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Relationship Between Cannabis Dispensary Density, Proximity, and Attitudes Toward Medical Cannabis: A Cross-Sectional Study

Thomas A. Clobes[1] | Sean Himebaugh[2] | Sandra Aguilar Gamez[1] | Mariza Torres[1]

[1]Health Sciences Department, California State University Channel Islands, Camarillo, California, USA | [2]Communication Department, California State University Channel Islands, Camarillo, California, USA

Correspondence: Thomas A. Clobes (thomas.clobes@csuci.edu)

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ABSTRACT

Background and Aims: Public attitudes toward medicinal cannabis (MC) remain mixed, particularly in areas with legal access to recreational cannabis (RC). This study aimed to explore the relationship between proximity to cannabis dispensaries, dispensary density, and attitudes toward MC. Specifically, we hypothesized that individuals living closer to cannabis dispensaries or in areas with higher dispensary density would have more negative attitudes toward MC.

Methods: Data were collected through an online survey administered from February to July 2021 and March to May 2022. Respondents' attitudes toward MC were measured using the Medical Cannabis Attitudes Scale (MCAS), and their zip code was used to calculate dispensary density and proximity. Statistical analyses included Spearman's rank-order correlation, ANOVA to assess relationships between attitudes, distance, and density, and a Generalized Least Squares regression analysis to evaluate the relationship between demographic, social, and geographic predictors and MCAS scores.

Results: A total of 935 respondents participated, with 743 residing in zip codes with no dispensaries, 160 in moderate-density zip codes, and 32 in high-density zip codes. A weak positive correlation was found between greater distance from a dispensary and more favorable attitudes toward MC MCAS, $r_s(933) = 0.090$, $p < 0.05$. However, there was no statistically significant difference in MCAS scores between different density groups ($F(2932) = 0.683$, $p = 0.505$). The overall model was significant, $F(9918) = 2.62$, $p = 0.005$, with an R^2 of 0.025; gender ($p = 0.004$), age ($p = 0.048$) and state legal status ($p < 0.001$) contributed significantly to the model.

Conclusion: The study provides evidence of a weak positive correlation between distance from cannabis dispensaries and favorable attitudes toward MC, with gender and state legal status contributing to attitudes, while dispensary density did not significantly impact attitudes. However, neither density nor distance from dispensaries contributed to the regression model. These findings suggest that while proximity may influence MC attitudes, the factors impacting attitudes toward MC require further investigation.

1 | Introduction

There has been a resurgence in the interest and usage of cannabis for medicinal purposes [1, 2]. Recent adjustments to legalization and access to cannabis throughout various countries has led to an increased interest in scientific study in the usage of cannabis as a therapeutic option [1]. The increased access and usage of cannabis has driven an interest in the development of products and proliferation of cannabis dispensaries [3]. The cannabis industry, while remaining illegal at the federal level within the USA, is projected to be worth $19B in 2024 [3].

The current landscape of cannabis culture within the USA is tenuous given the legal issues raised by the federal government versus conflicting state regulations in many areas [3]. As medicinal research has begun to develop new products for ingesting cannabis, science regarding dosage and frequency remains underdeveloped [4, 5]. This has led to the development of products that vary in intensity and with minimal control over product quality [6]. While delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD) have been given more attention in recent years by scientific and medicinal research, more methods have also been developed to distribute cannabis to the end user [2]. Development of various products for the ingestion of cannabis has coincided with the uprising of methods for the distribution of both medical (MC) and recreational cannabis (RC) to the end user.

The US has over 30 states or territories which allow for the sale of cannabis for either medical or recreational purposes [3]. However, a study by Pedersen et al. [7] established that within Los Angeles County a large number of cannabis storefronts were operating without a license. The lack of signage and the potential to mix cannabis with tobacco distribution from the unlicensed storefronts begins to reveal how the potential attitudes of the general public might be negatively affected. The growing economy of the cannabis market can lead to economic equity for underserved communities, but studies have shown that the majority of unlicensed storefronts have been located within highly impoverished areas with large populations of such groups [7, 8].

