

Impact of Cannabis Use on Benzodiazepine Requirements for Deep Sedation in Outpatient Plastic Surgery

A Retrospective Analysis

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Introduction

The legalization and use of cannabis raises important questions for perioperative medicine. Prior studies suggest cannabis users have increased requirements for propofol and fentanyl during general anesthesia. However, the impact of cannabis use has not been explored in the setting of deep sedation where benzodiazepines and nitric oxide are utilized. This study serves to evaluate whether cannabis use affects the midazolam and nitric oxide (N₂O) requirements during deep sedation at a single outpatient plastic surgery site.

Methods

Retrospective chart review of 291 adult patients (2023–2024) undergoing deep sedation at a single plastic surgery center.

- **Deep Sedation:** patients not easily arousable but respond purposefully to repeated or painful stimulation
- Standardized bolus doses of fentanyl and propofol in addition to midazolam
- N₂O administered in cases of refractory responsiveness to escalating doses of midazolam

Variables:

- Age, ASA classification, comorbidities, cannabis use (THC urine test)
- Midazolam doses (initial, continuous, total), N₂O use, alcohol use

Data Analysis

All data were de-identified and analyzed using SPSS (IBM).

- **Descriptive statistics** summarized demographics, comorbidities, and sedation metrics.
- **Independent t-tests** were used to compare cannabis users and non-users.
- Statistical significance was defined as **p < 0.05**. Effect sizes (Cohen’s d) were calculated for key comparisons.

Results

Age: Cannabis users were younger (42.4 vs. 50.3 years; $p=0.001$)

Procedure Duration: No significant difference ($p=0.101$)

Mental Disease: More prevalent in cannabis users ($p=0.03$)

Alcohol: Higher weekly intake among cannabis users ($p=0.011$)

Midazolam Requirement:

- Initial: 2.67 mg vs. 2.34 mg ($p=0.033$)
- Continuous: 3.20 mg vs. 1.75 mg ($p<0.001$)
- Total: 5.87 mg vs. 4.09 mg ($p=0.001$)

N₂O use: 48.4% of cannabis users vs. 13.2% of non-users ($p<0.001$)

Patient Comorbidity	Non-Users	Cannabis Users	Significance (P)
Palpitations	12 (5.3%)	0 (0.0%)	0.060
Hypertension	35 (15.4%)	9 (14.1%)	0.789
Thyroid disease	34 (12.3%)	5 (7.8%)	0.137
Post-Operative Nausea and Vomiting	42 (18.5%)	14 (21.8%)	0.545
Asthma	28 (12.3%)	4 (6.3%)	0.169
Obstructive Sleep Apnea	9 (4.0%)	2 (3.1%)	0.756
Musculoskeletal Disease	40 (17.6%)	14 (21.9%)	0.439
Anemia	12 (5.3%)	2 (3.1%)	0.475
Diabetes Mellitus	2 (0.9%)	1 (1.6%)	0.634
Mental Disease (anxiety, depression)	5 (2.2%)	5 (7.8%)	0.030*
Neoplasm	6 (2.6%)	0 (0.0%)	0.189
Gastroesophageal Reflux Disease	7 (3.1%)	2 (3.1%)	0.987
Liver disease	3 (1.3%)	2 (3.1%)	0.327
Inflammatory Bowel Disease	0 (0.0%)	2 (3.1%)	0.008*
Venous Thromboembolism	10 (4.4%)	0 (0.0%)	0.088
Epilepsy	2 (0.9%)	2 (3.1%)	0.173

Table 1: Comparison of Comorbidity Frequencies between Cannabis Users and Non- Users

