FINAL REPORT

Grantee: University of Newcastle

Grantee Representative: Associate Professor Amanda Baker

Summary of project achievements relative to original proposal specifications

Original Proposal	Study Achievements
Trial CBT among people experiencing coexisting depression and AOD use problems employing either a psychologist or computer program to deliver the treatment	Achieved as per original proposal
Conduct the trial in both a rural and urban setting	Achieved as per original proposal
Assess the efficacy of the interventions relative to a non-specific treatment control group on measures of AOD use, service utilisation, symptomatology and functioning	Achieved as per original proposal
Recruit 360 participants across these sites	Recruited 285 participants
Develop treatment manuals for the therapist-computer-delivered and non-specific interventions	Achieved as per original proposal
Conduct treatment fidelity analysis to ensure treatment was delivered in a consistent and competent fashion	Achieved as per original proposal
Administer initial, post-treatment, 6- and 12-monthly assessments to study participants, assessing mental health and AOD-related outcomes	Achieved as per original proposal 24- and 36-months assessments commenced (new addition to project)

TREATING COMORBID DEPRESSION AND ALCOHOL/OTHER DRUG USE PROBLEMS

The efficacy of computer-based treatment

CHIEF INVESTIGATORS

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OVERVIEW

People with depression and alcohol/other drug use comorbidity encounter problems in accessing existing treatments and services, highlighting the need to develop and test treatment alternatives that can overcome these barriers. This report describes the results of a study of integrated psychological treatment for depression and AOD use comorbidity, targeting both conditions simultaneously. Participants received integrated treatment delivered by a therapist, computer-delivered integrated treatment or a supportive counseling intervention (control) treatment delivered by a therapist. The results of this study revealed significant decreases in the following outcomes over time across the treatment groups: hazardous use of substances, alcohol use, cannabis use, depression scores, and cognitive vulnerability to depression. Significant improvements in functioning were also detected. In summary, this study suggests that participants with severe, current depressive and alcohol/other drug use problems will attend and report benefits from a computer-based integrated psychological treatment that are similar in magnitude to those reported by participants in an equivalent clinician-delivered treatment and across several previous studies of computer-based treatment for single conditions (i.e. depression- or alcohol-use only). These benefits include improvements in depressive-, AOD use, and general functioning outcomes. The promising results are particularly important, considering the computer-delivered intervention used an average of 12 minutes face-to-face clinician time per session compared with approximately one hour of face-to-face therapy among the therapist-delivered equivalents and the PCT (control) supportive intervention. The implications of these results are discussed.

ACKNOWLEDGEMENTS

The research team would like to acknowledge the involvement of the hundreds of study participants in this study. Clinical research does not happen without you, and we thank you sincerely.

This research was also supported in full by a generous grant from the Alcohol Education and Rehabilitation Foundation (AERF). Again, this research would not be possible without this very practical contribution and investment in research ideas. Not only do we wish to acknowledge this contribution, but we also would like to thank the AERF for this investment and particularly for their flexibility in meeting deadlines and troubleshooting issues that always emerge in large studies of this kind.

BACKGROUND AND BRIEF LITERATURE REVIEW

A reliable finding across population-based surveys is the common co-occurrence of mental disorders, referred to as 'comorbidity'. The presence of one mental disorder seems to increase the risk of developing additional mental disorders (Kessler, 1994). In Australia, for example, high rates of comorbidity were also detected among the NSMHWB respondents, with one in four people with either an anxiety, depressive or AOD use disorder also meeting criteria for another mental disorder (Andrews et al., 1997). Depression and AOD use disorders are two of the three most common mental disorders experienced by the Australian population (Andrews, Henderson, & Hall, 2001); results consistently reported in international epidemiological research and across gender, ethnic and age groupings (Lynskey, 1998). At a population level, the presence of comorbid depression and AOD use disorders has been associated with high levels of disability, days out of role and a significant contribution to the total burden of disease (Andrews et al., 1997). In addition, epidemiological research suggests that there is a consistent association between suicidality, depression and AOD use problems (e.g. Abraham & Fava, 1999; Beautrais, Joyce, & Mulder, 1999; Lewinsohn, Rohde, & Seeley, 1995).

Although much is known about the characteristics of people with single disorders who present for treatment, the exclusion of people with comorbid disorders from most studies and treatment services means that much less is known about the particular impact that coexisting conditions exerts on the individual seeking treatment. Our previous research suggests that while people with comorbid depression and alcohol/other drug (AOD) use problems report similar improvements following substance use treatment as do people without comorbid depression, they report consistently higher levels of depression and other psychiatric symptomatology, reduced social, personal and general functioning, lower rates of satisfaction with their quality of life and higher levels of AOD use. Other research suggests that these residual symptoms following treatment for AOD use problems could place people with comorbid depression at a heightened risk of relapse of both conditions and continued morbidity regardless of any initial treatment gains that might be made (Curran et al., 2000; Weaver et al., 2000).

Models of treatment of comorbidity

Treatment experts are currently undecided about whether the most effective strategy for managing comorbidity is to focus on the more acute or primary condition where identified, or whether both issues warrant treatment simultaneously (Weiss & Najavatis, 1998; Zweben et al., 2004). Little empirical evidence exists to suggest a firm answer to this problem, and approaches to treating people with comorbid issues will vary between treatment settings and research studies (Nunes & Quitkin, 1997). Several models of treatment exist that could be applied to people with comorbid depression and AOD use problems, and are guided by different aetiological models of comorbidity. These include "sequential", "parallel" or "integrated" treatment approaches.

INTEGRATED TREATMENT APPROACHES

The notion of integrated treatment was developed in response to the difficulties and challenges posed by sequential and parallel approaches (Proudfoot et al., 2003; Woody, 1996). In particular, integrating treatments for comorbid depression and AOD use problems can potentially overcome the complications in establishing primary and secondary disorders, and treatment can use strategies from both fields to address and relieve current distress within the client (Charney et al., 1998).

Experts suggest that integrated treatments can more easily be tailored to the particular needs of the client with comorbid depression and AOD use problems, targeting areas of high distress and priority as they identify, addressing both acute and non-acute symptoms (Ries, 1993). In addition, integrating treatments in the manner defined above provides clients with a coherent treatment plan that can arguably be delivered in a manner that is cost- and time-effective for service providers and clients themselves (Drake et al., 1998).

Limited evidence currently exists that evaluates the efficacy of integrated treatments among people with depression and AOD use comorbidity that address both mental health and AOD use problems simultaneously. Several pilot studies testing the efficacy of integrated approaches to comorbidity treatment have shown promising results, although these have been conducted almost exclusively among people with psychosis and AOD use comorbidity (Myrick & Brady, 2003).

In one of the few studies conducted among people with depression and comorbid AOD use problems, Daley and colleagues piloted an integrated motivational interview among 23 people with major depression and cocaine dependence (Daley et al., 1998). Upon discharge from an inpatient psychiatric facility, participants were consecutively assigned to receive motivational therapy or treatment as usual (psychoeducation, supportive counselling and pharmacotherapy) during the first month of outpatient care, and could access up to five individual and four group-based sessions. All participants were stabilised on antidepressants for the duration of the study, and motivational interviewing focussed on assisting people to better cope with various psychiatric and AOD-related issues that influence treatment adherence. Results indicated that attendance at the motivational treatment program was significantly greater than that for treatment as usual over the first month post-discharge. At the 90-day follow-up assessment, participants in the motivational group reported improved abstinence rates from cocaine and a significant decrease in severity of depressive symptoms than their treatment as usual counterparts. At the 12-month follow-up, differences between the treatment groups were found, and included significantly lower rates of rehospitalisation among the motivational interviewing group. Despite the small numbers of participants involved in this study, the lack of randomisation to treatment groups and the lack of an active CBT treatment component, the results are promising.

In a review of treatments for people with severe mental illness (psychotic spectrum disorders) and comorbid AOD use disorders, Drake et al. (2004) concluded that there is widespread anecdotal recognition within the field of comorbidity treatment that integrated approaches with this population leads to superior treatment responses. Furthermore, there is a real and pressing need to develop and rigorously evaluate integrated treatments for people with AOD use and depression comorbidity, given the absence of randomised controlled trials with this population (Degenhardt, 2002).

Cognitive Behaviour Therapy (CBT) and Motivational Interviewing

Psychological interventions, which allow the exploration of links between disorders, are of likely benefit to people with comorbid conditions, and are worthy of closer development and testing, in light of the potential for interactions between AOD use and pharmacotherapy (Nunes & Quitkin, 1997). The provisional consensus among comorbidity experts is generally that motivational interventions may enhance a sense of control over substances (Proudfoot et al., 2003), and that CBT might also help to mobilise and build skills to bring about and maintain change in both depression and AOD use. However, few studies have been conducted with

clinically relevant populations, such as among people with comorbid depression and AOD use problems. Consequently, the generalisability of the existing evidence for motivational approaches and CBT is open to question (Hollon, Shelton, & David, 1993).

Brief motivational interventions have shown efficacy in improving engagement and adherence with treatment services and, in some cases, have produced short-term improvements in mental health and AOD use outcomes. It is suggested that among the active ingredients of response to brief interventions is the provision of formal feedback, presented in a style that is commensurate with the client's current stage of change, along with the positive interpersonal style associated with motivational interviewing (Zweben & Zuckoff, 2002). CBT has the best-documented efficacy of the non-pharmacological approaches for the treatment of depression (APA, 2000b) and has also been used effectively among people with AOD use disorders (Shand et al., 2003).

In the first treatment study to address both depression and alcohol use problems concurrently, Brown, Evans, Miller, Burgess and Mueller (1997) recruited 35 people with alcohol dependence and scores of 10 or above on the Beck Depression Inventory (BDI-II, Beck, Steer, & Brown, 1996) to a study of treatment for depression. In addition to an inpatient treatment for alcohol dependence, participants were randomised to receive eight adjunctive individual sessions of either CBT aimed at reducing depressive symptomatology or a relaxation (control) condition. Results of this small-scale trial indicated that those who received the adjunctive CBT for depression had greater reductions in depressive symptoms, albeit on only one of the several measures of depression that were included in the study. The CBT for depression group reported greater a percentage of days abstinent and significantly better alcohol use outcomes at the six-month follow-up assessment than those who received the standard treatment. In further analyses of the data from this study, Ramsey, Brown, Stuart, Burgess and Miller (2002) revealed that the CBT group also reported improvements in managing situations involving negative mood without drinking, and an increase in negative expectancies for alcohol use following completion of treatment. These two variables were associated with reduced levels of drinking at the six-month follow-up assessment, a result not found for the relaxation group. Further investigation of the impact of CBT among people with more severe levels of depressive symptomatology is warranted as this study focussed on people with low levels of depression (scores in the minimal range BDI-II) and suffered from several methodological flaws (e.g. small sample size, follow-up assessors not blind to treatment allocation).

Accessible Treatment Options

In addition to service barriers, individuals with comorbid depression and AOD use disorders will experience a range of individual, ecomonic and community-level barriers to accessing treatment for their conditions (Anderson, 2003; Robertson & Donnermeyer, 1997). People may be geographically isolated, where services are limited, access to public transport restricted or unavailable and costs associated with travel high (Kavanagh et al., 2000; Robertson & Donnermeyer, 1997). People may experience financial disadvantage and are unable to pay for psychological and other available treatment services, whether within these isolated areas or urban centres. In addition, attitudinal barriers to treatment for depression or AOD use problems may override the perceived need for treatment even if it was available and readily accessible (Booth et al., 2000; Robertson & Donnermeyer, 1997). For example, the social and personal stigma associated with the diagnosis of a mental health or AOD use problem, along with concerns about the ineffectiveness of treatments, may make many individuals unlikely to regard their symptoms as serious enough to warrant intervention. The need to develop appropriate, evidence based treatments that are well accepted by these communities is clear (Booth et al.,

2000; Metsch & McCoy, 1999; Paykel et al., 2000).

Given these access issues, particularly for evidence-based psychological treatment for comorbid depression and AOD use problems, methods of improving the accessibility of efficacious treatments are of vital importance. Service providers and researchers alike are therefore examining ways to improve access to, and acceptability of, treatment. The importance of this issue is highlighted by Commonwealth and State health departments in Australia, which are prioritising improved access to services in policy documentation (NSWHealth, 2000).

There is evidence that alternative modes of treatment delivery can be effective, particularly for highly structured therapies such as CBT. For example, 50 participants with depression reported treatment gains after a cognitive bibliotherapy group, which were maintained over three years of follow-up (Smith, Floyd, & Jamison, 1997).

COMPUTER-BASED TREATMENT

The advent of the technological age has led to the application of computers in many settings, including the use of computers in therapy. Computer-based therapy is a relatively new field, but it has the potential to make a vast impact on treatment by significantly improving access to resources among individuals suffering with conditions like depression and AOD occurring comorbidly and in isolation of each other.

