Effectiveness of MMT and BMT

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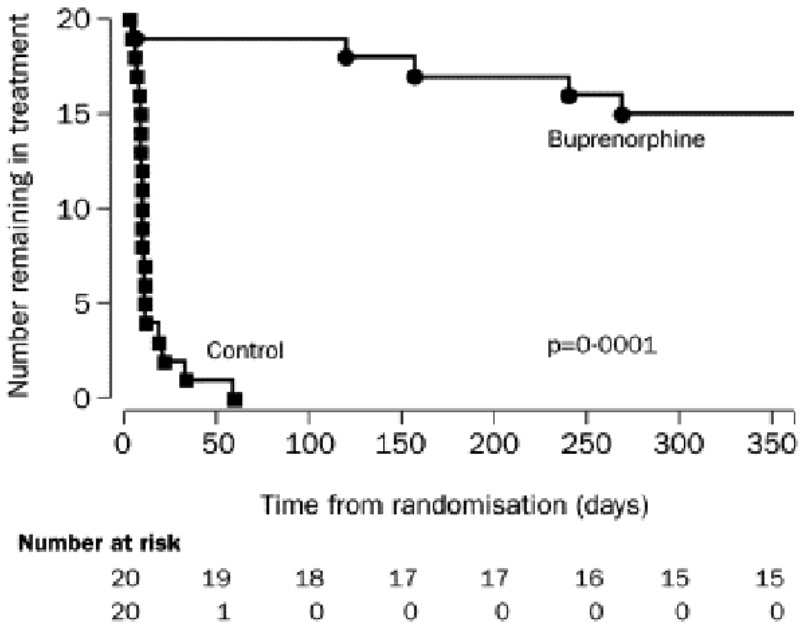
Retention in Treatment

Methadone helps reduce cravings and withdrawal symptoms, making it easier for individuals to remain committed to their treatment plan. Research shows that MMT is associated with improved retention rates in substance use disorder programs, primarily because methadone acts as a long-acting opioid agonist, stabilizing patients and allowing them to avoid the immediate highs and lows associated with short-acting opioids..

Buprenorphine, as a partial opioid agonist, helps manage withdrawal symptoms and cravings with a lower risk of producing euphoria compared to full agonists. This reduces the potential for misuse and supports a stable transition away from dependence on stronger opioids. Studies indicate that BMT is associated with increased retention in treatment programs, as it provides a safer and controlled pathway for patients, helping them to stay motivated and engaged in both medical and counseling aspects of their recovery.

