E-therapy for substance use issues

Brief literature review, March 2022

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Acknowledgements

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Executive summary

People need access to support for problems associated with substance use and a choice in the support options they receive. E-therapies (such as web-based tools, computerised interventions, text messaging, and mobile applications) are a unique support option as they can be accessed at any time, are available for people living in rural and isolated areas, do not depend on services or workers being available to provide support, and give people control over their own recovery and wellbeing.

This review looks at:

- how effective e-therapy approaches are for people in reducing problematic substance use
- features of e-therapy approaches that appear to be key in supporting positive change.

This review draws on studies published over the last 5 years. This includes meta-analyses and systematic reviews that look at the evidence from a range of other studies. Individual studies were also looked at including randomised controlled trials (RCTs) where people either received e-therapy as an alternative or no support. In some studies, people were offered e-therapies alone, or in some places they received a blended approach combining both e-therapy and in-person support.

Key findings

What the literature tells us is that e-therapies are more effective than receiving no treatment at all. In some instances e-therapies may be just as effective as in-person support.

- When looking at problematic alcohol use in particular, the evidence is consistent and robust in saying that e-therapies are effective when compared to receiving no treatment, or treatment that people would normally receive.
- Fewer studies looked at e-therapy for other substances. However, those that did indicate that e-therapies can be at least as effective as the treatment people would normally receive in reducing the use of other substances.
- E-therapies that are based on or incorporate elements of cognitive behavioural therapy (CBT) appear to be particularly effective in helping reduce people's use of alcohol and other substances.
- In some instances, people appear to have better outcomes in reducing alcohol and other substance use when they receive a blended therapy combining both an e-therapy and in-person support, than when they receive either alone.
- While e-therapies tend to lead to small but positive changes for people, this is a positive finding. Even small reductions in substance use can lead to significant improvements in people's physical and mental wellbeing.

These findings highlight benefits for using digital solutions to increase the effectiveness of approaches when addressing people's substance use issues.

Background

He Ara Oranga and *Kia Manawanui* identified the need for increased access to and choice of addiction and mental health support in the community, and to improve support for people with mild to moderate needs (Government Inquiry into Mental Health and Addiction, 2018; Ministry of Health, 2021).

In 2019/20 around four in five adults in New Zealand drank alcohol and one in five met criteria for hazardous drinking (Ministry of Health, 2020). In addition, about 7 percent of adults have a moderate to high risk of problematic cannabis use and 1 percent for amphetamines (Ministry of Health, 2020a). Approximately one-third of people who access mental health and addiction services access addiction services for support with substance use issues (Health and Disability Commissioner, 2020).

E-therapies, such as web-based tools, computerised interventions, text messaging, and mobile applications, enable remote access and broadens options for treatment and support. E-therapies are an important resource for providing a stepped care approach as they offer low-intensity support for people experiencing problems associated with substance use. *He Ara Oranga* highlighted that e-therapies can support people before problems escalate; improve the reach and accessibility of supports and services, particularly for people living in rural or isolated areas; and alleviate pressures in workforce capacity. The Office of the Prime Minister's Chief Science Advisor recommend e-therapies be endorsed by government agencies to ease the burden on New Zealand's mental health and addiction workforce and improve outcomes for tāngata whai ora (Potter et al., 2017).

A 2017 review looked at the effectiveness of e-therapies for mental health and problematic substance use (Te Pou o te Whakaaro Nui, 2018). Findings from several reviews indicated e-therapies may have a small but positive effect on reducing alcohol use. Since this review, there has been increased acceptance and use of e-therapies for mental health and substance use issues, along with improvements in technology. There is a need for up-to-date evidence on the effectiveness of e-therapies for substance use issues.

This literature review aims to synthesise recent evidence on:

- the effectiveness of e-therapies for substance use issues
- characteristics of effective tools.

Method

Literature searches were performed using EBSCO in April 2021 to identify studies published between 2017 and 2021. Searches identified meta-analyses, systematic reviews, and single randomised controlled trial (RCT) studies assessing the efficacy of e-therapy approaches to reducing substance use issues. Studies assessed standalone e-therapies (used in place of in-person treatment) and blended e-therapies (those used alongside in-person treatment).

Key words used in the search are outlined below.

- "Systematic review" OR meta-analysis OR review OR "evidence synthesis"
- "e-mental health" OR "online tool" OR web-based OR internet-based OR "mobile app"
- "Randomised controlled trial" OR RCT OR "controlled trial"
- "Substance *use" OR SUD OR addiction OR alcohol OR smoking OR tobacco OR nicotine OR "drug *use" OR cannabis OR "novel psychoactive substances" OR methamphetamine OR amphetamine OR heroin OR opioids OR polysubstance

Results

Our searches identified three meta-analyses, two systematic reviews, and nine single RCT studies looking at e-therapies for alcohol or any substance use issues. The main findings are presented below. The findings are grouped by primary substance, type of study, and main outcomes. It is important to note that the studies vary widely in theoretical approach, study and intervention design, timeframe, control groups, and outcomes. As such this section identifies general patterns in intervention effects on substance use and acknowledges the results of different studies are not directly comparable.

Alcohol

Meta-analyses

Findings from two meta-analyses suggest e-therapies are effective in reducing the frequency of alcohol use. These analyses indicate both standalone and blended e-therapies are more effective in reducing alcohol use frequency than receiving no treatment and, based on the meta-analyses below, may be as effective as face-to-face treatment in some instances.

Kiluk et al. (2019) analysed 15 studies assessing the efficacy of technology-delivered cognitive behavioural therapy (eCBT), many of which included elements of motivational interviewing, compared to different control groups. Standalone eCBT has a small but positive effect for people when compared to those receiving no treatment at all (Hedges' $g = 0.20$). People who received blended eCBT achieved better outcomes on average than those receiving treatment as usual (TAU) alone ($g = 0.30$). While the effect was small these outcomes were sustained for over 12 months ($g = 0.31$). Standalone eCBT performed as well as TAU and therapist-delivered CBT.

Saxton et al.'s (2021) analysis of 30 studies indicates standalone, computer-delivered personalised normative feedback (PNF)[1] interventions help reduce people's frequency of use of alcohol in the short-term and the severity of symptoms compared to people receiving no-treatment. When people received PNF in addition to other interventions their frequency of alcohol use also decreased on average, but there was no impact on the severity of their symptoms.

Overall, results from these two meta-analyses indicate e-therapies can have a small but positive effect on the frequency of alcohol use.

