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### COMPREHENSIVE REVIEW



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### Home-based detoxification for individuals with alcohol or drug dependence: A systematic review of the recent literature

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### Abstract

**Issue:** There is growing awareness of the benefits of treating patients in their own home, yet home-based detoxification of individuals with substance use disorder has received limited attention. While home-based alcohol detoxification seems to be safe and effective for patients without severe withdrawal, little is known about detoxification for illicit or polysubstance dependence. This review synthesises recent findings on home-based detoxification for alcohol and other substances.

Approach: A systematic search of published and unpublished studies from 2010 onwards was conducted. Studies describing home detoxification interventions and programs, along with qualitative, quantitative and mixed-methods research, were included. Study quality was assessed using the Mixed Methods Appraisal Tool. Findings were narratively synthesised.

**Key Findings:** Eleven publications were included. Many studies are descriptive, explorative or use a small sample, but four studies are of high quality. Five publications focused exclusively on alcohol detoxification. The outcomes in reducing or abstaining from substance use seem acceptable, except for opioids. Patients and families reported high satisfaction, viewing it as less stressful than inpatient care. However, no conclusions can be drawn regarding the effectiveness compared to other detoxification settings.

**Implications:** The limited evidence base illustrates a great need for further investigation and controlled trials of home-based detoxification and comparison between detoxification settings. Investigating the broader applicability across substances is crucial.

Conclusion: Home-based detoxification shows potential as a safe and patientpreferred intervention, though more research is required to assess its broader effectiveness and feasibility across various substances. It could play a valuable role within established care models.

### **KEYWORDS**

alcoholism, detoxification, home care services, substance use disorder, substance withdrawal

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### 1 | BACKGROUND AND RATIONALE

Substance use disorders (SUD) are a leading cause of illness, death and social and financial strain globally. Despite this, most individuals affected do not seek or receive treatment [1]. Substance dependence is marked by a range of cognitive, behavioural and physiological symptoms due to repeated and prolonged substance use. These symptoms include tolerance, intense cravings, loss of control over use and withdrawal symptoms when the substance is discontinued [2]. Alcohol is one of the most widely abused substances but drug use and polysubstance use are common as well. Results from the 2021 US National Survey on Drug Use and Health found that 17% of the total population has a SUD [3]. Of these cases, twothirds involve alcohol, with 48% being alcohol only. Half of the cases involve drug use, with 36% being drug-only cases, most commonly cannabis. Additionally, 16% of individuals have both alcohol and illicit drug use disorders.

Detoxification is the initial step in treating SUDs and involves the medical management of withdrawal symptoms. Detoxification services provide psychosocial and/or pharmacological support to help patients manage withdrawal, reduce discomfort and ensure their safety. Assisted detoxification can also enhance the effectiveness of psychosocial programs. For example, patients with severe alcohol use disorder who undergo medically supervised detox before starting psychosocial treatment are significantly more likely to maintain abstinence after 9 months of follow-up [4].

Detoxification takes between a few days and a few weeks, depending on the substance(s) and the severity of the dependence. Most withdrawal symptoms subside within the first week, though problems like anxiety and sleep disturbances can persist for several weeks. Withdrawal from sedative substances such as alcohol, benzodiazepines and gamma-hydroxybutyric acid can lead to severe or life-threatening complications. This is due to the overexcitation of the central nervous system during withdrawal, which can result in seizures, delirium tremens or even death. Detoxification from stimulants and opioids presents fewer medical risks, but still causes significant discomfort and cravings, leading to physical and mental distress. After opioid withdrawal, there is also an increased risk of overdose due to the loss of tolerance. A pharmacological approach is warranted for alcohol detoxification, typically using benzodiazepines or anti-epileptic drugs. For opioid detoxification, opioid agonists like methadone or buprenorphine are often used, along with symptomatic treatment for physical discomfort [5]. Detoxification from benzodiazepines is done through dose tapering. There is no recommended

pharmacological treatment for detoxification from stimulants and cannabis [6].

The significant unmet need and public health impact highlight the necessity for more accessible treatment options. However, detoxification is typically conducted in specialised settings, with limited availability in community or primary care, which restricts capacity and access [1, 7]. However, a 2017 review on community-based detoxification for alcohol use disorder found it to be both acceptable and safe, with high completion rates [8]. Some studies in the review even showed better outcomes in terms of drinking frequency, quantity and alcohol-related issues compared to facility-based detoxification, but the interventions and studies were highly varied, with most using follow-up periods of one to several months. Additionally, another systematic review found that most patients prefer outpatient treatment for substance abuse, and that shared decision-making and aligning treatments with patient preferences can lead to better outcomes [9].

Many outpatient detoxification services require individuals to visit a community clinic regularly, which can be challenging for those who have difficulty accessing or remaining at the clinic. To address this barrier, some services provide detoxification care in the patient's home. Home care models for substance use detoxification promote independence and eliminate the need for travel during uncomfortable withdrawal. Home-based withdrawal management is typically overseen by general practitioners or primary care teams. A 1997 review on alcohol detoxification found that home-based withdrawal is safe and effective for most patients, provided they have a stable and supportive environment, frequent monitoring is possible, and they do not have serious medical conditions or a history of complicated withdrawal. If the current withdrawal symptoms are not severe, homebased detox can be appropriate [10]. For those with more severe symptoms, such as hallucinations or heavy shaking, inpatient treatment is recommended. Likewise, a clinical trial showed that inpatient and outpatient treatments are equally effective for patients with mild alcohol use disorder, while those with more severe alcohol problems benefit more from inpatient treatment to reduce their drinking [11].

Currently, no literature review focuses specifically on home-based detoxification beyond alcohol detoxification alone. This paper aims to address that gap by answering the question: What is known from academic publications about home-based detoxification for alcohol and/or drugs? The goal of this review is to synthesise recent and diverse literature to identify current practices and research gaps in home-based withdrawal management and detoxification services for individuals with any SUD. It also aims to assess the feasibility, safety, effectiveness and satisfaction of such services.