In addition, population surveys reveal that, in Australia, 66% of households in 2003 had access to a computer at home, with just over half of the population reporting access to the internet at home (ABS, 2005). These rates of computer and internet access are comparable to other countries, including the United Kingdom (UK), United States (USA), Canada and Japan, and are only expected to increase (ABS, 2005). In light of this, computers and the Internet offer a potential solution to the barriers facing individuals in accessing psychological information and treatments for coexisting mental health and AOD use problems (Tate & Zabinski, 2004).

In a large scale randomised controlled trial conducted in the UK, Proudfoot and colleagues (2004) compared an eight-session computerised CBT with treatment as usual among 274 people with depression or anxiety-related conditions. Results indicated that the computerised CBT ('Beating the Blues') produced significant improvements in depression and anxiety symptoms, significant reductions in negative attributions and significant increases in positive thinking relative to the control condition. These differences were evident at the post-treatment assessment, and were maintained at six-month follow-up. Average satisfaction with treatment was over one and a half times higher in the computer group relative to controls who received treatment as usual (Proudfoot et al., 2004). Attrition rates were comparable to those encountered in face-to-face therapies, with around 35% of computer participants not completing their full complement of sessions. This study provides important evidence about the acceptability and efficacy of computerised treatments for anxiety and depression, although computer treatment was not compared with an equivalent therapist intervention, and people with AOD use problems were excluded, along with those who had been taking antidepressant/anxiolytic medication for six months or more prior to referral to the study.

In Australia, Christensen, Griffiths and Jorm (2004) recruited 525 people with significant levels of distress (as measured by elevated scores on the Kessler psychological distress scale) to a study of Internet-based CBT for depression. Following recruitment, participants were randomised to receive the six-session Internet-based CBT for depression (MoodGYM), access

to Internet-based education about depression (BluePages) or a six-week control condition which comprised weekly phonecalls from the research team to discuss various lifestyle factors. At six-weeks following completion of treatment, participants in the MoodGYM treatment reported significantly reduced levels of dysfunctional attitudes relative to controls (Christensen, Griffiths, & Jorm, 2004). BluePages (education) produced equivalent reductions in depressive symptoms to the MoodGYM CBT program. Attrition rates were significantly higher for the MoodGYM condition relative to the other conditions, with around 25% of people not completing their maximum potential number of sessions. Longer-term follow-up is required to test these effects over time. Nevertheless these results are particularly encouraging, in terms of the potential effectiveness of computerised modes of delivery of psychological treatment for depression.

In the AOD field, one small-scale study has been conducted using computer-based therapy among people with problematic alcohol use in the US. An eight-session Windows-based computer intervention was developed and trialed among 40 problem drinkers. Although the study lacked an alternative treatment control condition, the intervention resulted in clinically significant reductions in alcohol consumption that were maintained at 12-month follow-up (Hester & Delaney, 1997). The participants, including one-third who reported little or no prior computing experience, rated the intervention as "acceptable".

Only one small study has previously compared responses to a computerised treatment with an equivalent therapist-delivered control group. In this study, 36 people with moderate depression (Beck Depression Inventory scores above 16) were randomised to receive six-sessions of CBT delivered via computer, six-sessions of therapist-delivered treatment, or a wait-list control group (Selmi et al., 1990). Results indicated no differences existed between the computer-delivered and therapist-delivered interventions at two-month follow-up, and both treatment groups reported significantly greater reductions in depressive symptoms relative to controls. Participants had little prior experience with computers. Despite the small sample and short follow-up period, these results are encouraging in terms of the potential efficacy of computerised interventions.

Although several studies exist examining the efficacy of computer-based and alternative modes of delivery of the above treatment strategies, they each suffer from small sample sizes, short follow-up periods and exclusion of people with current or moderate-severe symptoms. In addition, only one study has compared computer-based treatment with an alternative treatment control groups, but this was among people with mild depression. No study has examined the use of computer-based therapy among people with comorbid problems, including those with comorbid depression and AOD misuse. Consequently, the potential benefits of this approach among a highly prevalent group with limited access to existing services remains unknown.

COMPUTER-BASED COGNITIVE BEHAVIOUR THERAPY FOR ALCOHOL (AND OTHER DRUG USE) AND COEXISTING DEPRESSION IN A RURAL AND URBAN AREA.

1.1 Introduction

In the absence of research investigating integrated computer-based treatments for people with co-occurring depression and alcohol (and other drug) use problems, and the need to develop and appropriate treatment program for this increasing group of the community, the SHADE study (Self-Help for Alcohol/other drugs and DEpression) was developed.

1.2 Aims and Hypotheses

The SHADE study commenced in 2004 with the overall aim to evaluate the effectiveness of integrated, computer-delivered Cognitive Behaviour Therapy (CBT) for alcohol and other drug (AOD) problems among people with coexisting depression. Specifically, the project aimed to:

- Trial CBT among people experiencing coexisting depression and AOD use problems employing either a psychologist or computer program to deliver the treatment;
- Conduct the trial in both a rural and urban setting;
- Assess the efficacy of the interventions relative to a non-specific treatment control group on measures of AOD use, service utilisation, symptomatology and functioning.

1.3 Methods

The study was conducted across two sites in New South Wales: (a) Centre for Metnal Health Studies, University of Newcastle (Hunter Region of New South Wales, Urban); and (b) Centre for Rural and Remote Mental Health, Bloomfield Hospital, (Orange, Rural).

Participants and Setting
Participants in the study were people with comorbid depression and current problematic use of alcohol or cannabis. To be eligible for the study, people were required to satisfy the following criteria:

- Current depressive symptomatology, as indicated by a score of 17 or greater on the Beck Depression Inventory II (BDI-II, Beck, Steer, & Brown, 1996);
- Current problematic use of at least one of the following: alcohol (i.e. consumption above recommended drinking levels as suggested by the NHMRC; equates to 4 standard drinks per day for men or 2 standard drinks per day for women with fewer than 2 alcohol free days per week); or cannabis (at least weekly use);
- Absence of a brain injury, organic brain disease and/or significant cognitive impairment; and
- Ability to understand English.

Participants were recruited from a range of sources, including AOD services (detoxification units, methadone clinics, counselling services), Centrelink, Personal Support Programs, outpatient mental health services (community mental health teams, community health centres), psychiatric rehabilitation services and psychiatric in-patient wards. In addition, news articles for the project were placed in the local media, inviting interested persons to self-refer.

At the urban recruitment site (co-ordinated through the Centre for Mental Health Studies, University of Newcastle), 570 referrals to the project were received. Of these, 480 could be contacted, and following screening, 256 people met the study inclusion criteria. Of the eligible sample, 23 people refused participation once the study was explained to them, 47 did not complete the full complement of initial assessments, and 186 people were admitted to the study (111 males, 75 females). Participants did not complete the assessments mainly due to moving out of the area, finding full time employment, loss of contact or failure to attend three consecutive appointments. This was anticipated in our predictions for the final sample size. Clients were keen to partake in the study but the main discrepancy in people referred and those eligible is that one particular media campaign via television in the urban site was focussed on depression rather than AOD use. This resulted in people contacting the project who met inclusion criteria for depression but not substance use. Appropriate referrals were made to other services. The urban site achieved its recruitment target of 180 participants.

At the rural recruitment site (co-ordinated through the Centre for Rural and Remote Mental Health, Orange, NSW), 166 referrals were made to the project. Of these, 137 could be contacted, and 88 people were admitted to the study (31 refusals/incomplete assessments, 18 ineligibles). Forty-six males and 42 females constituted the final rural sample. Recruitment was below the target of 180 at the rural site.

Following recruitment to the study, each participant was randomised into one of three treatment conditions: Therapist condition (10 sessions of CBT, face-to-face with a psychologist), Computer condition (10 sessions of CBT using a computer), or Control condition (10 sessions of Person-Centred Therapy, PCT, face-to-face with a psychologist). The first session was conducted face-to-face with all participants, and was identical in content across the conditions. At the conclusion of this initial session, participants were randomised to a further 9 sessions of PCT, CBT or computer-based CBT. Participants and therapists were blind to treatment allocation until the conclusion of session 1. Of the 186 participants in the final urban sample, 65 were allocated to the computer-based CBT condition, 60 to the therapist-delivered CBT condition, and 61 to PCT. From the rural site (n=88), 28 were allocated to computer-based CBT, 32 to therapist-delivered CBT, and 28 were allocated to PCT. Overall, 97 participants were allocated to the computer-delivered treatment condition, 88 to the therapist-delivered treatment and 89 to the PCT (control) condition).

Once the treatment phase had been completed, all participants, regardless of dropout, commenced the follow-up phase of the project. Follow-up assessments were conducted with an independent Psychologist, who was blind to treatment allocation. The post-treatment assessment occurred approximately 3 months following the initial assessment, with 6- and 12-month follow-up occurring at 6- and 12-months following completion of the post-treatment assessment. Rates of retention in the follow-up phases are 59% for the post-treatment assessment (Rural: n=39, 42%; Urban: n=126, 68%), 61% for 6-month follow-up (Rural: n=39, 44%; Urban: n=128, 69%) and 60% for the 12-month follow-up assessment (Rural: n=59, 44%; Urban: n=126, 68%). We have commenced contacting participants for 24- and 36-month follow-up assessment, to further investigate the longer-term effects of treatment provided in the study. This was not part of the original project grant, and separate funding has been sought for this phase of the project.

Assessment Instruments

The assessment battery comprised a number of instruments commonly used within AOD and mental health settings, and covered the domains of self-reported AOD use, AOD abuse/dependence, readiness to change AOD use, reasons for AOD use, general functioning, quality of life, and levels of depression. Basic demographic information was collected from participants, along with service utilisation data. The following instruments are of relevance to the analyses reported below:

- **Demographic Information**: using the relevant subscales of the Diagnostic Interview for Psychosis (DIP, Jablensky et al., 2000), basic demographic information was collected over the following domains: age, gender, ethnic background, Aboriginal/Torres Strait Islander background, marital status, living arrangements, employment and education status. In addition, the DIP has a section on service utilisation and rates of medication, which was also included in the current assessment battery.
- **Beck Depression Inventory II** (BDI-II, Beck, Steer, & Brown, 1996): is a 21-item self-report questionnaire used to screen for the presence of depressive symptoms over the previous two-week period. Items cover the range of symptoms listed in the DSM-IV (APA, 2000a) for major depressive disorders. The questionnaire has been validated with both adult and adolescent populations (age range 13-80 years) , and is commonly used to screen for depressive symptoms among people with drug and alcohol use problems (Dawe et al., 2002). The self-report scale is completed in around 15 minutes (Beck, Steer, & Brown, 1996). Scores on the BDI-II are categorised according to severity, with high scores associated with major depressive disorder. Scores range from 0 to 63, with the following cut-off points indicative of varying levels of severity of depression: 0-13: minimal depression; 14-19: mild depression; 20-27: moderate depression; 28 and over: severe depression. High scores on the BDI-II do not imply a diagnosis of depressive disorder, but rather indicate the presence of depressed mood (Beck, Steer, & Brown, 1996).
- **Opiate Treatment Index** (OTI, Darke et al., 1991): addresses the quantity and frequency of use across 11 substances, including: alcohol, cannabis, heroin, other opiates, amphetamines, cocaine, hallucinogens, barbiturates, tranquilisers, inhalants and tobacco. Each of the 11 drug types are assessed individually, and clients report on their last three using occasions in the month prior to assessment, estimating the amount of drug consumed on each of these occasions. An average use index for the previous month is calculated for each drug.
- **Global Assessment of Functioning** (GAF, APA, 1994): provides in index of overall psychological functioning incorporating the domains of psychological, social and occupational status, and forms the fifth axis of diagnosis within the DSM-IV (APA, 2000a). Scores are divided into ten ranges of functioning (1-10, 11-20, 21-30 etc.) with higher scores indicating better functioning. GAF ratings are assigned by a qualified clinician, and are made based on the level of functioning at the time of evaluation, and is important to re-administer over time, and following completion of a treatment program (APA, 2000a).
- **Alcohol Use Disorders Identification Test** (AUDIT, Saunders et al., 1993): is a 10-item screening questionnaire that focuses solely on patterns of drinking for the previous 12-month period. In contrast to measures of quantity and frequency, the AUDIT targets the presence of behaviours and thoughts about drinking that lead to a diagnosis of alcohol abuse and dependence. Studies using the AUDIT suggest that it is the best instrument to use as a screener for current alcohol use disorders, and is particularly useful to detect low levels of risky drinking (Dawe et al., 2002). The AUDIT has been used among people

with serious mental disorders, and is valid for use to screen for alcohol use disorders among these groups of clients. AUDIT scores of 10 or greater indicated hazardous drinking behaviours, with scores of 19 or greater indicating likely alcohol abuse/dependence among the respondent, with sensitivity and specificity upwards of 93% in each case (Dawe et al., 2002).