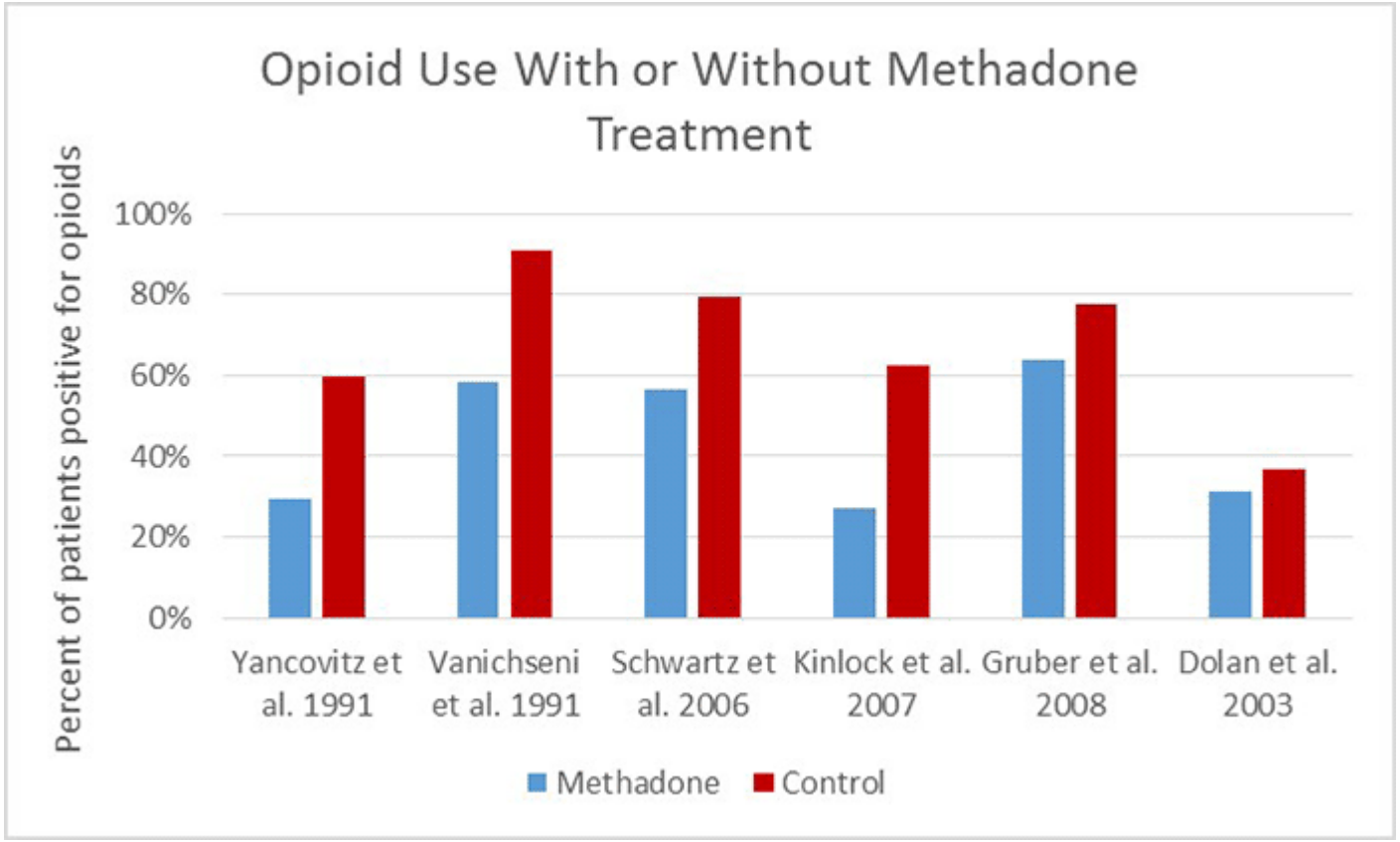
Stay in Treatment

A Swedish study compared patients maintained on 16 mg of buprenorphine daily to a control group that received buprenorphine for detoxification (6 days) followed by placebo.



