

# Overlooked and underestimated? Problematic alcohol use in clients recovering from drug dependence

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## ABSTRACT

**Aims** Despite recognition of the harms related to alcohol misuse and its potential to interfere substantially with sustained recovery from drug dependency, research evaluating drug treatment outcomes has not addressed the issue comprehensively. It has been overlooked possibly because treatment research has been framed according to the primary drug of choice, rather than investigating the interactions between different combinations of drugs and/or alcohol use. This paper reports on a systematic review investigating whether concurrent alcohol use could impede recovery from illicit drug use in two potential ways: first, alcohol could become a substitute addiction and/or secondly, alcohol misuse post-treatment may place an individual at risk for relapse to their primary drug problem. **Method** A systematic search of four relevant databases was undertaken to identify peer-reviewed, quantitative drug treatment outcome studies that reported alcohol use pre-, post-treatment and follow-up. **Results** The search revealed 567 papers, of which 13 were assessed as fulfilling the key inclusion criteria. The review indicated inconsistent and therefore inconclusive support for the substitution hypothesis. However, the data revealed consistent support for the hypothesis that alcohol use increases relapse to drug use. **Conclusions** (i) The potential negative impact of alcohol misuse on drug treatment outcomes remains under-researched and overlooked; (ii) alcohol consumption post-drug treatment may increase the likelihood that an individual will relapse to their primary drug; (iii) existing evidence regarding the substitution hypothesis is inconclusive, although there was an indication that a subgroup of participants will be vulnerable to alcohol becoming the primary addiction instead of drugs. We argue that future drug treatment outcome studies need to include detailed analysis of the influence of alcohol use pre- and post-drug treatment.

**Keywords** Alcohol misuse, drug dependence, illicit drug use, longitudinal studies, outcomes studies, recovery, relapse, residential drug treatment, substitution.

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## INTRODUCTION

While the social and health-related harms associated with alcohol misuse are well researched, the lines of investigation often tend to be conceptualized from a substance-specific perspective [1]. Research on illicit drug use is generally framed in relation to the primary drug of choice, with restricted attention given to other illicit substances and even less given to the concurrent use of legal substances, such as alcohol and nicotine [2]. This is likely to be the natural consequence of the layers of complexity that multiple variables introduce when investigating the treatment outcomes of drug dependence. However, research across a range of western countries has indicated that drug users tend to use or be dependent on

multiple illicit substances and may, contemporaneously, misuse alcohol [3–8]. We argue in this paper that there is a need for greater research into homotypic comorbidity between alcohol and illicit drug use disorders and how they may interact during treatment for drug dependency [1,9]. For example, in 2003, Gossop and colleagues reported on alcohol use outcomes among a treatment sample of drug users and concluded that alcohol use and, in particular, heavy drinking is an important but underestimated problem in the treatment of drug dependency [10]. However, since then there has been a paucity of research examining this issue further. Importantly, drug treatment services (particularly residential services) do not generally address alcohol misuse specifically [11]. It may be that in designing treatment programmes, service

providers operate with a core premise that generic addiction principles are uniformly sufficient for all polydrug users. These principles, however, fail to take into consideration the position of alcohol in many cultures as a legal and commonly used substance. This paper proposes that alcohol misuse may render recovering drug users vulnerable to relapse and/or 'substitution' where they replace their primary drug with alcohol. To investigate this we conducted a systematic review of the literature addressing the following two questions (taking into account that they may occur in combination): (i) does alcohol become a substitute for the primary drug(s) of choice; and (ii) does alcohol consumption play a role in relapse to illicit drug use?

## METHOD

### Search strategy

In order to answer the research questions, the inclusion criteria for papers in the systematic review were as follows: (i) quantitative drug treatment outcome studies that (ii) reported alcohol use pre-, post-treatment and follow-up; (iii) were limited to peer-reviewed studies published in English; (iv) and human participants aged over 18 years. Results were not restricted based on year of publication. The search (using the terms below) was conducted in September 2011 across four databases: Medline, PsychInfo, CINAHL and Academic Search Complete. This search produced 567 papers. Each abstract was read either by P.S. or B.R. and papers that clearly did not meet the inclusion criteria were excluded. This left 45 possibly relevant papers which were read in full independently by P.S. and B.R. who applied the inclusion criteria to each paper. During this review process papers were not excluded based on quality of design, but on whether they provided quantitative treatment outcome data for drug and alcohol use as per the inclusion criteria (by default excluding qualitative and case studies). Independent agreement was reached regarding the exclusion of 35 papers, with a further three being excluded following further discussion between B.R., P.S. and C.L.

