



Simultaneous Alcohol and Cannabis Use in College Students: Examining Context, Route of Administration, Cognitive Factors, and Consequences via Daily Diary

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Introduction

Over 50% of college students report using alcohol and 25% report using cannabis in the previous 30 days.¹ Using these substances simultaneously such that their effects overlap (commonly referred to as simultaneous alcohol and marijuana [SAM] use) is common among college students.²⁻³ College student SAM use occurs more often than concurrent alcohol and cannabis (commonly referred to as concurrent alcohol and marijuana [CAM] use [i.e., effects do not overlap]).² Select studies indicate consequences of SAM use are often greater than CAM or single substance use,⁴⁻⁵ whereas others report no significant differences across type of co-use day.⁶ Limited research has explored cognitions (motives, expectancies) and contexts (environmental, social) as predictors of SAM use.

The current study is a 21-day daily diary examination among college students, and addresses gaps in the literature via three aims: (1) identifying the most common types of alcohol and route of cannabis administration on single-substance vs co-use days, (2) comparing consequences, cognitions, and contexts on SAM vs CAM use days, and (3) examining consequences, cognitions, and contexts on SAM use days across type of alcohol and route of cannabis administration.

Method

Participants

- $N = 58$ college students who completed 2 or more days of daily surveys
 - $M = 14.97$ days ($SD = 5.92$), 71.29% compliance
- Mean age = 21.22, $SD = 2.09$; 65.5% women; 63.8% White
- Reported at least 1 SAM use day in the past 14 days (eligibility criterion)

Materials

Alcohol Use

- Baseline: Past 30-day alcohol use frequency
- Daily: Quantity (standard drinks)⁷; types of alcohol⁸

Cannabis Use (Daily only)

- Daily: Quantity (in grams)⁹; route of cannabis administration¹⁰

Co-Use

- Baseline: Past 14-day SAM use frequency³⁻⁴; Daily: Previous day SAM use⁷

Consequences (Daily only)

- Modified Brief Young Adult Alcohol Consequences Questionnaire^{4,6,11} and Modified Brief Marijuana Consequences Questionnaire^{4,6,12}
- 5-items; Four response options: attribution to alcohol alone, marijuana alone, alcohol and marijuana together, and have not experienced this consequence

Motives (Daily only)

- Modified Drinking Motives Questionnaire-Revised¹³⁻¹⁵: one item from each subscale (social, coping-anxiety, coping-depression, enhancement, conformity)
- Comprehensive Marijuana Motives Questionnaire¹⁶: one item from each subscale (conformity, availability/boredom, celebration, coping, enjoyment)
- Brief SAM Motives Measure¹⁷: one item from each subscale (conformity, calm/coping, social), two items from positive effects subscale (one for alcohol and one for cannabis)

Expectancies (Daily only)

- Modified the Alcohol Expectancy Questionnaire-Revised¹⁸⁻²⁰ and modified the Marijuana Effects Expectancy Questionnaire^{19,21}
 - 3-items each from relaxation and tension reduction subscale
- Asked prospectively; If participants selected an alcohol/marijuana expectancy, they were asked how much marijuana/alcohol alters the effect

Context (Location and Social; Daily only)

