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PANDEMIC AND SUBSTANCE USE: A CROSS-SECTIONAL ANALYSIS

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PANDEMIC AND SUBSTANCE USE: A CROSS SECTIONAL ANALYSIS

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A Thesis

Presented to the

Faculty of

California State University,

San Bernardino

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In Partial Fulfillment

of the Requirements for the Degree

Master of Science

in

Public Health

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by

Vanessa Elivia Ester Ermilio

May 2022

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Approved by:

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ABSTRACT

Background: The COVID-19 Pandemic called individuals to stay at home which may have impacted individuals to become not only physically, but socially isolated as well. With social isolation, comes an increase in mental health complications which may lead to an increase in substance use. The purpose of this study was to evaluate the potential association between COVID-19 social isolation and substance use among college students.

Method: The present study's data was collected from a public, four-year university located in Southern California. The survey was disseminated through instructors at the university and students were incentivized with extra course credit to participate. Highlights of the study population include: 66% Hispanic and 58% considered to be low-income recipients. All study participants were given an informed consent form and those who agreed to participate were given a virtual survey to complete via Qualtrics. In addition, all data collected was kept anonymous and a random sample was used to conduct analyses to ensure no participant of the study was identifiable. Data analyses consisted of the utilization of descriptive and bivariate statistics; SPSS Version 28 was used to analyze the data and 0.05 was used to show statistical significance.

Results: this study displayed that approximately 21% of the study participants reported having a worse physical health status due to COVID-19 related isolation. In addition, about 27% of the study population also reported having a worse mental health status due to COVID-19 related isolation. Around 24% of the

study population classified their mental health as being poor or very poor.

Furthermore, because of COVID-19 related isolation, 9.4% of study participants

reported drinking more and 7.3% of study participants reported using more

tobacco. Consequently, statistical significance was identified between drinking

more due to COVID-19 and mental health status. Statistical significance was also

found between increase of drinking and tobacco habits, suggesting that

participants who engaged more in substance use, did so in multiple types of

substances.

Conclusion: Results emphasize the importance of addressing mental health

complications and substance among college students during the COVID-19

pandemic.

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CHAPTER ONE

LITERATURE REVIEW

Overview

The following literature review provides a snapshot of the burden of COVID-19 pandemic, from a global to a local scale. The review further addresses the pandemic-related measures, such as isolation, quarantine, closures, etc. and their putative role on population mental health, substance use, and well-being.

COVID-19

The novel coronavirus (COVID-19) is an infectious disease that is caused by a coronavirus called SARS-CoV-2 (CDC, 2020). COVID-19 is believed to have first emerged in Wuhan, China in December 2019 and quickly began spreading across the world in February 2020. By the end of March 2020, the World Health Organization (WHO) characterized COVID-19 as a pandemic, and the United States declared COVID-19 as a national emergency (Katella, 2021).

Per John Hopkins University of Medicine, Coronavirus Resource Center, the first case of COVID-19 emerged in the United States on January 21st, 2020. As of March 2022, The Center for Disease Control and Prevention (CDC) reports that there has been a total of 79,787,583 cases and 974,569 deaths within the United States. While community transmission rate fluctuates, the U.S. community transmission rate remains to be considered high by CDC standards, and the country has a COVID positivity rate of 2.3% per 100,000 people within the last seven days (Mayo Clinic, March 2022).

COVID-19 continues to be a world problem to this day due to its ever-changing nature. The CDC notes that the virus is constantly mutating as it passes from person-to-person and country-to-country; when viruses change, that is known as a variant. Variants vary as some can spread easier than others and some propose greater threat to the health of an individual than others may. There can be multiple variants infecting a population at one time, but new variants can also replace previous variants that were impacting a community or population (CDC, 2020).

Prevention efforts, specifically vaccination, may be less successful in reducing or stopping the spread of a disease due to the variants making the virus more resistant to available COVID-19 vaccines (Bollinger & Ray, 2022). Emerging variants may allow the virus to continue to spread from host to host, making COVID-19 an ongoing virus of concern (CDC, 2021). The emergence of new variants are to be expected and emphasize the importance of vaccination against COVID-19 in order to slow the spread of the disease (Bollinger & Ray, 2022). In response, the CDC is constantly monitoring vaccine efficacy against the emerging COVID-19 variants to manage infection rates and prevent the spread of the disease to vulnerable populations (CDC, 2021).

