

Aimalohi Okpeku¹; Amie Goodin, PhD, MPP^{1,2}

¹ Department of Pharmaceutical Outcomes and Policy, University of Florida College of Pharmacy, Gainesville, FL

² Center for Drug Evaluation & Safety, University of Florida, Gainesville, FL

Introduction

- The recreational and medicinal use of cannabis is increasing among individuals with HIV due to growing reports of its potential to treat and manage symptoms of HIV/AIDS.

Objectives

- This review identified and evaluated recent studies assessing the association between marijuana use and HIV outcomes.

Methods

- We conducted a systematic literature review with reporting according to PRISMA guidelines.
- The following databases were searched: Web of Science, Embase, PubMed, and the Cochrane library; using the following inclusion criteria: English language, USA-based study dated between May 2016 – December 2020.
- For quality evaluation we used the ROBINS-I tool for observational studies.

Results

- 28 studies met inclusion criteria including 3 systematic reviews with meta-analysis, 3 narrative reviews, and 22 observational studies (Figure 1).
- For observational studies, outcomes were adherence (7 of 22), viral suppression (10 of 22), and pain (5 of 22); Table 1.
- 12 studies examining adherence and viral suppression were rated low quality, while no studies were rated moderate or high quality (Table 1).
- Some studies revealed a high prevalence of marijuana use among people living with HIV/AIDS (from 28% to 77%), especially in adolescents and young adults (Table 2).