California was the first state to legalize cannabis for medicinal purposes in 1996 [2]. Since then, over thirty states have allowed access to medicinal cannabis. This represents a dramatic shift from the attitudes that permeated the public dialogue in relation to cannabis as a "gateway drug" due to the public education programs of the 1970s and 1980s [9]. Programs like Drug Abuse Resistance Education, more commonly known as D.A.R.E., became part of the US government's "War on Drugs" [9]. The war on drugs has been found to disproportionately target people of color and impoverished communities in negative ways [10]. This aligns with the findings of Firth et al. [7] in their study of licensed and unlicensed cannabis dispensaries being more common in such neighborhoods.

The effect of public policy via the war on drugs has led to many medical professionals having biases against recommending cannabis for therapeutic purposes [1, 4]. While public perception has shifted somewhat favorably towards cannabis consumption for medical purposes, there is still a prevalent belief in many of the old stigmas surrounding cannabis as a "gateway" to crime and addiction [11, 12]. McGinty et al. [13] found that there was a near-even split among those in favor of legalization for RC usage and those opposed. The work conducted by Clobes and Gagnon [11] found that the attitudes of respondents in states with legal access to RC were less favorable toward MC. Further, it was discovered that those who opposed cannabis legalization were concerned about impaired driving, substance use disorders, and exposure of cannabis to youth [11, 14–17].

Moiseeva [18] explored the "not in my backyard" notion of many toward dispensaries in their local neighborhood, and concluded dispensaries are more likely to be permitted in economically disadvantaged neighborhoods because of resistance and influence from more affluent neighborhoods. Specifically considering density, dispensaries are present in higher densities in racially and economically disadvantaged neighborhoods [19]. These trends hold true for both licensed and unlicensed dispensaries [20]. However, some research has discovered decreased crime rates in neighborhoods after a dispensary opened [21]. With many opposing dispensaries near their homes, less dispensaries in economically and racially advantaged areas, and more negative attitudes toward MC in states allowing recreational use, this project sought to understand the impact of dispensary density and proximity on attitudes toward MC.

1.1 | Hypothesis

As a result of the relatively rapid shift in public access to medicinal cannabis, combined with a public attitude toward cannabis and the more negative views toward MC in states with legal access to RC, it was necessary to understand the relationship between dispensaries and attitudes toward MC. Specifically, this project investigated how the distance one lives from a dispensary and the density of dispensaries in one's residential zip code impacted attitudes toward MC. This project was guided by the hypothesis that the closer people live to cannabis dispensaries and the higher density of dispensaries in a given area, the more likely they are to have negative attitudes about MC. This hypothesis was proposed when considering the impact legal access to RC has had on attitudes toward MC and that more affluent and White dominated neighborhoods have been outspoken against dispensaries in their local areas—thus, it was thought that proximity and density of dispensaries may further impact attitudes toward MC.

2 | Methods

2.1 | Scale Selection

The MC component of the Recreational and Medical Cannabis Attitudes Scale (MCAS) was used to measure attitudes toward MC [22]. With a reliability coefficient of 0.86, the MCAS is a validated measure of MC attitudes. For this study, the MCAS included five questions, using a 5-point Likert scale with appropriate questions reverse coded. Possible point totals ranged from 5 to 25, with a higher score indicating a more positive

attitude toward MC. One question from the original MCAS, asking older adults about their attitudes toward MC when they were younger, was omitted from the scale. The distributed survey also collected demographic information from respondents, including zip code of residence to determine dispensary proximity and density.

2.2 | Respondent Recruitment

Adult respondents were recruited on the researchers' and university's social media accounts, with on-campus flyers, and through snowball sampling. Social media posts and flyers included a brief overview of the project, researcher contact information, and both a link and QR code to the online survey. The flyers were posted on bulletin boards throughout campus through heavy pedestrian traffic. The survey was first available from February through July 2021 and again from March through May 2022. Respondents were unable to complete the survey twice by limiting attempts to one from a single IP address.