Per the CDC, COVID-19 is spread through droplets that contain the SARS-CoV-2 virus. For example, an infected person can come into close contact with a non-infected individual and spread the virus by exhaling these virulent droplets that will enter the non-infected individual's portal of entries such as the

eyes, nose, or mouth. Transmission may also occur using surfaces such as a doorknob; an infected person can cough or sneeze onto a surface like a doorknob, and then a non-infected person will use said doorknob, touch a portal of entry like their eyes, and then become a host for the virus. Prevention efforts against the spread of COVID-19 include: social distancing, wearing a mask, vaccination, quarantining exposed individuals, isolating those diagnosed with the illness, health education, and improving health equity (CDC, 2020).

The pandemic took the world by storm; schools closed, businesses and organizations closed, jobs were lost, traveling ceased to exist, and many were told to begin to 'shelter in place'. COVID-19 is expected to trigger the biggest recession since World War II resulting in a $12 trillion loss in the global economy over 2020 and 2021, making the COVID-19 financial loss twice as great as the 2008 recession. In addition to the economic impact of COVID-19, this virus continues to impact other aspects of the world such as the social and emotional health of individuals (Gopinath, 2020).

Since the COVID-19 pandemic, there has been an evident increase in social isolation. Health Affairs published a blog in June 2020 titled "The Double Pandemic Of Social Isolation And COVID-19: Cross-Sector Policy Must Address Both" which brings up an important perspective that humans are a social species, and socializing is as biological as our bodies using hunger to signal us to eat. The lack of socialization occurring due to COVID-19 prevention efforts such as social distancing and 'sheltering in place' has increased distress among

Americans as when humans lack proximity to others, the brain and body may enter a heightened state of alert (Holt-Lunstad, 2020). Being around others, especially individuals we trust, can create a relaxed state of being and signals safety. In the long term, the distress caused by being out of our usual relaxed, safe state can result in an increase in blood pressure, stress hormones, and inflammatory responses; an ongoing basis of these adverse reactions can put us at an increased risk for chronic illnesses (Holt-Lunstad, 2020). For those with preexisting health conditions, this state of distress can escalate or hasten the progression of disease.

In the short term, the immediate effects of social isolation can include: mental health concerns, substance use, and domestic violence. Early signs of social isolation are often risk-heavy health behaviors that can be observed such as substance use, poorer sleep, and a poor relationship with food (i.e. emotional eating or overeating) (Holt-Lunstad, 2020).

<u>Substance Use</u>

Substance use also known as, substance use disorder is, "when a person's use of alcohol or another substance (drug) leads to health issues or problems at work, school, or home" (Berger, 2020). There are a total of seven substance categories which are as follows: depressants, stimulants, hallucinogens, dissociative anesthetics, narcotic analgesics, inhalants, and cannabis (*7 Drug Categories | International Association of Chiefs of Police*, n.d.). Of the seven substance categories, cannabis (marijuana) and depressants,

specifically alcohol, are the most abused substances in the United States (Green, 2014).

Using substances can affect your body through both short-term and long-term effects, that can be both physical and psychological. Short-term effects of substance use can put us through a wide range of variance in bodily or even mental function(s) which may include things like: increased heart rate, anxiety, stress, brain-fuzziness, and more. While short-term effects last only within a specific amount of time, it should be noted that short-term effects can lead to poor or risky behaviors. While under the influence of a substance, an individual is more likely to have an accident, vulnerable to sexual assault or unprotected sex, commit a sexual assault or violent act, or have generalized poor-decision making skills (*How Drugs Affect Your Body - Better Health Channel*, 2017).

Long-term effects of substance use may have a negative impact on overall health and wellbeing of an individual. Some long-term consequences of substance use include: harming your organs, the onset of cancer, increasing your risk of an infectious disease, decreasing your oral health, changes growth patterns in hair, acne or skin lesions, collapsed veins, mood swings, mental illness, psychosis, addiction, and overdose (*How Drugs Affect Your Body - Better Health Channel*, 2017).

Although drug use is heavily stigmatized in the United States, almost every adult in the U.S. is a drug user. Substance use is so common that 85% of Americans consume caffeine, a stimulant, daily through routine tasks such as a

morning cup of coffee or a soda at lunch or dinner (Mitchell et al., 2014).

Additionally, more than 131 million Americans also take medication prescribed by

their doctor to help with conditions such as: chronic pain, physical illness, or

mental illness. The medications a physician may prescribe to a patient can be

susceptible to patient abuse especially when it comes to prescribed opioids, anti-

anxiety medications and sedatives, and stimulants (Mayo Clinic, 2018). However,

out of all the substances available, alcohol is still the most abused drug in the

United States; being regularly consumed by Americans (Green, 2014).