- **Dysfunctional Attitude Scale** (DAS, Weissman & Beck, 1978): The 40–item DAS is a self-report scale that measures the extent to which respondents hold a set of dysfunctional beliefs about self, the world and the future (Weissman & Beck, 1978). High scores on these domains represent a cognitive vulnerability to depression, and the DAS is the most commonly used measure of this vulnerability (Brown et al., 1995).
- **Beck Hopelessness Scale** (BHS, Beck et al., 1974): is a 20-item self-report instrument that measures optimism about the future and indirectly estimates suicide risk. Participants complete the scale by providing true/false responses to 20 statements related to their thoughts about the future over the previous two-week period.

Content of the interventions

In general, a harm minimisation approach to reducing depression and AOD use was emphasised during the treatment phase of the SHADE study. This is in line with recommendations from state health departments in Australia (e.g. NSWHealth, 2000) and evidence from the literature (e.g. Drake et al., 1998; Moggi et al., 2002).

An integrated approach to treatment occurred, with the one clinician responsible for delivering treatment and co-ordinating care. Integration of strategies for depression and AOD use ensued, which allowed for recognition and exploration of the relationship between the depressive symptoms and substance use problem, including how each condition is exacerbated (Carroll, 2004). Motivational interviewing was used throughout the treatment program, as this set of techniques is considered central to integrated treatments (Mueser et al., 2003). Despite being developed for use in AOD use treatments, motivational interviewing is not limited to the AOD arena and can be used to help modify virtually any health-related behaviour, including mental health (Baker & Hambridge, 2002). Further, guidelines have also been provided for using motivational interviewing with people experiencing low mood (Rollnick, Mason, & Butler, 1999) as poor motivation and indecisiveness are commonly reported among people with depression. Thus, motivational interviewing is appropriate for depressed individuals experiencing ambivalence about the effort required to change, and the technique is suited to problem drinkers and drug users who are not contemplating change.

SESSION 1

The initial session was delivered to all participants, prior to allocation to the treatment conditions in the study. Specifically, the session comprised case formulation, feedback from assessment and rapport building. A brief motivational interview was commenced, where the issues of AOD use were raised and expectancies for use discussed, and self-help material provided for both depression and AOD use problems. Case formulation strategies included the following components: developing a problem list, preliminary schema analysis, discussion of the origins of current problems (AOD use and depression), activating and precipitating situations, development of a treatment plan and setting goals for treatment. Session content was manualised and incorporated the approaches of Persons, Davidson and Tompkins (2001), Miller and Rollnick (1991), Rollnick, Mason and Butler (1999) and Beck, Rush, Shaw and Emery (1979). When describing the above skills and concepts, examples relating to both depressive and AOD use triggers were used. This session lasted around 60 minutes.

At the conclusion of this session, the participant was provided with the randomisation envelope, which was opened and the resultant treatment allocation discussed. People allocated to receive further therapist- or computer-delivered SHADE therapy (described below), were introduced to the concept of mood and AOD monitoring (as per Beck et al., 1979; Beck et al., 1993) and asked to complete a daily mood/AOD monitoring task over the coming week. Participants allocated to Person-Centred Therapy (PCT) were asked to consider the issues discussed during the session as their only homework.

THERAPIST-DELIVERED SHADE THERAPY

SHADE therapy consisted of ten individual sessions of therapy, one week apart, including the first session described above as session one. SHADE therapy offered nine additional treatment sessions to participants designed to encourage a reduction in depression and AOD use. SHADE therapy incorporated motivational, behavioural and cognitive components, based on the work of Segal et al. (2002), Persons et al. (2001), Graham (2004), Beck et al. (1979; 1993) and Tarrier and Wells (1998). Participants took responsibility for any change that occurred throughout treatment, including deciding on their goals for therapy, such as a choice between complete abstinence from substances or a level of reduced, controlled usage (a harm reduction goal). Each of the SHADE therapy session was structured and manualised as per the following:

Session 1: as described above;

Session 2: Mood/AOD monitoring continues in the context of a rationale for CBT. Mindfulness training is commenced and activity scheduling introduced. Motivation enhancement continues in this session;

Session 3: Links between thoughts and behaviours are discussed and thought monitoring commenced specifically around triggers for depression and AOD use. Mindfulness training continues, along with activity scheduling and motivation enhancement;

Session 4: Phase II motivational interviewing is commenced and change plans for both AOD and depression are negotiated. Coping with cravings for AOD use is discussed and continues as required through until Session 10. Activity scheduling and mindfulness practice also continues until Session 10;

Session 5: Cognitive restructuring is introduced via the concept of identifying and managing unhelpful automatic thought patterns. Restructuring continues through until Session 10. Mindful breathing is introduced and motivation enhancement continues on a needs basis through until Session 10;

Session 6: Problem-solving techniques are introduced and applied to both AOD use and depression-relevant situations. Mindfulness training focusses on breathing with regular practice encouraged;

Session 7: Schema change methods are introduced and continue until Session 10;

Session 8: Refusal skills are practiced and an emergency plan developed for both cravings for AOD and depressive symptoms. Mindfulness training continues using the theme of allowing and letting things be;

Session 9: The concepts of "seemingly irrelevant decisions" and the abstinence/rule violation effect are introduced in the context of both AOD use and depression. Preventing relapse is discussed, and a plan developed for investing time in enjoyable and achievement activities and avoiding activities that tax resources;

Session 10: A relapse management plan is developed that involves both AOD and depression, and treatment is terminated. The research clinician reviewed depression and AOD use status of the participant during this session to determine the need for further intervention from another source. Referral to available treatment sources in the community was arranged where appropriate.

After session one, all participants and the research clinicians completed a therapist- and client-rated measure of therapeutic alliance (Agnew Relationship Measure, Agnew-Davies et al., 1998). This measure was repeated after sessions five and ten.

COMPUTER-DELIVERED SHADE THERAPY

The content of computer-delivered SHADE therapy was identical to that described for therapist-delivered SHADE therapy above. The computer-delivered SHADE CD-ROM contained interactive components, including video demonstrations, voiceovers and in-session exercises. The video components modelled CBT/mindfulness and other skills relevant to the therapy (activity scheduling, self-monitoring thoughts, challenging faulty cognitions, identifying cognitive schema, drink/drug refusal and problem solving). The CD-ROM was menu-driven, and participants were instructed to complete the nine sessions in sequence, one week apart, as per the clinician-delivered intervention. Participants were able to preview future sessions and review previous sessions throughout the treatment program.

Text presented in the SHADE CD-ROM was pitched at a reading level consistent with that of a person who has completed up to Year eight at high school in Australia (approximate age: 12-13 years). A similar computer-based intervention among problem drinkers, written at the eighth grade reading level was acceptable and comprehensible by all participants (Hester & Delaney, 1997).

Session one was completed face-to-face with a 'live' clinician, as per the description provided above. After completion of session one, participants randomly allocated to computer-delivered SHADE therapy proceeded as follows.

Computer-delivered SHADE therapy sessions were delivered according to the following format:

- Greet the person: the SHADE participant was greeted briefly upon arrival by the research clinician, and taken to the SHADE computer for their session. Interaction with the person was limited to non-specific topics, unrelated to SHADE therapy or participation in the research project (e.g. the weather).
- Introduce the module: for the first computer module (i.e. session two, following completion of session one face-to-face), the research clinician and the participant completed the introductory SHADE module together. This brief (approximately 5 minute) tutorial module oriented the person to the computer program, showed them how to use the mouse and keyboard, and taught them how to navigate their way through the program. Once complete, and for subsequent computer-delivered SHADE modules, the

research clinician briefly prepared the participant for computer therapy in the following way:

"Today I have set up Module XX on the computer for you to complete. You can go backwards and forwards through the computer program by clicking the mouse, and I've put a pen and some paper here for you to make notes if you would like to. You can also see that there is a printer connected to the computer, so you can print out any worksheets or other information whenever you wish. It's OK to get up and walk around a little bit during the session, just to make sure you keep comfortable. Allow yourself about one hour to complete this module. I'll come back into the room after about one hour to see how you are going."

- Commence the module: the research clinician left the participant to work through the computer-based SHADE module/session.
- Brief check-in: following completion of the SHADE computerised module, the research clinician met briefly with the participant for a "check-in" session of 10-15 minutes' duration. The content of this "check-in" was manualised, and in summary, comprised the following elements:
- Review Homework Activities: To check the participant's understanding of the assigned homework tasks, they were asked to describe the homework tasks in their own words. Research clinicians reinforced the importance of homework and its relevance to future modules.
- Develop a Plan for Completing Homework: Research clinicians and participants briefly explored any anticipate obstacles to completing homework activities, and developed and verbalised a plan for doing homework tasks through the week.
- Suicide and Mood Assessment: the research clinician used the brief 'check-in' to provide a general idea of their current mood. Where indicated, the research clinician conducted a suicide risk assessment with the person.
- Confirm Next Appointment: the person's next appointment was confirmed prior to completing the session.

The Agnew Relationship measure of therapeutic alliance was also administered to computer-delivered SHADE therapy participants and their check-in therapists following completion of sessions one, five and ten.

PERSON –CENTRED THERAPY – CONTROL (PCT)

This treatment was adapted for the project from the unpublished manual: Sellman, J.D., Sullivan, P.F, and Dore, G.M. (Unpublished). *Brief Treatment Programme for Alcohol Dependence: Person-Centred Therapy Therapists Manual.* Copyright, Christchurch School of Medicine. It was included as a means to control for therapist (live) contact, but not for the content of the active SHADE interventions.

Person-centred therapy is a form of psychotherapy originally developed by Carl Rogers in the 1940's. This treatment adopts the assumption that every individual has the capacity to make personal changes and has the ability and resources within themselves to make the necessary changes for personal growth to occur. If certain conditions are present within the therapeutic relationship, the client will be able to use this capacity to make positive changes.

The conditions which are provided for in PCT have been identified as non-specific factors of all successful psychotherapies. Here they are considered the specific principles of PCT. These essential factors that the therapist must provide are:

1. Genuineness or congruence,
2. Unconditional positive regard, and
3. Accurate empathy.

In PCT, therapists do not engage in the following: undue probing, give reassurance, criticise, praise, describe the client, interpret current behaviour in the light of past experiences, provide advice, or giving directions. The therapist allows the client to focus on their own inner experiences without trying to direct them in any way. The focus is on the here-and now. No attempt is made to gain an understanding of the client's past experiences. The environment provided by the therapy allows the client to begin to look at those feelings and thoughts which have previously been too anxiety-provoking to consider. This can act as a catalyst for change.

Changes which may occur as a result of PCT include the following:

- The client becomes aware of feelings which were previously denied, feared or struggled against. The client becomes more comfortable expressing these feelings as they occur.
- The client becomes aware of the differences between inner feelings and outward actions. These feelings are then allowed to influence behaviour in a way that is appropriate.
- The client becomes aware of existing problems and no longer sees them as being external to themselves. The client begins to own his or her part in contributing to the problem and seeks the solution to problems from within.
- The client shifts from being fearful of close relationships to cautiously testing relationships; eventually being able to express feelings in a relationship as they occur.
- The client moves from disapproval of themselves towards greater self-acceptance.

PCT was delivered individually over a total of ten therapy sessions, including the session one described above. Each session lasted around an hour, applying the three key principles of PCT (genuineness, unconditional positive regard and accurate empathy) to a 10 week therapeutic relationship with a client with depression and an alcohol and or drug dependency. In general, the three phases of therapy might be expected to correlate with session 2, sessions 3-9, and session 10 respectively. However, there is likely to be considerable variation within clients, from the situation where most of the 10 sessions are spent engaging into the therapeutic relationship, to the other extreme, where after rapid engagement the client begins to anticipate termination from the first session onwards.

The most common techniques used in the sessions were open-ended questions and reflective listening. Open-ended questions were used to maintain a nondirective therapeutic stance, conveying to the client, that they are responsible for the direction of therapy. Reflective listening was used to "stay with" the client, as they led the process of therapy. This technique assisted the therapist to keep on track with the line of discussion being taken by the client, as well as to convey to the client that the therapist is attentive to their thoughts and feelings.

Closed questions were only be used as clarification in the service of accurate empathy. Although the focus of PCT is on the here and now, if the client wished to talk about the past or future, this was up to them. If the client became "stuck" the therapist simply empathised with them rather than offering any advice or suggestions.

SELF-HELP MATERIAL

Each participant, regardless of treatment allocation, received psychoeducation about depression, alcohol, cannabis and amphetamine use as relevant. These psychoeducation materials are contained in the SHADE treatment manual under session one . Each participant also received a copy of the book 'Taming the Black Dog' (Aisbett, 2000) (available on-line at http://www.harpercollins.com.au/title.cfm?ISBN=0732267579&Author=0000715). This book makes use of cartoons and comic strips to explain the symptoms of depression and ways to assist people manage this condition, including CBT-related strategies.