2.3 | Density and Distance Calculations

The zip code each respondent reported as their zip code of residence was used for analysis. Using Weedmaps, the number of store-front dispensaries in each zip code was determined, including medical-only dispensaries, recreational dispensaries, and unlicensed ones [23]. Dispensaries that only provided delta-8 THC were not included. Dispensary density was calculated using the square mileage of each zip code. Respondents' distance from the closest dispensary was calculated using the geographic center of their reported zip code and the distance to the closest dispensary from that location.

The respondents were grouped into three tiers based on the dispensary density in their zip code of residence: no dispensaries, moderate number of dispensaries (more than zero to 0.003518 dispensaries per square mile), and high number of dispensaries (more than 0.003518 dispensaries per square mile). This was based on the number of dispensaries in high dispensary-count states (Oklahoma, California, and Oregon with an average dispensary density of 0.01808 per square mile) and moderate-density states (Colorado, Washington, Montana, Alaska, Florida, and Michigan with an average dispensary density of 0.003518 per square mile [24]).

2.4 | Data Analysis

The data analysis was completed using SPSS version 28.0. A two-tailed Spearman's rank-order correlation was run to assess the relationship between the proximity of cannabis dispensaries and MCAS. The correlation was run for the entire sample as well as individually for two of the three groupings of state legal status based on the respondent's state of residence: medical-only access and legal access to both MC and RC. No analysis was conducted with participants from states with no legal access due to the small sample size. An ANOVA was used to determine if MCAS varied between the three different density groups.

To evaluate the relationship between demographic, social, and geographic predictors and MCAS scores, a Generalized Least Squares (GLS) regression analysis was employed. While, diagnostic tests revealed no significant heteroscedasticity based on the Breusch-Pagan test ($p = 0.139$), the Durbin–Watson statistic ($DW = 0.982$) suggested potential autocorrelation among residuals. Therefore, though multiple regression analysis was considered, it was deemed inappropriate because its reliance on strict assumptions—such as homoscedasticity and independence of residuals—was not fully met in this data set.

The GLS analysis included one dependent variable (MCAS score) and nine independent variables**:** age, race, gender, ethnicity, education level, political party affiliation, legal status of cannabis in state of residence, dispensary density, and distance one lives from the closest dispensary. Categorical predictors (e.g., race, gender, education, and political affiliation) were dummy-coded to facilitate inclusion in the model, with one category per variable designated as the reference group. This analysis was completed for the entire sample and then within the state legal status groups of medical-only access and legal access to both MC and RC, omitting the legal status as an independent variable in the latter. Individuals from states without any legal access to cannabis were omitted from all relevant analyses due to the small number of said participants. Model fit was assessed using the R^2, and F-statistic, while individual predictors were evaluated for statistical significance based on $p < 0.05$. This approach allowed for a nuanced understanding of how demographic, social, and geographic factors contribute to MCAS scores.

2.5 | Ethical Review and Data Availability

The institutional review board at California State University Channel Islands approved the research protocols (#IO5559). Before commencing the survey, respondents were required to electronically acknowledge their informed consent. Given the sensitive nature of attitudes toward MC, the respondents' responses are not publicly available.

3 | Discussion

Overall, these results provide some evidence of a weak relationship between MCAS and the distance one lives from a dispensary and that gender and state legal status are meaningful predictors of MCAS scores, given the correlation results. Specifically, within states with legal access to MC and RC, gender and age were significant predictors. However, this weak correlation needs to be considered in the context of the lack of dispensary distance contributed to the GLS regression model. The results also suggest no relationship exists between dispensary density and MCAS. Further research is needed to examine the mechanisms underlying these associations and to explore other potential predictors not accounted for in this model.

The anticipated outcome was that there would be a stronger positive correlation between distance and MCAS attitudes with a difference in attitudes between the different density groups. This means that the closer a surveyed participant lives to a cannabis dispensary, or the more dispensaries there are in a given geographic area, the more negative the respondents' overall attitudes towards MC would be. It was found that there is a weak positive correlation between the distance and density that someone lives from a cannabis dispensary and their MCAS. Thus, the hypothesis regarding proximity was somewhat supported, though weakly, but the hypothesis regarding dispensary density and attitudes toward MC was not supported by this data.