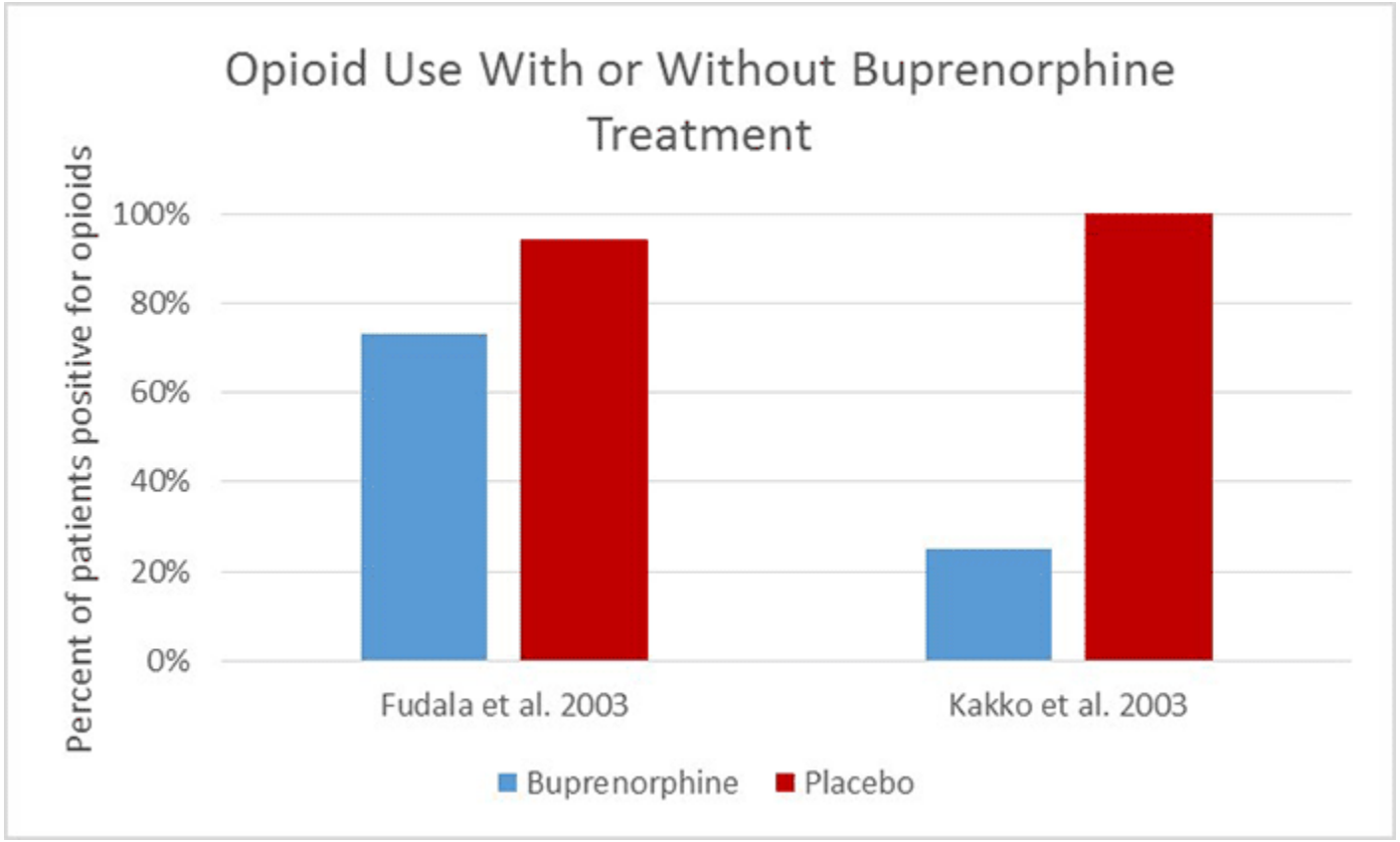
Illicit Drug Use

Methadone Maintenance Treatment (MMT) and Buprenorphine Maintenance Treatment (BMT) are widely recognized as effective strategies for reducing illicit drug use among individuals with opioid dependence. Both treatments work by mitigating withdrawal symptoms and cravings, allowing individuals to stabilize their lives without experiencing the highs and lows of opioid misuse. MMT involves the daily administration of methadone, a full opioid agonist that prevents withdrawal symptoms by binding to opioid receptors in the brain, reducing cravings without inducing euphoria.



Illicit Drug Use

Similarly, BMT uses buprenorphine, a partial agonist with a ceiling effect that limits euphoria and overdose risk, making it safer and appealing to a broader range of patients. Research has shown that both MMT and BMT significantly decrease illicit opioid use, reduce overdose rates, and improve overall health and social stability, though they may vary in effectiveness based on individual needs and treatment adherence.



Reducing Diseases

- The effects of methadone and buprenorphine maintenance treatments (MMT and BMT) on reducing diseases like HIV and hepatitis C (HCV) are significant. Both treatments help decrease the need for injection drug use, which is a major transmission route for these infections. By managing withdrawal symptoms and reducing cravings, MMT and BMT lower the likelihood of risky behaviors such as needle sharing. Methadone, as a full opioid agonist, and buprenorphine, as a partial agonist, each provide a structured and safer alternative to illicit opioid use, stabilizing patients and reducing the frequency of injection.

- Additionally, maintenance treatment programs often include health screenings, counseling, and education on safe practices, which further contribute to a reduction in the transmission of HIV and HCV. Studies consistently show that individuals in MMT or BMT have a lower risk of contracting HIV and HCV, which not only benefits individual health but also has positive public health implications by reducing the overall transmission rates in the community.

Reducing Crime

- The effects of methadone and buprenorphine maintenance treatments (MMT and BMT) on reducing crime rates are well-documented. Both treatments help individuals stabilize by managing opioid cravings and withdrawal symptoms, reducing the compulsion to engage in criminal activities to fund drug use. Studies show that individuals in MMT or BMT programs are less likely to be involved in theft, drug-related offenses, or other illegal activities often associated with substance dependence.

Social Effect

- These treatments enable individuals to focus on employment, education, and family responsibilities without the disruptions of constant drug-seeking behavior. Many people in MMT and BMT report enhanced quality of life, improved self-esteem, and the ability to rebuild relationships that were strained by addiction. Moreover, the support often provided in these programs, such as counseling and peer support, contributes to long-term recovery and a better outlook for a stable, productive life free from the chaotic cycle of opioid dependence.

