

Cannabis And College Students: Self-Perceived Mental Health Prior to, During, and After the Pandemic

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ABSTRACT

Introduction: College students demonstrated changes in levels of mental wellbeing as they and the world experienced new levels of stress and anxiety due to the COVID-19 pandemic. As access to healthcare became limited, students turned to alternative methods of coping, which included cannabis use. **Objective:** To determine if an association between cannabis use and self-perceived mental wellbeing during the pandemic among college students exists. **Method:** A paired samples *t*-Test was used to compare self-reported mental wellbeing at different times during the pandemic, a one-way ANOVA to compare self-reported mental health between respondents' cannabis use status, and a Tukey-Kramer post-hoc analysis was used to determine between group significance. All data collected were from participants at a single time point (retrospective self-report during April 2022). **Results:** Of 103 self-reported college students, the most significant differences in mental wellbeing were reported prior to and during the pandemic. Consistent significant differences were observed between each of the college student groups derived from those students who entirely avoided cannabis use or cessation of use (highest rating), $p = .018$, as compared to those who initiated cannabis use prior to and during the pandemic (lowest rating) $p = .045$. Post pandemic mental wellbeing demonstrated a higher level of mental wellbeing among those who had some exposure to cannabis compared to those who avoided cannabis entirely. **Conclusions:** It cannot be concluded that mental wellbeing was lower due to cannabis use. However, it is possible those with lower self-perceived mental wellbeing turned to cannabis use.

Key words: = college students; pandemic; COVID-19; cannabis; mental health

By mid-April 2020, the COVID-19 virus had spread to over 185 countries around the world (Varghese et al., 2020). The public health response to this outbreak was to take maximal precautions to prevent a strain on limited resources and equipment. This led to the global adaptation of social distancing protocols (Glogowsky et al., 2021) in order to “flatten the curve” and contain the spread of the virus around the world. One group specifically impacted by the protocols of lockdown and isolation was college-aged students. Though the impact of social distancing and isolation was found to be helpful in reducing the spread of COVID-19, the forced isolation, lack of social interaction, and disruptions to daily life led

to a “Secondary Pandemic” of reduced mental wellbeing. (Ganesan et al., 2021).

In a longitudinal study from 2017, a common link was found between physical and mental wellbeing relating specifically to isolation and a lack of social interaction (Ohrnberger et al., 2017). Their findings suggest that social isolation is a leading cause of decline in physical and mental wellbeing, with a direct overlap between the two (Ohrnberger et al., 2017). This is substantiated by the findings of Kandola and Stubbs (2020) who identified that anxiety disorders increase the risk of cardiovascular disease and premature mortality.

These studies inform us that the methods used by the governments of the world in dealing with COVID-19 all combined to create a secondary series of health problems due to isolation. The primary stressors focused on in this review center around isolation and self-treatment of college students occurring around the pandemic. We strived for our research to differ from others, as we focused specifically on college students and looked at a period of time that was particularly stressful.

Isolation and Loneliness

Even before the pandemic, a primary contributing factor to the increased usage of substances was isolation (Bartel et al., 2020). It has been found that those who used cannabis prior to the pandemic experienced an average 20% increase in usage during lockdown (Bartel et al., 2020). Those who used cannabis the least frequently prior to the pandemic were most likely to increase their consumption during the height of the pandemic (Assaf et al., 2020; Jurkowitz, 2020). There were increases in usage from those studied by Lake et al. (2022), which indicate that daily and weekly consumption rose, with the majority of users claiming that the escalation in usage was due to increased feelings of anxiety.

College students tend to have a more adverse reaction to loneliness and isolation (Hager et al., 2022). According to Hager et al., younger demographics have been found to have higher risks of negative mental wellbeing due to isolation since that time alone tends to get filled with things like Repetitive Negative Thinking (RNT). RNT is described as pervasive negative thoughts that take hold during periods of strife, manifesting as chronic worry. Research suggests that RNT may be the link between loneliness and depression (Hager et al., 2022; Spinhoven et al., 2018).