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This review differs from the Nadkarni review [8] in three key ways: (i) it investigates only home-based, rather than community-based, interventions; (ii) it includes all substances, not just alcohol; and (iii) it was conducted approximately 7 years later. The review is part of an exploratory study project in Antwerp, Belgium, where a crisis resolution and home treatment team is using a newly developed practical treatment protocol for homebased detoxification, which will be evaluated in patients detoxifying from alcohol and/or drugs in their own home.

#### **METHODS** 2

The aim was to synthesise all available recent literature on home-based detoxification. To achieve this, a pragmatic review design was employed to systematically search, retrieve, extract and analyse heterogeneous literature about home-based detoxification from any source of evidence. Unlike a traditional systematic approach, this methodology adopted a broader scope, including studies regardless of their design or methodological quality. The review protocol was not registered.

### 2.1 | Search strategy and selection criteria

The review included studies on home-based detoxification published between 2010 and October 2023. The specific inclusion criteria were:

- · Participants: All patients with any substance use disorder, as well as their relatives and care professionals.
- Concept: Detoxification or withdrawal management. Studies that focused solely on relapse prevention or psychosocial support without detoxification were excluded.
- Context: Detoxification provided at the patient's home with regular home visits. This excluded care in institutional or other outpatient settings (e.g., office-based), or home detoxification without regular visits (e.g., unobserved buprenorphine induction at home).

The review incorporated quantitative, qualitative and mixed-method studies to capture various aspects of home detoxification. Descriptive observational studies, including individual case reports and cross-sectional studies, were also considered. All evaluations and outcomes were included. Reviews and commentaries on home-based detoxification were excluded. To identify potentially relevant studies, the academic databases PubMed, Scopus and Embase were searched with the following terms in the title or abstract:

(alcohol\* OR substance\* OR drug\* OR opioid\* OR benzodiazepine\* OR amphetamine\* OR ghb OR cocaine OR cannabis) AND (detox\* OR withdraw\* OR dependen\*) AND (home OR home-based OR home-based OR 'crisis resolution') AND NOT (animal\* OR mice OR mouse OR rats)

All records were exported to Endnote, after which duplications were removed. One researcher then screened the titles and abstracts before conducting a fulltext review. The search strategy aimed to identify both published and unpublished studies. Consequently, reference lists of the included studies were examined for additional research, and further (inter)national literature was searched on Google Scholar using keywords such as 'home + detoxification' and 'home + withdrawal'. When there was uncertainty about a study's inclusion, the publications were discussed with the research team.

#### 2.2 Data extraction

The research objective was to investigate the scale and modalities of home-based detoxification implementation, the demographic and clinical characteristics of patients receiving this treatment, and the outcomes related to feasibility, effectiveness in reducing or stopping substance use, safety and satisfaction. Two researchers independently and manually extracted data using a data table that included the following pre-determined categories: author, year, country, study design, sample, population, program description, inclusion criteria, exclusion criteria, substances covered, age, gender, outcomes and results. The findings are presented in both tabular form and as a narrative summary, after which the implications of the results are discussed.

### 2.3 **Quality assessment**

The mixed methods appraisal tool (MMAT) was used to assess the methodological quality of the included studies [12]. The MMAT was chosen because of the variety in the designs of the included studies. The MMAT consists of two general questions that are used for all studies and a subset of questions specific to the study design. All questions were rated as 'no,' 'yes' or 'can't tell'. The quality assessment was done by two authors (Eva Rens and Anna Ceelen). Each paper was individually assessed by each author. Differences in ratings were discussed and resolved collaboratively. A score out of five is calculated for the design-specific questions based on the number of 'yes' per study. All studies were included in this review, regardless of their quality, but

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we reflect on the evidence in light of the methodological quality.

### 3 | RESULTS

Figure 1 presents the results of the literature search. The systematic database search retrieved 5191 records (PubMed n=1007, Scopus n=1458, Embase n=2726), after which 3282 unique records remained after deduplication. One researcher initially screened the titles and abstracts of all records, resulting in 28 studies deemed eligible for further evaluation. The full texts of these 28 studies were then reviewed, leading to the inclusion of seven records in the review. Common reasons for exclusion included the absence of full text and descriptions

indicating that regular home visits did not occur during detoxification (e.g., cases with only a single home visit, only digital follow-up, or self-detoxification without home visits). An additional publication was found through Google Scholar [13] and another was identified by examining the reference lists of the included studies [14]. Furthermore, one Dutch [15] and one French-language [16] publication were discovered via Google Scholar. Ultimately, 11 publications focusing on home-based detoxification were included in the review.

An overview of the included publications is presented in Table 1. Three home detox programs took place in India [13, 17, 18], one in Canada [19], one in Australia [20], one in Thailand [21], and five in Europe (Belgium [22], the Netherlands [15], Switzerland [16], two in the United Kingdom [14, 23]).

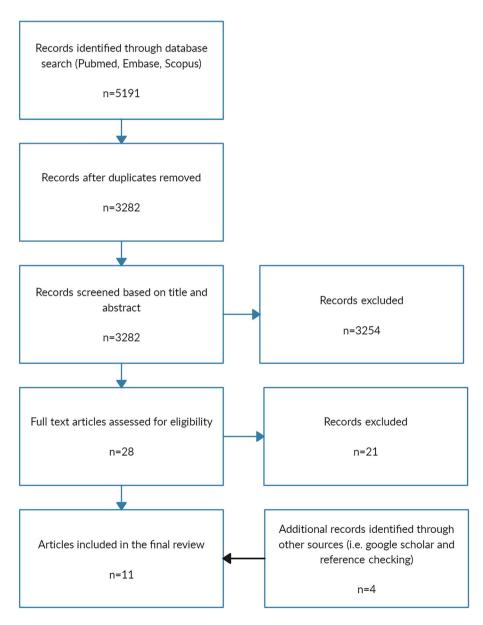


FIGURE 1 Flowchart of screening and study selection process.