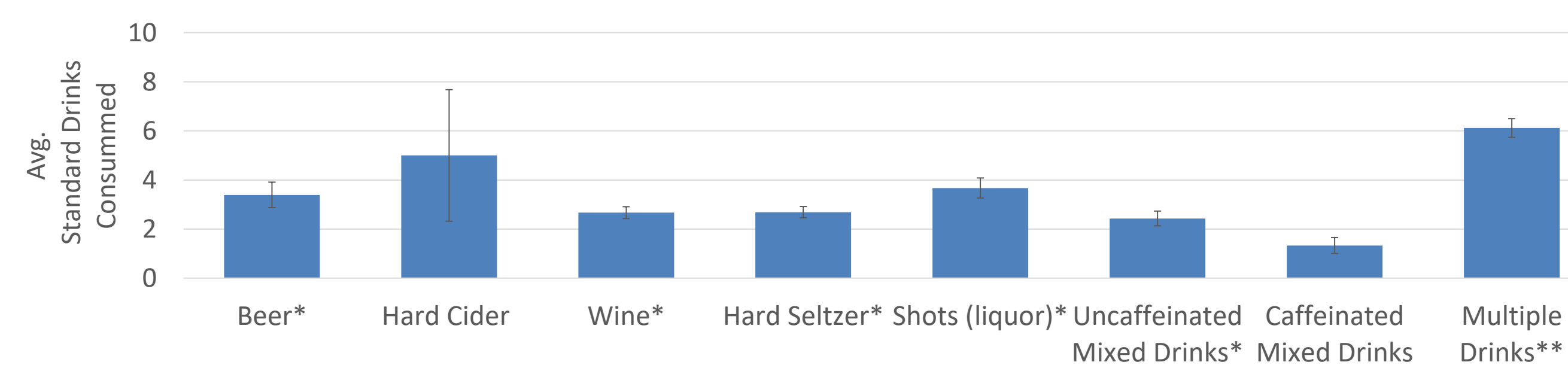
- Asked where they used alcohol and/or cannabis the previous day (six options, could select more than one)²²
- Asked if others were present when using alcohol and/or cannabis

Procedure and Analyses

- After completing a baseline survey, eligible participants were enrolled in 21 consecutive days of online daily surveys (March 2021-October 2022)
- Analyses were completed in SPSS v.28 and HLM v.8
- Multilevel analyses controlled for past 30-day alcohol use frequency, aggregates of the level 1 variables, and gender (cisgender women and men).
 - Level 1 variables were group-mean centered and level 2 variables (other than gender) were grand-mean centered.

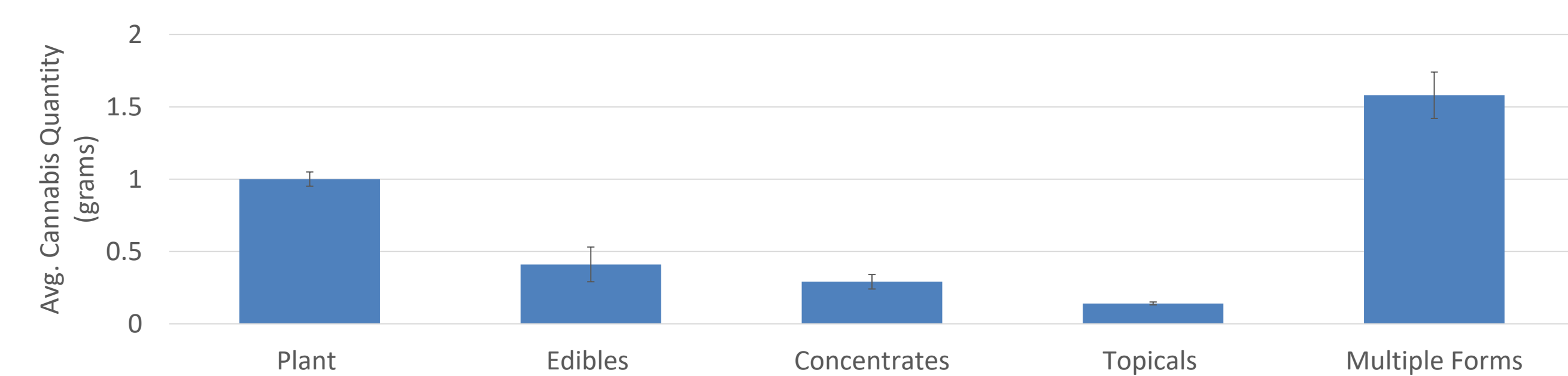
Results

Aim 1: Number of Drinks Consumed by Alcohol Type



Note: **Multiple Types of Drinks served as category of reference
*Significantly fewer drinks than days with multiple types of drinks.