Self-Medication for Mental Wellbeing

Self-perceived mental health and/or wellbeing is one's perception of their mental wellbeing from a general standpoint. This self-perceived mental health/wellbeing affords a generalization of populations suffering from a form of mental health disorders, mental health or emotional distress that is not usually apparent in perceived

health according to a Canadian Health Survey conducted by the Government of Northwest Territories (2014).

According to sources that include quantitative (Gaviria-Mendoza et al., 2022; Makowska et al., 2020) and qualitative studies (Kaggwa et al., 2021), self-medication became a major factor in the immediate response of the general public to the pandemic lockdown. The lack of coherent information from leadership (Algara et al., 2022) led to many people around the world turning to alternative sources for information about self-treatment. It has been found that people turned to social media for information about self-treating for COVID-19, and gravitated towards things such as over-the-counter pain medications, as well as cannabis for self-treatment of other chronic neurological and self-perceived mental health conditions, while hospitals and clinics focused on providing treatment and resources exclusively to those in immediate need (Brenneke et al., 2022). Research by Norton et al., revealed a 20% usage of alternative medicines by people under 50 years old to treat COVID-19. This suggests a prevalence among college students and other younger adults to seek non-traditional methods, such as cannabis, rather than therapy or prescription medications.

Alternative Methods for Coping

Literature has unveiled how people react when faced with stressful situations and times of uncertainty, which include alternative coping strategies such as seeking social support, providing acts of compassion, engagement in exercising, and employment of positive thinking (Ogueji et al., 2021). It was also found that the mental wellbeing of college students should consider promotion of physical activity (VanKim & Nelson, 2013). Other health behavior changes related to sex, parental status, job status, depression, and having more time available during the pandemic were the most cited reasons for these successful coping outcomes (Knell et al., 2020). While these approaches proved helpful for some, there were still many others who turned to alternative medicines as methods for treatment during the pandemic lockdown; this includes the use of cannabis according to the data collected from this project.

Cannabis

Living situations of younger users, especially those away at college, whether dependent or independent, correlated a decrease in cannabis prevalence during the lockdowns, but not frequency (Merrill et al., 2022). In a similar study, younger users reduced their cannabis consumption due to a change in accessibility of cannabis (Boehnke et al., 2021). This evidence demonstrates the effectiveness of cannabis as a coping strategy for self-perceived anxiety and mental distresses for many people.

Complementary and alternative medicine approaches for various ailments remain underexplored. These methods include a vast range from neurological conditions to physical conditions, as compared to traditional approaches, cannabis may pose some beneficial mechanisms. Much of the literature cited found anxiety to be a reoccurring theme for cannabis consumption and use. Cannabis does afford some potential side effects, which are often mild to moderate. Medical practitioners are encouraged to advise their patients of the probable ill-effects of cannabis use (Hall & Solowij, 1998), as well as its beneficial properties as an alternative and complementary based medication, prior to consideration of use (Weisman & Rodríguez, 2021).

In some users, cannabis is utilized as a relief system for panic and anxiety, and frequent cannabis users have a higher prevalence of self-perceived anxiety, according to data by Crippa et al. (2009). It was found in a study conducted by Rup et al. (2021) that individuals with lower levels of self-perceived mental health statuses report more frequent use. In her report, Rotermann (2020) discusses an association between utilization of cannabis and self-perceived lower levels of mental wellbeing. Additionally, those with lower levels of self-perceived mental wellbeing were twice as likely to use cannabis as compared to those with higher levels of self-perceived mental wellbeing (Rotermann, 2020). However, it cannot be determined if those with lower levels of self-perceived mental wellbeing are more prone to using cannabis, or if cannabis is the cause of lower levels of self-perceived mental wellbeing.

The present study aims to use retrospective, self-report, cross-sectional data to identify relationships between self-perceived mental

wellbeing and cannabis consumption among college students and other young adults before the pandemic, during the first year of the lockdown, and at present (as of April 2022) to determine commonalities and/or disparities. An extensive study by Liu et al. (2014) lends credence to the claims that education is a key determinant of alternative self-care methods utilized and that college students have a high appetite for further complementary and alternative medicine knowledge.