### 3.1 | Quality assessment

One randomised controlled trial (RCT), two qualitative studies and one mixed-method study were of high quality (36%; score 4/5 or 5/5). One RCT, one explorative case series studies with a small sample and one evaluation of electronic medical records were of moderate quality (27%; score 3/5). One case note review and one descriptive evaluation were of very low quality (18%; score 1/5). Finally, the study by Bachmann et al. [16] provides no empirical data, and the study by Santermans et al. [22] provides too little information and data. Therefore, the quality of these papers was not further assessed. The quality scores are reported in Table 1. The full quality assessment can be consulted in Data S1, Supporting Information.

## 3.2 | Eligibility criteria for home-based detoxification

An overview of the program descriptions, eligibility criteria and contra-indications for home-based detoxification in the included studies is presented in Table 2. Eligibility criteria and contra-indications varied substantially between detoxification programs and study designs. The level of detail in which inclusion and exclusion criteria were described also varied widely across publications, making comparability difficult. Furthermore, it was sometimes unclear whether the criteria were study or program criteria.

Five of the described programs provided home-based detoxification for any substance of concern [13, 15, 16, 19, 20], five for alcohol only [17, 18, 21–23], and one for opioids only [14]. The vast majority of home detox programs required that the patient had no history of seizures or complicated withdrawal (e.g., delirium tremens), had a stable living environment, and had no serious psychiatric (e.g., psychosis or suicidality) or medical illness. One program made short-term accommodation available for the duration of the program if the patient had no stable housing [19]. Moreover, the need for the presence of a support person or designated carer was mentioned in six programs.

# 3.3 | Delivery of home-based detoxification

In the majority of publications describing the number of visits, the patient was visited and monitored at least daily during the withdrawal phase. Weekends were sometimes an exception. In an Indian program, patients were visited on alternate days in the first 10 days [13]. The frequency

of home visits was often reduced after the withdrawal phase. There were large differences regarding treatment duration, with the shortest maximum treatment being 10 days [15], and the longest 12 weeks [21]. Some programs did not specify a maximum treatment duration, but report that this was dependent on the substance and the individual.

The home-based care was usually delivered by a multi-disciplinary team [16, 19, 22] or by nursing staff who were generally assisted by the general practitioner or another physician for pharmacological treatment, and/or by a case manager or voluntary sector staff for psychosocial follow-up [14, 15, 19, 23]. In the Indian CONTAD (Community Orientated Non-specialist Treatment of Alcohol Dependence) program for alcohol detoxification, the home-based care was delivered by lay-health workers (i.e., without formal qualifications in mental health care) who were extensively trained to monitor the withdrawal (e.g., measuring blood pressure) and to provide relapse prevention counselling [17]. In the RCT on contingency management for alcohol dependence, community health workers provided support [21].

# 3.4 | Characteristics of home-based detoxification service users

Patient characteristics were explored in some of the included publications. As regards gender, the distribution ranges from 41% men in the Canadian program, for any substance [19], to 62% men in the Belgian study, for alcohol only [22]. Most patients were middle aged, but the mean age was higher in programs that exclusively treated alcohol dependence. In the Canadian program for any substance, there were significantly more women in the age group of 18 to 24 years old [19].

Three programs discussed the proportion of different primary substance dependences [13, 19, 20]. In all, alcohol was the most common primary substance of concern, making up about half of the caseload. Other common substances were methamphetamines, cannabis and opioids. As regards methamphetamines, there was a remarkable trend in the Australian program, as the proportion reporting methamphetamine as primary drug increased from 4% in 2011 to 23% by 2016 [20].

Two studies reported comorbidities. In a pilot study with 37 patients with any substance dependence, 10 (27%) had a comorbid psychiatric disorder [13]. In a case note review of alcohol-dependent males, it was found that almost half (47%) had a medical comorbidity, 26% had a comorbid mood disorder, anxiety disorder and/or personality disorder, and 6% had a psychotic disorder [18].

Referral sources were only reported in the Canadian program and included 41% from community-based

**TABLE 1** Overview and details of studies included in the review.

Author, year, country	Study design	Sample size Population	Population	Substances covered	Age	Gender	Gender Outcomes	Results	Quality (score 0-5)
Nadkarni et al. (2020); India	Explorative case series study 11 with comparison between baseline and 3-month follow-up	11	Adult males	Alcohol	Mean 100% 38.2 years male	male	Alcohol consumption in the past 2 weeks.     Heavy drinking days with time line follow back.     Short inventory of problems.     Adverse events.	Alcohol consumption • Predominantly mild to in the past 2 weeks.  Heavy drinking days with clinical parameters with time line follow within normal range or normalised over the course of detoxification. Problems.  Significant reduction in median daily alcohol consumption in grams (44.8 vs. 4.1), median percentage heavy drinking days (35.7 vs. 0) and the median short inventory of problems—score.  • Two unplanned hospitalisations (1 unknown reason, 1 misinterpretation of tremor as seizure).	м
Lodge et al. (2022); Canada	Descriptive exploration of patient data	343	All patients seeking to detoxify between August 2019 and September 2021 via the multidisciplinary Mobile Withdrawal Management Service	Any substance	Majority between ages 25 and 44	41% male	No predefined outcomes. Description and evaluation of newly established.  Mobile withdrawal management service.	<ul> <li>Most referrals by primary care practitioners (41%), followed by outpatient addiction clinics (38%).</li> <li>64.5% program completion rate.</li> <li>Alcohol most common</li> </ul>	м

Offer of short-term housing solution for 32 individuals in precarious

complications, but no

housing.
• Nine clinical

hospitalisations, or

deaths.

overdoses,

primary drug, followed by

methamphetamines.