### Search terms

The following search terms were used: drug or 'substance \*use\*' or 'substance dependence' or 'addict\*' or 'opiate \*use\*' or 'heroin \*use\*' or 'amphetamine \*use\*' or 'cocaine \*use\*' AND 'alcohol \*use\*' or 'alcohol problem\*' or alcoholi\* or 'heavy drink\*' or drinking AND 'treatment outcome' or longitudinal or relapse.

The remaining seven were identified as being relevant to the review. Further searches of reference and citation lists conducted independently by P.S., B.R. and C.L.

produced another four peer-reviewed papers, one book chapter and a report that met the inclusion criteria such that, overall, there were 13 relevant publications, of which five were relevant to the question of alcohol and relapse and eight to addressing the substitution hypothesis. These 13 papers were read, summarized and discussed in detail by P.S., B.R. and C.L. and the ideas and implications of the papers discussed by all authors.

### Does alcohol become a substitute addiction in those recovering from drug use?

Our review identified eight papers that provided data addressing the question of whether alcohol becomes a substitute addiction following recovery from illicit drug use [10,12–18]. Six of these papers reported on the outcomes of large-scale longitudinal studies (conducted in Australia, Ireland, the United States and England) which reported on the efficacy of various treatments for illicit drug addiction and documented alcohol consumption during and after treatment. These longitudinal studies include the Treatment Outcome Prospective Study (TOPS; [17]); the Drug Abuse Reporting Program (DARP; [15,16]); the National Treatment Outcome Study (NTORS; [10]); the Australian Treatment Outcome Study (ATOS; [12]); and the Research Outcome Study (ROSIE; [13]).

The findings regarding alcohol consumption and its relationship to drug use pre- and post-treatment were mixed. The DARP studies [15,16] indicate that overall alcohol use increased post-treatment at the 1- and 6-year follow-up time-points while drug use decreased, suggesting indirectly that substitution may be occurring. Simpson and colleagues [16] found that a small group of participants reported a direct inverse relationship between quitting heroin use and increasing alcohol use post-treatment (13%). Interestingly, alcohol use gradually declined at the 12-year follow-up mark along with a concurrent decrease in opioid use, indicating that substitution may occur early post-treatment, but gradually all drug and alcohol use declined over the 12 years. The TOPS study findings indicated that alcohol use remained at problematic levels for recovering drug users despite an overall decrease in illicit drug use 12 months post-treatment [17]. The data, however, were analysed in such a way that it was not possible to examine change at the level of the individual. Gossop and colleagues [10] specifically investigated changes in alcohol use among a subsample of NTORS participants, comprised of drug users in treatment services. Forty-five per cent of individuals who were abstinent from alcohol at intake were found to have begun drinking by the 1-year follow-up. However, when they conducted further analyses to examine if alcohol use increased in those who had improved drug

treatment outcomes (i.e. substitution hypothesis) they did not find any significant effects. Gossop and colleagues concluded that heavy drinking post-drug treatment should be viewed more as a function of general polydrug use rather than substitution, although caution needs to be taken when interpreting these findings, as the sample size ( $n = 62$ ) for those with improved drug treatment outcomes was low [10].

Findings from the ROSIE data [13] indicated that 15% of users who reported no alcohol at baseline consumed alcohol 1 year later; however, whether they were also abstinent (i.e. suggesting substitution) from illicit drugs was not reported. Darke *et al.* [12] found no inverse relationship between reduced heroin use and alcohol consumption at follow-up. However, similar to the TOPS study, their analyses did not investigate change in alcohol and heroin use at the individual level, only on average within the sample. Furthermore, this study did not report the specific level of alcohol consumption, making it difficult to ascertain whether drinking was a problem at either baseline or follow-up. These measurement issues make it difficult to investigate the substitution hypothesis appropriately, a conclusion also offered in 1979 by Belenko [19] in a narrative review on the use of alcohol among illicit drug users.