Figure 1: PRISMA Flow Diagram

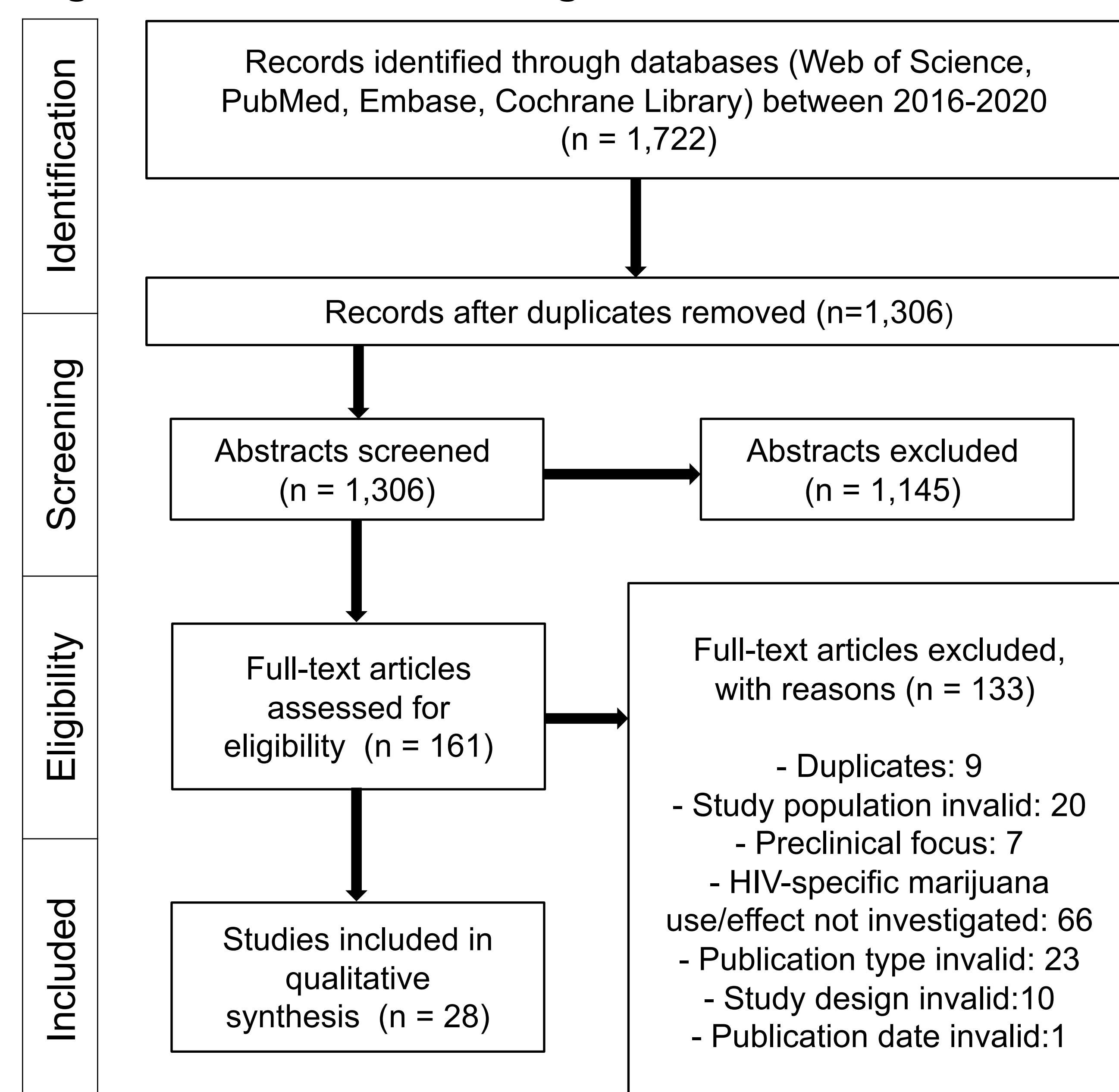


Table 1: Observational Studies - Outcomes Assessed and Risk of Bias

Study	Outcome assessed	Findings	Assessment of Bias
Gross et al. 2016	Adherence assessment	Participants engaged in daily marijuana use were least likely to be adherent	Not assessable
Morgan et al. 2016	Adherence, linkage to care, retention in care and viral suppression.	Heavy marijuana users were more likely to be unaware of their HIV seropositive status	Not assessable
Kipp et al. 2017	Adherence	Indicated marijuana use was associated with a 37% chance of missing their next medical appointment	Low
Sinha et al. 2017	Adherence, viral load suppression	No association between marijuana use and adherence	Moderate
Vidot et al. 2017	Adherence assessment	No association between marijuana use and adherence	Moderate
Okafor et al.2017	Adherence & viral suppression	No statistically significant association between CD4+ cell count and detectable HIV viral load and prevalence of marijuana use	Critical
Mannes et al.2017	Adherence	Moderate/heavy marijuana use was not significantly correlated with level of adherence	Not assessable
Zhang,Y et al. 2018	Adherence	Marijuana use predicted suboptimal adherence	Low
Merlin et al.2019	VL suppression & pain	VL suppression this suggests that the subset of patients using cannabis are more likely to have lapsed adherence.	Low
Deepika et al. 2020	Viral suppression	No statistically significant association between HIV viral load and marijuana use	Critical
Lee JT, et al. 2020	VL suppression	No statistically significant association between marijuana use and viral suppression	Critical
Slawek, et al. 2020	VL suppression	No statistically significant association between HIV viral load and marijuana use	Critical

Color Key for Rating of Assessment of Bias: Not assessable Low Moderate Serious Critical

Table 2: Prevalence of marijuana use

Author/Year	Findings
Gamarel et al. 2016	27.5% marijuana use weekly or more in adolescent and young adults living with HIV in a cohort of 2105 patients
Hartzler et al. 2017	Use of Cannabis among PLHIV reported highest use at 31% compare to 19% for alcohol, 13% for methamphetamine, 11% for cocaine, and 4% for opioid
Hartzler et al. 2017	Study findings included 49% of cannabis users screened positive for Cannabis use disorder, greater CUD prevalence among PLWH.
Okafor et al. 2017	Describes higher utilization, and frequency of use of marijuana among HIV positive as compared to HIV(-) in a cohort study.
Dawson-Rose et al. 2017	In a cohort study, sample size (N=168) highest prevalence use 52.4% marijuana compared to other substances among HIV participants
Shiau, S. et al. 2017	In a nationally representative sample of HIV infected and uninfected, 77% of HIV-infected adults reported marijuana use compared to 44.5% of uninfected participants
Sohler, N. et al. 2018	Cannabis was the most used substance (N = 311, 39.4%) among HIV cohort study
Pacek, L.R. et al. 2018	Reports finding in nationally representative sample of 626 PLWH, 34.9% were past-year users of cannabis regardless of frequency, while 26.9% were non-daily users and 8.0% used cannabis daily

Discussion

- The studies showed few significant associations between medical marijuana and HIV related outcomes.
- Ratings of risk of bias for all non-randomized studies ranged from serious risk of bias to critical risk of bias.

Limitations

- The studies do not consistently investigate cannabis as either a therapeutic agent or as a safety concern for PLWH.
- Measures of marijuana exposure were self-reported for frequency of use, with no information regarding route of administration, source, quantity, and potency in most studies.
- The ROBINS-I tool is not useful for assessing bias in cross sectional studies.

Conclusions

- Not enough evidence to support marijuana use for improving adherence or for viral suppression as an effective treatment option for HIV/AIDS.
- This review suggests the need for high-quality research measurements in the assessment of marijuana use in HIV.

References (other):

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