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Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence (Review)

Mattick RP, Breen C, Kimber J, Davoli M

Introduction

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- Methadone treatment is the first widely used opioid replacement therapy for heroin dependence and is utilized in many countries.
- The effectiveness of methadone as a maintenance treatment for opioid dependence has been debated compared to non-drug therapies.
- The aim of this study is to evaluate the effects of methadone maintenance therapy compared to treatments that do not involve opioid replacement.
- Previous research indicates that methadone can improve patient retention in treatment and reduce heroin use.
- Despite the widespread use of methadone, there are still controversies regarding its effectiveness, highlighting the need for further investigation.

Method

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- The review focused on randomized controlled trials (RCTs) comparing methadone maintenance therapy with non-opioid replacement treatments such as detoxification and placebo medication.
- The inclusion criteria specified that participants must be individuals with opioid dependence, regardless of prior treatment history.
- Data extraction and analysis were conducted independently by two reviewers to ensure accuracy and minimize bias in evaluating the studies.
- The methodological quality of the included studies was assessed based on factors such as randomization procedure and allocation concealment to determine the risk of bias.
- A meta-analytic approach was employed to calculate pooled effect sizes for primary outcomes, including treatment retention and opioid use, providing a comprehensive synthesis of the results.

Result

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- A total of eleven randomized controlled trials were included in the review, comprising 1,969 participants.
- Methadone maintenance therapy significantly improved retention in treatment, with relative risks (RR) ranging from 3.05 to 4.44 compared to non-opioid treatments.
- Participants receiving methadone had a lower rate of morphine-positive urine tests, with an RR of 0.66, indicating reduced heroin use.
- Self-reported heroin use was also significantly lower among those in methadone treatment compared to control groups.
- There was no statistically significant difference in criminal activity between the methadone group and non-opioid treatments, with an RR of 0.39.

Result

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- The study found no significant impact of methadone on mortality rates, with an RR of 0.48.
- The quality of evidence for retention and heroin use outcomes was rated as high, indicating robust findings.
- The studies included varied in their settings, comprising prisons, hospitals, and community-based treatments.
- Most studies reported adequate dosing of methadone, typically ranging from 60 mg to 100 mg per day.

Discussion

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- While methadone has been shown to decrease heroin use, the study highlights the need for further research to explore its impact on criminal activity and mortality, where no significant differences were observed.
- The review emphasizes the importance of individualized treatment plans, as factors such as dosage and the therapeutic relationship can influence treatment outcomes.
- Despite its effectiveness, the ongoing controversy surrounding methadone calls for continued evaluation of its role in opioid dependence treatment in various populations and settings.

Open Access Research

BMJ Open

Methadone maintenance treatment programme reduces criminal activity and improves social well-being of drug users in China: a systematic review and meta-analysis

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- The study found that methadone maintenance treatment (MMT) significantly reduced criminal activity among drug users in China.

- The self-reported arrest rate decreased from 13.1% at baseline to 3.4% and 4.3% after 6 and 12 months, respectively.

- Additionally, the rate of drug selling dropped from 7.6% to 1.9% and 3% after 6 and 12 months.

- Conversely, the employment rate and family relationships improved substantially, increasing from 26.4% to 59.8% and from 37.9% to 75% after 12 months of treatment.

- These findings highlight the effectiveness of MMT in enhancing the social and familial well-being of drug users in China.

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Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence (Review)

Mattick RP, Breen C, Kimber J, Davoli M

Introduction

Buprenorphine maintenance treatment is recognized as an effective approach for managing opioid dependence.

Buprenorphine is a partial agonist that has weaker effects compared to methadone and heroin, potentially providing greater safety.

The use of buprenorphine can help reduce illicit drug use and increase the duration of treatment.

This study aims to evaluate the efficacy of buprenorphine compared to placebo and methadone in the management of opioid dependence.

Method

The review included randomized controlled trials comparing buprenorphine maintenance therapy to methadone maintenance therapy or placebo in individuals with opioid dependence.

Participants included those dependent on heroin or other opioids, with no distinctions made between users of heroin and those in methadone treatment prior to the study.

Buprenorphine maintenance was administered in doses above 1 mg, using various formulations such as sublingual tablets and implants.

Control interventions included methadone maintenance therapy with doses of 20 mg or higher or placebo, ensuring that all studies included a maintenance phase.