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Quality (score 0-5)			NA It	رم م
Results	<ul> <li>4 52% alcohol as primary drug, followed by cannabis (15%) and methamphetamines (13%).</li> <li>4 Reduction in use of primary drug (94% vs. 23%) and secondary drug(s) (24% vs. 11.6%) from baseline to end of service.</li> <li>5 87% extremely satisfied with service.</li> <li>Low awareness of program and difficulties in finding appropriate support person as barriers.</li> <li>Estimated cost of \$4.8 million with 89%</li> </ul>	expenditure on staff.	<ul> <li>50% detoxification         completion and         abstinence after treatment         completion.</li> <li>No severe detoxification         related adverse effects.</li> </ul>	<ul> <li>14% continued abstinence throughout intervention period with no additional effect of contingency management.</li> <li>Significantly higher odds of transition into sustained abstinence for higher educated and CM-H than for HV (not for CM-L).</li> </ul>
Outcomes	No predefined outcomes.		No predefined outcomes. Description of patient population.	Primary: continued reported abstinence.     Secondary: number of positive breath samples and rates of prolonged reported abstinence.
Gender	male male		62.5% male	75.2% male
Age	Mean 38 years		Mean 48 years	Mean 75.2% 50.1 years male
Substances covered	Any substance		Alcohol	Alcohol
Population	All patients included for home-based detoxification in the Drug and Alcohol Withdrawal Network between July 2011 and June 2016		Adult patients undergoing detoxification with support of mobile crisis team Pharos	Adults
Sample size	700 (n = 10 for semistructured interviews)		24	159 (80 HV, 42 CM-L, 37 CM-H)
Study design	Combination of descriptive exploration of patient data, self-reported survey data at baseline and discharge, semi-structured interviews with discharged patients and estimation of direct costs		Santermans et al. Descriptive exploration of (2019); Belgium patient data	RCT with three groups:  1. Home visits only (HV)  2. Home visits + contingency management 30 baht cash (CM-L)  3. Home visits + contingency management 60 baht cash (CM-H)
Author, year, country	Wright et al. (2018); Australia		Santermans et al. (2019); Belgium	Jirapramukpitak et al. (2020); Thailand

Author, year, country	Study design	Sample size	Population	Substances covered	Age	Gender	Gender Outcomes	Results	Quality (score 0-5)
								• 58% abstinence at follow- up, significantly higher in the CM-H group (71% vs. 52% HV vs. 57% CM-L).	
Penders et al. (2012); The Netherlands	Qualitative study with semistructured interviews	9 (6 patients, 3 support persons)	Adults	Single alcohol or substance dependence	Patients: between 33 and 53 years	56% male	Patients' and support persons experience with home detoxification	<ul> <li>Perceived as less stressful than inpatient treatment.</li> <li>Support from a loved one in difficult moments and continuation of normal life are positive aspects.</li> <li>Lack of home visits at the weekends seen as shortcoming.</li> </ul>	v
Chavan et al. (2010); India	Descriptive exploration during pilot study of the program	37	Adults	Any substance	Mean 26 years (range 21–40 years)	Not reported	Not No predefined reported outcomes	<ul> <li>54% alcohol dependence,</li> <li>18.9% natural opioids,</li> <li>16.2% synthetic opioids,</li> <li>8.1% cannabis.</li> <li>27% psychiatric</li> <li>comorbidity.</li> <li>59.5% no prior treatments.</li> <li>75.6% abstinence from primary drug at 1-month follow-up, 54% at 2-month follow-up and 48.6% at 3-month follow-up.</li> <li>No severe adverse events, but 5 hospital admissions due to relapse or reeemergence of psychiatric illness.</li> </ul>	⊷
Bachmann et al. (2023); Switzerland	Description of a newly developed home treatment module with a clinical vignette of one patient		Individuals with SUD, with or without another psychiatric illness	Any substance	_	_	No predefined outcomes	• First impressions coincide NA with results of home treatment programs for patients who present with acute psychiatric disturbances.	NA

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Author, year,				Substances	_				Quality
country	Study design	Sample size	Population	covered	Age	Gender	Gender Outcomes	Results	(score 0-5)
								<ul> <li>Patient and social circle satisfied with service.</li> </ul>	
Nemlekar et al. (2021); India	Case note review	100	Adult males	Alcohol	Mean 100% 41.3 years male	male	No predefined outcomes	<ul> <li>Daily alcohol use between 3 and 30 units.</li> <li>35 completed home detoxification, 61 lost to follow-up, 4 requiring hospital admission (worsening symptoms).</li> <li>26% mood, anxiety and personality disorders each, 6% psychosis, 3% cannabis use.</li> <li>47% with medical comorbidities, significantly associated with unfavourable outcome.</li> </ul>	<b>□</b>
Carlebach et al. (2011); UK	Descriptive qualitative design using interviews and semi-structured comment sheets	35 interviews Adults (18 service users, 6 family members, 11 staff members) 22 comment sheets	Adults	Alcohol	Not reported	male	Service users, family members and staff experience with home detoxification	<ul> <li>Relatively satisfied with service.</li> <li>Home detoxification is seen as positive and useful, for example, by being able to continue working.</li> <li>It can be difficult to remain motivated during wait time.</li> <li>Additional support in knowing how to resist peer pressure is useful for some.</li> </ul>	v
Day and Strang (2011); UK	RCT with two groups: • inpatient • home-based	68 (inpatient = 35, home- based = 33)	68 (inpatient Patients requesting = 35, home- detoxification based = 33)	Opioids	Mean 60% 28.9 years male	60% male	Primary: successful completion of detoxification process	• No significant higher completion rate for	4
									(Continues)

(exif report and unine inpatients (51.4% ws.  - Secondary patient   - Longer mean medicated satisfaction at previod for outpatients   1 month follow-up,   100 minutes (51.4% ws. 12.4%), uplake of aftereare at   - Not difference in mean   1 and features to the mean   1 and features   1	Author, year, country	Study design	Sample size Population	Substances covered	Age	Gender Outcomes	Results	Quality (score 0-5)
· · · · · · · · · · · · · · · · · · ·						(self-report and urine	inpatients (51.4% vs.	
• • • • • • • • • • • • • • • • • • •						drug screening).		
• • • • • •						<ul> <li>Secondary: patient</li> </ul>		
• • • • • •						satisfaction at	period for outpatients	
• • • • • •						1-month follow-up,	(17.9 vs. 11.2 days).	
						uptake of aftercare at	<ul> <li>No difference in mean</li> </ul>	
						1- and 6-month	quantity of prescribed	
						follow-up and use of	lofexidine (1.2 mg) or	
• • • •						opioids at 1 and	diazepam (13 mg) per	
• • • • •						6 months after	detoxification day.	
						completion.		
							ibuprofen per	
							detoxification day (486 vs.	
							80 mg)	
							1-month follow-up with	
							16.2% opioid-free.	
							6-month follow-up with	
							12.5% opioid-free (no	
							significant differences	
							between groups).	
significant correlation between satisfaction score and length of medicated period and the mean total lofexidine dose.  • Results favour inpatient setting with length of detoxification taken into account.								
significant correlation between satisfaction score and length of medicated period and the mean total lofexidine dose.  • Results favour inpatient setting with length of detoxification taken into account.							outpatient group with a	
between satisfaction score and length of medicated period and the mean total lofexidine dose.  Results favour inpatient setting with length of detoxification taken into account.							significant correlation	
and length of medicated period and the mean total lofexidine dose.  • Results favour inpatient setting with length of detoxification taken into account.							between satisfaction score	
period and the mean total lofexidine dose.  • Results favour inpatient setting with length of detoxification taken into account.							and length of medicated	
lofexidine dose.  • Results favour inpatient setting with length of detoxification taken into account.							period and the mean total	
Results favour inpatient     setting with length of     detoxification taken into     account.							lofexidine dose.	
setting with length of detoxification taken into							<ul> <li>Results favour inpatient</li> </ul>	
detoxification taken into							setting with length of	
account.							detoxification taken into	
							account.	