Systematic reviews

Several reviews indicate e-therapies show promise for alcohol use disorder and coexisting alcohol issues and mental health challenges. These reviews indicate e-therapies show promise in being cost-effective and accessible treatments to address problematic alcohol use, as well as co-existing mental health and substance use issues.

Kazemi et al.'s (2018) systematic review provides a comprehensive summary and critique of 12 studies on e-therapies to reduce problematic substance use, largely focusing on alcohol.

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[1] PNF interventions use social judgements about a particular behaviour by an individual's peer group to promote thoughtful consideration about their own behaviour. PNF is based on the premise that people over- or underestimate consumption levels and judgements of their peers which contributes to justifying and maintaining their own behaviours. When confronted by misperceptions of their peer group's behaviour and/or the disapproval of their peer group, the person will adjust their own behaviour towards the newly realised norm.

They conclude that e-therapies show promise in the prevention, treatment, and aftercare of alcohol use issues due to its high accessibility, potential to reach many people, and cost-effectiveness.

Sugarman et al.'s (2017) systematic review of 11 studies (including six RCTs) outlines the efficacy of e-therapies for substance use issues and co-existing mental health challenges. The authors conclude that e-therapies, particularly computer-delivered Self-Help for Alcohol and drug use and Depression (SHADE), helped to significantly reduce people's alcohol consumption at a similar rate to therapist-delivered SHADE and produced greater reductions than brief interventions delivered in-person.

The results of several systematic reviews therefore add further evidence suggesting e-therapies show promise for the treatment of and in reducing alcohol use.

Individual studies

Consistent with meta-analysis findings, further evidence from recent individual studies indicates completing standalone e-therapies has a small but positive impact on people's frequency of alcohol use compared to receiving no treatment.

Three studies show people who completed e-therapies experienced greater reductions in alcohol use than those who received no treatment (Boß et al., 2018; Gajecki et al., 2017; Zill et al., 2019). A web-based intervention either guided by an eCoach or unguided resulted in greater reductions in the mean number of standard units of alcohol consumed each week and were sustained over time compared to the control group (6 weeks guided = -8.5; unguided = -8.0; 6 months guided = -9.8; unguided = -12.4) (Boß et al., 2018). Adherence was significantly greater in the guided group (59.4 percent completion) than the unguided group (46.2 percent completion; p = 0.005).

Gajecki et al.'s (2017) analysis of a skills-training smartphone app (TeleCoach™) shows significantly greater reductions in excessive alcohol use (defined as drinking more than 14 standard glasses of alcohol per week for men and 9 for women), quantity of drinks per week, and frequency of drinking among people who used the app than those who did not. Further, men and women who used the app were two to three times less likely to drink alcohol excessively than those who did not use the app (odds ratios 2.68 and 1.71 respectively).

Zill et al.'s (2019) analysis compared people receiving an internet-based CBT intervention with people in control groups receiving face-to-face treatment or no treatment at all. They found internet-based CBT resulted in small reductions in past-month alcohol consumption at 3- and 6-month follow-up (d = 0.28 and 0.33 respectively). Over the same time periods, moderate reductions were found for past-week alcohol consumption (3 months d = 0.42; 6 months d = 0.54), moderate reductions in past-month number of intoxicated days (3-month d = 0.39, 6-month d = 0.74), and large reductions in past-month binge drinking (3-month d = 0.87, 6-month d = 1.4).

Some individual studies comparing e-therapies to in-person treatments reveal more mixed results. Johansson and colleague's (2020) study shows eCBT resulted in equivalent reductions in past-week alcohol consumption as in-person CBT at 6-month follow-up. However, in-person CBT was more effective than eCBT in most secondary outcomes including the number of binge drinking days and average quantity of drinks per drinking day.

Another study indicates that adding computerised and gamified attentional bias modification training to regular treatment for people meeting criteria for an alcohol use disorder did not augment the effects of regular treatment alone (Heitmann et al., 2021). The addition of e-therapy to regular treatment did not lead to improved outcomes.

Other substances

Meta-analyses

Several meta-analyses suggest that e-therapies are more effective than receiving no treatment and some in-person treatments for reducing other substance use. However, findings do not appear to be entirely consistent across all substances like cannabis and stimulants.

Boumparis et al.'s (2017) meta-analysis indicates that e-therapies had a small but positive effect on reducing substance use ($g = 0.30$) compared to people in control groups overall. E-therapies were similarly effective when compared against control groups who received treatment ($g = 0.31$) and those who did not receive treatment ($g = 0.31$). Further, when e-therapies were added to regular treatments, greater reductions were found than standalone e-therapies ($g = 0.41$ and 0.17 respectively). Comparing effects by type of substance, e-therapies had a small but positive effect on reducing opioid use ($g = 0.36$) and any other substance use ($g = 0.35$) apart from stimulant use.

Saxton et al.'s (2021) meta-analysis indicates that PNFs have no significant effect on reducing cannabis use.

Meta-analyses therefore indicate e-therapies, particularly those that are combined with regular treatment, can have a positive effect on reducing some other substance use.

Systematic reviews

Systematic review findings are mixed, with evidence showing e-therapies have no effect on reducing substance use compared to people receiving standard in-person support, and other findings indicating e-therapies are as effective as face-to-face treatments.

Two of the 12 studies Kazemi et al. (2018) reviewed examine the efficacy of e-therapies on substance use. One study with young people indicated that a digitally-based continuing-care reduces substance use problem severity and the likelihood of relapse to their primary substance. It also increases the likelihood of participating in prosocial behaviours compared to people in control groups receiving standard in-person aftercare. The other study shows a blended approach consisting of a 17-week self-monitoring program with motivational counselling had no effect on cannabis use but significantly reduced desire to use.

Sugarman et al.'s (2018) review includes a study showing a computer-delivered intervention (SHADE) reduced cannabis use at similar rates to therapist-delivered SHADE and in-person brief interventions, while another found computer-delivered SHADE had no effect on cannabis use.

The results from systematic reviews are therefore mixed and outcomes may depend on how and when e-therapies are delivered and the substance of concern.

Individual studies

Findings from RCTs assessing the efficacy of e-therapies for reducing people's substance use are mixed. Overall, some studies suggest standalone and blended e-therapies produce better outcomes in reducing substance use than TAU, while others show e-therapies have equivalent outcomes as TAU.

Two studies show that standalone and blended e-therapies result in greater reductions in substance use than TAU. Kiluk et al. (2018) indicates computer-delivered and in-person CBT are associated with greater reductions in any drug (including cannabis, cocaine, opioids, and hallucinogens) or alcohol use than TAU, with 6 month follow-up analyses showing more sustained effects of eCBT over time than therapist-delivered CBT and TAU.