METHODS

Recruitment

This project was part of an undergraduate course on medical cannabis. The project was constrained to a timeline within the traditional semester calendar of the university. This research was independently conducted by a group of undergraduate students. Recruitment for this study was conducted via various social media platforms (Facebook, Instagram, Twitter, Snapchat, Discord, and GroupMe). Student researchers shared the link on their individual social media accounts and requested their personal network to complete the survey and share it. No paid advertising was utilized. Participants were provided an anonymous survey created on Qualtrics. Snowball sampling was utilized as an additional method for recruitment as well. No incentives were provided for study participation. The study was made available beginning on April 8, 2022, and closed on April 29, 2022. Due to the constraints of the traditional semester, an ideal sample size was not the goal but, rather, as many respondents as possible during the permitted timeframe.

Data Analysis

IBM SPSS statistics (version 27.0) was used to complete the data analysis. A paired samples *t*-Test was used to compare self-reported mental health at the beginning of the pandemic in March of 2020, during, and when lockdown requirements had been lifted after March 2021. A one-way ANOVA was utilized for evaluation of significant differences between participants' cannabis use status (did not use, started using, continued using, and stopped using). Differences in self-

reported mental health by cannabis use status was determined using a Tukey-Kramer post-hoc analysis. Statistical significance was set at $p < .05$.

Mental Health Measure

Approval for this project was granted by the California State University Channel Islands Institutional Review Board in accordance with university standards. The participants utilized a 5-point Likert scale answering the questions “How would you rate your emotional/mental health prior to the COVID-19 pandemic?”, “How would you rate your emotional/mental health during the COVID-19 pandemic?”, and “How would you rate your current emotional/mental health?” Participants could select “very poor,” “poor,” “good,” “very good,” or “extremely good,” where (1) was very poor and (5) was extremely good.

Cannabis Use Measure

For this portion of the survey, participants continued to utilize a 5-point Likert scale

answering the following questions, “Did you initiate, continue, or stop using cannabis during the first year of the pandemic for any reason?”, “Did your use of cannabis increase, decrease, or stay the same from when you initiated use during the first year of the pandemic to now?”, and “Did your use of cannabis increase, decrease, or stay the same prior to the pandemic to now?” Participants could select “very poor,” “poor,” “good,” “very good,” or “extremely good,” where (1) was very poor and (5) was extremely good.

