | 18-19 | 2 | 1.12% |
| | 20-29 | 51 | 28.49% |
| | 30-39 | 40 | 22.35% |
| | 40-49 | 37 | 20.67% |
| | 50-59 | 26 | 14.53% |
| | 60-69 | 17 | 9.50% |
| | 70 + | 6 | 3.35% |
| **Race** | | | |
| | White or Caucasian | 129 | 72.07% |
| | Black or African American | 19 | 10.62% |
| | Hispanic or Latinx | 19 | 10.62% |
| | Asian or Asian American | 11 | 6.15% |
| | American Indian or Alaska Native | 0 | 0.00% |
| | Native Hawaiian/Pacific Islander | 0 | 0.00% |
| | Other | 1 | 0.56% |
| **Employment status** | | | |
| | Employed entire time | 103 | 57.54% |
| | Employment terminated | 31 | 17.32% |
| | Not employed /homemaker | 45 | 25.14% |

## Positive Affect and Negative Affect Schedule - Expanded

The PANAS-X (Watson & Clark, 1999) is a 60-item questionnaire used to determine emotional affect using a five-point Likert Scale, ranging from 1 = Very Slightly or Not at all to 5 = Extremely. Researchers can choose to evaluate a range of timeframes; for this particular study, researchers chose to utilize a weekly timeframe. Results are combined into the following scales presented in Table 2.

Table 2. The scales in the PANAS-X and how they are categorized.

| **Scales** | **Emotional Affect included in Scale** |
|---|---|
| | |
| **General Dimension Scales** | Positive Affect |
| | Negative Affect |

| | |
|---|---|
| **Basic Negative Emotion Scales** | Fear |
| | Hostility |
| | Guilt |
| | Sadness |
| **Basic Positive Emotion Scales** | Joviality |
| | Self-Assurance |
| | Attentiveness |
| **Other Affective States** | Shyness |
| | Fatigue |
| | Serenity |
| | Surprise |

**Quarantine** Respondents were asked to indicate their quarantine status from the following options: mandatory quarantine, self-quarantine, or not quarantining. This self-assessment of quarantine status was used to understand each respondent's personal level of restriction and whether they were internally or externally motivated. Table 3 shows the frequency of responses.

Table 3. Responses to quarantine status are in this table.

| **Quarantine Status** | **# of respondents** | **Percentage** |
|---|---|---|
| | | |
| Mandatory quarantine | 48 | 26.82% |
| Self-quarantine | 86 | 48.05% |
| No quarantine | 45 | 25.14% |

## Results

A within-subjects repeated measures ANOVA was conducted to compare the weekly results of PANAS-X (DV) to respondent's quarantine status (IV). Results are shown in Table 4.

Table 4. The Positive Affect and Negative Affect Schedule results are below.
Note: * p > 0.001

| **Scale** | ***F*-stat** |
|---|---|
| | |
| General Dimension: Negative Affect | 4.61* |
| General Dimension: Positive Affect | 2.43* |
| Basic Negative Emotion Scale | 9.76* |
| Fear | 7.69* |
| Hostility | 3.30* |
| Guilt | 7.29* |

| | |
|---|---|
| Sadness | 3.90* |
| Basic Positive Emotion Scale | 4.65* |
| Joviality | 1.13 |
| Self-Assurance | 1.17 |
| Attentiveness | 15.51* |
| Shyness | 1.26 |
| Fatigue | 6.38* |
| Serenity | 0.49 |
| Surprise | 12.13* |

The General Dimension Scales were statistically significant when compared to quarantine status. Negative Affect, $F(2, 9) = 4.61$, $P < 0.001$, ratings were higher in respondents that either self-quarantined or were under mandatory quarantine compared to those not in quarantine. Positive Affect, $F(2, 9) = 2.43$, $P = 0.01$, ratings were higher each week in respondents that did not quarantine.

The main effect for the Basic Negative Emotion Scale, $F(2, 9) = 9.76$, $P < 0.001$, was statistically significant, showing that there was an increase in negative emotions with respondents that quarantined, whether self- or mandated, when compared to those that did not quarantine. The main effect for the following scales that were incorporated in the Basic Negative Emotion Scale were also significant. Fear, $F(2, 9) = 7.69$, $P < 0.001$, was statistically significant. Post Hoc tests indicate that self-quarantined respondents reported significantly more Fear in Week 1 when compared to Week 7-10. Respondents that did not quarantine had significantly higher Fear ratings in Week 1 compared to Week 10. Hostility, $F(2, 9) = 3.30$, $P < 0.001$, was higher in the first weeks of quarantine compared to the later weeks. Guilt, $F(9, 18) = 7.29$, $P < 0.001$, was significantly higher for respondents that quarantined in Week 4 when compared to Weeks 1, 2, 3, and 5. Sadness, $F(2, 9) = 3.90$, $P < 0.001$, ratings were consistently lower in respondents that did not quarantine compared to those that did.

The main effect for the Basic Positive Emotion Scale, $F(2, 9) = 4.65$, $P < 0.001$, was statistically significant, in that respondents that did not quarantine scored higher on the Basic Positive Emotion Scale compared to those that did. However, when the scales were analyzed individually, only Attentiveness was statistically significant, $F(2, 9) = 15.51$, $P < 0.001$. Post hoc tests indicated that Attentiveness was rated significantly higher in Week 1 than in any other week for respondents that were self-quarantined. For respondents that were under mandatory quarantine, Attentiveness was significantly higher in Week 1 compared to Weeks 3-10, and Week 2 was significantly higher than Week 10. The main effect for the remaining scales in the Basic Positive Emotion Scale were not significant. The main effect of Joviality, $F(2, 9) = 1.13$, $P = 0.34$, and Self-Assurance, $F(2, 9) = 1.17$, $P = 0.31$, shows that these positive emotions were not impacted by quarantine status.