Paris et al.'s (2018) study shows people who received eCBT in addition to TAU experienced greater reductions in substance use frequency over 8 weeks (including alcohol, cocaine, cannabis, opiates, benzodiazepines, and heroin) than TAU alone. Further, people who completed eCBT reported more abstinent days than those who received TAU alone (77 percent and 62 percent respectively).

Blow et al.'s (2017) study is partially consistent with the above findings. Compared to enhanced TAU, only in-person brief interventions resulted in fewer days using any substance (including alcohol, cannabis, cocaine, methamphetamine, inhalants, street opioids, hallucinogens; and prescription drugs including opioids, sedatives, and stimulants). Computer-delivered brief intervention (CBI) had no effect on reducing substance use. However, when assessing cannabis use specifically, people who received therapist-delivered and CBI experienced fewer days using cannabis ($d = 0.24$ and 0.17 respectively) than enhanced TAU. The authors suggest that while CBI results were less robust than therapist-delivered treatment, CBI reduced required staff time for treatment.

One study shows that standalone and blended e-therapies have equivalent effects as TAU. Tiburcio et al.'s (2018) findings show standalone e-therapy performed as well as TAU in reducing substance use frequency and severity (including cannabis, cocaine, and inhalants), but e-therapy provided no further benefit when added to TAU.

Overall, results from individual studies suggest standalone and blended e-therapies may, in some instances, produce better outcomes in reducing symptoms of problematic substance use than TAU alone. Evidence is mixed however, as some results show people who receive in-person treatment experience greater reductions in substance use than those who complete e-therapies, and some blended e-therapies do not enhance TAU.

Discussion

Overall, research indicates e-therapies are more effective than receiving no treatment and may be as effective as in-person treatments in reducing problematic substance use in some instances. Where studies show greater effectiveness of e-therapy interventions, effect sizes were mostly small. This is a promising finding as even small reductions in substance use are associated with significant improvements in physical and mental wellbeing (Kiluk et al., 2019).

When comparing by type of substance, there is more robust evidence that standalone and blended e-therapies are effective at reducing alcohol use than for other substance use compared to TAU or receiving no treatment. This is consistent with an earlier review of e-therapies for substance use (Te Pou, 2017), showing that e-therapies had a potentially small but positive effect on reducing alcohol use. Evidence for reducing other substance use is

promising in that it is likely that e-therapies can be at least as effective as TAU, but findings are less consistent and robust. It is difficult to gauge the efficacy of e-therapies compared to receiving no treatment in reducing problematic substance use because most studies in this space compare e-therapies to TAU. It is also largely unclear whether e-therapies are more suited to reducing use of specific types of substances other than alcohol as, among studies that assess more than one type of substance use, most analyses tend to group all substances together (excluding Boumparis et al. 2017 and Blow et al. 2017).

It is important to consider the characteristics of e-therapies that are shown to be effective in reducing substance use. Among studies showing greater or equivalent efficacy of e-therapies compared to in-person or no treatment, those that are based on or incorporate CBT elements appear most frequently (Boumparis et al., 2017; Johansson et al., 2017; Kiluk et al., 2018, 2019; Paris et al., 2018). Other notable approaches among effective e-therapies include motivational interviewing (Blow et al., 2017; Boß et al., 2018; Boumparis et al., 2017) and skills training (Gajecki et al., 2017).

Attrition appears to be the main limitation across studies, with many participants disengaging after initial assessments (Gajecki et al., 2017; Kazemi et al., 2017; Tiburcio et al., 2018). Factors underlying attrition include lower willingness to change and reduced motivation to continue treatment (Tiburcio et al., 2018). Research indicates attrition is an issue across both e-therapies and in-person treatments (Johansson et al., 2017; Tiburcio et al., 2018). Some evidence suggests attrition is lower in guided e-therapies compared to unguided approaches, indicating greater retention when a clinician is involved (Boß et al., 2018). Other suggestions to reduce attrition include having initial sessions in-person to explain interventions and answer questions, regular personalised reminders, inquiring into difficulties with treatment adherence, proposing alternatives, performing home visits, and gamifying interventions to maintain motivation (Boß et al., 2018; Boyle et al., 2017; Kazemi et al., 2017; Tiburcio et al., 2018).

Despite limitations, e-therapies offer unique benefits compared to in-person interventions. These benefits include greater accessibility due to people being able to use them at their own time, place, and pace; increasing choice of and access to support for people living in rural or isolated areas; allowing anonymous help seeking which bypasses stigma around accessing addiction services; giving people control and agency over their own recovery; reducing workers' workload; and acting as a brief preventative approach for mild or emerging issues associated with substance use (Kazemi et al., 2017; Sugarman et al., 2017).

E-therapies offer tāngata whai ora consistent access to evidence-based treatment that local practitioners may not be trained to deliver, that may not be available or easily accessible in their community. E-therapies can be accessed at any time and revisited after completion, meaning it is available as or when people's risk or distress increases. Having consistent access to evidence-based treatment can therefore bolster people's self-management skills, encourage learning, and support continuous change. These may be reflected in the finding across studies that e-therapies result in more sustained outcomes over time compared to TAU (Boß et al., 2018; Kiluk et al., 2018, 2019).

As highlighted in the literature, people who received blended e-therapies reported, on average, better outcomes than people who received TAU alone or standalone e-therapies (Boumparis et al., 2017). This highlights an incentive for addiction services to integrate digital solutions into in-person treatments to maximise the benefits for people accessing

services. Studies also indicate more sustained effects of substance use reduction over time compared to TAU. Overall, these benefits align with priorities identified in *He Ara Oranga* (2018) and *Kia Manawanui* (2021) regarding accessibility, increasing choice of and access to support, and providing people with options for support while waiting to access services or when accessing services is difficult.