Abbreviation: NA, not applicable (no empirical study); RCT, randomised controlled trial; SUD, substance use disorder.

Reference	Program description	Eligibility criteria	Contra-indications
Nadkarni et al. (2020)	<ul> <li>1-2 home visits with intensive monitoring by trained lay health workers who take up acute care needs related to alcohol detoxification and longer-term goals of relapse prevention.</li> <li>Fixed dose medication regime prescribed by primary care physician.</li> </ul>	Adult (≥18 years) male participants were eligible for inclusion in the study if they scored 20 or more on the Alcohol Use Disorders Identification Test [36] screening, or if they scored between 16 to 19 (possible harmful drinkers) on and had a positive screening on follow-up questions identifying symptoms of alcohol withdrawal.  Eligibility criteria specifically for home detoxification included:  • stable housing  • caregiver available and willing to stay with the patient  • patient agreeable for home visit/ contact by the lay health worker  • appropriate care arrangements put in place for any children and vulnerable adults.	<ul> <li>A history of seizures or severe confusion during alcohol withdrawal.</li> <li>A history of hallucinations.</li> <li>Unexplained loss of consciousness.</li> <li>Head injury with loss of consciousness in the past 1 year.</li> <li>Seizures even when not withdrawing from alcohol or on treatment for epilepsy.</li> <li>Use of any other substance of misuse (except tobacco).</li> <li>Blood in the stool or in vomitus in the past year.</li> <li>A history of or current Wernicke's encephalopathy.</li> <li>A history of angina/coronary heart disease.</li> <li>On regular benzodiazepines.</li> <li>Physical health problems requiring immediate medical/surgical attention.</li> <li>Unstable medical or psychiatric conditions.</li> <li>Signs of liver compromise.</li> <li>Severely dehydrated.</li> <li>Cerebrovascular accident in the past year.</li> <li>Recent cardiac event.</li> <li>Untreated/uncontrolled hypertension.</li> <li>Significant respiratory problems.</li> </ul>
Lodge et al. (2022)	<ul> <li>Access to care anywhere in the community, including at home.</li> <li>Daily visits or contacts (e.g., phone calls) the patients daily for up to 30 days.</li> <li>Care delivered by health and support workers, peer support workers, nurses and a physician.</li> <li>Pharmacological treatment and psychosocial support.</li> </ul>	<ul> <li>Age ≥18 years.</li> <li>Medical stability.</li> <li>Psychiatric stability (e.g., no active suicidality or psychosis).</li> </ul>	History of complicated withdrawal requiring medical intervention (including past history of withdrawal seizures or delirium tremens).  'There are no additional exclusion criteria. For those without (safe) housing, short-term accommodation is made available for the duration of the program'.
Wright et al. (2018)	<ul> <li>Free home-based withdrawal for any substance by specialist nurses, in collaboration with the patient's general practitioner.</li> <li>Length and nature are client- and drug-specific.</li> </ul>	<ul> <li>Having a 'safe alcohol/drug free environment'.</li> <li>The presence of a support person to monitor progress.</li> </ul>	'physical or psychiatric contraindications to withdrawal (e.g. history of seizure in previous withdrawals, high risk of suicide)'.
Santermans et al. (2019)	<ul> <li>Acute psychiatric care for up to 4 weeks in the patient's home.</li> <li>Multidisciplinary team (i.e., psychiatrist, psychologist, social worker and different bachelors and masters with experience in mental health care).</li> </ul>	<ul> <li>Age ≥16 years.</li> <li>Presence of a psychiatric crisis.</li> <li>Residence in the area.</li> <li>Presence of a carer.</li> <li>A willingness to cooperate.</li> </ul>	<ul> <li>Severe withdrawal in the past (delirium tremens, seizures).</li> <li>Misuse of substances other than alcohol.</li> <li>Severe health problems.</li> <li>Serious psychiatric illness (such as an acute psychosis).</li> </ul>

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TABLE 2 (Continued)