ASSESSMENT/TREATMENT DROPOUT

Assertive follow-up of participants was required to encourage continued participation in the treatment programs. This was in consideration of the research team's prior experience with comorbid populations and the increasing emergence of literature indicating that a high level of commitment is necessary in order to engage and retain comorbid populations in treatment (Desmond et al., 1995; Stein et al., 2004). In line with the recommendations of Stein et al. (2004) and Desmond et al. (1995) the following procedures were put in place to maximise the retention of participants in the SHADE study:

- Collecting next of kin information at the commencement of the study and gaining consent to contact this person in the event that the participant could not be located using their last known contact information;
- Informing participants about follow-up assessments and appointments at every opportunity, including the use of written confirmation of appointment time/day and confirming attendance the day of the scheduled appointment with a phone call;
- Being flexible and supportive around appointment scheduling;
- Providing resources for travel to attend initial assessment and follow-up sessions; and
- Hiring experienced staff sensitive to the importance of assertive outreach with comorbid clients.

In addition, the following protocol was used when a person missed a treatment session:

(1) The research clinician contacted the participant, arranged an alternative appointment time and sent a handwritten confirmation of the new appointment time/day to the participant's home address;
(2) On the day of the rescheduled appointment the research clinician telephoned the participant to remind them of the appointment;
(3) If the rescheduled session was also missed, the research clinician telephoned the participant and rescheduled for a second time;
(4) The research clinician contacted the participant on the day of the appointment to remind him/her to attend;
(5) If the appointment was missed again, the research clinician followed steps 1 and 2 and arranged a final appointment time/day convenient to the participant;
(6) If a participant missed three consecutive appointments, they were not assertively followed for further treatment and classified as a treatment dropout.

All participants, regardless of missed appointments, continued to receive follow-up on each of the assessment occasions.

1.4 Statistical analysis

Data were analysed using the Statistical Package for Social Sciences (SPSS) for Windows, Version 12.0. As a partial correction for the number of statistical tests performed on the dataset, the level of significance was set at 0.01. Significance values between p=0.01 and p=0.05 were regarded as non-significant trends.

Characteristics of the sample at baseline

Exploratory data analysis was conducted on the full sample of participants (N=274) across basic demographic variables such as age, gender, martial status, education levels and employment rates, along with levels of depression and AOD use. Rates of treatment attendance and follow-up completion were also calculated.

Depression outcomes

Analyses in this section were conducted on the full sample of follow-up completers as a function of their treatment allocation. Repeated measures ANOVA compared changes in key depression outcomes over time for these participants, according to their treatment allocation. Key outcomes included: BDI-II scores, BHS total scores, and DAS total scores. Bonferroni follow-up tests more closely examined any significant changes in these key variables.

Alcohol/other drug use outcomes

AOD use outcomes were compared over time for participants as a function of their treatment allocation (i.e. PCT, SHADE – therapist or SHADE-computer) rather than the number of sessions people attended.

ALCOHOL USE OUTCOMES

A sub-selection of follow-up completers met criteria for harmful use of alcohol at entry to the study. Repeated measures ANOVA examined changes in levels of alcohol use (OTI alcohol scores) and scores on the AUDIT questionnaire for these participants over the four assessment occasions according to treatment allocation. Bonferroni follow-up tests were used to more closely examine any changes in these key outcomes that were significant.

CANNABIS USE OUTCOMES

Similarly, a sub-sample of the follow-up completers met criteria for harmful use of cannabis at entry to the study. Repeated measures ANOVA compared levels of cannabis use (OTI scores) for this group over the assessment occasions, as a function of treatment allocation. Bonferroni post-hoc tests examined any significant changes in these variables.

OTHER ALCOHOL/OTHER DRUG USE OUTCOMES

Repeated measures ANOVA compared poly-drug use over the four assessments as a function of treatment allocation. An aggregate global AOD use score was calculated for all participants, which estimated the number of days in the previous month at which participants consumed AOD at hazardous levels. Repeated measures ANOVA examined changes in this hazardous use index over time according to treatment allocation. One between subjects factor (intervention status) and one within subjects factor (time – initial, three-months, six-months and 12-months) was entered into these analyses. Bonferroni follow-up tests were conducted on any changes in outcome variables that reached significance. Chi-squared analyses compared post-treatment, six- and 12-month substance use status (abstinent, using below threshold and using above threshold) for alcohol and cannabis as a function of treatment allocation.

Other outcomes

Other outcomes of interest included GAF scores and treatment utilisation. Treatment utilisation data consisted of medication rates, and involvement in any AOD treatment (yes/no)and difference in these variables was examined according to treatment allocation via chi-squared analyses. A count of the number of specialists (general practitioners, community mental health workers, psychiatrists, psychologists and other private specialists) was also generated, and differences examined at each follow-up occasion according to treatment allocation using oneway ANOVAs, with Bonferroni post-hoc adjustments made on significant results. This approach was also used to examine hospitalisation rates among the sample.

Therapeutic Alliance Outcomes

After sessions one, five and ten, participants and therapists each completed a measure of therapeutic alliance (Agnew-Davies et al., 1998). Five subscales were calculated from participant and therapist responses (bond, confidence, openness, and client initiative). Oneway ANOVAs compared scores on these subscales at each administration with treatment allocation. Bonferroni post-hoc analyses more closely examined any significant differences in these scores.

1.5 Results

Characteristics of the sample at baseline

Two hundred and seventy four people were recruited to the current study. Table 1 displays demographic characteristics of the sample.

Table 1: Presenting characteristics of participants (N=274)

	Participants	
	n	%
Gender		
Males	157	57
Females	117	43
Marital Status		
Single, never married	95	35
Married/Defacto	81	30
Separated/Divorced/Widowed	71	26
Living Situation		
Alone	73	27
Parents/Relatives/Children	56	20
Partner	81	30
Friends	21	8
Current Accommodation		
Own home	77	28
Family Home	32	12
Rental (public and private)	109	40
Crisis/Temporary	17	6

Of the 274 participants, 43% were female, and the majority (n=221, 81%) were born in Australia. The majority of the sample was single, never having been married (35%), and at entry to the study were living either alone (27%), with parents or relatives (20%) or with a

partner (30%). Twenty four people (9%) identified themselves as being of Aboriginal or Torres Strait Islander descent. Over half the sample (n=160) reported having children, with family size ranging from one child (n=41, 15%), through to three (n=43, 16%) and up to seven children (n=1, 0.4%).

The mean age of the sample was 40 years (M=39.56, range 17-70 years), and, on average, participants had left school at around 16 years of age (M=16.04, range 12-19 years). After schooling, participants reported a range of additional educational experiences, gaining tertiary qualifications (n=42, 15%), and trade and technical qualifications (n=121, 44%). At entry to the study, 58% of the sample (n=159) were not in employment and were receiving either a disability pension (n=56, 20%) or unemployment benefit (n=65, 24%).

As indicated in Table 2 below, many participants reported deterioration across a range of domains in the 12-months prior to assessment. Specifically, this included obvious dysfunction in completing household activities such as cooking, cleaning, paying bills etc. due to a lack of interest or perceived incompetence in participating in these tasks.

Table 2: Disability indices of participants (N=274).

	Participants	
	n	%
Participation in Household Activities in Past 12-months		
No Dysfunction	66	24
Obvious Dysfunction	127	46
Severe Dysfunction	39	14
Overall Socialising in Past 12-months		
No Dysfunction	56	20
Obvious Dysfunction	143	52
Severe Dysfunction	46	17
Social Withdrawal in Past 12-months		
No Dysfunction	45	16
Obvious Dysfunction	165	60
Severe Dysfunction	37	14
Interpersonal Relationships in Past 12-months		
No Deterioration	57	21
Subjective Deterioration	155	57
Objective Deterioration	24	9
Intimate Relationships in Past 12-months		
No Dysfunction	169	62
Obvious Dysfunction	63	23
Severe Dysfunction	14	5

The majority of the sample reported obvious dysfunction in their social interactions over the year prior to the assessment, including reduced overall socialising, maintaining a restricted range of social contacts or friends, and only sporadic participation in any organised activities (according to the DIP, Jablensky et al., 2000). Social withdrawal was also high among the sample, with the majority of people reported obvious dysfunction in terms of generally avoidant behaviour, only mixing with people if encouraged or pressured (as per the DIP, Jablensky et al., 2000). Furthermore, intimate relationships were also dysfunctional among the sample, with the

majority reporting that, although they had close friends or intimate relationships in the past, they had not enjoyed such intimacy in the 12-months prior to assessment (as per the DIP, Jablensky et al., 2000).

Treatment History

Table 3 displays the previous treatment participation rates of the sample as reported at the baseline assessment.

Table 3: Treatment history of participants in the 12-months prior to baseline (N=274).

	Participants	
	n	%
Alcohol/other Drug Treatment in past 12 months	108	39
Methadone program	10	9
Buprenorphine program	2	2
Other alcohol/other drug medication	13	12
Detoxification program	33	31
Drug free counseling	36	33
Therapeutic community	37	34
Alcoholics Anonymous	12	11
Narcotics Anonymous	5	5
Current psychiatric medication	154	57
Antidepressant	134	87
Antipsychotic	20	13
Taken as prescribed?	108	70
No impairment due to side effects	70	45
At least mild impairment due to side effects	84	56
	Mean (Range)	S.D.
Weeks on current psychiatric medication (n=154)	84.64 (1-780)	131.79
Appointments with Health Professionals in Past 12-months		
Community Mental Health Team	1.85 (0-50)	5.76
General Practitioner	7.90 (0-52)	10.60
Specialist Medical Practitioner	0.80 (0-20)	2.12
Psychiatrist	0.50 (0-20)	2.07
Psychologist	0.69 (0-35)	3.40
Inpatient admissions in past 12-months	0.66 (0-10)	1.36

Participants reported participation in a range of treatments for AOD use and depression. For example, over half the sample (57%) was currently taking medication for a psychiatric condition, most often an antidepressant (87%). Of these, 84 people (56%) reported at least mild impairment due to the side effects of this medication, and 70% reported taking their medication as it was prescribed.

As indicated in Table 3, treatment utilisation among the sample was generally low, with the most common form of treatment being medication. This is despite the eligibility criteria of the current study limiting participation to people with moderate current levels of depressive symptomatology and hazardous use of substances. Although on a few occasions, antipsychotic medication was prescribed, it was not being used to treat psychotic symptoms. Rather, participants reported using the antipsychotic medication for its sedative properties.

The sample on average had visited a general practitioner (GP) eight times in the previous 12-month period. However, around one-quarter of the sample had made two or fewer visits to the GP in the prior 12-months, including 11% (n=29) who had not visited the GP at all. Specialists were accessed less frequently, with around 77% (n=210) of the sample reporting no visits to a psychiatrist in the previous 12-months, and approximately 75% (n=206) reporting no visits to a psychologist. Community mental health teams had been visited an average of two times in the previous 12-month period, with 169 participants (62%) reported no visits at all during this time.

Less than half of the sample reported participation in treatment for AOD use in the past 12-months, despite each participant meeting criteria for harmful use of alcohol or cannabis at entry to the study. Of these participants, 9% (n=10/108) were currently enrolled in a methadone maintenance program, a further 36 (33%) reported receiving drug free counselling, and 12 people (11%) were engaged with Alcoholics Anonymous. Thirty-three people reported involvement in detoxification (n=33/108, 31%) at entry to the study. Apart from methadone, pharmacotherapy for AOD use (e.g. campral, naltrexone, acamprosoate etc.) was reported 13 study participants (12%) with 2 participants using buprenorphine in the past 12-months (2%).

Depression

For the 12-months prior to assessment, 172 participants (63%) met criteria for a major depressive episode according to DSM-IV criteria, and 74% of participants (n=202) met criteria for lifetime major depressive disorder. Current levels of depression were high among the study sample, with mean BDI-II scores in the severe range of symptomatology (M=32.01, S.D.=9.27, range 17-59). On average, participants reported first experiencing a depressive episode at age 21 (M=21.43, S.D.=13.02, Range=12-58). In considering their history of depression and alcohol/other drug use, 10% of participants and therapists rated themselves as having a substance-induced depression (primary substance use disorder), with 61% being rated as having an independent depressive disorder (primary depressive disorder), and 29% being unable to have a primacy established due to the participant's two conditions always co-occurring, with very few (if any) periods of abstinence from alcohol/other drugs. For their current episode of depression/AOD use that brought participants to the study, 24% were rated as having a substance-induced depressive episode, 36% an independent depressive episode, and 46% as being difficult to determine primacy.

Alcohol/other drug use

Previous 12-month rates of alcohol dependence were: 64% (n=174) for alcohol and 30% for cannabis dependence (n=83). Lifetime rates of alcohol and cannabis dependence were similar, with 71% (n=195) of participants meeting criteria for alcohol dependence, and 38% (n=104) meeting criteria for cannabis dependence. Most participants who met abuse criteria for cannabis or alcohol, also went on to meet criteria for dependence on these drugs. Six percent (n=16) met criteria for alcohol abuse alone in the 12-month prior to baseline (n=18, 7% for lifetime abuse) and 6% (n=16) met abuse criteria alone for cannabis use over the same time period (n=20, 7%).