The GLS revealed that gender, age, and state legal status of cannabis are significant predictors of MCAS. The variation in MCAS with state legal status is consistent with prior research [25]. Some research has shown variation with age while other research has not, but the variations in MCAS with gender are not consistent with this prior research [22, 25]. Males reporting a lower MCAS is inconsistent with previous research on attitudes, utilization patterns, and views toward legalization, where males tend to be in support of cannabis in general [26, 27].

This study begins to explore the existing paucity in the public's overall attitudes about MC. It has been found, per Arora et al. [22], that people may have a generally more favorable attitude towards cannabis as a therapeutic agent while also feeling less likely to support access to legal RC. Additionally, the current study scrutinizes the access to cannabis through the lens of those affected by a "not in my backyard" syndrome. The present research was based on the understanding that there is a difference between believing that MC access is positive for patients, but having access in someone's own neighborhood would be frowned upon. It was found by Iannacchione et al. [28] that there are initial strong resistances to the expansion of cannabis access, followed by longer periods of calm. That study provides limited support for the findings of a weak positive correlation between the proximity to a dispensary and an overall more negative attitude towards cannabis.

The density of dispensaries in one's zip code of residence, in this data, did not have an impact on attitudes toward MC. Possibly, this is due to the relatively small density levels in many areas of the country [24]. Given this, even the areas of the country considered high-density for this project generally have a relatively low density of dispensaries. State density, used to classify the density groups, is not a perfect measure as there are some geographically large states, such as Alaska, with relatively small populations. Conversely, other states, with Pennsylvania as an example, are relatively small with large populations. However, this is still a valid variable given that a low-population density state with a moderate geography size, such as Oklahoma, has a high-dispensary density. Future research should examine attitudes toward MC and density with a higher level of density detail.

Based on previous research, there are many factors that have demonstrated an impact upon the outcome of MCAS and distance from cannabis access. While this study focuses on one's proximity to cannabis dispensaries and the density of dispensaries in their zip code of residence to determine overall attitudes, it does not account for more specific criteria. Specific criteria, as mentioned by Firth et. al [7], includes the impact of unlicensed products as well as the appeal to youth. With the potential rescheduling of cannabis from its current status as a Schedule I drug, the potential exists to gain much deeper understanding due to the potential for larger samples of more diverse populations in future studies.

3.1 | Limitations

There were several limitations in the collection of this data. This data was collected as part of an undergraduate research project, which means that there was a shorter window of time for the collection of data due to academic schedules for those researchers. A result of that was a smaller sample size compared to the population for the country. Additionally, respondents not being recruited using a probability-based method could have led to those who feel strongly positively or negatively toward MC being more likely to agree to participate. These factors also contributed to a younger-skewing sample, limiting potential generalizability of these findings.

Another limitation of this study, which may potentially explain the weak correlation, is that while this project used zip codes to establish proximity from cannabis dispensaries, it did not determine the exact location of a respondent's residence from a dispensary. It is possible that someone can live in the same zip code and be a considerable distance closer or further away from a cannabis dispensary and the negative associations, such as impaired driving, substance use disorders, and exposure of cannabis to youth. People who live in the same zip code may have different attitudes toward MC based on their daily lived experiences with cannabis dispensaries. The US Postal Service describes zip codes as being based on population rather than area [29]. Therefore, it is possible for many zip codes to exist in tight proximity to dispensary-dense areas, while other zip codes are large enough to not have a dispensary around for a much farther distance. Participants were also not asked how long they had lived in such a residence nor dispensary proximity and density of recent prior residences.

This project did not consider dispensaries that only sell delta-9 THC. Since the passage of the Farm Bill in 2018, through a loophole in the law, the proliferation of use and delta-9 containing products and storefronts that sell such products has been widespread [30, 31]. Given this omission, it is not known how the presence or lack thereof of such businesses impacted attitudes toward MC.