Reference	Program description	Eligibility criteria	Contra-indications
Jirapramukpitak et al. (2020)	<ul> <li>Brief advice and psychoeducation of patients and relatives about withdrawal (symptoms), prescribed medication</li> <li>Daily home visits by community health workers during first week, three times a week in the following 11 weeks with two follow-up visits at weeks 13 and 16 after end of intervention.</li> <li>Breath sample each visit with cash prize for negative test in contingency groups.</li> </ul>	<ul> <li>Age ≥18 years.</li> <li>A DSM-IV [35] diagnosis of current alcohol dependence.</li> <li>Not in any formal alcohol drinking problem treatment program within 3 months prior to entering the study.</li> </ul>	<ul> <li>Any active, serious psychiatric and/or medical disorder which required hospitalisation.</li> <li>Other substance dependence, except tobacco.</li> </ul>
Penders et al. (2012)	<ul> <li>Daily home visits during the weekdays for 10 days.</li> <li>Monitoring by an experienced nurse.</li> <li>At least three home visits by a case manager for psychosocial support.</li> </ul>	<ul> <li>A single alcohol abuse problem (excessive use or dependence).</li> <li>A stable living environment with at least one support person.</li> </ul>	<ul> <li>A history of complicated alcohol withdrawal.</li> <li>A serious psychiatric or medical comorbidity.</li> </ul>
Chavan et al. (2010)	<ul> <li>Community team of medical social workers and nurses.</li> <li>Home visits for up to 2 weeks, on alternate days until day 10, and once in 3-4 days afterwards.</li> <li>Detoxification initiation with buprenorphine or clonidine for opiate dependence, and lorazepam and B-complex for alcohol dependence.</li> </ul>	<ul> <li>Fulfilling ICD-10 criteria for substance dependence.</li> <li>Willingness to stay in the house for initial few days.</li> <li>Willingness of at least one family member to supervise the patient's treatment round the clock.</li> </ul>	Associated surgical and medical illness
Bachmann et al. (2023)	<ul> <li>Care delivered by a multidisciplinary team.</li> <li>Regular visits from a psychiatrist as well as nurses, up to three times a day.</li> <li>Duration of follow-up based on individual needs.</li> <li>Permanently available service by phone and direct transfer to the hospital if needed.</li> </ul>	Patients with a severe substance use disorder with or without another psychiatric illness like psychosis, bipolar disorder, severe depression or a severe personality disorder	Not mentioned
Nemlekar et al. (2021)	<ul> <li>Fixed dose benzodiazepine scheme provided at home by a tertiary care psychiatric hospital.</li> <li>No information about frequency of visits or duration of treatment.</li> </ul>	Patients with alcohol use disorder	Not mentioned
Carlebach et al. (2011)	<ul> <li>Partnership arrangement between the National Health Service and the voluntary sector.</li> <li>Assessment for home detoxification after referral by a nurse.</li> <li>Care delivered by two community National Health Service nurses, with voluntary sector staff providing a range of psychosocial services, including counselling and complementary therapies.</li> </ul>	Patients with alcohol use disorder	Not mentioned

Reference	Program description	Eligibility criteria	Contra-indications
Day and Strang (2011)	<ul> <li>At least 1 h of individual interaction each weekday with social support and encouragement of involvement by family members and friends.</li> <li>Structured lofexidine detoxification (same protocol for both groups): daily distribution by nurses for home-based group, with weekend doses supplied on Friday.</li> </ul>	<ul> <li>Meeting ICD-10 [37] criteria for opioid dependence and requesting a medically assisted opioid detoxification.</li> <li>Consenting to randomisation and to receive treatment and monitoring within the study.</li> </ul>	<ul><li> Currently pregnant.</li><li> Dependent on alcohol or</li></ul>

Abbreviations: DSM-IV, diagnostic and statistical manual of mental disorders, fourth edition; ICD-10, International statistical classification of diseases and related health problems 10th Revision.

primary care practitioners, 38% from specialised outpatient addiction clinics, 14% from in-hospital transfers, 5% from psychiatric services and 2% other sources [19].

### 3.5 | Abstinence and reduction of substance use

Four studies used abstinence as their main outcome. A pilot study of an Indian home-based detoxification program with 37 patients with any substance dependence found that three-thirds (75.6%) was abstinent from the primary substance at 1 month follow-up, which further reduced to half of all patients that were still abstinent at 2-month (54.0%) and 3-month (48.6%) follow-up [13]. Of the 24 patients for whom home-based detoxification was initiated by a Belgian mobile crisis team, half completed the detoxification and were abstinent at discharge [22]. An RCT with opioid-dependent patients found that in the study arm of those undergoing home-based detoxification, 5 out of 33 (15.1%) were heroin-free after 1 month, of whom one received opioid substitution treatment, leaving 12.1% fully abstinent from all opioids [14]. After 6 months, only 3 (9.1%) and 2 (6.1%) out of 33 individuals were abstinent from heroin and all opioids, respectively. In an RCT in Thailand, abstinence was evaluated in those receiving home detoxification for alcohol disorder with or without additional contingency management [21]. It was found that 58% of the total sample was abstinent after the 12-week intervention, and that this was significantly higher among those receiving the highest level of contingency management: 52% of those receiving home detoxification only, 57% of those receiving a lower cash incentive, and 71% of those receiving a higher cash incentive. Regarding continuous abstinence, only 14% of the sample could abstain throughout the 12-week intervention period, but there was no effect of the addition of contingency management. It was, however, found that those with a higher education and those

receiving the highest cash prize had higher odds of transitioning into sustained abstinence.

Two studies used reduction of substance use as their main outcome. In the Australian Drug and Alcohol Withdrawal Network program, patients in almost all (94%) detoxification episodes reported using their primary substance of concern 'most days or more often' at baseline, and this had reduced to 23% at discharge [20]. An explorative study with 11 alcohol dependent males found that one patient relapsed during the home detoxification, but that there was a significant reduction in median daily alcohol consumption and percentage heavy drinking days, with a median of zero heavy drinking days and 4.1 g of alcohol per day at the 3 month follow up period [17]. Finally, one study reported that 64.5% of those enrolled completed the detox program as defined by participants' self-identified goal at intake, which were not further specified but could involve abstinence, substance use reduction or harm reduction [19].

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# 3.6 | Direct comparison between home-based and inpatient detoxification

An RCT compared the detoxification completion rate, the mean quantity of medication (lofexidine or diazepam) needed per day, the mean medicated period, patient satisfaction and abstinence at 1- and 6-months follow-up between inpatient and home-based detoxification in 68 opioid-dependent patients in the United Kingdom [14]. Outpatients had a significantly longer mean medicated period (17.9 vs. 11.2 days) but were more satisfied with their treatment process. There were no statistically significant differences in completed detoxification rate, the mean prescribed daily quantity of lofexidine (1.2 mg) or diazepam (13 mg) and opioid abstinence after 1 or 6 months. However, inpatients were prescribed significantly more ibuprofen per detoxification day (486 vs. 80 mg). At

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1-month follow-up, 12% outpatients and 20% inpatients were opioid-free. At the 6-month follow-up, 6% outpatients and 17% inpatients were opioid-free. However, these differences were not statistically significant.