Almog and colleagues [14] reported on the use of alcohol in 375 males who were in drug-free or methadone treatment programmes. They found an inverse relationship between heroin and alcohol use in the pre-treatment, treatment and discharge phases (except for Anglo participants in the methadone programme who, it could be argued, are already substituting). Finally, DeLeon [18] conducted a 2-year follow-up of individuals treated within a Therapeutic Community. Alcohol use among illicit drug-dependent individuals was low post-treatment, although there was a subgroup who reported high alcohol use pre- and post-treatment for drug use. These findings did not provide support for alcohol substitution, although the author notes that clients may be reluctant to report alcohol use following treatment, given the abstinence model of the Therapeutic Community.

In summary, evidence for the substitution hypothesis is mixed (one supporting, another supporting in a subgroup, three unclear and three finding no evidence), and therefore inconclusive. It is possible that more in-depth qualitative studies will also shed light on this inter-relationship; however, it is likely that there are considerable individual differences at play, suggesting that subgroups of recovering users might be especially at risk (e.g. [16]). For example, Lehman & Simpson [20] argued that substitution with alcohol might be higher in individuals with a history of alcohol abuse and familial alcoholism.

### Does alcohol use post-treatment lead to relapse to illicit drug use?

Five studies were identified as addressing the question of whether alcohol consumption may be related to relapse to illicit drug use following drug treatment [10,11,21–23]. In one study by Mengis and colleagues [22], alcohol use at 4 weeks (but not at baseline) predicted relapse to cocaine use for clients being treated using cognitive-behavioural therapy (CBT) or a 12-Step programme ( $n = 128$ ). In particular, alcohol use at 4 weeks was associated positively with relapse to cocaine use at 8 and 12 weeks and alcohol use at week 8 predicted cocaine relapse at week 12. Stenbacka and colleagues [11] examined alcohol use in a group attending methadone maintenance treatment ( $n = 204$ ), and found that those who relapsed to illicit drug use were more likely to test positive for alcohol use than participants who did not relapse [11]. Furthermore, the authors found that more frequent users of alcohol, as evidenced by four or more positive screens for alcohol use, experienced more relapse episodes.

McKay and colleagues [21] found that 98 cocaine-dependent participants who were able to abstain from alcohol consumption had better drug use outcomes following treatment. Furthermore, drinking following treatment was found consistently to be associated with worse cocaine use outcomes 6 months later. The majority of participants (61.9%) reported drinking on the day of their relapse at the 6-month follow-up, although the authors note that the analyses did not allow interpretation of whether or not the alcohol triggered a relapse to cocaine use. Finally, alcohol use post-treatment had a stronger relationship to subsequent cocaine relapse than a diagnosis of alcohol dependency at intake to treatment [21]. Gossop and colleagues [10] found that participants ( $n = 418$ ) who engaged in ongoing heavy drinking from intake onwards, or those who increased alcohol use following treatment, were more likely to be using illicit substances 6 months later. Finally, a small study ( $n = 20$ ) by Frawley & Smith [23] looked at the relationship between alcohol use during chemical aversion treatment and relapse to cocaine use. They found that alcohol use at 6 months was associated significantly with relapse at 18 months for individuals treated for alcohol and cocaine use ( $n = 11$ ), but not for individuals treated for cocaine use only ( $n = 9$ ). The small sample size limits the conclusions that can be drawn.

In summary, all five studies provide some support for the proposition that the use of alcohol may contribute to relapse to drug use. Three of the studies showed an association between alcohol use and relapse within a single time-point [11,21,23]. The other two studies found that alcohol use at an earlier time-point predicted relapse at a

later time-point [10,22]. While there is some evidence that alcohol use may contribute to relapse for some individuals, the studies cited do not provide an understanding of the nature of this relationship nor the possible mechanisms involved. We suggest that further empirical and qualitative studies are necessary in order to understand the possible mechanisms involved if alcohol use does indeed trigger relapse to drug use, especially if this relationship is only substantial for a subgroup of individuals.

## DISCUSSION

Currently there is limited research that examines specifically the trajectory of alcohol use in recovering drug-dependent clients. By reviewing 13 studies which included data on the alcohol use of clients recovering from drug dependence, we have identified sufficient evidence to warrant further investigation of the effects of alcohol misuse on drug treatment outcomes. These findings need to be interpreted in light of the exclusion of non-English papers and participants aged under 18 years. Also, it is likely that the influence of alcohol will differ based on cultural and legal variation between countries, and this review is possibly more relevant in countries where alcohol is legally available. Keeping these limitations in mind, there is consistent (albeit a small number of studies) evidence to indicate that alcohol consumption post-drug treatment increases the likelihood that an individual will relapse to their primary drug. The data were mixed and generally lacking in sufficient detail to draw any conclusions regarding the substitution hypothesis, although there was an indication that a subgroup of participants will be vulnerable to alcohol becoming the primary addiction instead of drugs.