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Appendix

Table 1. Meta-analyses and systematic reviews

Title and authors	Studies	Target population and total sample	Intervention(s)	Substance type(s)	Findings
Internet interventions for adult illicit substance users: A meta-analysis Boumparis et al., 2017	Seventeen studies up to January 2016. Studies were conducted in five countries (Australia, Brazil, Sweden, Switzerland, United States). Studies had to include a measurement of participants' substance use at post-treatment (measured through self-report, toxicology screening or both) and at follow-up. Most studies recruited participants from clinical settings (five outpatient facilities, four hospitals, one	Adult current users of one or more illicit substances (cocaine, amphetamines, opioids, or any other illicit substances) Three target subgroups: opioid users ($n = 4$ studies), stimulant users ($n = 4$), users of any illicit substances ($n = 9$) $N = 2,836$ participants ($n = 1,461$ intervention; $n = 1,375$ control)	Internet or computerised interventions compared with active (e.g. TAU, motivational interviewing, brief intervention, psychoeducation) or non-active (e.g. waiting-list, assessment-only) control conditions in reducing SU Specific intervention types included: - community reinforcement approach (CRA) - cognitive behaviour therapy (CBT) - motivational interviewing (MI) - contingency management (CM) - cognitive rehabilitation (CR) - treatment as usual (TAU) - brief intervention (BI)	Any illicit substances including heroin, cocaine, opioids, benzodiazepines, ecstasy, amphetamines, and methamphetamines	**Intervention approaches** MI was the dominant approach in interventions for any illicit substance users. For specific substances: CRA was primarily used for opioid users and CBT was primarily used for stimulant users. **Results** Internet interventions showed a small but significant overall effect size for reducing illicit SU at post-treatment (Hedges' $g = 0.30$) and at the follow-up assessment ($g = 0.22$). Specifically, internet interventions reduced opioid use ($g = 0.36$) and any illicit SU ($g = 0.32$). They did not reduce stimulant use. These findings are consistent with broader literature on the effects of interventions on nicotine, alcohol, and cannabis use, showing small but significant reductions. **Subgroup comparisons**

Title and authors	Studies	Target population and total sample	Intervention(s)	Substance type(s)	Findings
	residential care); the remaining seven recruited from the community.

Nine trials conducted add-on interventions, eight applied unguided standalone interventions. | | | | Add-on interventions showed greater reductions (g = 0.41) than unguided standalone interventions (g = 0.17).

Interventions were effective compared to active controls (g = 0.31) and non-active controls (g = 0.31).

Studies that applied toxicology screenings showed greater reductions (g = 0.42) than self-reported screenings (g = 0.26).

DSM-IV diagnoses were associated with greater reductions (g = 0.42) than cut-off scores on self-reported SU (g = 0.21).

Studies with interventions conducted in outpatient clinics showed greater effect sizes (g = 0.36) than other settings (gs 0.11 to 0.23). |
| **A systematic review of the mHealth interventions to prevent alcohol and substance abuse** | 12 studies on mHealth-based interventions for substance use.

Ten out of 12 studies used text messaging-based interventions. Nine were randomised | Young adults with substance abuse issues.

Ages ranged from 12 to 45 years old, with the majority being 18–25. | mHealth interventions in various formats: web-based, text messaging, SMS, smartphone apps. | Alcohol and cannabis | Most reviewed papers got at least partial positive results wherein there was evidence of efficacy in some primary alcohol-related outcomes but not others.

- Eg Weitzel et al. (2007): reported fewer drinks per drinking day in the intervention group (handheld computer + messaging) but no other |

Title and authors	Studies	Target population and total sample	Intervention(s)	Substance type(s)	Findings
Kazemi et al., 2017	pilot trials and RCTs which included control groups; the remaining studies included a longitudinal pre-post study, a single group pilot trial, and a randomised pilot trial which did not have control groups.				group differences on alcohol variables **Limitations** Attrition was a limitation in several studies; there tended to be high rates of initial use followed by decreases in engagement with mobile interventions unless there was regular contact and prompts. **Overall** mHealth interventions can reach a large number of individuals, promote self-regulation, and enhance traditional interventions by increasing access to support within the person's own environment. People generally found messages from mHealth interventions motivating and interesting, and no obvious negative effects were reported.
Technology-delivered cognitive-behavioral interventions for alcohol use: A meta-analysis	Fifteen studies on technology-delivered CBT-based interventions for alcohol use ("CBT Tech")	Adults aged 18+ Alcohol criteria: alcohol users meeting criteria for a disorder, non-dependent but	Technology-delivered CBT (web-based programs, smartphone apps) or combined CBT.	Alcohol	**CBT Tech vs assessment only or minimal treatment** Significantly more effective at early follow-up ($g = 0.20$, small effect), but non-significant at late follow-up.

Title and authors	Studies	Target population and total sample	Intervention(s)	Substance type(s)	Findings
Kiluk et al., 2019	published between 1997 and 2017 Six studies compared CBT Tech to assessment only or minimal treatment, three compared to treatment as usual (TAU), seven studied CBT Tech plus TAU versus TAU only, and two compared CBT Tech to CBT with a therapist. Measured effect sizes at early follow-up (1 to 3 months) and late follow-up (6 to 12 months) post-intervention. 95% included non-dependent drinkers. 60% explicitly targeted alcohol use moderation.	heavy drinkers, or poly-drug use. $N = 10,407$ participants Participants were recruited from the community (10 studies), specialty clinics or medical facilities (3) and college campuses (2)	Content of interventions ranged from 4 to 62 sessions/modules/exercises.		**CBT Tech vs TAU** Non-significant differences at early or late follow-up. **CBT Tech with TAU vs TAU alone** Significantly more effective at early follow-up ($g = 0.30$) and late follow-up ($g = 0.31$). **CBT Tech vs CBT with therapist** Showed no significant differences at early and late follow-up. Overall, results show benefits of CBT Tech as a standalone treatment compared to no treatment, or as an addition to TAU compared to TAU alone.

Title and authors	Studies	Target population and total sample	Intervention(s)	Substance type(s)	Findings
The efficacy of Personalized Normative Feedback interventions across addictions: A systematic review and meta-analysis Saxton et al., 2021	30 RCT studies using Personalized Normative Feedback (PNF) for hazardous alcohol use, problem gambling, and illicit drug and tobacco use relative to passive control groups in reducing frequency of use and symptom severity. Thirteen studies assessed the efficacy of at least one pure PNF against a passive control; twelve of these focused on alcohol, one on gambling. Twenty-four studies assessed the efficacy of mixed PNF against a passive control; of these, three also included a pure	Adults aged 18 years and older, or mixed groups of adults and adolescents 16 years and older. People with some level of problematic alcohol use, other drug or tobacco use, or gambling as determined by a screening tool, health professional, or standard definition by researchers. *N* = 24,740 Participants recruited from a range of settings (university, community, outpatient waiting rooms, online) and countries (USA, Canada, Australia, France, New	'Pure PNF' – no other intervention implemented 'Mixed PNF' – PNF plus self-directed interventions	Alcohol and cannabis	**Pure PNF** *Frequency* Eight studies (7 alcohol, 1 gambling). There were no significant differences between pure PNF interventions and the control groups on frequency at 0 to 3 months, 4 to 11 months, or 12 to 23 months post-baseline. *Symptom severity* Eleven studies (10 alcohol, 1 gambling). There were significantly lower symptom severity scores in the pure PNF group than the control at the 0 to 3 month follow-up period, with a small effect size. Results were non-significant for further follow-up periods. **Mixed PNF** *Frequency* Fourteen studies (10 alcohol, 2 gambling, 2 illicit drug use). There was significantly lower frequency in the mixed PNF group compared to the control groups, with a small effect size and minimal heterogeneity. Effects