Distance from a dispensary location and the overall density of cannabis dispensaries are only two of many likely contributing factors to one's overall attitude toward cannabis accessibility. This study did not determine other compounding factors. People's attitudes can be influenced by things that have not been accounted for, such as their daily exposure to messaging about politics and the law. According to Hoewe and Peacock [32], prolonged exposure to media with agenda biases can influence the way that people think of issues. While some people may

view cannabis as medicinal or valuable, others might see cannabis as problematic. Government employees can have stronger biases against cannabis usage, for example. A recent report from Kulak et al. [33] demonstrated that military reservists, who serve on a part-time basis, demonstrated that certain minority service members had more negative attitudes towards MC and RC. There are a number of contributing factors to those findings, such as the societal perception of associations between specific races and cannabis use, in addition to the current institutional bias of the federal government against cannabis (Kulak et al. [33]). In each case, there are more factors at play which contribute to a respondent's overall attitude towards MC that extend beyond density and distance.

4 | Results

Survey responses were collected from 935 respondents. The specific demographics of the respondents are provided in Table 1 with the corresponding MCAS score; there were no significant differences between the two sampling periods. Of the total respondents, 743 resided in a zip code with no dispensaries, 160 lived in moderate-density zip codes, and 32 lived in high-density zip codes. California was overrepresented in the sample with 728 respondents (77.9%). Other states representing more than 1% of the sample included Missouri (51; 5.5%), Texas (22; 2.4%), and Illinois (15; 1.6%). Thirty-five other states were also represented with 10 or less respondents each. The majority of respondents, at the time of being surveyed, lived in states with legal access to both MC and RC (789; 84.4%) with a mean MCAS of 16.8 (SD = 2.5). There were 139 (14.9%) respondents from states with medical access only (mean MCAS = 16.3, SD = 2.5) and 7 (0.75%) who resided in states with no legal access to cannabis (mean MCAS = 14.6, SD = 0.79).

The range of distance from a dispensary was 0–384 miles, with a mean of 8.06 miles (SD = 15.5). The mean MCAS score for all respondents was 16.7 (SD = 2.46) and was 16.8 (SD = 2.51) for those residing in zip codes without any dispensaries, 16.6 (SD = 2.27) for those residing in a moderate density zip code, and 16.3 (SD = 2.31) for those living in a high-density zip code.

A Spearman's rank-order correlation was run to assess the relationship between distance one lives from a cannabis dispensary and MCAS. Preliminary analysis showed the relationship to be monotonic, as assessed by visual inspection of a scatterplot. There was a statistically significant, weak positive correlation between the distance one lives from a cannabis dispensary and MCAS, $r_s(933) = 0.090$, $p = 0.006$. As the distance one lives from a dispensary increases, their attitude toward MC weakly becomes more positive. This held true for those living in states with legal access to both MC and RC, $r_s(787) = 0.891$, $p = 0.005$, but not for those living in states with only legal access to MC, $r_s(137) = 0.119$, $p = 0.162$.

The assumption of homogeneity of variances was met for the MCAS data, as assessed by Levene's test for equality of variances ($p = 0.635$ and $p = 0.253$, respectively). There was no statistically significant difference in MCAS score between the different dispensary density groups, $F(2932) = 0.683$, $p = 0.505$. Regardless of the density grouping, the mean MCAS was similar throughout the respondents.

A GLS regression analysis was conducted to examine the relationship between demographic, social, and geographic predictors and scores on the MCAS. The predictors included age, race,

TABLE 1 | Demographics of survey respondents and corresponding MCAS.