Thirty years ago a number of researchers identified the lack of studies investigating the issue of alcohol use among drug users and the potential negative impact it plays in recovery (see [19]). Since then we have progressed little in our understanding of this issue, due primarily to the lack of studies reporting detailed alcohol consumption data pre- and post-drug treatment. This review found only 13 studies which provided these data. These 13 studies generally examined overall increases or decreases in alcohol and drug use, which limits our ability to understand the individual interactions between drug use recovery and the use of alcohol. We argue that there is a need for studies to examine explicitly the substitution hypothesis and the role of alcohol in relapse to illicit drug use (e.g. using cross-lagged models or latent growth modelling and mixture modelling) to identify subgroups especially at risk.

Given the findings, it is important to consider the potential underlying mechanisms at play in the two scenarios examined in this review. In the context of relapse prevention, possible hypotheses regarding underlying mechanisms include alcohol use as a compensatory drug to manage cravings, a consequence of addictive behaviour in clients with histories of polysubstance use [24] and, secondly, the possible detrimental effect that alcohol has on impulse control and decision-making on clients recovering from drug dependency. These findings highlight the ongoing need for relapse prevention programmes to identify and address possible triggers for relapse in the recovering drug user (i.e. [25]), of which alcohol is possibly a prime candidate of risk. Finally, recent animal studies into the reward pathways of the brain suggest that drug addiction may alter the dopamine pathways in the brain, and hence it is possible that the recovering drug user may be more vulnerable to dependency (and therefore substitution) to other drugs via cross-tolerance and cross-sensitization [26,27]. This line of research implies that individuals recovering from drug use may need to abstain from all drugs of addiction, including alcohol. It is, of course, equally possible that alcohol and illicit drug use simply co-occur, rather than alcohol leading to relapse to drug use. It is also likely that multiple reasons explain simultaneously the apparent relationship between alcohol use during and post-treatment and relapse.

Finally, it is important to consider the treatment implications of this review. Residential drug treatment has documented success in impacting on chronic illicit drug use (e.g. [28]); however, these programmes may sometimes overlook the harm of alcohol use [18]. The cultural ubiquity and legality of alcohol use in western countries, in particular, may have allowed its potential as a significant threat to sustained recovery from drug misuse to be underestimated in drug treatment programmes. Treatment programmes tend to include content which is relevant to the use of all psychoactive substances, but alcohol may occupy a substantially different niche in many societies compared with other drugs of addiction. We argue that if alcohol use is not addressed specifically in drug treatment programmes, then recovering drug users may be at risk of poor outcomes and health-related harm. This situation may also apply to other harmful legal drugs such as nicotine. For example, Gudyish and colleagues have raised the issue of nicotine addiction not being addressed in drug treatment, despite the inarguable harms related to smoking and the high prevalence of use in this population [29,30]. In a review of staff surveys, the lack of interventions for smoking in drug treatment programmes was attributed most frequently to limitations in staff knowledge of how to assess and treat smoking [29]. It may also be related to the idea that

depriving clients of all substances of addiction is too severe, and will interfere with their ability to stay in treatment and remain abstinent from their primary addiction. However, the counter-argument for this is the possibility that addiction fundamentally changes the reward pathways in the brain [26,27], making substance users more vulnerable to any drugs of addiction and suggesting that dependent users need to abstain from all psychoactive drugs post-treatment. These issues all warrant further investigation and discussion if we are to increase drug treatment efficacy.

In conclusion, we argue that the role of alcohol use in relation to recovery from drug dependency has been underestimated and overlooked. Very few studies have directly investigated this issue. This is particularly the case with regard to the potential risks of vulnerability to relapse triggered by alcohol misuse and/or substitution of alcohol for the drug of choice. This review raises a number of areas for further research in addition to recommending that drug treatment programmes consider including a specific intervention concentrated on alcohol skills-based training focused on relapse prevention and the harms related to alcohol misuse. This would be a necessary step in protecting clients from inadvertently compromising their recovery and future wellbeing via the use of alcohol.

#### Declarations of interest

None.

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