While there is not a singular cause of substance use, factors such as:

environment, peer pressure, anxiety, emotional distress, and even genetics can

increase a person's likelihood of engaging in the act. Substance use is often

used as a coping mechanism for those undergoing depression, post-traumatic

stress syndrome, or other mental health challenges (Berger, 2020).

College Student Health

College cultivates an interesting time in a young adult's life as it can be the

first taste of freedom as well as the soft entry to adulthood. Along with freedom

and becoming an adult, college students have more control of their own health

since they no longer are being held accountable by their parents as they were in

previous stages of their life. With that said, college students often may see a

decline in their health. A scholarly article titled, *Health problems of college

students,* notes that young adults have been experiencing higher rates of

morbidity, disability, and mortality from factors such as developmental, environmental, and behavioral risk factors.

Literature shows college students engage in behavioral risk factors greater than the general population. Some of these risk factors may include: smoking, binge drinking, risky sexual behavior, insufficient physical activity, insufficient fruit and vegetable intake, insufficient sleep, fatigue, stress, and mental health complications such as stress, anxiety, and depression (Kwan, 2016).

For example, behaviors that may impact a college student include: procrastination, lack of self-discipline, lack of motivation, tendency to memorize, and being insecure in public speaking situations (Horton, 2015). These behaviors may impact a college student's health since these behaviors may require students to engage in coping mechanisms that could be harmful to their overall health and wellbeing.

Likewise, college students may struggle with both physical and mental health status due to the behaviors they choose to engage in. On college campuses, most accidents, sexual assaults, rape, fighting, and other crimes are linked to alcohol and other drug use. Consequently, college students are more likely to have mental health complications such as clinical depression compared to people of similar ages and backgrounds in the workforce (Horton, 2015).

Additionally, a study was conducted at a private Midwestern college with a sample size of 111 students to examine the process by which work-life balance may lead to college student anxiety and depressive symptoms. The study found

that work-life balance was negatively related to students' perceived stress, general anxiety, and depressive symptoms. Results also indicated that perceived stress arbitrated the relationship between work-life balance and anxiety, as well as the relationship between work-life balance and depressive symptoms (Sprung & Rogers, 2021).

Summary

COVID-19 is an infectious disease that is believed to have started in Wuhan, China and quickly spread throughout the world. COVID-19 is spread by an infected person coming into close contact with a non-infected individual; the infected person exhales these virulent droplets that will enter the non-infected individual's portal of entries such as the eyes, nose, or mouth. Public health strategies to prevent COVID-19 include: social distancing, wearing a mask, vaccination, quarantining exposed individuals, isolating those diagnosed with the illness, health education, and improving health equity. The COVID-19 virus continues to be an issue as the virus quickly mutates, forming new variants of concern.

As COVID-19 spread globally, consequently, the economy shut down and people were required to stay at home. Stay at home orders resulted in an increase in social isolation since individuals were not able to gather and interact with each other as they did prior to the pandemic. Social isolation is suggested to have adverse impacts on mental health that may increase an individual's

likelihood of engaging in riskier behaviors such as substance use as a coping mechanism.

Substance use has both short- and long-term effects on the health status of an individual. Short term effects may include things like: increased heart rate, anxiety, stress, brain-fuzziness, and more as well as engaging in riskier behaviors such as: having an accident, vulnerable to sexual assault or unprotected sex, commit a sexual assault or violent act, or have generalized poor-decision making skills. In the long term, substance use may have negative impacts such as: harming your organs, the onset of cancer, increasing your risk of an infectious disease, decreasing your oral health, changes growth patterns in hair, acne or skin lesions, collapsed veins, mood swings, mental illness, psychosis, addiction, and overdose.

As stated, substance use is commonly associated as being a coping mechanism for individuals struggling with mental health complications (like social isolation). Due to the isolating nature of the COVID-19 pandemic, many individuals have struggled with their mental health and thus have turned to substance use to navigate through the unique circumstances. The use of substances can have a negative impact on the health and wellbeing of an individual as it increases their likelihood of poor-decision making skills, assault, an accident, and more along with physiological effects on the body such as increased heart rate and brain-fuzziness. College students may be at a higher risk for substance use during the COVID-19 Pandemic as college students are

already at a higher risk for mental health complications without the presence of COVID-19.

Purpose Statement

The purpose of this study is to evaluate the potential association between COVID-19 social isolation and substance use among college students.

