

Investigating Associations of COVID-19 related Anxiety, Depression, and Anxiety Sensitivity among E-Cigarette Users

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INTRO

- Rates of anxiety and depression have increased during COVID-19.
- Individuals with mental health problems have disproportionate rates of nicotine addiction.
- Those with nicotine addiction, including e-cigarette dependence, experience elevated rates of psychological distress and may be at increased risk for heightened distress during the COVID-19 pandemic.
- The purpose of this study was to investigate rates of anxiety and depression among adults with and without e-cigarette dependence.
- We hypothesized that higher rates of depression and anxiety would be observed among those with e-cigarette dependence symptoms (vs. no dependence).
- Given the amplifying role of anxiety sensitivity (AS), we investigated the role of AS in the relation between dependence and COVID-related anxiety.

METHOD

- Participants ($N = 383$; 67.6% White; 47.5% female; $M_{age} = 34.9$) included U.S. adults from Amazon's Mechanical Turk who endorsed past 6-month e-cigarette use.
- Self-report measures of depression (PHQ-9), COVID-related anxiety (CAS), e-cigarette dependence (PSECDI), and AS (ASI-3) were completed.

RESULTS

- In this sample, 12.3% reported high e-cigarette dependence, 15.4% clinical levels of COVID-19-related anxiety, and 43.9% depression symptoms.
- Although most individuals reported no impact of COVID-19 on use (see Fig. 1), 43% of participants reported increased consideration of the associated health risks of e-cigarette use due to COVID-19.
- Participants with e-cigarette dependence symptoms reported significantly greater COVID-19-related anxiety but similar rates of depression (see Fig. 2).
- Exploratory analyses yielded a significant indirect effect of AS on the relation between e-cigarette dependence and COVID-19-related anxiety (see Fig. 3).

DISCUSSION

- Findings indicate increased COVID-related anxiety among e-cigarette users and point to AS as a potential malleable factor that may be targeted in treatment.
- Results contribute to our knowledge of contextual and individual factors associated with mental health symptoms in nicotine users and highlight the need for continued research in this area to alleviate distress and improve health.

Anxiety sensitivity may affect COVID-19-related anxiety among e-cigarette users.



Figure 1. E-cigarette use during COVID-19

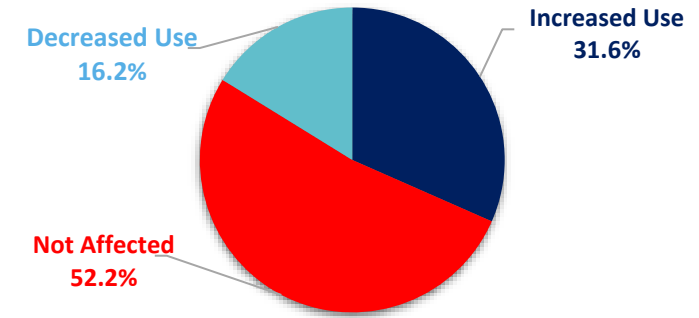


Figure 2. Results of t -tests comparing COVID-19-related anxiety (on left) and depression (on right) symptoms between adults with and without e-cigarette dependence.