Title and authors	Studies	Target population and total sample	Intervention(s)	Substance type(s)	Findings
	PNF group, 19 focused on alcohol, two on gambling, and three on cannabis.	Zealand, Sweden, Brazil, Switzerland)			persisted at 4 to 11 month follow-ups with moderate heterogeneity. *Symptom severity* Twenty studies (18 alcohol, 2 gambling, 2 illicit drug use). There were no significant differences in symptom severity for mixed PNF participants compared to controls for most follow-up periods except for 12 to 23, where symptom severity was lower for the control groups with minimal heterogeneity.
Technology-based interventions for substance use and comorbid disorders: An examination of the emerging literature Sugarman et al., 2017	Eleven studies: six RCTs; two uncontrolled pilot, feasibility, and acceptability studies; three published protocols and descriptive articles on treatment development. Among these studies were nine distinct technology-based interventions (TBIs) for SUD and co-existing mental	People with SUDs and comorbid psychiatric diagnoses and/or symptoms *N* = 2,503 total participants *n* = 1,468 (RCT studies only)	TBIs that were delivered by automated computer, internet, or mobile system with minimal to no live therapist involvement: - Self-Help for Anxiety and other drug use and Depression (SHADE) ○ 9-session manualised treatment incorporating CBT and MI elements - DEAL – a preventive TBI addressing problematic alcohol use and	Alcohol and cannabis	**SHADE** Evidence for SHADE is mixed: one study indicated that SHADE is effective in reducing cannabis use compared to therapist-delivered SHADE and brief in-person interventions (BI), and no significant differences in alcohol use between intervention groups. A larger replication RCT showed that participants in both SHADE groups showed greater reductions in alcohol use at 3-month follow-up compared to those in supportive counselling, computerised SHADE resulted in 2.5 times greater reductions in alcohol use

Title and authors	Studies	Target population and total sample	Intervention(s)	Substance type(s)	Findings

	health challenges (including depression, PTSD).		depressed mood among college students
			   ○ Single-session, brief personalised feedback intervention
			- A text messaging TBI focused on comorbid depression and SUDs tested as an addition to standard care
			   ○ Sends participants two automated supportive text messages each day for three mounts on stress management, abstinence, and overall wellbeing.
			- VetChange – a web-based intervention targeted at Operation Enduring Freedom and Operation Iraqi Freedom (OEF/OIF) veterans with comorbid problem alcohol use and PTSD symptoms
			   ○ Eight 20-minute weekly psychoeducational and interactive
					than therapist-delivered SHADE, and no significant differences were found between groups for cannabis use.
					
					Across studies, computer-delivered SHADE was equivalent to therapist-delivered SHADE, outperformed therapist-delivered SHADE in reducing alcohol use, and required an average of only 16 minutes of clinician time per session compared to 60 minutes for therapist-delivered SHADE.
					
					Preventive TBI for problematic alcohol use and depressive symptoms
					
					No significant differences observed between conditions (brief TBI and control) with respect to alcohol use and depressive symptoms.
					
					Supportive text messaging TBI
					
					A pilot RCT showed that people who received the text messages (compared to those who received generic ones fortnightly) had reduced depressive symptoms (effect size = 0.85), but no significant differences were found for alcohol abstinence rates.

Title and authors	Studies	Target population and total sample	Intervention(s)	Substance type(s)	Findings
			web-based modules that provide personalised feedback on severity of alcohol problems and PTSD symptoms, assesses readiness to change, and helps users identify high-risk situations, set goals, and develop adaptive coping skills		**VetChange** The intervention group showed significantly greater decreases in alcohol use and PTSD symptoms than participants (veterans) in the delayed treatment group. Only 34% of the intervention group and 39% of the delayed treatment group completed all eight modules (54% intervention and 58% delayed completed four; 90% intervention and 88% delayed completed one). **Overall** TBIs with the strongest support were computer-delivered SHADE (in particular) and VetChange as they were skills-focused and were associated with reductions in psychiatric symptoms and substance use. SHADE is the only TBI that has been compared to an in-person equivalent and tested in a replication study.

Table 2. Single studies

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings

A randomized controlled trial of brief interventions to reduce drug use among adults in a low-income urban emergency department: the HealthiER You study
 	
Blow et al., 2017
	N = 780 drug using adults
	
	Recruited from low-income urban emergency departments in Flint, Michigan, USA
		Primary outcome: Number of days used any drug
		
		Secondary outcome: Number of weighted drug-days (number of days using any drug, weighted by the number of drugs used each day) and number of days using marijuana
		
		Measured using 90-day TLFB
		
		Effects measured at 3-, 6- and 12-months follow-up compared to baseline
			Randomly assigned into three conditions (based on motivational interviewing principles):
			- Computer-delivered brief intervention (CBI)
			  ○ Touchscreen tablet computer with headphones
			  ○ Virtual health counsellor
			- Therapist-delivered, computer-guided BI (TBI)
			  ○ Masters-level therapist using a touchscreen tablet to assist in guiding sessions
			- Enhanced usual care (EUC-ED)
			Then re-randomised into two boosters at 3-months follow-up:
			- Adapted motivational
				Cocaine, marijuana, opioid, alcohol, stimulant	Frequency of substance use
					Other psychiatric diagnoses
						Response rates were above 80% at all follow-up periods (3 months: 81%, 6 months: 85%, 12 months: 87%) and similar across all three intervention groups.
						
						Results
						Compared to EUC-ED, the TBI showed significantly fewer days using any drug (Z = -2.03, p = 0.0422) and weighted drug-days (Z = -2.19, p = 0.0283). Both CBI and TBI showed fewer number of days using marijuana compared to EUC-ED (CBI: Z = -2.05, p = 0.0406; TBI: Z = -2.56, p = 0.0104). AMET did not have a significant impact on any outcome.
						
						Only TBI had a significant effect compared to EUC-ED on the number of days of marijuana use at 3-month follow-up
						
						TBI reduced marijuana use days at all three follow-ups, and reduced total number of days using any drugs and weighted drug-days at 6 and 12 months.