Research Questions (RQ)

1. What is the general physical health status of study participants?

2. Has the physical health status of the study participants gotten worse due to COVID-19 related isolation?

3. What is the general mental health status of study participants?

4. Has the mental health status of the study participants gotten worse due to COVID-19 related isolation?

5. How often did study participants drink alcoholic beverages in the past 12 months?

6. Have drinking habits of study participants changed as a result of COVID-19?

7. What types of tobacco products are study participants using?

8. Have tobacco habits of study participants changed as a result of COVID-19?

9. Is there a significant association between drinking more alcoholic beverages in the past 12 months due to COVID-19 and low physical health status?

10. Is there a significant association between using more tobacco due to COVID-19 and low general physical health status?

11. Is there a significant association between drinking more alcoholic beverages in the past 12 months due to COVID-19 and low mental health status?

12. Is there a significant association between using more tobacco due to COVID-19 and low general mental health status?

13. Is there a significant association between drinking more alcoholic beverages in the past 12 months due to COVID-19 also using more tobacco?

<center>Significance to Public Health</center>

This study is relevant to public health because of the prevalence of substance use and mental health complications within the United States. Approximately 8.5 million Americans suffered from both a substance use complication as well as a mental health disorder (American Addiction Centers, 2022). In addition, death related to substance use remains high as accidental drug overdose remains a leading cause of death among persons under the age of 45 (*NCDAS*, 2022). Due to the acknowledged relative nature of mental health

complications and substance use disorder, a comprehensive approach is

necessary to re-access the potential relationship between the two conditions.

Results can be utilized to create and implement wellness practices to promote

good general mental health status and moderate substance use behavior.

CHAPTER TWO

METHODS

Study Design

The present study used a cross sectional approach to identify the potential

relationship between COVID-19 social isolation and substance use among

college students.

Data Collection

Data was collected from a four-year public university in Southern

California. Eligibility criteria included: being currently enrolled, aged 18 years or

more, and their instructor disseminated the survey with extra credit option. The

majority (87%) of students at the university come from the immediate geographic

area. The student population is predominantly (63%) female and 81% are first

generation college students. Additionally, 58% of the population are classified as

being low-income recipients, and a majority (66%) are also Hispanic.

All participants received an informed consent form and those agreeing to

participate were further given a virtual survey to complete via Qualtrics and

participants were given extra credit in their courses. All data were collected and

kept anonymous, and a random sample was used to conduct further analyses,

thus ensuring no accidental identification can occur based on the order of

responses.

<u>Measures</u>

The independent variable of the study was COVID-19 and related isolation while dependent was substance use (defined as tobacco and/or alcohol use). The following questions related to latent variables were asked to participants:

General physical health status was evaluated using the following survey question:

"How would you describe your general physical health status?"

General mental health status was evaluated using the following question:

"How would you describe your general mental health status?"

Change in physical health status due to COVID-19 was evaluated using the following survey question:

"I feel my physical health status has gotten worse due to COVID-19-related isolation?"

Change in mental health status due to COVID-19 was evaluated using the following survey question:

"I feel my mental health status has gotten worse due to COVID-19-related isolation'

General drinking habits was evaluated using the following survey question:

"In the past 12 months, how many times did you drink alcoholic beverages?"

Change in drinking habits due to COVID-19 was evaluated using the following survey question:

"Do you feel your drinking habits have changed as a result of COVID-19?"

General tobacco habits were evaluated using the following question:

"Which of the following tobacco products have you ever used?"

Change in tobacco habits due to COVID-19 was evaluated using the following survey question:

"Do you feel your tobacco use habits have changed as a result of COVID-19?"

Data Analyses

Descriptive statistical analysis was used in order to answer the research questions 1-8. Bivariate statistics (chi-square) was conducted to answer research questions 9-12. SPSS Version 28 was used to analyze the data and p less than 0.05 was used for significance.

Ethics

The present study was approved by the Institutional Review Board of California State University, of San Bernardino (IRB-FY2022-146). The key three principles of Belmont were followed. As outlined in the *Belmont Report*, the key three principles are: respect for persons, beneficence, and justice (the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1976).

Respect for persons encompasses at least two ethical convictions such as: individuals should be treated as autonomous agents and persons should also be entitled to protection. When dealing with respect for persons, it is essential to

acknowledge the autonomy of an individual and protect the diminished autonomy an individual may possess.

Beneficence as an ethical principle that ensures an individual is not only protected from harm, but the researcher is also making efforts to support and secure their well-being. The two rules of beneficence are to: not to cause harm and to maximize possible benefits while also minimizing possible harms.