Gender		MCAS (SD)
Female	697 (74.5%)	16.8 (2.4)
Male	234 (25.0%)	16.4 (2.5)
Nonbinary	4 (0.4%)	17.8 (2.8)
Age (years)		
18–24	299 (32.0%)	16.8 (2.4)
25–34	211 (22.6%)	16.8 (2.3)
35–44	168 (18.0%)	16.6 (2.5)
45–54	115 (12.3%)	16.6 (2.3)
55–64	84 (9.0%)	17.0 (2.8)
65–74	39 (4.2%)	16.1 (3.1)
75–84	15 (1.6%)	15.9 (2.4)
85 and older	4 (0.4%)	13.7 (1.5)
Race		
White	542 (58.0%)	16.7 (2.0)
Black	59 (6.3%)	17.2 (2.3)
Asian	58 (6.2%)	16.8 (2.9)
Native Hawaiian/Pacific Islander	16 (1.7%)	15.4 (2.5)
American Indian/Alaska Native	9 (1.0%)	15.9 (3.4)
Other	250 (26.7%)	16.7 (2.4)
Ethnicity		
Hispanic/Latino	405 (43.3%)	16.7 (2.5)
Non-Hispanic/Latino	529 (56.6%)	16.7 (2.4)
Education		
Some high school	12 (12.8%)	17.7 (3.1)
High school	358 (38.3%)	16.9 (2.6)
Trade school	85 (9.1%)	16.3 (2.8)
Bachelor's degree	314 (33.6%)	16.7 (2.2)
Masters' degree	119 (12.7%)	16.6 (2.5)
Doctorate	46 (4.9%)	16.6 (2.4)
Political affiliation		
Democrat	465 (49.7%)	16.8 (2.2)
Republican	163 (17.4%)	16.6 (2.9)
Independent	201 (21.5%)	16.5 (2.5)
Libertarian	28 (3.0%)	17.3 (2.2)
Not registered	57 (6.1%)	16.4 (2.9)
Other	21 (1.4%)	17.7 (1.3)

gender, ethnicity, education, political party affiliation, status of cannabis legal status in state of residence, cannabis density, and distance of primary residence from a cannabis dispensary. The overall model was significant, $F(9918) = 2.61$, $p = 0.006$, with an R^2 of 0.025, indicating that the predictors collectively explained approximately 2.5% of the variance in MCAS scores. Among the predictors, gender was significantly associated with MCAS scores: male individuals reported significantly lower MCAS on average ($\beta = -0.52$, $p = 0.006$). Likewise, older individuals reported lower average MCAS ($\beta = -0.11$, $p = 0.048$). However, individuals living in states with legal access to MC and RC reported significantly higher average MCAS scores ($\beta = 0.86$, $p = 0.001$) than those living in states with legal access to only MC. Other predictors, including race, ethnicity, political affiliation, dispensary density, and distance of residence from closest dispensary, were not significant at the $p < 0.05$ level (Table 2). The low R^2, though, suggests limited explanatory power.

In states with legal access to only MC, the model explained 4.3% of the variance in MCAS scores ($R^2 = 0.043$; Table 3). The model

TABLE 2 | Generalized least squares regression results for MCAS scores.

Predictor	Coefficient ± standard error (95% confidence interval)	*t*-value	*p*-value
Intercept	16.1 ± 0.81 (14.5, 17.6)	19.9	< 0.001
Age	−0.11 ± 0.056 (−0.220, −0.001)	−1.9	0.048
Race	−0.025 ± 0.082 (−0.19, 0.14)	−0.31	0.86
Gender	−0.52 ± 0.19 (−0.90, −0.15)	−2.8	0.006
Ethnicity	−0.14 ± 0.22 (−0.58, 0.30)	−0.62	0.54
Education	−0.12 ± 0.069 (−0.25, 0.020)	−1.7	0.096
Political affiliation	−0.041 ± 0.054 (−0.15, 0.064)	−0.77	0.44
Dispensary density	−0.33 ± 0.25 (−0.83, 0.17)	−1.3	0.19
Distance residence from dispensary	0.0030 ± 0.005 (−0.007, 0.013)	0.58	0.56
State legal status	0.86 ± 0.27 (0.335, 1.40)	3.2	0.001

TABLE 3 | Generalized least squares regression results for MCAS scores in states with access to only MC.