Aim 1: Grams of Cannabis Used by Route of Administration



Aim 2 (SAM vs. CAM days)

- The number of consequences and number of alcohol and marijuana expectancies did not significantly vary across CAM and SAM use days.
- The likelihood that a participant reported using a coping with anxiety alcohol motive ($B = -1.72$, $SE = 0.79$, $OR = 0.18$, $p = .032$) or enhancement motive ($B = -1.52$, $SE = 0.73$, $OR = 0.22$, $p = .040$) was **significantly higher** on SAM use days vs CAM use days.
- The likelihood that a participant reported using a celebration cannabis motive was **significantly higher** on SAM use days vs CAM use days ($B = -1.46$, $SE = 0.71$, $OR = 0.23$, $p = .041$).
 - All other alcohol and cannabis motives were not significantly different.
- The likelihood of participants being with others was **significantly higher** on SAM use days vs CAM use days ($B = -1.71$, $SE = 0.79$, $OR = 0.18$, $p = .032$).
- Participants consumed **significantly more drinks** on SAM versus CAM use days ($B = -1.45$, $SE = 0.62$, $p = .020$).
 - There was not a significant difference in quantity of cannabis used.

Aim 3 (SAM days only)

- There was a **significant** difference in the number of SAM consequences reported on days when multiple forms of cannabis were used compared to days when only plant was used ($B = 0.86$, $p = .010$). There was not a significant difference across types of alcohol.
- For the analyses that were able to run, there were not significant differences in the likelihood of reporting SAM motives or being with others across types of alcohol or routes of cannabis administration, or significant differences in SAM expectancies across types of alcohol and routes of cannabis administration.

Figure 1. Types of Alcohol (Portion of Alcohol Days Reported)