Lastly, justice is an ethical principle that emphasizes the need to treat people need to be treated equally by distributing burdens and benefits equally. Distribution of equality is gaged on the following formulations, "(1) to each people an equal share, (2) to each person according to individual need, (3) to each person according to individual effort, (4) to each person according to societal contribution, and (5) to each person according to merit" (Protections (OHRP), 2010).

To ensure respect for persons and autonomy, all study participants were provided with informed consent forms. In addition, participation in this study was voluntary and the participants could leave the study at any time without consequences (i.e., negative impact to their academics). Beneficence was ensured by all efforts being made to reduce harm and increase benefits. Questions in this study were kept to a minimum to avoid and reduce participant boredom. This survey was also made anonymous to ensure students were not able to be identified upon answering sensitive questions and felt comfortable answering said questions. During data analysis, a random sample was utilized to

prevent unique crosstabulations that could have identified a participant of rare

cases. Participants were also provided incentives as part of an increasing

benefit. Lastly, all students 18 years of age or older, who are enrolled at CSUSB,

were allowed to participate in the study. The less-restrictive edibility requirement

of the study allowed for further justice; no group was burdened with the study

while another benefited.

CHAPTER THREE

RESULTS

What is the general physical health status of study participants?

Approximately 46% of study participants described their general physical health status as being good or excellent, while 5.2% of study participants reported their general physical health status as being poor or very poor. On the other hand, 49% of the study population reported having an average general physical health status.

Table 1. Reported physical health status of study participants.	
Average	49.0%
Excellent	8.3%
Good	37.5%
Poor	4.2%
Very Poor	1.0%

Has the physical health status of the study participants gotten worse due to COVID-19 related isolation?

About half (49%) of the respondents reported their physical health status has not gotten worse due to COVID-19 related isolation whereas 20.8% said it has, and 29.2% of the respondents did not isolate.

Table 2. Percent of participants reporting new physical health status due to COVID-19 related isolation.

	No, I Do Not Have a New Physical Health Status Due to COVID-19 Related Isolation	Yes, I Do Have a New Physical Health Status Due to COVID-19 Related Isolation
Do you have a new physical health status due to COVID-19 related isolation?	78.9%	21.1%

What is the general mental health status of study participants?

Just under 70% (67.7%) of participants reported an average or good general mental health status while 23.9% of the study population reported having poor or very poor mental health status.

Table 3. Percent of participants reporting general mental health status.

Average	32.3%
Excellent	8.3%
Good	35.4%
Poor	22.9%
Very Poor	1.0%

Has the mental health status of the study participants gotten worse due to COVID-19 related isolation?

While 62.9% of study participants did not feel that their mental health status had gotten worse due to COVID-19 related isolation, 37.1% of study participants reported having worse mental health status due to COVID-19 related isolation.

Table 4. Percent of participants reporting new mental health status due to COVID-19 related isolation.

	No, I Do Not Have a New Mental Health Status Due to COVID-19 Related Isolation	Yes, I Do Have a New Mental Health Status Due to COVID-19 Related Isolation
Do you have a new mental health status due to COVID-19 related isolation?	62.9%	37.1%

How often did study participants drink alcoholic beverages in the past 12 months?

In the past 12 months, 38.5% of study participants did not drink in the past 12 months. On the other hand, 61.5% of study participants did drink within the past 12 months.

Table 5. Study Participants Drinking Alcoholic Beverages in the Past 12 Months.		
	No, I Did Not Drink in the Past 12 Months	Yes, I Did Drink in the Past 12 Months
Did you drink alcohol in the past 12 months?	38.5%	61.5%

Have drinking habits of study participants changed as a result of COVID-19?

While 46.9% of study participants reported no change in drinking due to COVID-19 and 37.5% of study participants reported never drinking, 9.4% of participants reported drinking more as a result of COVID-19.

Table 6. Percent of participants reporting drinking due to COVID-19.		
	No, My Drinking Habits Did Not Change Due to COVID-19	Yes, Drinking Habits Did Change Due to COVID-19
Have your drinking habits changed due to COVID-19?	90.6%	9.4%

What types of tobacco products are study participants using?

Most commonly used tobacco products among study participants was: vape (9.4%), vape, hookah (5.2%), cigarette (4.2%), cigarette, vape (3.1%), and other (28.1%).