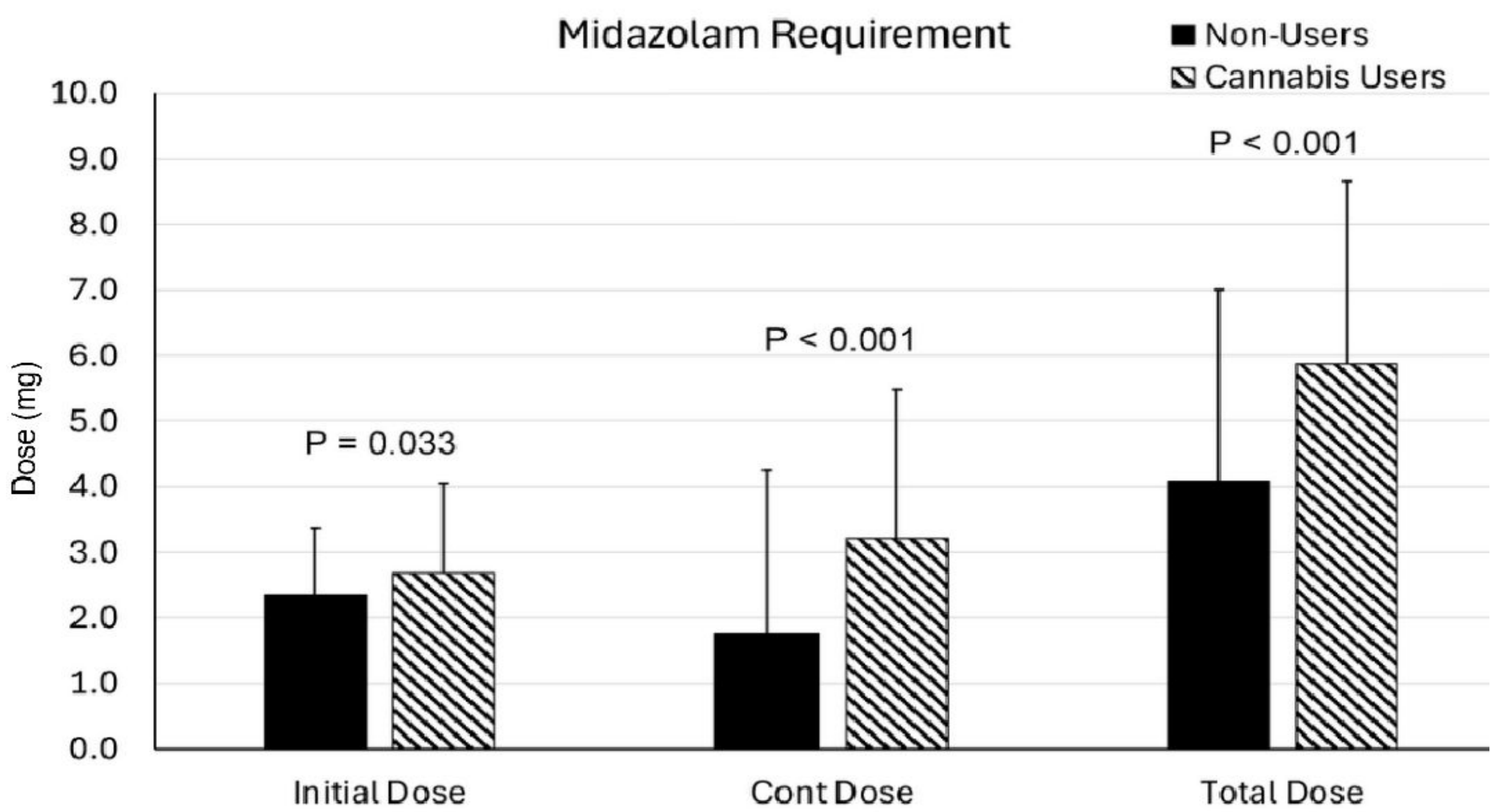


Figure 1: Comparison of Midazolam Requirement between Cannabis Users and Non-Users