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
			enhancement therapy (AMET) - Enhanced usual care booster (EUC-B) Both boosters were administered by a research assistant			CBI reduced number of days using marijuana at 6 and 12 months follow-up. Findings for CBI were less robust than TBI but reduced staff time for implementation. Both computer- and therapist-assisted BIs can reduce drug use among people seeking ED care, with no additional beneficial effect from a subsequent booster session.
Efficacy of a web-based intervention with and without guidance for employees with risky drinking: results of a three-arm randomized controlled trial Boß et al., 2017	*N* = 434 adults consuming at least 21/14 (men/women) standard units of alcohol (SUA) per week or scored over 8/6 (men/women) on Alcohol Use Disorders Identification Test (AUDIT) 178 men, 256 women Aged 18 years and older.	AUDIT – hazardous drinking Timeline-Follow-Back (TFB) – alcohol consumption in past 7 days General health measure: Depression Anxiety Stress Scale (DASS-21) – assess symptoms of depression, anxiety, and stress at t2 and t3 Work-related health: Irritation Scale (IS) – assess rumination in	Five web-based modules (CWT) over 5 weeks including personalized normative feedback (PNF), motivational interviewing (MI), goal setting, problem-solving, and emotion regulation Two intervention groups: one received an unguided self-help version (*n* = 146) and the other received additional adherence-focused guidance by eCoaches (*n* = 144).	Alcohol	**Primary** Weekly consumed SUA at t1. **Secondary** Weekly consumed SUA at t2 Numbers of participants in group within low-risk drinking range General and work-specific health measures	**Intervention usage** On average, people in the unguided CWT group completed 2.5 modules and people in the guided CWT group completed 3.0 training modules. Adherence (completing a minimum of the first three training modules) was significantly greater in the guided CWT group (*p* = .005) than in the unguided group. **Primary** All study groups showed reduced mean weekly SUA from t1 to t2 (control = -3.2, unguided CTW = -8.0, guided = -8.5). There were no significant differences between unguided and guided CWT in adjusted and unadjusted models.

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
	Mean = 47 years Openly recruited from German working population between 2014 to 2016	context of working environment at t2 and t3 Effort Reward Imbalance Questionnaire – Short Form (ERI-SF) – assess aspects of working context as possible baseline predictors of intervention effects Measured at start of intervention (t1), 6 weeks later (t2), and 6 months later (t3)	Controls were on a waiting list for treatment with full access to usual care (*n* = 144).			Participants who received any type of CWT reduced their weekly drinking by 4.9 SUA on average compared to controls. **Secondary** The combined intervention group (guided + unguided CWT) showed significant effects at t3, showing lower SUA by 5.7 compared to controls. In the unguided and guided groups, 36% and 43% of participants fell below the low-risk threshold at t2, respectively. The difference between both intervention groups was not significant. The intervention also reduced symptoms of depression, stress, and anxiety with small effect sizes.
Skills training via smartphone app for university students with excessive alcohol consumption: A randomized	*N* = 330 University students already in a study on estimated blood alcohol concentration (eBAC) feedback apps	Daily Drinking Questionnaire (DDQ) – quantity and frequency of alcohol consumption AUDIT – hazardous drinking eBAC calculated using values from	Participants randomised into three groups: • TeleCoach – a web-based skills training smartphone app o Access to an eBAC app for 18 weeks + TeleCoach for 12 weeks	Alcohol	**Primary** Proportion of students with excessive alcohol consumption in each group **Secondary** • Frequency – number of days in 7-day	**Retention** 72.7% of participants responded to both follow-ups, 7.6% responded to only the first follow-up, 6.7% responded to only the second follow-up. Non-responses did not significantly differ in baseline characteristics. **Primary** The proportion of students with eBAC was significantly higher in the control

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
controlled trial Gajecki et al., 2017	who reported continued excessive alcohol consumption at 6-week follow-up	the DDQ in conjunction with the participant's weight and gender Measured at baseline and at 6- and 12-week follow-ups	• Wait list group ○ Access to an eBAC app for 18 weeks + TeleCoach for 6 weeks - Assessment-only group (controls)		period during which the participant consumed alcohol • Quantity - number of standard glasses in 7-day period binge drinking occasions • Average eBAC per week – mean eBAC over 7-day period peak eBAC per month – eBAC calculated from the peak consumption day in the last 30 days	group (72.7%) compared to both the intervention group (45.3%) and wait list group (50.0%) at first follow-up (p < .001) but not at second. **Secondary** There were significant reductions in frequency of alcohol use at both follow-ups and in quantity at the first follow-up for the intervention group compared to the wait list and control groups (ps < 0.05). Analyses by gender showed that men in the intervention group compared to men in the control group had higher odds ratios for *not* having excessive alcohol consumption (eBAC) than women in the intervention group compared to women controls (i.e. men showed a larger reduction in alcohol consumption than women as a result of the intervention). Men also showed lower peak eBAC at both follow-ups compared to the wait list and control groups.
Effectiveness of attentional bias modification training as	*N* = 169 People diagnosed with alcohol or	Odd-One-Out Assessment (OOOT) - Measures attentional bias	Intervention: TAU + Bouncing Image Training Task (BITT) (TAU+ABM)	Alcohol, cannabis	**Primary:** Attentional bias, frequency of alcohol and cannabis use,	Both intervention and control groups showed declines in frequency of substance use from baseline to post-test, and did not change significantly from post-test to 6- and 12-month

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
add-on to regular treatment in alcohol and cannabis use disorder: A multicenter randomized control trial Heitmann et al., 2021	cannabis use disorder Aged 18 years and older Recruited from treatment centres in the Netherlands	(engagement and disengagement) to alcohol or cannabis-related stimuli Measurements in Addiction of Triage and Evaluation Questionnaire (MATE-Q) – administered by interview at baseline then online at follow-ups. Includes the measures below: Alcohol – frequency (self-reported number of days in past 30 days they consumed alcohol) and amount (self-reported number of standard glasses on a regular drinking day) Cannabis – frequency (self-reported number of	- Attentional bias modification training - Four 2.5 minute training sessions Controls: TAU + placebo - Designed to be similar to BITT but not configured to change attentional patterns towards substance-relevant cues TAU only - 350 to 750 minutes of protocolled CBT-based intervention in a specialised addiction care institution, including a 30% range of possible additional interventions such as medication		amount of alcohol consumed, craving **Secondary:** depressive symptoms, anxiety symptoms, stress levels	follow-ups. The intervention and control groups did not differ significantly. Both intervention and control groups showed declines in cravings from baseline to post-test, increased after 6 months, then remained the same after 12 months. The intervention and control groups did not differ significantly. In both intervention and control groups, depressive, anxiety, and stress levels decreased significantly from baseline to post-test, significantly increased from post-test to 6 months, and remained stable between 6 months and 12 months. Post-hoc analyses: The intervention and control groups did not differ significantly on: - engagement and disengagement bias - substance use and craving by number of sessions completed - substance use and craving by diagnosis (AUD or CUD) - substance use when excluding participants who reported no substance use in the past 30 days