Table 7. Percent of participants reporting types of tobacco products used.	
Cigarette	4.2%
Cigarette, Cigar	1.0%
Cigarette, Electronic cigarette, Vape	2.1%
Cigarette, Electronic cigarette, Vape, Hookah, Other	1.0%
Cigarette, Hookah	1.0%
Cigarette, Vape	3.1%
Electronic Cigarette	1.0%
Electronic Cigarette, Vape, Other	1.0%
Hookah	1.0%
Other	28.1%
Vape	9.4%
Vape, Hookah	5.2%

Have tobacco habits of study participants changed as a result of COVID-19?

While 66.7% of respondents reported never using any tobacco products and 25% of respondents reported no change, 7.3% of respondents reported using more tobacco as a result of COVID-19.

Table 8. Percent of participants reporting a change in tobacco habits due to COVID-19.

	No, My Tobacco Habits Did Not Change Due to COVID-19	Yes, My Tobacco Habits Did Change Due to COVID-19
Have your tobacco habits changed due to COVID-19?	92.7%	7.3%

Is there a significant association between drinking more alcoholic beverages due to COVID-19 and low physical health status?

Drinking more due to COVID-19 and lower physical health were not statistically significant due to the p-value being more than 0.05. 9.5% of respondents reported a new drinking habit due to COVID-19. Of the 9.5% who reported drinking more, 5.3% did not have a new physical health status while 4.2% did report having a new physical health status.

Table 9. The association between drinking more alcoholic beverages due to COVID-19 and low physical health status.

	No, Physical Health Status Did Not Change Due to COVID-19 Related Isolation	Yes, Physical Health Status Changed Due to COVID-19 Related Isolation
No, I Did Not Drink in the Past 12 Months Due to COVID-19	73.7%	16.8%
Yes, I Did Drink in the Past 12 Months Due to COVID-19	5.3%	4.2%

Is there a significant association between using more tobacco due to COVID-19 and low general physical health status?

Smoking more due to COVID-19 and lower physical health were not statistically significant due to the p-value being more than 0.05. 7.4% of study participants reported a new tobacco habit due to COVID-19. 5.3% of study participants who reported new smoking habits due to COVID-19 but did not have a new physical health status and 2.1% of respondents who reported new tobacco habits also reported a new physical health status.

Table 10. The association between using more tobacco due to COVID-19 and new physical health status due to COVID-19 related isolation.

	No, Physical Health Status Did Not Change Due to COVID-19 Related Isolation	Yes, Physical Health Status Changed Due to COVID-19 Related Isolation
No, My Tobacco Habits Did Not Change Due to COVID-19	73.7%	18.9%
Yes, My Tobacco Habits Did Change Due to COVID-19	5.3%	21.1%

Is there a significant association between drinking more alcoholic beverages in the past 12 months due to COVID-19 and low mental health status?

Drinking more due to COVID-19 and lower mental health are statistically significant due to the p-value being less than 0.05. 11.4% of study participants reported a new drinking habit due to COVID-19. 2.9% of study participants reported new drinking habits due to COVID-19 but did not have a new mental health status. 8.6% of study participants reported new drinking habits due to COVID-19 and a new mental health status. 88.6% of study participants did not report a change in drinking habits due to COVID-19.

Table 11. The association between drinking more alcoholic beverages in the past 12 months due to COVID-19 and mental health status.

	No, Mental Health Status Did Not Worsen Due to COVID-19 Related Isolation	Yes, Mental Health Status Worsened Due to COVID-19 Related Isolation
No, I Did Not Drink in the Past 12 Months Due to COVID-19	60.0%	28.6%
Yes, I Did Drink in the Past 12 Months Due to COVID-19	2.9%	8.6%

Is there a significant association between using more tobacco due to COVID-19 and low general mental health status?

Smoking more due to COVID-19 and lower mental health are not statistically significant due to the p-value being less than 0.05. 7.3% of study participants reported a new smoking habit due to COVID-19. 4.1% study participants reported new smoking habits due to COVID-19 but did not have a

low mental health status. 3.1% study participants reported new smoking habits

due to COVID-19 and a low mental health status. 92.7% study participants did

not report a change in smoking habits due to COVID-19.

Table 12. The association between using more tobacco due to COVID-19 and mental health status.

	Excellent/Good General Mental Health Status	Average/Poor/Very Poor General Mental Health Status
No, My Tobacco Habits Did Not Change Due to COVID-19	42.7%	50.0%
Yes, My Tobacco Habits Did Change Due to COVID-19	1.0%	6.2%

Is there a significant association between drinking more alcoholic

beverages in the past 12 months due to COVID-19 also using more tobacco?