Current level of use of alcohol, cannabis, amphetamines and tobacco was also assessed for the month prior to assessment. These results are displayed in Table 5.6.

Table 4: Levels of use of alcohol, cannabis, amphetamines and tobacco at baseline assessment (N=274).

	Participants	
	Mean (Range)	S.D.
OTI q-score[+]		
Alcohol	7.86 (0-68)	8.70
Cannabis	5.19 (0-100)	12.56
Amphetamines	0.15 (0-7.67)	0.80
Tobacco	12.79 (0-55)	12.55
Poly-drug use Score[~]	2.46 (0-8)	1.17

[+]Opiate Treatment Index (Darke et al., 1991) quotient score, indicating average daily use over the month prior to assessment. 0.14=once weekly use, 1=once daily use, 2=twice daily use, etc.
[~]Poly-drug use calculated by summing the number of drug classes (including alcohol and tobacco) the participant used in the month prior to assessment.

As indicated in Table 4, the sample was drinking an average of eight standard drinks per day for the month prior to assessment. Cannabis use occurred at a mean rate of five times (joint/bongs) daily for the previous month, while amphetamine usage was approximately once weekly among the study sample. Participants reported smoking an average of 13 cigarettes per day, while poly-drug use for the month prior to assessment was almost two, indicating people used an average of two substances over the previous month.

A hazardous use index score was also calculated, which estimated the number of day equivalents in the previous 28-day period participants used a range of ten drug types at harmful levels (range 0-280). Among this study sample, participants reported an average hazardous use index of 35 days (M=34.62, S.D.= 16.36, range 4-93) for the previous 28-day period to assessment.

ALCOHOL USE

One hundred and sixty eight participants (62%) met criteria for harmful use of alcohol at entry to the study, comprising 88 males and 80 females. Among these respondents, scores on the AUDIT questionnaire were, on average, 27.09 (S.D.=8.72, range=2-68), corresponding to a threshold score of alcohol dependence. This sub-sample were consuming an average of 11 standard drinks per day for the month prior to assessment (M(OTI score)=11.30, S.D.=7.55), with levels of alcohol use ranging from two to 68 standard drinks per day for the prior month.

Reasons for using alcohol were also explored among the sub-group of participants meeting criteria for hazardous use. These results are displayed in Table 5. The most commonly cited reason for using alcohol was as a coping mechanism, followed closely by enjoyment and social motives.

Table 5: Drug use motives at baseline

	Participants	
	Mean	S.D.
Alcohol use motives (n=168)[+]		
Social	3.65	0.83
Coping	3.97	0.69
Pleasure Enhancement	3.52	0.81
Illness	2.96	0.71
Cannabis use motives (n=109) [+]		
Social	2.92	0.97
Coping	3.84	1.84
Pleasure Enhancement	3.60	0.85
Illness	3.27	4.29

[+] A score of 1=almost never, 2=never, 3=sometimes, 4=often, 5=always

CANNABIS USE

One hundred and nine participants in the study (n=40%) met criteria for harmful use of cannabis at assessment, including 71 males and 38 females. This sub-group were consuming cannabis at high levels for the month prior to assessment, reporting an average of 12 use occasions per day (M=11.92, S.D.=16.82). The range of cannabis use in the preceding month was quite varied for these 109 participants, whose self-reported use ranged from weekly (OTI score of 0.14) through to 100 use occasions per day.

Table 5 displays the motives people within this sub-group gave for using cannabis. Cannabis was most often used as a coping strategy, followed closely for reasons such as enjoyment (or to enhance mood) or to cope with symptoms of depression.

Depression Outcomes

MAJOR DEPRESSIVE DISORDER

One-third of the PCT (Control) condition met criteria for major depressive disorder at the six-month follow-up assessment. This rate was similar to that reported in the two SHADE therapy conditions at this follow-up timepoint. At the 12-month assessment, rates for each treatment group remained relatively stable, and chi-squared analysis revealed no significant differences existed in rates of major depression between the treatment groups at either the six-month (χ^2_4=1.574, p=0.813) or 12-month (χ^2_4=6.521, p=0.163) follow-up assessments. Table 6 displays these data in more detail.

Table 6 Rates of major depressive disorder at the six- and 12-month follow-up assessments, according to treatment allocation.

	Assessment Occasion			
	6-months*		12-months+	
	n	%	n	%
Treatment Allocation				
Therapist-delivered SHADE therapy	17/52	33	17/57	30
Computer-delivered SHADE therapy	24/58	41	19/57	33
PCT (Control)	19/50	38	16/49	33

*Refers to the period of time between the initial and six-month assessments
+Refers to the period of time between the six- and 12-month assessments

CURRENT DEPRESSION

Current levels of depression were measured using the BDI-II at each assessment timepoint. Changes in BDI-II scores are displayed in Figure 1 and Table 7.

Table 7 Mean BDI-II scores, according to treatment allocation.

	Assessment Occasion							
	Initial		Post-treatment		6-months		12-months	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Treatment Allocation								
Therapist-delivered SHADE therapy	34.19	8.95	21.86	11.48	18.76	12.05	20.64	16.17
Computer-delivered SHADE therapy	31.66	8.27	19.22	12.89	20.34	11.42	20.95	10.39
PCT (Control)	28.86	6.70	21.36	11.60	19.36	13.44	18.57	11.95

BDI-II scores were in the severe range for the group at the initial assessment (threshold score for severe=28) across the treatment conditions. In general, scores decreased for the group as a whole over the follow-up period, relative to this baseline score. There was a significant main effect for time ($F(3,324)=51.359$, $p=0.000$), with Bonferroni post-hoc tests indicating that across the treatment conditions, participants reported significantly lower BDI-II scores relative to baseline at the post-treatment, 6-month and 12-month follow-up assessments ($F(3,324)=46.14$, $p=0.000$).

SHADE therapy – therapist participants reported a 12-point reduction on the BDI-II at the post-treatment assessment relative to baseline, a 15-point reduction at six-months and a 14-point reduction at 12-month follow-up. Similarly, participants in the SHADE therapy – computer condition recorded a 12-point reduction in BDI-II scores at post-treatment, and approximately 11-points for the six- and 12-month follow-up assessments. PCT (control) group participants additionally reported an eight-point reduction at post-treatment, and 10-points at six- and 12-months. At 12-months, all three treatment groups reported an average depression score in the moderate range; a reduction from the baseline average of severe. Repeated measures ANOVA indicated that the change in BDI-II scores was not significantly different across the treatment groups ($F(6,324)=1.382$, $p=0.221$).

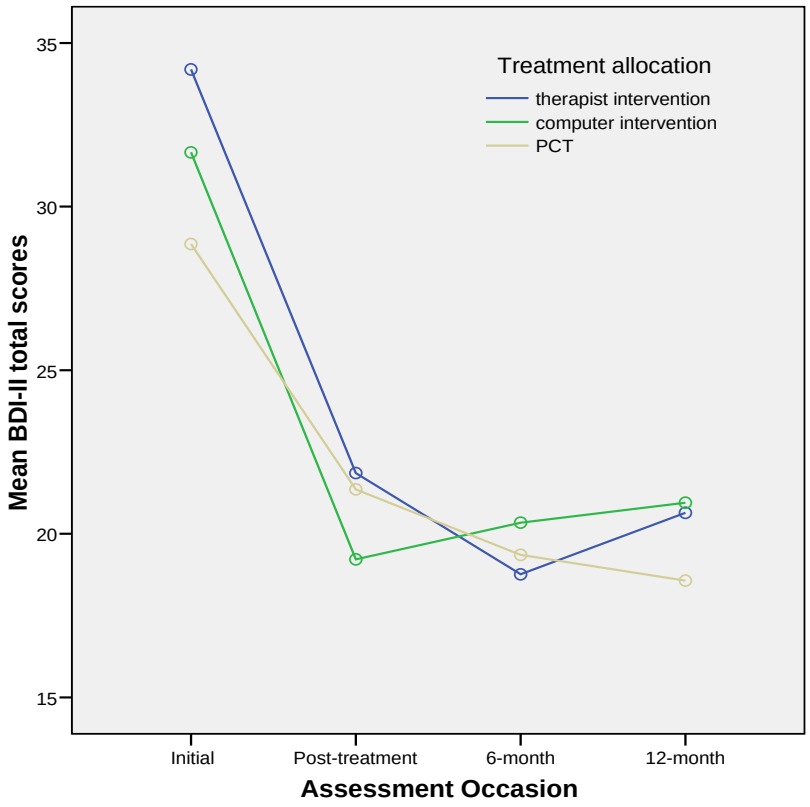

Figure 1: Mean BDI-II scores over time and according to treatment allocation

COGNITIVE VULNERABILITY TO DEPRESSION

Scores on the Dysfunction Attitude Scale (DAS) were added together to form a total score. The mean and standard deviations of the DAS total scores are displayed in Table 8 according to treatment allocation at each follow-up assessment.

Table 8 Mean Dysfunction Attitude Scale total scores in the month prior to assessment, according to treatment allocation.

	Assessment Occasion							
	Initial		Post-treatment		6-months		12-months	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Treatment Allocation								
Therapist-delivered SHADE therapy	153.42	33.02	136.03	38.84	133.77	39.27	130.49	37.49
Computer-delivered SHADE therapy	152.26	28.30	135.13	33.35	133.05	30.51	131.97	33.43
PCT (Control)	144.78	30.79	138.06	35.26	135.77	34.37	137.64	40.95

DAS total scores decreased gradually for the sample as a whole over time. Figure 2 displays these data.

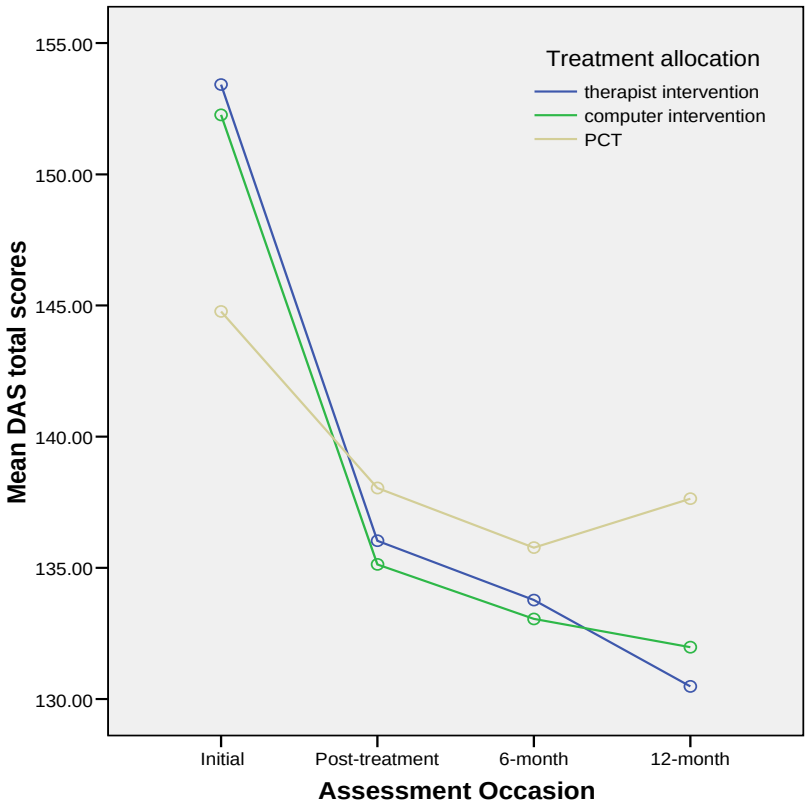

Figure 2 Mean Dysfunctional Attitude Scale (DAS) total scores over time and according to treatment allocation. Note that the range of potential scores on the DAS is 0 to 280.

Repeated measures ANOVA indicated a significant decrease in DAS total scores occurred for the sample over time ($F(3,264)=11.3777$, $p=0.000$). Bonferroni follow-up tests indicated that the post-treatment, six-month and 12-month follow-up assessment DAS total scores were significantly less than the initial assessment ($F(3,264)=8.733$, $p=0.000$). There was no significant difference in changes in DAS scores over time according to treatment allocation ($F(6,264)=0.701$, $p=0.649$). However, participants in the PCT (Control) recorded a 7-point reduction in DAS scores, relative to the SHADE therapy – computer group who reported a 20-point reduction and the SHADE therapy – therapist group who reported a 23-point reduction in DAS scores at 12-months relative to baseline.

SUICIDALITY

Beck Hopeless Scale total scores were calculated for the entire sample at each assessment occasion, with lower scores indicating increased suicidality and hopelessness. As indicated in Figure 3, BHS total scores increased over the course of the study, from an average of 8.95 at baseline, through to an average of 12.82 for the whole sample at the 12-month follow-up assessment.