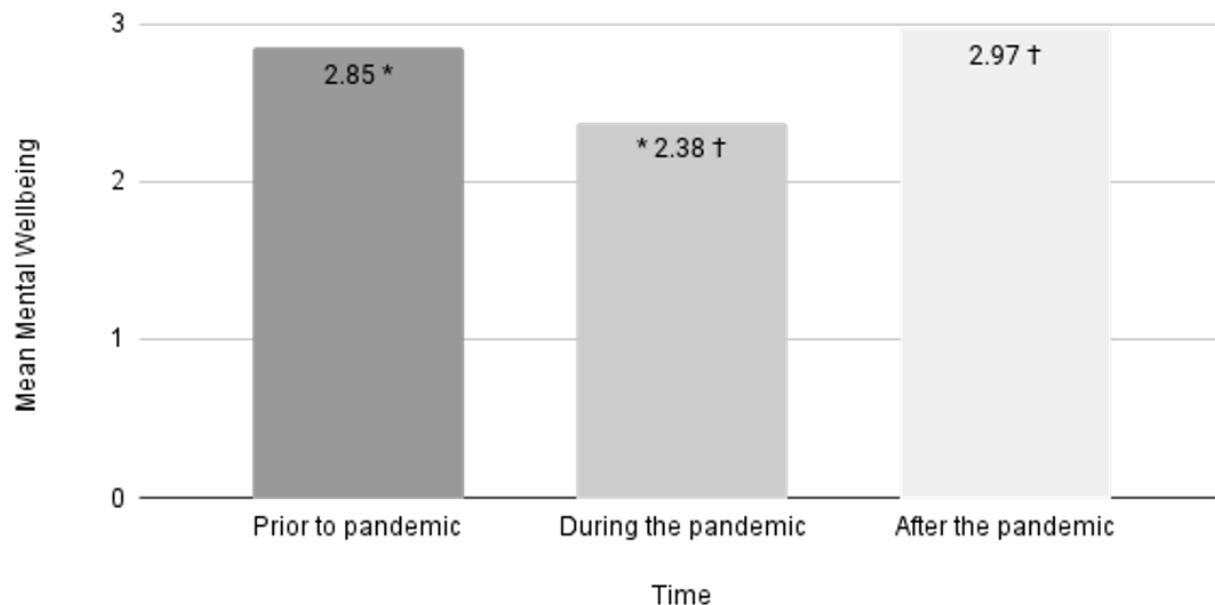
RESULTS

When the study was concluded, 122 individuals responded to the survey invitation. However, 19 did not complete the entire survey, and their data was not included in the analysis. Most of the participants were between the ages of 18-24, identified as female, and were Hispanic (Table 1). The final analysis included 103 participants, which can be seen in Table 1.

Table 1. *Participant Demographics (N = 103)*

	N	%
Gender		
Female	74	71.84%
Male	25	24.27%
Non-binary / third gender	4	0.04%
Average Age		
23 years		
Race		
Undisclosed	1	0.01%
Other	23	22.33%
Black or African American	4	0.04%
Asian	23	23.33%
American Indian or Alaska Native	4	0.04%
White	48	46.60%
Ethnicity		
Non-Hispanic	50	48.54%
Hispanic	53	51.46%

Figure 1. Average College Students' Mental Wellbeing Values



Note. * = Significance between prior to and during the pandemic; † = significance between during and after the pandemic.

Mental Wellness

Referring to Figure 1, the mean self-reported mental wellness was 2.85 ($SD = 0.9$) prior to the pandemic, 2.38 ($SD = 1.0$) during the pandemic, and 2.97 ($SD = 1.0$) after the COVID-19 related mandates were lifted. The mean self-reported mental wellness during the pandemic was significantly lower than the mean reported prior to the pandemic, $M = 0.476$, 95% CI [0.286, 0.665], $t(102) = 4.985$, $p < .001$. The mean from after the

lifting of mandates was significantly higher than the mean during the pandemic, $M = 0.592$, 95% CI [0.374, 0.810], $t(102) = 5.389$, $p < .001$. The mean self-reported mental wellness after the lifting of mandates was comparable to the mean from before the pandemic, $M = 0.177$, 95% CI [0.106, 0.339], $t(102) = 1.037$, $p = .302$, a non-significant difference. There were no others between groups that were statistically significant. Table 2 denotes the non-significant differences found during the analysis of the data.

Table 2. Non-Significant Differences Prior to, During, and After COVID-19 Pandemic Lockdown

		Stopped Using	Started Using	Continued Use	Did Not Use
Highest Self-Perceived Mental Wellness Values Prior to March of 2020	$n =$	10	14	58	21
	$M =$	3.5	2.43	2.84	2.86
	$SD =$	0.97	0.76	0.91	0.73
Highest Self-Perceived Mental Wellness Values During Pandemic	$n =$	10	14	58	21
	$M =$	2.7	1.93	2.28	2.81
	$SD =$	1.2	0.7	1	1

		Stopped Using	Started Using	Continued Use	Did Not Use
Highest Self-Perceived Mental Wellness Values After March of 2021	<i>n</i> =	10	14	58	21
	<i>M</i> =	3.1	3.07	2.95	2.9
	<i>SD</i> =	0.74	0.92	1	0.83

Significant Variations

There was a significant variation in self-reported mental wellness prior to the pandemic between the different levels of cannabis use, $F(3, 99) = 2.99, p = .035$. There was a significant difference in self-reported mental wellness from those who stopped using cannabis ($n = 10, M = 3.50, SD = 0.97$) compared to those who started using cannabis ($n = 14, M = 2.43, SD = 0.76; p = .018$). There were no other pre-pandemic groups that were statistically significant.

There was a significant variation in self-reported mental wellness during the pandemic between the different levels of cannabis use, $F(3, 99) = 3.01, p = .034$. There was a significant difference in self-reported mental wellness from those who did not use cannabis ($n = 21, M = 2.81, SD = 1.0$) compared to those who started using cannabis ($n = 14, M = 1.93, SD = 0.73; p = .045$). There were no other groups that were statistically significant. The differences in self-reported mental wellness after the pandemic between different cannabis use levels was not significant, $F(3, 99) = 0.160, p = .923$.