Primary outcome measures focused on treatment retention, opioid use (measured by urinalysis and self-reports), and other substance use, as well as criminal activity and mortality.

Result

The review included 31 trials with a total of 5,430 participants, showing varied quality of evidence from high to moderate.

Buprenorphine demonstrated significantly better retention in treatment compared to placebo at all doses examined, with a risk ratio of 1.50 for low doses.

High-dose buprenorphine (≥ 16 mg) was shown to be more effective than placebo in suppressing illicit opioid use.

However, low- and medium-dose buprenorphine did not significantly suppress illicit opioid use compared to placebo.

Buprenorphine, when administered in flexible doses, was less effective than methadone in retaining participants in treatment, with a risk ratio of 0.83.

No difference between the buprenorphine and methadone groups were found for Criminal activity. For the other comparisons, no data on criminal activity were reported in the included studies.

Discussion

Buprenorphine is effective in retaining individuals in treatment for opioid dependence, particularly at doses above 2 mg, and can significantly reduce illicit opioid use at higher doses.

The results indicate that while both medications can be effective, methadone has a clear advantage in treatment retention, which is crucial for successful long-term outcomes.

Other outcome measures could be included in future studies, such as self-reported drug use, criminal activity, physical health, and psychological health, which were too infrequently and irregularly reported in the literature analyzed in the current review.

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Buprenorphine versus methadone for the treatment of opioid dependence: a systematic review and meta-analysis of randomised and observational studies

Louisa Degenhardt, Brodie Clark, Georgina Macpherson, Oscar Leppan, Suzanne Nielsen, Emma Zahra, Briony Larance, Jo Kimber, Daniel Martino-Burke, Matthew Hickman, Michael Farrell

Introduction

- Opioid dependence, as defined by the ICD, involves a cluster of symptoms that include impaired control over opioid use, prominence of use of a substance in a person's life, and physiological symptoms including tolerance and withdrawal.

- Fatal opioid overdose is a major adverse outcome of extra-medical opioid use, as is non-fatal overdose.

- People who inject drugs are at risk of HIV and hepatitis C virus (HCV) infection, in addition to skin and soft tissue infections and infective endocarditis.

- Other outcomes associated with opioid dependence include poorer quality of life, physical and mental health problems, criminal activity, and involvement with the criminal justice system.

Introduction

- Opioid agonist treatment (OAT) is an effective treatment for opioid dependence that reduces harms across multiple health outcomes.

- A range of opioids have been used in OAT, but the two most common are buprenorphine and methadone, both of which are included in the WHO Model List of Essential Medicines.

- There has been considerable discussion about whether and which of these two medications should be preferred, and in which contexts.

- Methadone is a full opioid agonist with no ceiling for respiratory depression, whereas buprenorphine is a partial agonist with a ceiling effect for respiratory depression at higher doses.

Methods

- This study conducted a systematic review and meta-analysis in accordance with GATHER and PRISMA guidelines.
- Searches were performed in MEDLINE, Embase, PsycINFO, and CENTRAL from the inception of these databases until August 1, 2022.
- Randomized controlled trials (RCTs) and observational studies comparing buprenorphine and methadone treatment were included.
- The study population comprised adults (aged ≥18 years) with opioid dependence.
- Primary outcomes included treatment retention at various time points (1, 3, 6, 12, and 24 months). Treatment adherence and extra-medical opioid use were also examined.

Methods

- Secondary outcomes encompassed use of other drugs; opioid craving; precipitated withdrawal; criminal activity; engagement with the criminal justice system; mental health; non-fatal overdose; physical health; sleep quality; pain; global functioning, including treatment satisfaction; and adverse events.

- Data on study characteristics, participant details, and treatment received were extracted.

- Authors of the studies were contacted for additional data when required.