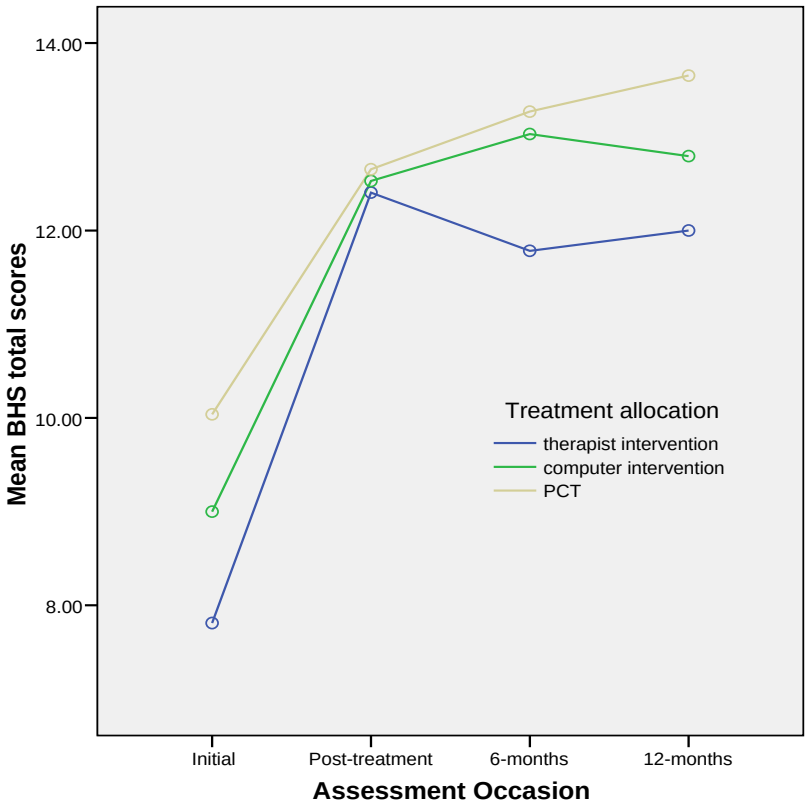

Figure 3 Mean hopeless scores (BHS) over time and according to treatment allocation.

Repeated measures ANOVA indicated that changes in BHS total scores were statistically significant for the group as a whole over time ($F(3,282)=19.816$, $p=0.000$). Bonferroni follow-up tests indicated that the post-treatment, six- and 12-month BHS average total scores were each significantly higher for the sample relative to the baseline BHS scores ($F(3,282)=18.080$, $p=0.000$). The means and standard deviations associated with BHS total scores are displayed at each assessment timepoint in Table 9. Repeated measures ANOVA indicated no significant treatment effects were associated with changes in BHS scores over time ($F(6,282)=0.365$, $p=0.901$).

Table 9 Mean Beck Hopelessness Scale total scores in the month prior to assessment, according to treatment allocation.

	Assessment Occasion							
	Initial		Post-treatment		6-months		12-months	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Treatment Allocation								
Therapist-delivered SHADE therapy	7.81	5.765	12.41	5.81	11.78	6.17	12.00	6.70
Computer-delivered SHADE therapy	9.00	5.18	12.53	5.33	13.03	5.15	12.79	5.66
PCT (Control)	10.04	5.61	12.65	5.40	13.27	5.47	13.65	5.56

Alcohol/other drug use Outcomes

ALCOHOL USE OUTCOMES

This section describes the alcohol use outcomes for people completing each phase of assessment, who met criteria for problematic use of alcohol at the initial assessment (n=76). Table 10 displays the mean alcohol use levels of this sub-group according to treatment allocation.

Table 9 Mean daily alcohol use* in the month prior to assessment, according to treatment allocation. Note that this only includes those people meeting criteria for problematic alcohol use at entry to the study (n=76).

	Assessment Occasion							
	Initial		Post-treatment		6-months		12-months	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Treatment Allocation								
Therapist-delivered SHADE therapy	10.66	6.70	5.23	6.13	4.43	5.41	4.23	4.85
Computer-delivered SHADE therapy	12.67	7.56	4.03	6.24	6.15	5.80	6.35	10.30
PCT (Control)	8.95	6.13	5.21	4.30	4.19	4.26	6.13	6.67

*A score of 1 equates to once daily use over the month prior to survey. A score of 2 equates to two standard drinks per day, 3 to three standard drinks per day, etc.

At baseline, the sub-group of participants meeting criteria for harmful alcohol use reported drinking between nine and 13 standard drinks per day for the month prior to assessment. By the 12-month follow-up, the sample as a whole reduced their level of alcohol consumption and reported drinking by five-six standard drinks per day on average. Repeated measures ANOVA revealed that this reduction over the course of the assessment was statistically significant ($F(1,73)=24.717$, $p=0.000$). Bonferroni follow-up tests indicated specifically that levels of alcohol use were significantly lower at each of the follow-up assessments, relative to baseline ($F(3,73)=14.971$, $p=0.000$). Figure 4 displays these data below.

A trend emerged for increased reduction in alcohol use over time, as a function of treatment allocation, in favour of computer-based treatment at the post-treatment assessment. Participants in the therapist-delivered SHADE therapy group reported reduced their alcohol intake by, on average, five standard drinks at the post-treatment assessment, and six standard drinks at the six- and 12-month follow-up assessments. Computer-delivered SHADE participants reduced their drinking by nine standard drinks per day, on average, by the post-treatment assessment, seven per day at six-months and six drinks per day at 12-months. The PCT (control) group experienced a four-drink per day reduction in alcohol use at the post-treatment assessment, five drinks per day at six-months, and three drinks per day at the 12-month assessment. Repeated measures ANOVA revealed that this pattern of change was not statistically significant (cubic: $F(2,73)=3.074$, $p=0.050$). Interestingly, alcohol use increased for both computer-delivered SHADE and PCT (control) participants over the six- and 12-month follow-up periods relative to therapist-delivered SHADE participants, although this was not statistically significant and levels of use of alcohol remained significantly lower than that reported at baseline for all three treatment groups.

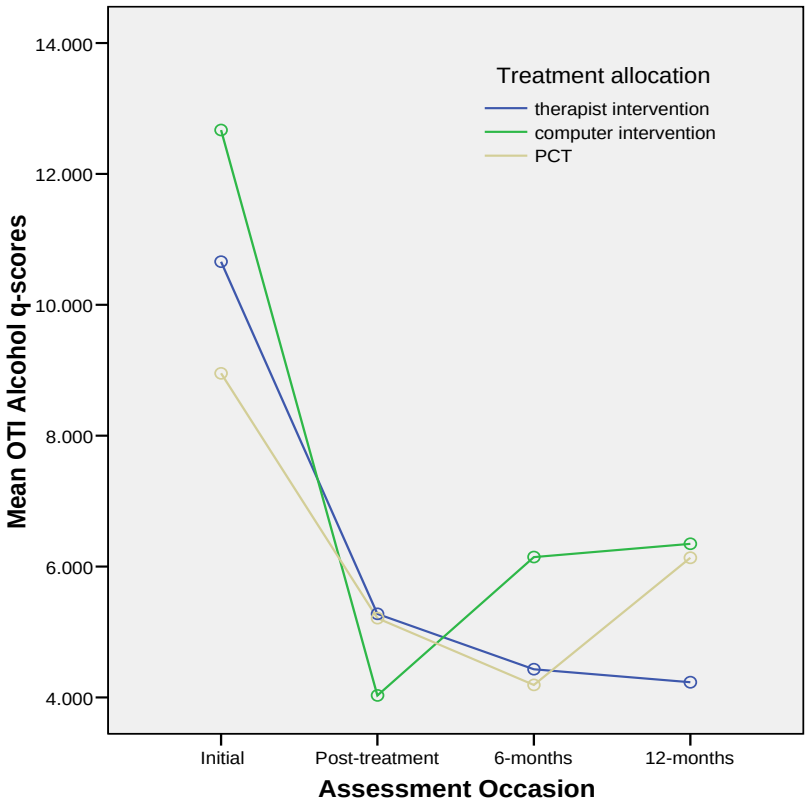

Figure 4 Mean daily alcohol use over time and according to treatment allocation. Note that these data include only those people meeting criteria for harmful alcohol use at entry to the study and who completed all assessments.

Total scores on the AUDIT were calculated at each assessment timepoint for people meeting criteria for harmful use of alcohol at entry to the study. Figure 5 displays this information, according to treatment allocation.

AUDIT scores at baseline for this sub-group were high, indicating likely alcohol abuse/dependence for the 12-months prior to assessment (i.e. scores of 19 or greater indicate likely abuse/dependence). In general, AUDIT scores decreased over the follow-up assessments for each of the treatment groups. Repeated measures ANOVA revealed that the reductions in AUDIT scores for the sample as a whole over time was statistically significant ($F(1,65)=45.116$, $p=0.000$), but the interaction between changes in AUDIT scores over time and treatment allocation was not significant ($F(2,65)=1.348$, $p=0.267$). Bonferroni follow-up tests indicated that AUDIT scores at the post-treatment, six-month and 12-month ($F(3,63)=15.074$, $p=0.000$) follow-up assessment were each significantly lower than the initial assessment occasion.

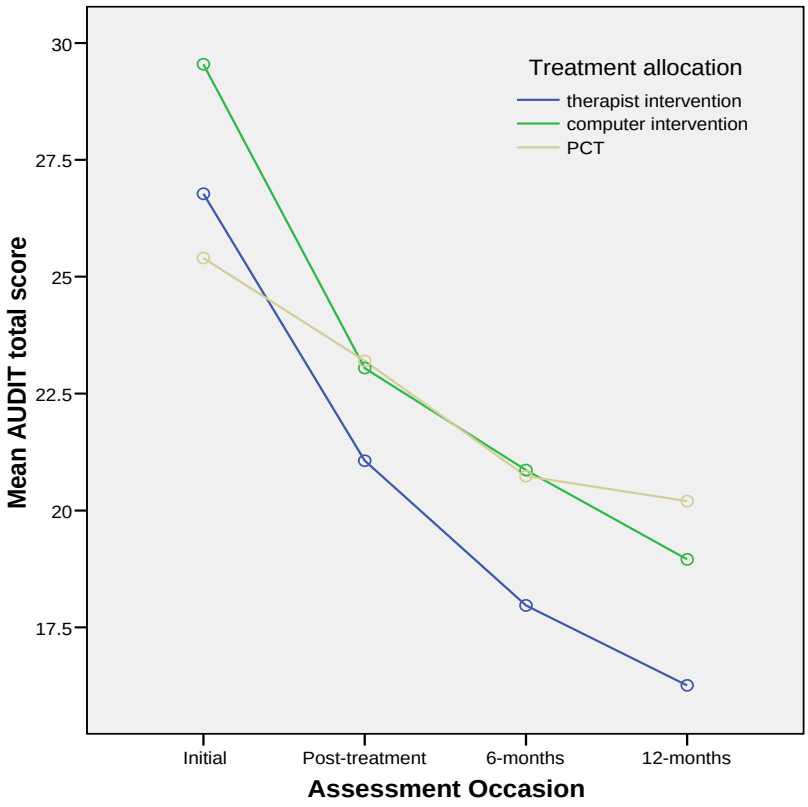

Figure 5 Mean AUDIT scores over time and according to treatment allocation. Note that these data only include those participants meeting criteria for harmful use of alcohol at the initial assessment.

Table 10 displays the mean and standard deviations associated with these AUDIT scores over time.

Table 10 Mean AUDIT* scores in the month prior to assessment, according to treatment allocation. Note that these data only include those participants meeting criteria for harmful use of alcohol at the initial assessment, who completed all assessments (n=76).

	Assessment Occasion							
	Initial		Post-treatment		6-months		12-months	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Treatment Allocation								
Therapist-delivered SHADE therapy	26.77	7.22	21.06	9.75	17.97	9.55	16.26	9.25
Computer-delivered SHADE therapy	29.55	5.71	23.05	9.17	20.86	10.43	18.95	11.34
PCT (Control)	25.40	6.63	23.20	6.56	20.73	7.89	20.20	10.95

*A score above 19 indicates likely alcohol abuse or dependence.

Participants in the two SHADE treatment conditions (therapist-delivered and computer-delivered SHADE) reported an 11-point reduction in AUDIT total scores at the 12-month assessment. In contrast, PCT (control) participants reported a five-point reduction over the same time period, although this difference was not statistically significant. At 12-months,

participants in the therapist- and computer-delivered SHADE treatment groups were, on average, below the threshold for likely alcohol abuse/dependence (score of 19), with PCT (control) group participants remaining above this threshold at 12-month follow-up.

Alcohol-use status was calculated at each follow-up point, in terms of those who reported abstinence, those who continued to drink within recommended safe guidelines (4 standard drinks per day for men, 2 for women, with 2 alcohol free days per week), and those using above this safe threshold (see Table 10). There was a trend (non-significant) for higher rates of abstinence among computer-delivered participants at the post-treatment assessment (χ^2_4=9.400, p=0.052), with over one-quarter of this group reporting abstinence compared with 5% and 17% in the therapist-delivered and PCT groups respectively. This trend had disappeared by the six- and 12-month assessments, with rates of abstinence from alcohol at between 16-19%. Importantly, only between one third and 44% of sample remained above the threshold for hazardous use of alcohol at the 12-month assessment timepoint.