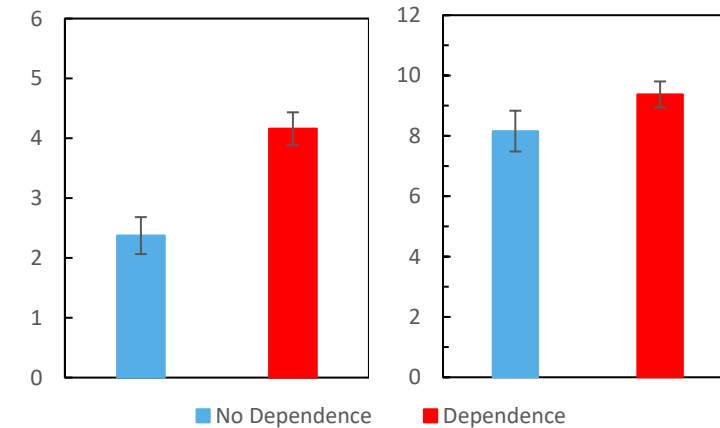
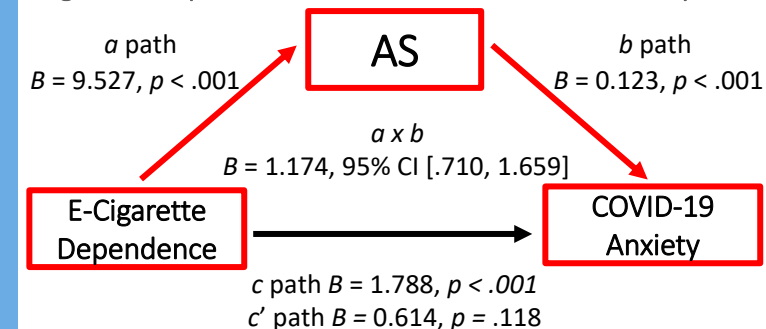


Figure 3. Indirect effect of AS in relation between e-cigarette dependence and COVID-19-related anxiety.



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Background: Rates of anxiety and depression have increased in the wake of the COVID-19 pandemic. Research has shown that individuals with mental health problems have disproportionate rates of nicotine addiction, and at the same time, those with nicotine addiction experience elevated rates of psychological distress. Given the environmental impacts (Soule et al., 2020) and heightened distress due to COVID-19, those with nicotine addiction, including electronic cigarette (e-cigarette) users, may be at increased risk for heightened distress during this time. Accordingly, we investigated these rates among a sample of e-cigarette users and predicted higher rates of depression and anxiety among those with e-cigarette dependence symptoms (vs. no dependence). To identify potential factors contributing to distress, we explored the role of anxiety sensitivity (AS) – a known transdiagnostic factor that has been associated with more severe patterns of e-cigarette use (Zvolensky et al., 2019).

Method: Participants ($N = 383$; 67.6% White; 47.5% female; $M_{age} = 34.9$) included U.S. adults from Amazon's Mechanical Turk who endorsed past 6-month e-cigarette use. During the summer and fall of 2020, participants completed a battery of questionnaires that assessed depression, COVID-19 anxiety, e-cigarette use, and AS.

Results: Results indicated 15.4% of participants screened positive for clinical levels of COVID-19-related anxiety and 43.9% reported symptoms of depression. Regarding e-cigarette use, 12.3% reported high dependence, and 31.6%, 52.2%, and 16.2% indicated that COVID-19 had increased, not affected, or decreased their e-cigarette use, respectively. Participants with e-cigarette dependence symptoms (vs. no dependence) reported significantly greater COVID-19 anxiety ($t [381] = 3.98, p < .001$), but similar rates of depression were observed ($t [381] = 1.57, p = .118$). Pearson correlations yielded significant correlations between variables ($r_s = .16 - .329, p_s < .01$). Finally, AS was evaluated in the relation between e-cigarette dependence and COVID-19 anxiety. The indirect effect was estimated by bootstrapping with 10,000 resamples with a 95% confidence interval (Hayes, 2018), yielding a significant indirect ($b = 1.17, 95\% \text{ CI} = 0.71, 1.66$) effect of AS.

Conclusion: Despite known health concerns, most participants reported no change or an increase in e-cigarette use due to COVID-19. Participants with e-cigarette dependence reported significantly higher COVID-19-related anxiety symptoms, and AS was supported as a potential factor contributing to greater COVID-19-related anxiety. Despite limitations, findings highlight increased distress among e-cigarette users and point to AS as a potential malleable factor that may be targeted in treatment. Further research is needed to understand the long-term impact of COVID-19 on anxiety, depression, and rates of nicotine dependence.

Measures

Patient Health Questionnaire – 9 (Kroenke et al., 2001)

Coronavirus Anxiety Scale (Lee et al., 2020)

Penn State Electronic Cigarette Dependence Index (Foulds et al., 2015)

Anxiety Sensitivity Index – 3 (Taylor et al., 2007)

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