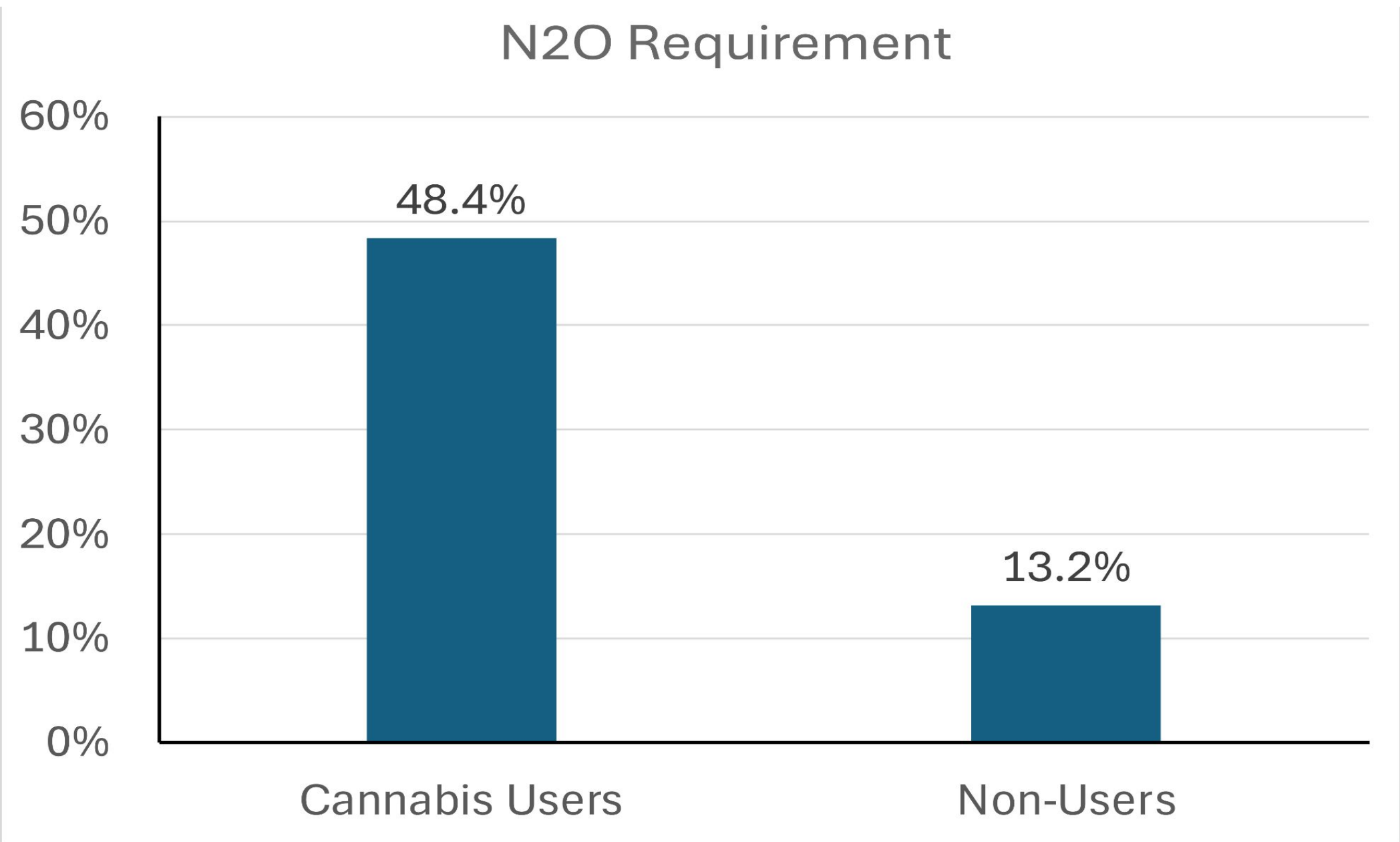


Figure 2: Comparison of Nitric Oxide Requirement between Cannabis Users and Non-Users

Conclusion

Cannabis users required significantly more sedatives, including benzodiazepines and nitrous oxide, to achieve deep sedation. These findings support:

- Routine cannabis screening during pre-op evaluations
- Individualized anesthetic planning based on THC exposure

Limitations: This was a single-site retrospective study with a relatively small sample size.

Future studies: Explore the impact of cannabis use on benzodiazepine requirements in a multi-site, prospective study across multiple types of surgical procedures.

References

1. Alexander JC et al. *Proc (Bayl Univ Med Cent)*. 2019
2. King DD et al. *AANA J*. 2021
3. Imasogie N et al. *PLoS One*. 2021
4. Groening JM et al. *Psychiatry Res*. 2024