Table 10 Alcohol use status according to treatment allocation.

	Treatment Allocation					
	Therapist-delivered SHADE		Computer-delivered SHADE		PCT (Control)	
	n	%	n	%	n	%
Post-treatment Follow-up						
Abstinent	3	5	15	26	8	17
Using – below threshold	25	45	22	39	19	40
Using above threshold	28	50	20	35	20	43
6-month Follow-up						
Abstinent	9	17	10	17	9	19
Using – below threshold	21	39	27	46	21	45
Using above threshold	24	44	22	37	17	36
12-month Follow-up						
Abstinent	9	16	10	18	9	19
Using – below threshold	30	52	21	38	22	46
Using above threshold	19	33	24	44	17	35

CANNABIS USE OUTCOMES

The analyses in this section include only this sub-group of participants who met criteria for harmful use of cannabis at entry to the study. Table 11 displays the mean levels of cannabis use for those participants meeting criteria for hazardous use of cannabis at entry to the study over the follow-up assessment period.

Levels of cannabis use at baseline were high, with participants across the treatment conditions reporting an average of between nine and 17 use occasions per day in the month prior to assessment. Despite the apparent differences between the study groups in cannabis use at the initial assessment, oneway ANOVA revealed no significant differences existed ($F(2,108)=2.672$, $p=0.074$).

Table 11 Mean daily cannabis use* in the month prior to assessment, according to treatment allocation, meeting criteria for hazardous cannabis use at entry to the study.

	Assessment Occasion							
	Initial		3-months		6-months		12-months	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Treatment Allocation								
Therapist-delivered SHADE therapy	9.14	9.61	4.16	7.24	2.34	3.49	3.60	5.21
Computer-delivered SHADE therapy	16.99	25.73	13.72	24.14	15.29	18.92	13.01	25.45
PCT (Control)	12.14	13.86	13.39	18.27	14.02	22.66	8.15	14.14

*A score of 1 equates to once daily use on average over the month prior to survey. A score of 2 equates to two use occasions per day, 3 to three use occasions per day, etc.

Repeated measures ANOVA indicated no significant differences in cannabis use over time, or according to treatment allocation. Those in the PCT (control) condition and in the computer-delivered SHADE treatment, reported a four-point reduction in cannabis use occasions per day at the 12-month follow-up assessment, relative to baseline. This was despite increases in daily cannabis use reported by PCT (control) participants at post-treatment and six-month assessments (see Figure 6).

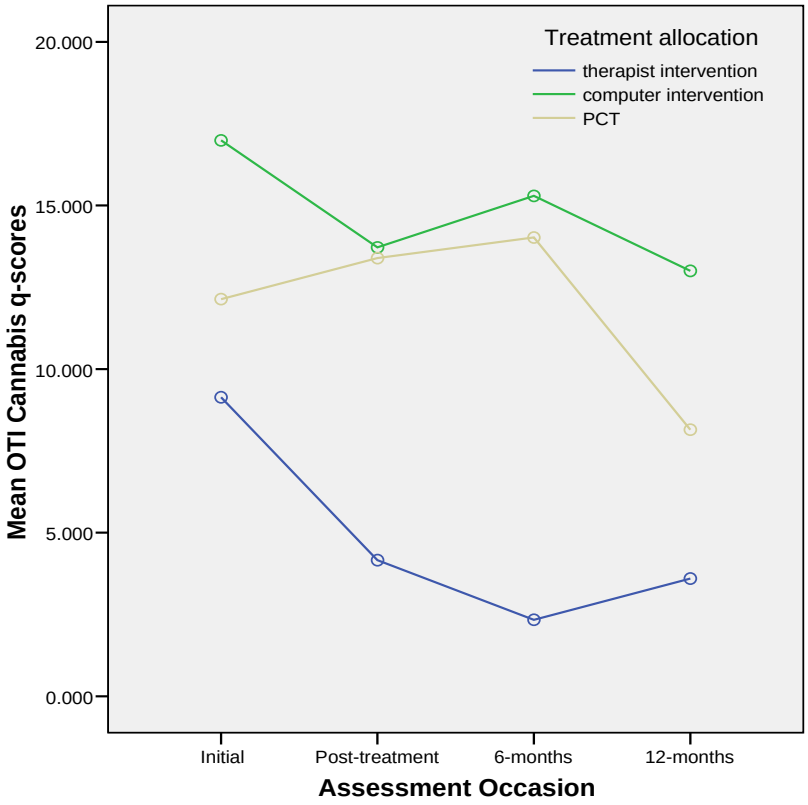

Figure 6 Mean daily cannabis use over time and according to treatment allocation. Note that these data only include those participants who met threshold criteria for harmful use of cannabis at entry to the study.

Participants in the therapist-delivered SHADE condition experienced a six-point reduction in daily cannabis use over the same time period. It is important to note that despite these

reductions, cannabis use for this sub-group of participants, particularly those in the computer-delivered and PCT (control) conditions remained at a level indicating daily use of between 8 and 13 times in the month prior to the 12-month assessment.

Cannabis-use status was calculated at each follow-up point, in terms of those who reported abstinence, those who continued to use below the threshold for entry to the study (i.e. weekly use of cannabis), and those using above this threshold (see Table 12). Rates of abstinence from cannabis appeared higher among participants in the therapist-delivered SHADE condition at each of the follow-up occasions (i.e. range 69-74% compared with 51-64% among computer-delivered participants and 60-70% for PCT (controls)). However, these differences were not statistically significant (e.g. post-treatment: χ^2_4=5.333, p=0.255 six-month: χ^2_4=6.334, p=0.176 12-month: χ^2_4=4.676, p=0.322). Importantly, only between 23-33% of the sample remained above the threshold for hazardous use of cannabis at the 12-month assessment timepoint.

Table 12 Cannabis use status according to treatment allocation.

	Treatment Allocation					
	Therapist-delivered SHADE		Computer-delivered SHADE		PCT (Control)	
	n	%	n	%	n	%
Post-treatment Follow-up						
Abstinent	38	69	32	55	28	60
Using – below threshold	2	4	0	0	1	2
Using above threshold	15	27	26	45	18	38
6-month Follow-up						
Abstinent	38	70	30	51	31	66
Using – below threshold	2	4	1	2	1	2
Using above threshold	14	26	28	48	15	32
12-month Follow-up						
Abstinent	42	74	35	64	33	70
Using – below threshold	0	0	2	4	3	6
Using above threshold	15	26	18	33	11	23

OTHER ALCOHOL/OTHER DRUG USE OUTCOMES

The number of drug classes in the month prior to assessment (poly-drug use) was calculated at each assessment occasion. The mean poly-drug use scores for the sample are displayed in Table 13.

Table 13 Mean poly-drug use in the month prior to assessment, according to treatment allocation.

	Assessment Occasion							
	Initial		3-months		6-months		12-months	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Treatment Allocation								
Therapist-delivered SHADE therapy	2.07	1.01	1.88	1.05	1.72	0.93	1.70	0.96
Computer-delivered SHADE therapy	2.64	1.06	2.02	1.05	2.21	1.07	1.90	1.08
PCT (Control)	2.45	1.06	2.24	1.30	1.79	1.11	2.00	1.04

From a clinical perspective, poly-drug use remained relatively constant over the course of the study, with participants in this sub-group reporting using between two and three substances in the month prior to each assessment. However, repeated measures ANOVA indicated a significant reduction in poly-drug use was evidence across the treatment conditions over the follow-up time period (F(3,333)=26.650, p=0.000). Bonferroni post-hoc tests revealed that at each follow-up assessment (post-treatment, six- 12-months), participants reported significantly lower poly-drug use than at baseline, however in reality, this difference varied between 0.19 and 0.74 drugs.

An aggregate score was calculated for the number of days in the previous month participants used a range of ten substances at hazardous levels. Figure 7 displays the mean hazardous use aggregate scores over time, according to treatment allocation.

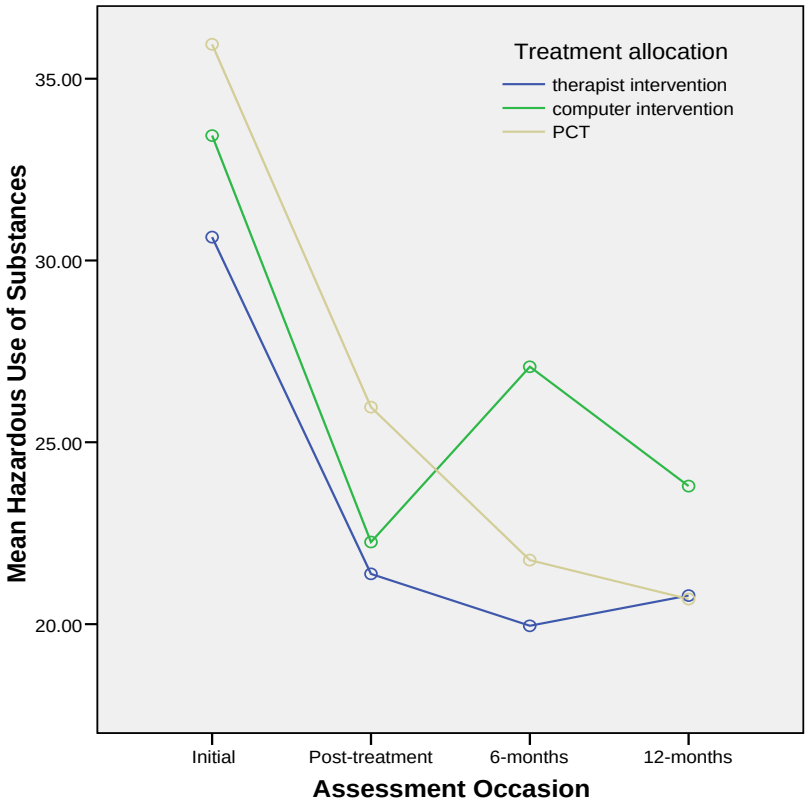

Figure 7 Mean hazardous use aggregate scores use over time and according to treatment allocation.

At the 12-month follow-up assessment, participants in the therapist- and computer-delivered SHADE treatment groups reported a 10-point reduction in the number of days in the previous month on which they used substances at a hazardous level. PCT (control) group participants reported a 15-point reduction over the same time period, however there was no significant differences between treatment groups across these assessment timepoints (F(6,321)=1.246, p=0.282). In general, participants did report significant reductions in hazardous use over time (F(3,321)=38.640, p=0.000), with Bonferroni post-hoc tests indicating that participants reported reduced hazardous use days at each of the follow-up assessment occasions relative to baseline (F(3,321)=15.566, p=0.000). The means and standard deviations corresponding to these data are displayed in Table 14.

Table 14 Mean hazardous use aggregate scores* for the month prior to assessment, according to treatment allocation.

	Assessment Occasion							
	Initial		3-months		6-months		12-months	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Treatment Allocation								
Therapist-delivered SHADE therapy	30.64	11.21	21.38	15.73	19.95	17.01	20.79	18.32
Computer-delivered SHADE therapy	33.44	13.58	22.26	18.29	27.08	19.17	23.79	17.98
PCT (Control)	35.95	16.16	25.97	19.59	21.76	18.19	20.69	14.27

* Range 0-280 days.

Other Outcomes

GENERAL FUNCTIONING OUTCOMES

General functioning was assessed at each follow-up occasion via the Global Assessment of Functioning (GAF). Changes in GAF scores over time are displayed in Figure 8.

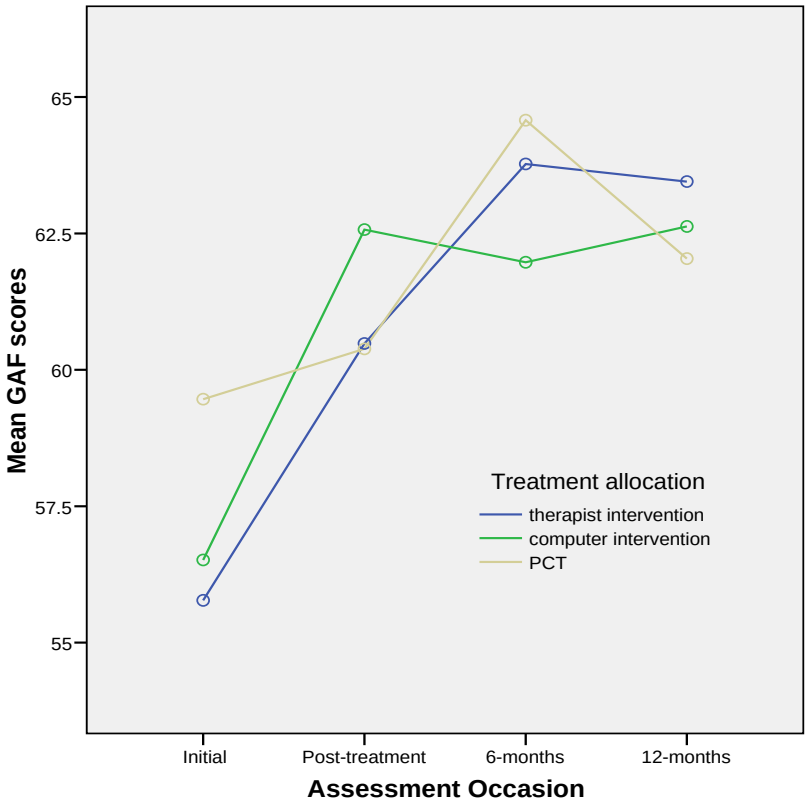

Figure 8 Mean Global Assessment of Functioning (GAF) scores over time and according to treatment allocation. Note that scores on the GAF can range from 0-100.