Drinking more alcoholic beverages in the past 12 months and using more

tobacco due to COVID-19 were statistically significant due to the p value being

less than 0.05. 71% of respondents who reported a change in habits had a

change in both vices.

Table 13. The association between drinking more alcoholic beverages in the past 12 months due to COVID-19 and using more tobacco.

	No, My Tobacco Habits Did Not Change Due to COVID-19	Yes, My Tobacco Habits Did Change Due to COVID-19
No, I Did Not Drink in the Past 12 Months Due to COVID-19	38.5%	0.0%
Yes, I Did Drink in the Past 12 Months Due to COVID-19	54.2%	7.3%

CHAPTER FOUR

CONCLUSION

Discussion

The purpose of this study was to identify the potential relationship

between COVID-19 social isolation and substance use within college students.

The present study utilized a cross sectional approach to identify the potential

relationship between COVID-19 social isolation and substance and had multiple

note-worthy findings. Key findings of this study include: 20.8% of study

participants reported having a worse physical health status due to COVID-19

isolation, 27.1% of study participants reported having worse mental health status

due to COVID-19 isolation, 23.9% of the study population reported having poor

or very poor mental health status, 9.4% of study participants reported drinking

more due to COVID-19 isolation, 7.3% of study participants reported using more

tobacco as a result of COVID-19 isolation. In addition, statistical significance,

suggesting a relationship, was found between drinking more due to COVID-19

and lower mental health status, as well as general increase in both drinking and

tobacco habits.

Approximately 21% of study participants reported having a worse physical

health status due to COVID-19 related isolation. Declination in physical health

status can lead to preventable, chronic diseases. Preventable diseases, often

called lifestyle diseases, are primarily attributed to an inactive lifestyle which

leads to the classification of poor physical health. Lifestyle diseases include but are not limited to conditions such as: obesity, health disease, high blood pressure, high cholesterol, stroke, diabetes, and osteoporosis (MedlinePlus, 2021). Target health education measures to promote adequate nutrition and physical activity.

Just over 27% of study participants reported having worse mental health status due to COVID-19 related isolation. Worse mental health status associated with COVID-19 related isolation can be a risk factor for individuals to engage in harmful health behaviors and suffer from loneliness. In addition, loneliness can also impact a person's overall health. Studies show that isolated persons are more likely to suffer from conditions such as depression, decline in cognitive function, heart disease, diabetes, arthritis, and Alzheimer's disease (Dossey, 2020). Target health education measure to promote good mental health status and coping mechanisms.

Approximately 24% of the study population reported having poor or very poor mental health status. Poor or very poor mental health status can be a risk factor for individuals to engage in harmful health behaviors. A similar study measuring isolation or rather, loneliness determined a 49% prevalence of perceived loneliness through the COVID-19 Pandemic. Of that 49% that considered themselves to be lonely, they also reported notable differences in their substance use habits when it came to drinking, using drugs, and severe

drug use (Horigian et al., 2021). Target health education measure to promote good mental health status.

Due to COVID-19 related isolation, 9.4% of study participants reported drinking more than they did prior to the pandemic. Drinking is a risky health behavior that may result in further health complications such as accidents or disease. Drinking attributes to numerous accidents every year. Consequently, in 2016, 28% of all traffic-related deaths in the US were involving an alcohol-impaired driver (CDC, 2020). Furthermore, alcohol can affect the body by disrupting brain function, heart damage, liver damage, inflammation of the pancreas, increase risk of cancer, and weaken the immune system. Specific conditions associated with alcohol can include cirrhosis, fibrosis, alcoholic hepatitis, stroke, high blood pressure, liver cancer, and colorectal cancer (National Institute on Alcohol Abuse and Alcoholism, 2022). Target health education measure to promote moderate drinking behavior.

As a result of COVID-19 related isolation, 7.3% of study participants reported using more tobacco. It should also be noted that the most commonly used tobacco products among study participants were: vape (9.4%), vape, hookah (5.2%), cigarette (4.2%), cigarette, vape (3.1%), and other (28.1%). Tobacco use may increase the likelihood of disease and harm to organs. Smoking tobacco alone attributes to an increase risk of tuberculosis along with cancer, heart disease, stroke, lung ailments, diabetes, and chronic obstructive pulmonary disease (COPD). It is estimated that more than 16 million Americans are living

with a disease that is caused by smoking (CDC, 2017). Target health education measure to prevent tobacco use and smoking cessation is recommended to lower tobacco use prevalence.