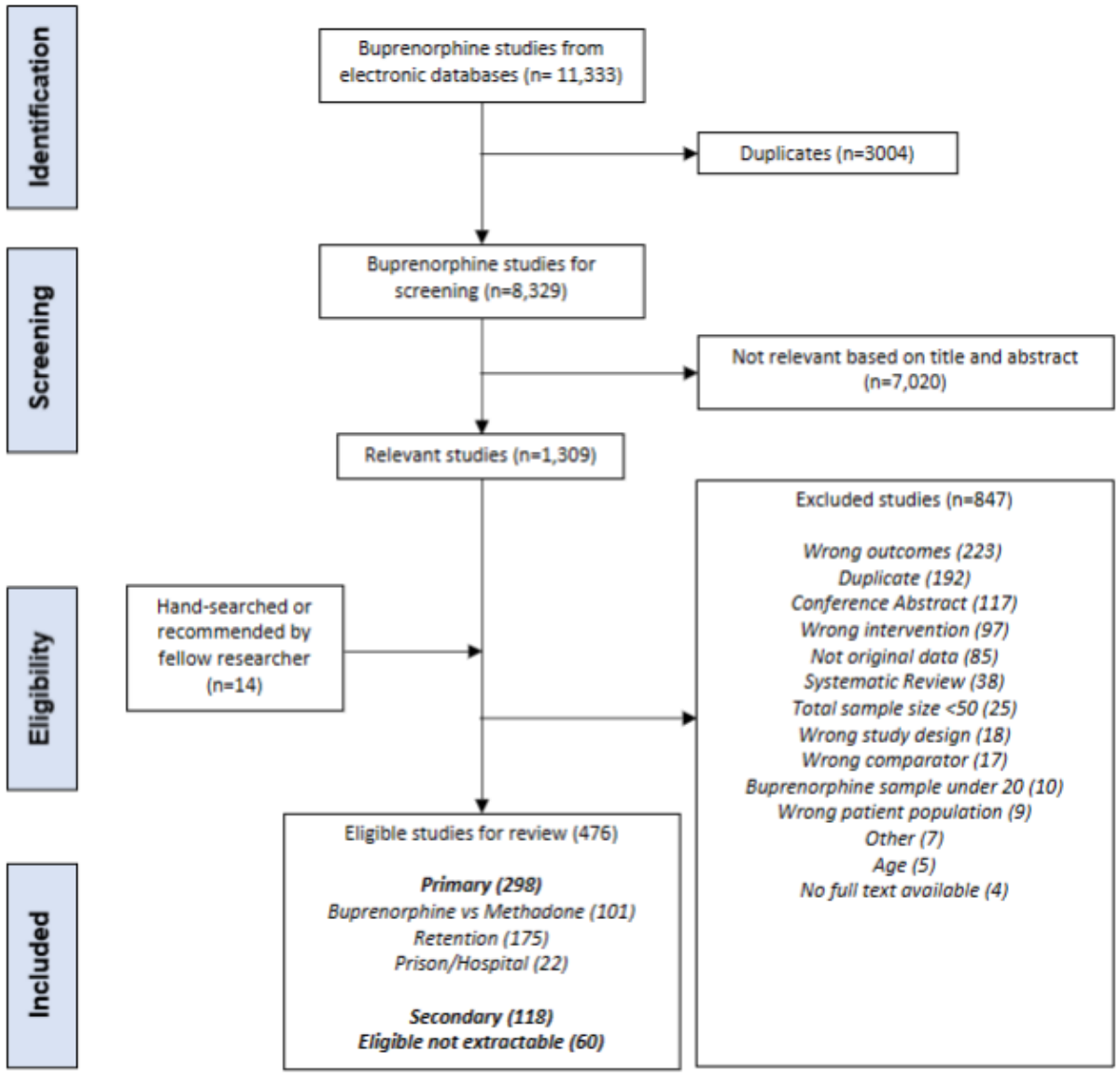
- Comparative estimates were pooled using random-effects meta-analyses.

- A total of 101 eligible studies were identified, comprising 32 RCTs and 69 observational studies.

Methods

- A total of 1,040,827 participants were included in these primary studies.
- Inclusion criteria encompassed various treatment settings, including inpatient and outpatient facilities.
- Exclusion criteria were people younger than 18 years, trials exclusively including pregnant women and use of buprenorphine for detoxification.
- No restrictions were placed on language or publication type.
- Analyses included direct comparisons of risk ratios and standardized mean differences.
- This study is registered with PROSPERO (CRD42020205109).

Figure B1. PRISMA flow diagram



Results

- At timepoints beyond 1 month, retention was better for methadone than for buprenorphine.

- Retention was generally higher in RCTs than observational studies.