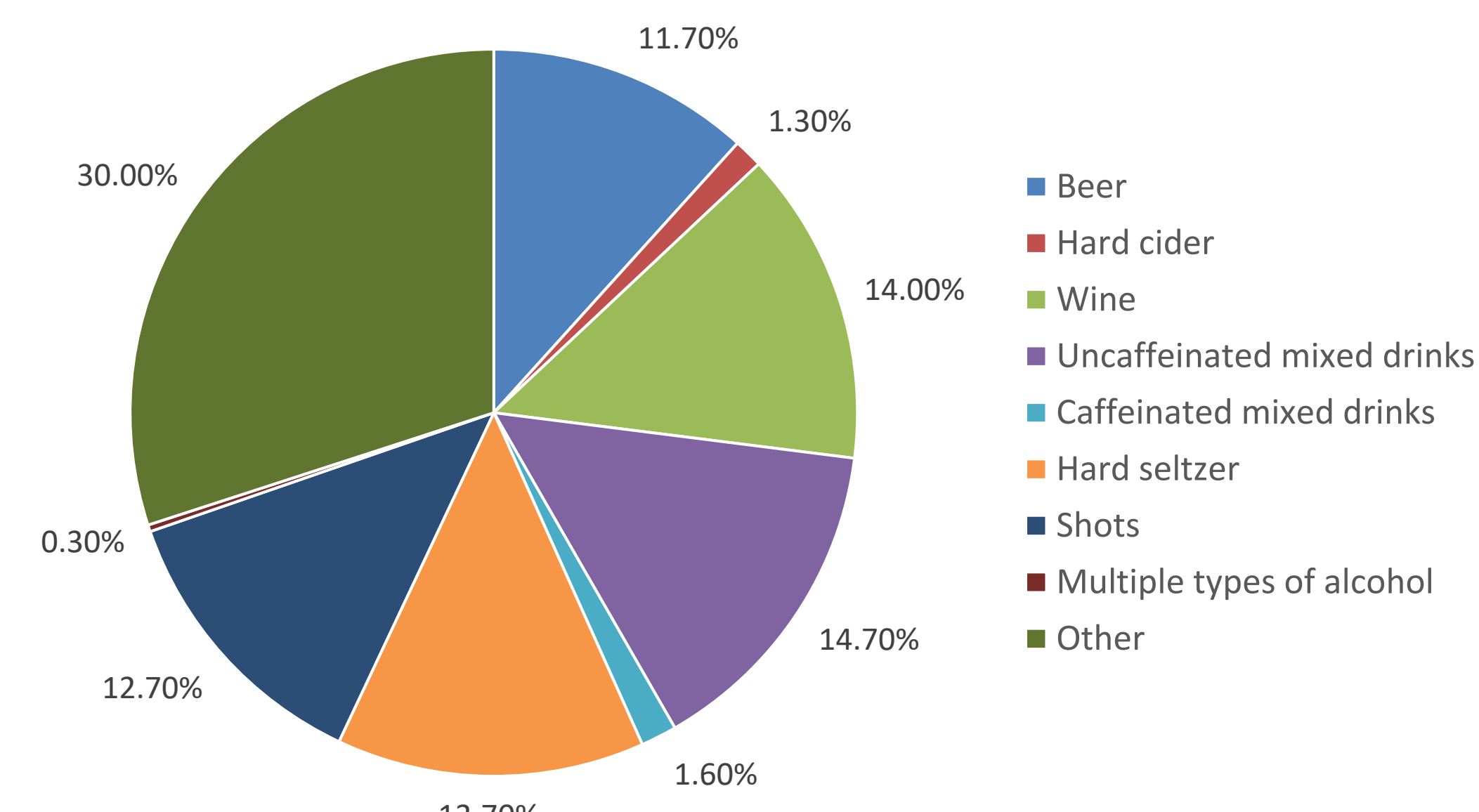
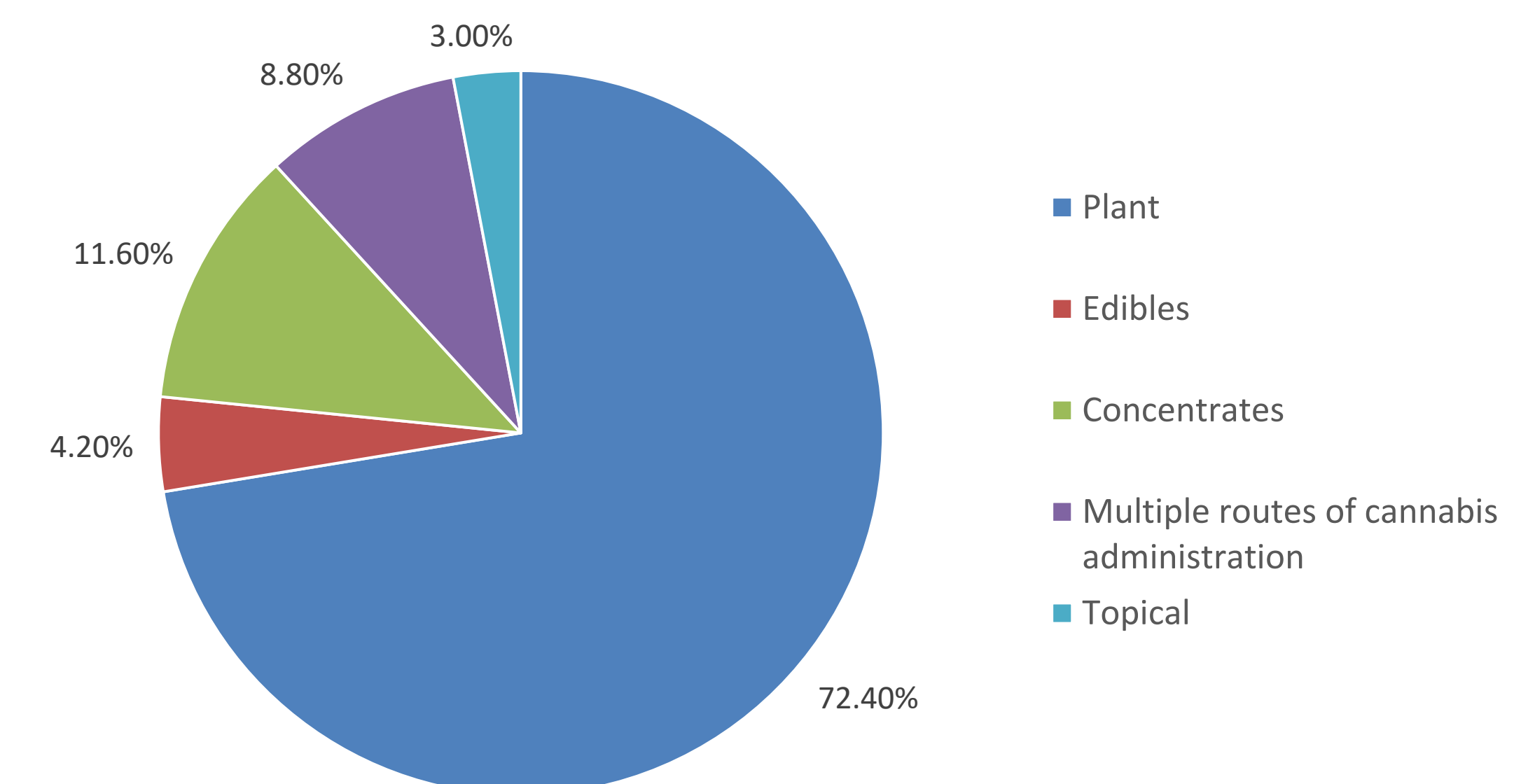