For the Other Affective States, there were significant effects found for Fatigue and Surprise. Fatigue, $F(2, 9) = 6.38$, $P < 0.001$, was statistically significant, showing that respondents that quarantined, whether self- or mandated, were more fatigued every week than those who did not. Surprise, $F(2, 9) = 12.13$, $P < 0.001$, was also statistically significant. Post hoc tests show that quarantined participants were significantly less surprised in Week 1 compared to Week 4-10. Effects of Serenity, $F(2, 9) = 0.49$, $P = 0.88$, and Shyness, $F(2, 9) = 1.26$, $P = 0.25$, were not significant.

## Discussion

Human beings are social beings, and these results support the hypothesis that quarantine can create an enormous amount of emotional distress. Negative emotions were significantly higher in respondents that self-quarantined or were under mandatory quarantine, indicating that such isolation

has a negative effect on overall affect and mental health. This may be due to a variety of circumstances that accompany quarantine, including but not limited to social isolation from friends and family, loss of autonomy (even if self-imposed), missing out on events or travel, or financial burdens from lost work opportunities due to confinement.

While the hypothesized negative affect increasing over the surveying period was not validated, the statistical analysis revealed that people who quarantined had higher levels of negative affect, including emotions of Fear, Hostility, Guilt, Sadness, Fatigue, and Surprise in particular weeks compared to those that did not. This was especially prevalent in specific weeks during the survey when uncertainty and negative news in the media abounded. Week 1 of this survey was sent out in mid-March, which was 2 weeks into quarantine in Texas, where 69.8% of respondents resided. At that point, fear from COVID-19 was still novel. During Week 4 of this survey, news sources reported on reopening of states, the pulling of WHO funding, the death toll in the U.S. passing Italy, limited supplies in grocery stores continued to be an issue, lockdown protests began, amid other controversial news stories [9]. During weeks 7-10, governmental restrictions were beginning to be lessened and more people were venturing out into public places again [10].

Fear and Hostility were higher in the first weeks of the survey when compared to later weeks. The cause of Fear and Hostility could be due to the novelty of the COVID-19 virus, along with the lack of information available and the necessity to stay home without contact with individuals outside of the respondents' households. People confined to their homes have greater time and opportunity to be exposed to and consume sensationalized news stories and headlines, which may have also influenced the fear that these respondents felt [11].

Attentiveness was also higher at the beginning of the survey compared to later weeks. Attentiveness could have been affected by other people or children in the home, employment status and workload. This correlates with an increase in Fatigue as the weeks progress. 37% of respondents had children and experienced increasing responsibility of their children constantly being home and needing care and attention, while still managing a full workload in a new work-from-home environment. These demands naturally decrease bandwidth to attend to specific areas of life and cause increase in fatigue.

During week 4, there was a significant increase in Guilt for respondents that quarantined. This increase could be due to employment status. 57.6% of respondents were still employed and may have felt guilty due to the enormous loss of jobs throughout the country or an inability to effectively perform their job due to an increase in responsibility in the household. 17.3% of respondents lost their job due to the COVID-19 pandemic and an inability to provide for their family could be the cause of their guilt. Respondents may have also felt guilty that they were still healthy and not affected by the virus as many other areas of the country were at this point in time.

Respondents who quarantined were significantly more Surprised in Week 4, when compared to the following weeks. This Surprise rating could be correlated with events portrayed in the media that were occurring during that week.

The negative feelings and emotions exacerbated by quarantine suggests that people need an outlet to avoid becoming overwhelmed by negative emotion. The CDC [11] has put forth suggestions for maintaining healthy coping mechanisms during quarantining. Developing a plan for if you do become sick with COVID-19 can reduce the stress about becoming sick. The CDC suggests taking breaks from watching, reading, or listening to new stories as these can be upsetting. They also suggest taking care of your body by meditating, exercising, eating healthy, well-balanced meals, getting plenty of sleep, and avoiding excessive alcohol and drug use. Participating in activities that are enjoying, connection with others and community or faith-based organizations are also ways of coping with the effects of quarantine/isolation.

## Limitations/Future Research

69.8% of respondents were in Texas, as this is where the company is located and 72.1% of

respondents were Caucasian; future research should try to reach different geographic locations and demographic subsets of respondents, as different areas of the country and ethnic groups may have dissimilar difficulties related to the COVID-19 pandemic. Future research could also examine whether participating in the activities outlined by the CDC decrease negative emotional affect or take a more exploratory look at why participants felt guilty.

A self-selection effect may have taken place as Week 1's survey had 680 responses. A high attrition rate was found from Week 1 to Week 10, even with multiple methods used to follow up with respondents. Perhaps, respondents who lost their jobs or contracted the virus were less likely to continue filling out the survey due to an increase in negative affect. To improve the attrition rate, higher or guaranteed compensation could be provided. Researchers could also follow-up with respondents to understand why they didn't continue to complete the survey.

## Conflicts of Interest

None declared.

## Abbreviations

PANAS-X: Positive and Negative Affect Schedule – Expanded

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