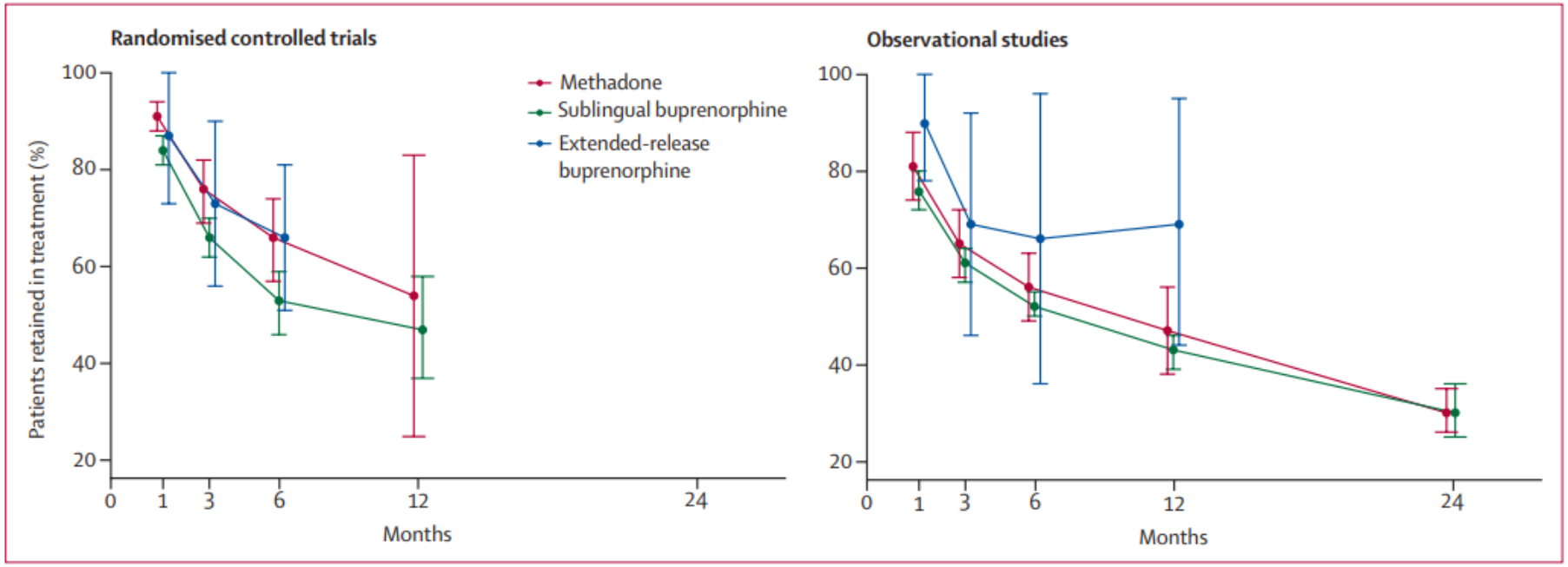


Figure 1: **Retention in treatment with buprenorphine versus methadone at 1, 3, 6, 12, and 24 months**
Buprenorphine data are stratified by route of administration. Error bars are 95% CIs.

Results

- There was no evidence suggesting that adherence to treatment differed with buprenorphine compared with methadone.

- There was some evidence that extra-medical opioid use was lower in those receiving buprenorphine.
- There was evidence of reduced cocaine use, cravings, anxiety, and cardiac dysfunction among people receiving buprenorphine compared with methadone.
- Evidence was found for reduced hospitalization in people receiving methadone.
- Buprenorphine was associated with higher treatment satisfaction compared with methadone.

Discussion and conclusion

- There is consistent evidence across timepoints and study types that retention is better for methadone than buprenorphine after the first month of treatment.

- Few statistically significant differences between these treatments were identified for most other outcomes.

- Where differences were identified they were generally based on a small number of available studies and were not consistent across metrics and study types.

- This review highlights the importance of interventions to improve retention on opioid agonist treatment (OAT) as well as of harmonization of data collection for future evidence syntheses.

Discussion and conclusion

- There is a need for future studies to expand evidence for many outcomes by standardizing measurement and reporting of outcomes.

- RCTs were often substantially limited by small sample sizes and low statistical power to detect differences between groups.

- Observational studies were constrained by the very high likelihood of selection bias and confounding due to probable differences in characteristics of people receiving buprenorphine compared with methadone.

- Future research could explore whether there are benefits for retention and other health outcomes in key subpopulations such as adolescents and older adults.

- The limited data on outcomes such as treatment satisfaction and quality of life demonstrate a need for patient-centred non-consumption outcomes to be included in future studies to investigate the real-world effectiveness of OAT.