Predictor	Coefficient ± standard error (95% confidence interval)	*t*-value	*p*-value
Intercept	20.6 ± 3.4 (13.9, 27.2)	6.04	< 0.001
Age	−0.0129 ± 0.19 (−0.381, 0.356)	−0.07	0.945
Race	−0.708 ± 0.40 (−1.50, 0.078)	−1.77	0.080
Gender	−0.0864 ± 1.30 (−2.63, 2.46)	−0.07	0.947
Ethnicity	−0.0864 ± 1.30 (−2.63, 2.46)	−0.07	0.947
Education	−0.171 ± 0.208 (−0.578, 0.237)	−0.82	0.413
Political affiliation	−0.0928 ± 0.132 (−0.352, 0.166)	−0.70	0.485
Dispensary density	−0.177 ± 0.666 (−1.48, 1.13)	−0.27	0.791
Distance residence from dispensary	0.0452 ± 0.0380 (−0.029, 0.120)	1.20	0.232

TABLE 4 | Generalized least squares regression results for MCAS scores in states with access to RC and MC.

Predictor	Coefficient ± standard error (95% confidence interval)	*t*-value	*p*-value
Intercept	18.4 ± 0.750 (16.9, 19.9)	24.54	< 0.001
Age	−0.140 ± 0.0590 (−0.255, -0.024)	−2.37	0.018
Race	0.0145 ± 0.0840 (−0.150, 0.179)	0.17	0.863
Gender	−0.520 ± 0.190 (−0.892, −0.147)	−2.74	0.006
Ethnicity	−0.0639 ± 0.228 (−0.511, 0.383)	−0.28	0.780
Education	−0.116 ± 0.0740 (−0.261, 0.029)	−1.57	0.116
Political affiliation	−0.0365 ± 0.0590 (−0.152, 0.079)	−0.62	0.535
Dispensary density	−0.313 ± 0.275 (−0.851, 0.226)	−1.14	0.256
Distance residence from dispensary	0.00210 ± 0.00500 (−0.008, 0.012)	0.40	0.691

was not statistically significant ($F(8131) = 0.832$, $p = 0.562$). This indicates limited explanatory value of the model The model for respondents in states with legal access to both MC and RC explained only 2.5% of the variance in MCAS scores ($R^2 = 0.025$; Table 4). The overall model was statistically significant ($F(8780) = 2.517$, $p = 0.0105$). Significant predictors included age ($\beta = -0.1396$, $p = 0.018$) and gender ($\beta = -0.5196$, $p = 0.006$), with older individuals and those identifying as male reporting lower MCAS. All other variables, including race, ethnicity, education, political affiliation, dispensary density, and distance of residence from closest dispensary, were not statistically significant predictors ($p > 0.05$). The low R^2 suggests limited explanatory power.

5 | Conclusion

Despite an increase in the use of MC, there are lingering stigmas that impact its users. Likewise, there are tangible negative impacts from the presence of cannabis dispensaries in different communities. This study sought to understand how dispensary density and proximity impact attitudes toward MC. There is evidence that there is a weak positive correlation between dispensary distance from one's residence and attitudes. Male individuals reported significantly lower MCAS but individuals living in states with legal access to MC and RC reported significantly higher MCAS. However, the data did not support dispensary density as impacting one's attitude. This evidence is likely unclear due to the complexity of the issue and the many variables that impact attitudes toward MC.

Author Contributions

Thomas A. Clobes: conceptualization, investigation, writing – original draft, methodology, writing – review and editing. **Sean Himebaugh:** conceptualization, investigation, writing – original draft, methodology, writing – review and editing. **Sandra Aguilar Gamez:** conceptualization, investigation, writing – original draft, writing – review and editing. **Mariza Torres:** conceptualization, investigation, writing – original draft, methodology, writing – review and editing.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Due to the sensitive nature of cannabis use and varying legal status throughout the country, the data is not being made publicly available.

Transparency Statement

The lead author Thomas A. Clobes affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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