Drinking more due to COVID-19 and lower mental health are statistically significant due to the p-value being less than 0.05. Poor mental health and an increase in drinking habits can contribute to a declination in overall health and wellbeing. Heavy or long-term use of alcohol can lead to further mental health complications due to alcohol disrupting the brain's natural equilibrium. In addition to alcohol impacting the brain function, alcohol consumption may also influence the social relationships of an individual (Fuller, 2022). Social relationships may play a heavy importance on an individual as socially isolated individuals may result in psychological and physical disintegration (Umberson & Karas Montez, 2010). Target health education measure is suggested to promote moderate drinking behavior to lower its impact on mental health status.

Drinking and tobacco use had statistical significance due to the p-value being less than 0.05. Drinking and using tobacco can have adverse effects on overall health and wellbeing. Drinking and using tobacco also may be a contributing factor to chronic diseases like cancer, liver disease, heart disease, and more. When alcohol and tobacco are used together, the risk of cancers, like cancers of the mouth and throat or liver cancer, increases (*NIAAA Publications*, 2007). Target health education measure to promote moderate drinking and smoking behavior to lower consumer use.

Strengths and Limitations

A major strength of this study was the incentives that were provided to participants. The incentives to participate in the study aided in reducing selection bias among the participants; incentives encouraged a wider range of participants to engage in the study. The larger cohort of study participants helped reduce selection bias since the population was not limited to a specific subgroup within the study's target population. The nature of the randomized participants assisted in creating an unknown outcome for the study, thus reducing selection bias (Pannucci & Wilkins, 2010). However, there were also limitations to this study. Limitations of the study include: participants came from one university and possibly underreported mental health status along with substance use activity (alcohol and tobacco). Topics that can be classified as sensitive such as mental health and substance use, can often be underreported by the study participants due to response bias. Response bias occurs when survey questionnaires can come off as intrusive to the participant due to the nature of directness when asking the participant(s) to report sensitive information (Choi & Pak, 2005).

Conclusion

The COVID-19 Pandemic is a significant public health problem that has impacted not only the mental health of individuals, but the prevalence of substance use as well. The data collected in this study has shown the significance between lower mental health status and drinking alcohol.

Additionally, the data has also shown the relationship between alcohol and tobacco use. Public health interventions are encouraged to promote moderate substance use and good mental health practices alike.

APPENDIX A:

INSTITUTIONAL REVIEW BOARD LETTER OF APPROVAL

February 22, 2022

CSUSB INSTITUTIONAL REVIEW BOARD
Protocol Change/Modification
IRB-FY2022-146
Status: Approved

Prof. Monideepa Becerra
CNS - Health Science
California State University, San Bernardino
5500 University Parkway
San Bernardino, California 92407

Dear Prof. Becerra:

The protocol change/modification to your application to use human subjects, titled "Student health needs assessment-Third round" has been reviewed and approved by the Chair of the Institutional Review Board (IRB). A change in your informed consent requires resubmission of your protocol as amended. Please ensure your CITI Human Subjects Training is kept up-to-date and current throughout the study. A lapse in your approval may result in your not being able to use the data collected during the lapse in your approval.

This approval notice does not replace any departmental or additional campus approvals which may be required including access to CSUSB campus facilities and affiliate campuses. Investigators should consider the changing COVID-19 circumstances based on current CDC, California Department of Public Health, and campus guidance and submit appropriate protocol modifications to the IRB as needed. CSUSB campus and affiliate health screenings should be completed for all campus human research related activities. Human research activities conducted at off-campus sites should follow CDC, California Department of Public Health, and local guidance. See CSUSB's COVID-19 Prevention Plan for more information regarding campus requirements.

You are required to notify the IRB of the following by submitting the appropriate form (modification, unanticipated/adverse event, renewal, study closure) through the online Cayuse IRB Submission System.

1. If you need to make any changes/modifications to your protocol submit a modification form as the IRB must review all changes before implementing them in your study to ensure the degree of risk has not changed.
2. If any unanticipated adverse events are experienced by subjects during your research study or project.
3. If your study has not been completed submit a renewal to the IRB.
4. If you are no longer conducting the study or project submit a study closure.

You are required to keep copies of the informed consent forms and data for at least three years.

If you have any questions regarding the IRB decision, please contact Michael Gillespie, Research Compliance Officer. Mr. Gillespie can be reached by phone at (909) 537-7588, by fax at (909) 537-7028, or by email at mgillesp@csusb.edu. Please include your application approval number IRB-FY2022-146 in all correspondence.

Best of luck with your research.

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