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
		days in past 30 days they used cannabis) Abbreviated version of Obsessive-Compulsive Drinking Scale (OCDS) – measured craving for alcohol or cannabis in the past 7 days Depression Anxiety Distress Scale (DASS) – measure depressive and anxious feelings, and stress levels Measured at baseline, post-test, 6-, and 12-months follow-up				- number of standard drinks consumed (for participants with AUD only) Overall, ABM training did not augment the effects of TAU or have clinically significant impacts on substance use, cravings, and psychological symptoms. Around 60 to 65% of participants relapsed within one year of completing treatment.
Internet-based therapy versus face-to-face therapy for alcohol use disorder, a randomized	*N* = 301 Adults with alcohol use disorder (at least 3 ICD-10 criteria or at least 15 points on the AUDIT)	AUDIT – hazardous drinking ICD-10 – self-reported alcohol dependence criteria Timeline follow-back – number of drinks	Internet-delivered CBT (ICBT) - 5 unguided modules completed over 10 to 12 weeks Face-to-face CBT	Alcohol	**Primary** Difference between groups (ICBT and face-to-face CBT) in number of standard drinks consumed in past 7 days at 6-month follow-up	**Retention and usage** Attrition was 33% at the 3-month follow-up and 43% at the 6-month follow-up. There was no difference in attrition between the ICBT and face-to-face CBT groups at both follow-ups.

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
controlled non-inferiority trial Johansson et al., 2020	Recruited through an open-access website of an outpatient clinic within the Stockholm Centre for Dependence Disorders	consumed in past 7 days Measured at baseline, 3 months, and 6 months follow-up	- 5 modules delivered in 30 to 45-minute sessions		**Secondary** Number of standard drinks consumed in past 7 days at 3-month follow-up Number of non-drinking days after 6 months Number of binge drinking days after 6 months Average number of drinks on drinking days after 6 months 'Zone' categories (e.g. low-risk measured by AUDIT)	The face-to-face group completed more modules than the ICBT group (4.19 and 3.74 respectively). **Primary** At 6-month follow-up, ICBT was non-inferior (i.e. performed as well as) face-to-face CBT in reducing alcohol consumption. **Secondary** Non-inferiority could not be shown at 6 months for total AUDIT score and number of binge drinking days. At 3 months, non-inferiority could not be shown for number of sober days, drinks per week, and number binge drinking days. Overall, there were small differences in outcomes between the treatment groups. Failing to show non-inferiority for some secondary outcomes indicates there may be some additional benefits from face-to-face treatment. Treatment use and satisfaction were also higher in face-to-face group than ICBT.
Randomized clinical trial of computerized and clinician-delivered CBT	*N* = 137 Adults who met DSM-IV-TR criteria for	Substance use and psychiatric diagnoses: Structured Clinical Interview for DSM-	TAU - Weekly group and/or individual therapy Clinician-delivered CBT	Cocaine, marijuana, opioid, alcohol	**Primary**: Change in self-reported frequency of substance use (frequency of any	Treatment retention was highest in CBT4CBT (M = 62 of 84 days), followed by TAU (M = 55 days), and lowest in clinician-delivered CBT (M = 43 days).

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
in comparison with standard outpatient treatment for substance use disorders: Primary within-treatment and follow-up outcomes Kiluk et al., 2018	substance abuse or dependence for current (prior 30 days) cocaine, marijuana, opioid or alcohol Recruited from individuals seeking treatment at the Substance Abuse Treatment Unit of the Connecticut Mental Health Center between January 2012 and October 2016	IV-TR Axis I Disorders (SCID) Substance Use Calendar Measured before treatment (baseline), weekly during treatment, at the end of treatment (12 weeks), and at 1-, 3- and 6-month follow-ups	- 12 weekly individual manual-guided CBT sessions CBT4CBT (+ monitoring) - One CBT module per with brief (~10 minutes) in-person weekly clinical monitoring		drug or alcohol use, by week, from baseline through week 12) **Secondary**: Results of urine toxicology screens	There were greater reductions in frequency of any drug or alcohol use over time for clinician-delivered CBT compared to TAU (p < 0.01), and for CBT4CBT compared to TAU (p = 0.02). Six-month follow-up data show a significant effect of CBT4CBT, indicating sustained effects over time relative to that of TAU (p = 0.04). The effect of clinician-delivered CBT did not differ significantly from that of TAU at follow-up. There were significant group differences only when comparing percentages of cocaine-negative urine specimens for the sample and for those who reported cocaine as their primary substance. Those assigned to CBT4CBT had a higher percentage of negative results than those in TAU. Rates of any drug use and alcohol did not differ by treatment condition. Rates of drug-free urine specimens favoured CBT4CBT over the other two conditions, but did not reach statistical or clinical significance. In assessing basic knowledge of cognitive and behavioural concepts

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
						(e.g. "everyone's triggers are the same", "it's always best to trust your guy when thinking about a problem") at baseline and at the end of treatment, the whole sample showed increases over time (p < 0.01). The CBT4CBT group showed the largest increase in correct answers (81%), followed by TAU (72%), then clinician-delivered CBT (65%). There were no significant differences in satisfaction with treatment between groups, but favoured CBT4CBT for all three satisfaction measures. Important author's note: results show favourable results for CBT4CBT but don't necessarily infer that it is of equivalent or superior efficacy than therapist-delivered CBT.
Culturally Adapted, Web-Based Cognitive Behavioral Therapy for Spanish-Speaking Individuals with Substance	*N* = 92 people seeking treatment at three institutions offering outpatient services in Connecticut, US	Substance use and psychiatric diagnoses: Structured Clinical Interview for DSM-IV Addiction Severity Index Self-reported primary drug used	Standard TAU: - Supportive individual and group counselling - Legal, medical, psychological, and social support services - 8 weeks Culturally adapted computer-based	Cocaine, marijuana, opioid, alcohol, or other stimulants	**Primary** Days of primary substance use by week **Secondary** % Self-reported days of primary substance abstinence during treatment	**Intervention usage** Participants completed an average of 45 of 56 days of treatment, with no statistically significant differences between groups. The TAU group completed more group sessions (5.2 vs 2.4) but the CBT4CBT group completed a larger proportion of the 7 possible modules (mean = 5.3), balancing the overall treatment exposure.