DISCUSSION

This study used retrospective self-report data from a convenience sample of college students to examine cannabis use and self-perceived mental wellbeing during the COVID-19 pandemic. It cannot be definitely concluded from this data that cannabis is associated with lower levels of self-perceived mental wellbeing. While the data showed those who recently stopped using cannabis reported higher levels of self-perceived mental wellbeing during the pandemic, and those who continued using cannabis had worse self-reported mental wellbeing, perhaps those struggling with mental wellbeing turned to cannabis, rather than cannabis being the cause of poor mental wellbeing outcomes. In similar research, Rotermann (2020) was unable to demonstrate the causal relationship between

worsening self-perceived mental wellbeing and cannabis use.

Prior to the pandemic, in March 2020, those who stopped using cannabis for the duration of the pandemic had significantly higher levels of self-perceived mental wellbeing compared to those who started using cannabis at the beginning of the pandemic. The individuals whose cannabis use stayed the same, and who did not use, had comparable levels of self-perceived mental wellbeing. Our data suggests that it cannot be concluded that cannabis was the cause of lower levels of mental wellbeing, or that lower levels of self-perceived mental wellbeing encouraged the use of cannabis during this perilous time.

During the pandemic, between March 2020 – March 2021, it was discovered that those who started using cannabis had the lowest levels of self-perceived mental wellbeing, and this was significantly different from those who did not use cannabis. Individuals who stopped using cannabis during the pandemic, or whose use stayed the same, had comparable self-perceived mental wellbeing scores.

It appears once the pandemic lockdown restrictions had been lifted by March of 2021, all self-perceived mental wellbeing levels returned to near baseline. For study participants, when thinking about their mental wellbeing, and cannabis use prior to the pandemic, it was those who did not start using that resulted in higher levels of self-perceived mental wellbeing, as compared to those who initiated use or continued use throughout the course of the pandemic.

Limitations

This study was limited with a small sample size, however, due to the limitation of the academic calendar, it was not possible to have the survey available for more than four weeks. Unfortunately for the current study, the sample size was limited to 103 respondents with viable data. Furthermore, if the survey had been

available for longer, it is probable more respondents would have provided additional data.

The federal status of cannabis adds additional challenges to recruiting respondents to a survey due to advertising restrictions with various outlets. This resulted in more reliance on snowball sampling, as defined in Methods, which increased issues of anonymity and confidentiality and further discouraged participation in the survey. This recruitment technique also potentially limited diversity in the sample, and therefore, is not representative of the population. An example of this is the relatively high number of cannabis users in our sample (Sandler et al., 2019; *Facebook Terms of Service*, 2022).

The respondents were asked to report their own status of mental wellbeing according to questions that were not validated instruments. As this project was taken on as a part of an undergraduate class, time and depth were both limited. This is reflected in the relatively crude and vague instruments used to collect our data, such as asking people to rate their self-perceived “mental wellbeing,” versus asking them to consider different aspects of mental wellbeing when answering the unvalidated questions.

The survey required the subjects to report their self-perceived mental wellbeing retrospectively some time after the pandemic lockdown restrictions had been lifted. The questions specifically asked for answers related to “after March 2021,” and the survey that collected this data was implemented in April of 2022.

Conclusion

Students who started using cannabis at the beginning of the pandemic had lower levels of self-perceived mental wellbeing. It is unknown whether or not it is related to cannabis use. Significant differences were discovered in self-perceived mental wellbeing between those who did not use compared to those who either started using or continued cannabis use during the pandemic. While during the pandemic, there was a significant difference between those who did not use cannabis and those who began using. It cannot be concluded that their self-perceived mental wellbeing was lower due to cannabis use. However, it is possible their lower self-perceived mental wellbeing states promoted cannabis use. The associations between cannabis use and self-

perceived mental wellbeing are relevant to science and should remain at the forefront of ongoing research to better understand these correlations.

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