Figure 2. Routes of Administration (Portion of Cannabis Days Reported)



Discussion

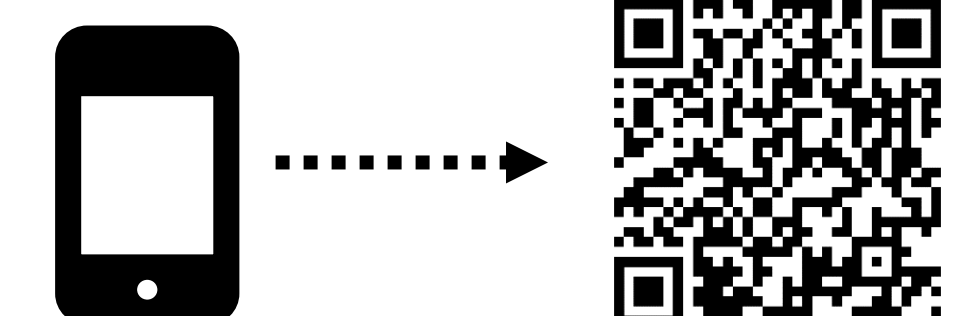
Plant was most common for cannabis, whereas consuming multiple types of alcohol was most common (and led to greater consumption). SAM use days were riskier than CAM use days, with greater endorsement of select motives, consuming more drinks, and being with others. More SAM consequences were reported when participants used more than one type of cannabis (compared to using plant).

Implications: Alcohol and cannabis motives varied across SAM and CAM use days; practitioners may consider addressing motives specific to SAM use. Health education campaigns on college campuses may want to address the risks of using multiple forms of cannabis on SAM use days (i.e., more consequences compared to using plant).

Limitations: Data collection is occurring in a state where recreational cannabis use was legalized towards the beginning of data collection (July 2021).²³ However, participants may still be unwilling to report their cannabis use due to federal regulations and campus-specific restrictions, leading to slower recruitment of participants. Adequate power has not been reached; data collection is still ongoing. Thus, new trends may emerge, and current results should be interpreted with caution.

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