### 3.7 | Safety of home-based detoxification

No serious adverse events such as seizures, overdoses or death were reported in any of the publications. One publication reported two unplanned hospitalisations, one of which was for unknown reasons and one for misinterpretation of tremor as a seizure [17]. One publication reported nine instances of 'clinical complications as defined by program criteria' which were not further specified but did not require hospitalisation [19]. One case note review study reported that 4 out of 100 patients required admission because of worsening symptoms [18].

A study with 11 alcohol-dependent males reported the course of the clinical parameters and found that blood pressure, pulse and temperature remained within the normal range, and that disorientation, ataxia and sleep disturbances normalised over the course of the detoxification, which generally lasted 5 to 7 days [17].

# 3.8 | Satisfaction and experiences of home-based detoxification service users

Patient experience was explored by three studies with (semi-structured) interviews and/or comment sheets. Penders et al. interviewed six patients with a single alcohol or substance dependence included in their program and three support persons who were all generally positive about home detoxification [15]. They perceived homebased detoxification as less stressful than inpatient treatment, partly because during difficult moments they could receive support from a loved one. They noted a lack of home visits during the weekend as a shortcoming. In the United Kingdom, a community alcohol service was evaluated through interviews and comment sheets. Home detoxification was seen as positive by service users and family members. Being able to continue working was reported as an important plus. Remaining motivated during the waiting time was seen by many as a difficulty.

Wright et al. included semi-structured interviews with 10 patients as part of a broader exploration of the free home-based withdrawal service of the Australian Drug and Alcohol Withdrawal Network [20]. Service users valued the person-centred approach but mentioned low awareness of the program and difficulties finding an appropriate support person as barriers for participation. As part of a follow-up survey, the vast majority (87%) of respondents were 'extremely' satisfied with the service.

In an RCT comparing inpatient and home-based opioid detoxification, the outpatients rated their satisfaction with the treatment process significantly higher than inpatients [14]. However, a significant correlation was also reported between the satisfaction score and the length of medicated detoxification period and the mean total lofexidine dose. This may have contributed to the correlation between setting and satisfaction, as the outpatient group had a significantly longer mean medicated period (17.9 days) than the inpatient group did (11.2 days). Finally, in a description of a new home detoxification program in Switzerland, it was reported that patients and their social circle were satisfied with the service [16].

### 3.9 | Cost of home-based detoxification

Only one mixed-method study examined the cost of a home-based detoxification program, namely the Drug and Alcohol Withdrawal Network program that provided free home-based withdrawal for any substance by specialist nurses [20]. The 5-year direct costs of the program were estimated at \$4.8 million for a total of 700 patients who underwent home-based detoxification. The majority (89%) of expenditure was on staff. Nurses logged their hours and an estimated 24% of logged time was spent travelling to and from clients' home, 40% face-to-face liaising with clients, and 36% was spent on administration, meetings and referrals. However, no reliable comparison of costs or cost-effectiveness with inpatient detoxification was possible.

### 4 | DISCUSSION

This review presents an overview of the recent scientific literature dealing specifically with home-based interventions for detoxification from any substance. The findings should be interpreted considering certain limitations and observations. A pragmatic approach was adopted, allowing for the inclusion of any publication since 2010 that described a study, intervention or program related to home detoxification. As a result, the publications varied widely, making comparisons challenging. However, this diversity also provided valuable insights into the different outcomes associated with home detoxification and allowed for triangulation of the findings. It is important to note that most of the included publications were descriptive evaluations of detoxification programs, and did not include a comparator. Only two RCTs were included, and of those, only one compared inpatient detoxification with home-based detoxification.

The reliability of the findings in this review is affected by the variability in the quality of the included studies. A considerable proportion (45%) of the studies were rated as moderate or low quality, reflecting limitations in methodology, small sample sizes or inadequate data reporting. Furthermore, two studies were excluded from the quality assessment due to insufficient empirical data or a lack of detailed information, which further constrains the evidence base. The strongest evidence pertains to qualitative outcomes, such as patient satisfaction and staff experiences, while the evidence supporting the effectiveness of home detoxification is less robust. Consequently, the overall conclusions should be approached with caution, taking into account the moderate and low quality of a significant portion of the included research.

It was found that home detoxification services reach a diverse patient group in terms of age, gender and clinical profile. Based on heterogeneous and mostly uncontrolled investigational study data, home-based detoxification seems generally safe with acceptable outcomes for the majority of patients. Service users and their relatives are satisfied with home-detoxification and appreciate the comfort of their familiar home environment, the possibility to continue working and the proximity to support figures.

The majority of home-based detoxification research today focuses on alcohol dependence. Even in detoxification programs that have a broader scope and provide withdrawal management for any substance, about half of detoxifications involve alcohol [13, 20]. Nonetheless, evaluations of these programs highlight the necessity for detoxification services targeting other substances. Dependence on methamphetamine and opioids is prevalent, with one study reporting a significant increase in methamphetamine detoxifications, rising from 4% in 2011 to 23% in 2016 [20]. This is in line with epidemiological data reporting a marked increase in methamphetamine use and harms, which can be linked to the ongoing opioid pandemic, a trend that is pronounced in the United States but is also present worldwide [24]. There is a pressing need for further research on assisted detoxification and home-based interventions for users of illicit drugs and polydrug users, focusing on aligning care needs with appropriate treatment options for these populations.

It is important to note that some of the included studies exclusively selected low-risk patients based on stringent exclusion criteria. The eligibility criteria for home-based detoxification programs tend to favour individuals with stable home environments, support systems, and manageable substance use issues. Thus, it can be concluded that assisted home-based detoxification is a potentially safe option for low-risk individuals within the current treatment options for substance withdrawal. The same conclusion was drawn by other studies and reviews concerning outpatient and home-based detoxification for alcohol dependence [8, 10]. Similarly, an uncontrolled

study by Allan et al. compared home-based detoxification with detoxification in a day hospital setting for alcohol dependence and found both settings to be equally safe [25]. However, home-based detoxification requires intensive monitoring, especially when withdrawing from alcohol or sedatives, and is not suitable for all patients. While there is broad agreement on certain criteria for exclusion—such as a history of seizures, severe withdrawal complications, or severe medical or psychiatric comorbidities—there remains considerable variability in the inclusion criteria and procedures used across different detoxification programs.