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
Use Disorders: A Randomized Clinical Trial Paris et al., 2018		Above assessments had Spanish translations available Abstinence outcome: self-reported drug and alcohol use, verified by urine toxicology and breathalyser Participants measured before treatment (baseline), weekly during treatment, at the end of treatment (8 weeks), and at 1-, 3- and 6-month follow-ups	training for cognitive behavioural therapy (CBT4CBT + TAU) - Web-based program for CBT Teaches CBT skills using multi-media tools		% Negative urine specimens for any drug % Positive breathalyser tests	**Results** There was a greater reduction in frequency of substance use among the CBT4CBT group than TAU alone (*p* = 0.01). There were significant differences in self-reported days of abstinence from the primary drug used during treatment (77% CBT vs 62% TAU). There were no significant between-group differences in results of urine samples and breathalysers but favoured the CBT group slightly. Participants who had a current 'severe' mental health diagnosis who were assigned to TAU showed less change in frequency of drug use over time than the rest of the study sample, i.e. CBT4CBT was effective in reducing substance use even among people with current psychotic or bipolar disorder.
Web-based intervention to reduce substance abuse and depression: A three arm randomized trial in Mexico	*N* = 74 Participants were: - people seeking treatment for problemati	Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) – determines risk score for different types of	Web-based program - Guided program incorporating CBT strategies. Completed over 8 weeks if used at least 1 hour per week	Cannabis, cocaine, inhalants	Frequency and quantity of substance use in the past 7 days Severity of substance use	**Motivation to change** At baseline 2.7% were in the precontemplation stage, 24.3% in contemplation, and 73% in action. Of those in action, 92.2% reached the end of the study without a change in level and 7.1% regressed in their readiness to change. Of those who began at the contemplation stage, 83.3% advanced

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
Tiburcio et al., 2018	c substance use (excluding alcohol, tobacco, and opiates) - had not received treatment in previous 12 months - used the internet at least twice a week - at least 17 years old - low-to-moderate drug-related risk - no report of suicidal ideation in previous 3 months	psychoactive substances TLFB – measures frequency and quantity of substance use in the past 7 days Drug Abuse Screening Test (DAST-20) – measures severity of substance use Eight questions about internet use – frequency, duration, accessibility, online activities One question about mental health care in the last 6 months Two questions exploring suicide risk in the last 3 months Patient Health Questionnaire (PHQ-9) –	ASSIST self-help + treatment as usual (ASSIST+TAU) - Uses the ASSIST self-help strategies guide completed over 2 weeks - Followed by 6 weeks of TAU TAU - 8 weekly sessions ordinarily offered at the treatment centre (usually CBT interventions)		Depressive symptoms Readiness to change substance use	to the action stage and 16.7% had no change. **Results** From baseline to follow-up, there were reductions in participants' average days of use (from 2.61 at BL to 0.48 at PT to 0.38 at FU), severity of use (7.2 at BL to 5.9 at PT to 5.0 at FU), and depressive symptomatology (5.4 at BL to 1.3 at PT to 0.7 at FU) regardless of type of treatment received. Effect sizes were large in reducing average days of substance use ($d = -1.1$) and moderate in reducing severity ($d = -0.7$). Results indicate standalone and additional web-based treatment perform as well as standard treatment, but results should be interpreted with caution due to small sample size.

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
		depressive symptoms in the past 2 weeks Change Questionnaire – readiness to change Measured at baseline (BL), 8 weeks post-treatment (PT), and 1 month follow-up (FU)				
The effectiveness of an internet intervention aimed at reducing alcohol consumption in adults Zill et al., 2019	N = 608 adults with problematic alcohol consumption Aged 18 and over	Self-reported measures to determine average daily consumption of grams of pure alcohol: - Timeline-Follow-Back (TFB) – past 7 days - Quantity-Frequency-Index (QFI) – past 30 days Measured at baseline, 3-month (t1), and 6-month follow-up (t2)	Vorvida – a German internet intervention based on CBT methods Care as usual/waiting list (CAU/WL) Parallel-group pragmatic RCT	Alcohol	**Primary** Amount of alcohol consumed in past 7 and 30 days at t1 **Secondary** • Binge drinking – how many days they drank 5 or more drinks on one occasion • Drunkenness – how many days in past 30	**Retention** The drop-out rate between 25% between t0 and t1, 7% from t1 to t2, resulting in a total drop-out rate of 30% between t0 and t2. Drop-outs were higher in the intervention group (37% at t2) than the control group (23% at t2). **Primary** Small to medium effects – people using Vorvida consumed less alcohol in the past 30 days (Cohen's d = 0.278; Vorvida = 40.8 g/day, control group d = 56.8 g/day) and 7 days (Cohen's d = 0.419; Vorvida d = 34.3 g/day, control group = 43.7 g/day).

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
					days they felt drunk	Effects were slightly larger at t2 – people using Vorvida consumed less alcohol in the past 30 days (Cohen's d = 0.327; Vorvida = 32.3 g/day, control group = 44.1 g/day) and 7 days (Cohen's d = 0.540; Vorvida = 25.7 g/day, control group = 38.6 g/day). **Secondary** *Binge drinking* Large effect – at t1, people in Vorvida group had lower rates of binge drinking in the past 30 days than those in control group (Cohen's d = 0.873; Vorvida = 8.1 days, control group = 14.6 days). At t2, effects were larger (Cohen's d = 1.40; Vorvida = 4.6 days, control group = 14.5 days). *Drunkenness* Small to medium effect – at t1, Vorvida group had lower rates of drunkenness in the past 30 days (Cohen's d = 0.392; Vorvida = 2.9 days, control group = 4.6 days). At t2, effects were larger (Cohen's d = 0.742; Vorvida = 1.5 days, control group 4.4 days). **Other:**

Title and authors	Data and sample details	Measures	Intervention	Substance type	Outcomes	Findings
						There was a larger proportion of low-risk drinking behaviours in the past 30 days for Vorvida group over time – 7.5% of participants were low-risk at baseline compared to 20.9% at t1 and 38.9% at t2. A similar pattern was found when measuring the past 7 days (12.4% at baseline, 24.8% at t1, 41.8% at t2). In contrast, low-risk drinking estimates remained relatively stable over time. Analyses showed high levels of satisfaction with Vorvida at t1 (M = 27.4, SD = 5.3) and t2 (M = 28.2, SD = 5.4) out of a possible maximum of 32 points. At t2, 94% of participants reported they would recommend Vorvida to a friend, 90% agreed it was the type of treatment they wanted, and 92% said they would use it again.