Detoxification outcomes were unsatisfactory in one high-quality RCT that investigated home-based opioid detoxification, where fewer than 10% of patients achieved abstinence. There is some evidence that community detoxification, including home-based detoxification, might be less likely to be successful for opioid-dependent individuals. An evaluation of two RCTs indicated that inpatient and outpatient opioid detoxification have similar costeffectiveness when successful detoxification is taken into account, despite inpatient treatment being 24 times more expensive [26]. Additionally, a retrospective analysis of data from the Substance Abuse and Mental Health Services Administration found that residential programs reported a 65% completion rate compared to 52% for outpatient settings, and that this effect is moderated by opioids being the drug of choice [27]. The authors posited that individuals misusing opioids might benefit from greater protection against environmental and social triggers that can lead to relapse and treatment non-completion. Furthermore, detoxification for opioid dependence poses significant risks, as reduced opioid tolerance increases the likelihood of accidental overdose and death, highlighting the need for extra caution post-detoxification. There is a need for further research into the safety and facilitators of community and home detoxification for opioid users.

It is important to note that this review primarily utilised short-term follow-up periods. Approximately half of the patients undergoing alcohol detoxification remain abstinent after 3 months [13, 21]. Jirapramukpitak et al. [21] combined home-based treatment with contingency management and found that those receiving larger rewards for abstinence had higher rates of success. This suggests that a stepped care model for patients with SUDs could be beneficial, allowing for contingency management to be added for individuals who do not respond to standard home treatment.

It is known that relapse is common, as it is estimated that about 40% to 80% of patients re-start using substances in the first year after completing treatment [28, 29]. Even more, a meta-analysis found that only up to 54% of individuals with a SUD achieve remission after an average follow-up period of 17 years, which supports the contention that SUDs are chronic conditions for a significant proportion of patients [30].

It is also important to recognise that abstinence may not always be the primary treatment goal for patients. Some of the included studies therefore reported a significant reduction of substance use or heavy use days, or completion of 'self-identified goals', in about three-quarters of the patients [17, 19, 20].

The characteristics of service users in home detoxification programs show a diverse patient population across all age groups and varying gender distributions. In two of the detoxification programs described, 59% and 46% of patients were female, while it is known that SUDs are more common among men [31]. In line with this, earlier reports on home detoxification for alcohol dependence indicated that women and younger age groups were relatively more represented in home detoxification services compared with inpatient care services [10]. Possible hypotheses are that these groups enter into treatment in an earlier stage when the SUD is not too severe, or that the barriers to inpatient treatment are higher and homebased detoxification is a more acceptable treatment for women and/or young people, who may experience more stigma related to addiction, and often have family commitments or caregiving responsibilities that influence their treatment choices [31, 32].

Currently, it remains unclear whether patient characteristics, outcomes and cost-efficiency differ between home detoxification and other community-based detoxification methods. However, a study conducted in 2000 compared home-based detoxification with detoxification in a day hospital and found that approximately 78% of patients successfully completed detoxification in both outpatient settings, over an average time of 8 days [25]. After 2 months, 45% of patients in the home detoxification group and 31% in the day hospital group demonstrated significant improvements in various alcohol-related issues. Future controlled research is needed to compare home-based detoxification with other detoxification settings.

Home detoxification is typically provided by a multidisciplinary team that includes physicians, nursing staff and psychosocial personnel. However, it remains unclear whether the success of detoxification is affected by the level of multidisciplinary involvement or the type of team, such as a specialised team versus a primary care team. Nadkarni has studied home-based detoxification in India and argues that home-based care is especially useful in low resource settings where hospital-based care is less accessible [33]. To address the shortage of specialised staff, the authors propose a collaborative care model in which specialists train and supervise non-specialist health workers, enabling them to provide psychosocial interventions for individuals with substance use disorders. This approach was exemplified in the CONTAD program mentioned in this review, where lay health workers received training from an experienced psychologist and psychiatrist [17]. Also, the psychosocial homebased care was delivered by community health workers in the RCT on contingency management [21].

Finally, although not included in the current review, telehealth can be a valuable approach to home detoxification, whether or not in conjunction with home visits. A case study using videoconferencing and peripheral monitoring devices found that telehealth detoxification was successful and safe [34].

As pointed out before in a review about community detoxification by Nadkarni et al. [8], there is a scarcity of high-quality evidence for home-based detoxification interventions, mainly due to a lack of RCTs. This limitation makes meta-analysis unfeasible and hinders the development of clinical practice guidelines specifically for home detoxification procedures. This lack of research is especially true for cost-effectiveness and comparisons with other settings, and for substances other than alcohol.

Despite the limited evidence base, home-based detoxification has been shown to be a viable treatment option that offers benefits for both patients and their families. It can be integrated into various care models, such as primary home care services and crisis resolution teams, and can range from brief support with periodic check-ins to intensive daily visits from healthcare professionals. This flexibility allows home-based detoxification to be tailored to meet the diverse needs and circumstances of patients. This would benefit the patients as well as society as a whole, as increasing access and scaling-up evidence-based treatments in the community is one of the main public health strategies to reduce the burden and unmet needs for SUDs [1].

### **AUTHOR CONTRIBUTIONS**

Eva Rens: Investigation, Methodology, Writing – original draft, Writing – review & editing. Anna Ceelen: Investigation, Methodology, Writing – original draft, Writing – review & editing. Nicolaas Martens: Conceptualization, Methodology, Project administration, Writing – review & editing. Lynn Van Camp: Conceptualization, Funding acquisition, Writing – review & editing. Marianne Destoop: Conceptualization, Methodology, Supervision, Writing – review & editing.

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### CONFLICT OF INTEREST STATEMENT

No conflict of interest declared.

### DATA AVAILABILITY STATEMENT

Data sharing not applicable-no new data generated.

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### SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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