GAF scores in both the therapist- and computer-delivered SHADE therapy conditions increased fairly uniformly across the assessments, increasing by between five and eight points on the rating scale between the initial and follow-up assessments. In contrast, GAF scores for the PCT (control) group increased by 1-point at post-treatment, by five points at 6-months and by three-points at 12-month assessments. However, there were no significant differences between treatment groups over time on this variable ($F(6,267)=0.760$, $p=0.602$). Repeated measures

ANOVA did indicate that the sample as a whole reported significantly improved GAF scores over time ($F(3,267)=7.660$, $p=0.000$), such that participants at each follow-up assessment reported significantly higher GAF scores than at baseline (Bonferroni adjustment: $F(3,267)=6.243$, $p=0.000$). These data are also displayed in Table 15.

Table 15 Mean Global Assessment of Functioning* in the month prior to assessment, according to treatment allocation.

	Assessment Occasion							
	Initial		3-months		6-months		12-months	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Treatment Allocation								
Therapist-delivered SHADE therapy	55.77	9.74	60.48	12.96	63.77	15.50	63.45	14.08
Computer-delivered SHADE therapy	56.51	9.46	62.57	11.19	61.97	10.44	62.63	11.41
PCT (Control)	59.46	10.61	60.38	11.64	64.58	12.34	62.04	12.15

*Higher scores indicate better functioning.

TREATMENT UTILISATION OUTCOMES

Treatment utilisation was assessed across several domains. Table 16 displays the rates of medication reported by participants at the 12-month assessment timepoint. Rates of medication were similar for all participants across treatment conditions, with around 50% reporting current use of psychiatric medication ($\chi^2_2=0.860$, $p=0.650$).

Table 16 Rates of medication reported by participants, according to treatment allocation.

	Treatment Allocation					
	Therapist-delivered SHADE		Computer-delivered SHADE		PCT (Control)	
	n	%	n	%	n	%
Current psychiatric medication	32	56	28	49	24	48
Compliant with current medication	21	66	19	70	16	67
Time on current medication						
52 weeks or less (in last 12-months)	6	19	9	32	11	46
53 weeks or more	26	81	19	68	13	54

At the 12-month assessment, participants reported roughly equal rates of compliance with their prescribed psychiatric medication, with chi-square analysis indicating no significant differences between the three treatment conditions ($\chi^2_2=0.160$, $p=0.923$). Around 19% of therapist-delivered SHADE participants had commenced psychiatric medication in the time since starting with the study, compared with 32% of computer-delivered SHADE participants and 46% of those in the PCT (control) group. However, these apparent differences were not statistically significant ($\chi^2_2=4.735$, $p=0.094$).

Participation in treatment for AOD use was also recorded at 12-month follow-up, with 33% (n=19) therapist-delivered SHADE participants reporting current involvement in AOD treatment, compared with 37% (n=21) computer-delivered SHADE participants and 36% (n=18) of PCT (controls). Chi-squared analysis indicated that these differences were not statistically significant ($\chi^2_2=0.166$, $p=0.920$). Of those participants reporting current AOD treatment at 12-months, the most common forms of treatment were AOD medication (n=10) and attendance at Alcoholics Anonymous (n=10).

Involvement with other health professionals was assessed at the 12-month follow-up timepoint. Table 17 displays the number of visits to health professionals according to treatment allocation. Note that rates of health professional involvement refer to the six-month period between the six- and 12-month follow-up timepoints.

Table 17 Mean number of visits to health professionals over a six-month period, according to treatment allocation.

	12-month Assessment Occasion			
	Mean	S.D.	Range	p
GENERAL PRACTITIONER				
Therapist-delivered SHADE therapy	6.74	9.10	0-50	
Computer-delivered SHADE therapy	8.70	10.28	0-50	0.541
PCT (Control)	7.62	8.86	0-52	
PSYCHIATRIST				
Therapist-delivered SHADE therapy	0.16	0.97	0-7	
Computer-delivered SHADE therapy	0.60	2.23	0-12	0.278
PCT (Control)	1.50	7.34	0-50	
PSYCHOLOGIST				
Therapist-delivered SHADE therapy	0.46	1.94	0-12	
Computer-delivered SHADE therapy	0.27	1.42	0-10	0.492
PCT (Control)	1.06	5.74	0-40	
MENTAL HEALTH TEAM				
Therapist-delivered SHADE therapy	2.02	5.39	0-30	
Computer-delivered SHADE therapy	3.58	9.85	0-60	0.193
PCT (Control)	1.08	5.11	0-35	
HOSPITALISATIONS				
Therapist-delivered SHADE therapy	0.44	1.00	0-6	
Computer-delivered SHADE therapy	0.65	1.06	0-6	0.542
PCT (Control)	0.54	0.97	0-4	

Participants had most contact with a general practitioner (GP) over the course of the study, and no significant differences existed at any of the timepoints in the number of visits each treatment group made to GPs, psychiatrists, psychologists or mental health teams. Rates of access of GPs were still quite low for the sample, with 31% of the sample having two or fewer visits to the GP over this time period, including 10% having no contact at all. Ninety-one and 93% of the sample at 12-months reported no contact with a psychiatrist or psychologist respectively, and around 77% still had no contact with a mental health team at this timepoint. In addition, at 12-month follow-up, participants reported psychiatric hospitalisations relatively infrequently across the treatment conditions, on average between 0.44 and 0.65 admissions. No significant differences were reported in rates of access of health professionals or hospitalisations according to treatment allocation.

Therapeutic Alliance Outcomes

Therapeutic alliance was rated by participants and therapists across the treatment conditions after sessions one, five and ten of therapy. Responses on the questionnaire were divided into four subscales: Confidence, Client Initiative, Openness and Bond. Table 18 displays the mean and standard deviations for each of these subscales, from both participant and clinician perspectives for each of the treatment conditions.

As indicated in Table 18, no differences were evident in therapeutic alliance at session one as a function of treatment modality. Several client-rated significant differences emerged over sessions five and 10, on the subscales of client initiative (session 5), openness (session10), and bond (sessions 5 and 10). For example, clients rated their initiative in treatment significantly lower in the therapist-delivered SHADE treatment relative to the PCT (control) group ($F(2,103)=5.398$, $p=0.006$). Therapist-delivered participants rated their openness in treatment significantly more highly than computer-delivered participants at session 10 ($F(2,82)=5.221$, $p=0.007$). In addition, therapeutic bond was rated significantly more highly by therapist-delivered SHADE participants relative to the computer-delivered participants at sessions 5 ($F(2,100)=3.975$, $p=0.022$) and ten, with PCT (control) participants at session 10 also rating their bond in treatment significantly more highly than those in the computer-delivered treatment condition $F(2,81)=6.428$, $p=0.003$).

Table 18 Mean subscale scores on the Agnew Relationship Measure (ARM, Agnew-Davies et al., 1998)*, according to treatment allocation.

	Subscales of the ARM							
	Confidence		Client Initiative		Openness		Bond	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Session 1 - CLIENTS								
Therapist-delivered SHADE	5.77	0.86	3.29	1.07	5.26	1.00	6.29	0.86
Computer-delivered SHADE	5.74	0.94	3.26	0.87	5.20	1.02	6.31	0.83
PCT (Control)	5.79	0.94	3.30	0.88	5.36	1.09	6.23	0.77
Session 1 – THERAPISTS								
Therapist-delivered SHADE	5.27	0.66	4.55	0.60	4.81	0.94	6.26	0.68
Computer-delivered SHADE	5.27	0.63	4.38	0.63	4.74	1.09	6.31	0.66
PCT (Control)	5.20	0.61	4.38	0.65	4.92	0.85	6.33	0.67
Session 5 - CLIENTS								
Therapist-delivered SHADE	6.17	0.82	3.63^{+}	1.07	5.60	0.96	6.84^{+}	0.56
Computer-delivered SHADE	5.97	0.80	3.95	0.91	5.40	1.13	6.15^{+}	0.80
PCT (Control)	5.74	0.99	4.42^{+}	0.96	5.34	0.91	6.52	0.59
Session 5 – THERAPISTS								
Therapist-delivered SHADE	5.77^{+}	0.71	4.68$^{\sim}$	0.90	5.23	0.93	6.45	0.42
Computer-delivered SHADE	5.52	0.78	4.98^{+}	0.80	5.00	1.28	6.20	0.69
PCT (Control)	5.11^{+}	0.73	5.80$^{+\sim}$	0.62	5.22	0.90	6.41	0.69
Session 10 - CLIENTS								
Therapist-delivered SHADE	6.58	0.58	3.84	1.16	6.08^{+}	0.82	6.84^{+}	0.30
Computer-delivered SHADE	6.15	0.79	3.94	0.94	5.26^{+}	1.18	6.13$^{+\sim}$	1.22
PCT (Control)	6.17	0.77	4.47	1.34	5.74	0.84	6.67$^{\sim}$	0.45
Session 10 - THERAPISTS								
Therapist-delivered SHADE	6.16$^{+\sim}$	0.77	4.82	0.78	5.96	1.05	6.72	0.40
Computer-delivered SHADE	5.42^{+}	1.040	4.85	0.77	5.08	1.20	6.36	0.57
PCT (Control)	5.42$^{\sim}$	0.68	5.39	0.79	5.38	0.79	6.58	0.40

* Increasing scores indicate increasing levels of therapeutic alliance.
$^{+}$ Significant difference between treatment conditions, $p<0.01$, $^{\sim}$ Significant difference between treatment conditions, $p<0.01$.

Therapist ratings closely mirrored those provided by the clients at sessions one, five and ten, with no significant difference evidence in ratings of therapeutic alliances at session one. At session five, therapists rated their client's initiative in treatment significantly more highly for

the PCT (control) participants relative to both the therapist- and computer-delivered SHADE treatment conditions ($F(2,91)=10.278$, $p=0.000$), however by session ten this difference had disappeared, and only a non-significant trend emerged for the therapist-delivered group to be rated lower than the PCT (control) group on this subscale $F(2,70)=2.514$, $p=0.022$). Confidence in the treatment being provided was rated significantly more highly by therapists for participants in the therapist-delivered SHADE treatment at session 5, relative to the PCT (controls) ($F(2,89)=3.525$, $p=0.002$). By session ten, therapists rated both computer-delivered and PCT (control) participants significantly lower on this subscale than the therapist-delivered SHADE treatment group ($F(2,70)=4.558$, $p=0.002$). At session ten, there was a trend (non-significant) for therapists to rate computer-based treatment participants significantly lower than the therapist-delivered treatment group on the subscales of bond ($F(2,71)=3.758$, $p=0.028$) and openness in therapy ($F(2,72)=4.861$, $p=0.013$).

1.5 Discussion

The results of this study indicate that participants with comorbid depression and AOD use problems will attend a program of psychological treatment targeted at both conditions, and report some benefits on depression and AOD outcomes as a result of this participation. Regardless of treatment allocation, participants reported significant reductions in depression over the 12-month study period and significant reductions in alcohol consumption over the course of the study. A statistically non-significant trend emerged to suggest that the reduction in alcohol use was greater for people in the computer-delivered SHADE condition at the post-treatment assessment, reporting a reduction of nine standard drinks per day at this assessment occasion, relative to a five- and four-drink reduction in the therapist-delivered SHADE and PCT (control) groups. In addition, a non-significant trend also emerged for increased rates of abstinence from alcohol among computer-delivered SHADE participants at the post-treatment assessment relative to the other treatment conditions (26% vs 17% PCT (control) and 5% therapist-delivered SHADE treatment). Significant reductions were also reported by the whole sample in their hazardous use of a range of substances and the number of drug classes used at each assessment timepoint. General functioning significantly improved overall at each follow-up assessment, as did participant's cognitive vulnerability to depression (DAS scores). Suicidality and hopelessness also significantly reduced across the entire sample over the follow-up period. These results and their implications are discussed in detail below.

Depression outcomes

Reductions in depressive symptoms were a key goal of treatment for the study, with participants reporting significant reductions in BDI-II scores over the follow-up period. As indicated above, treatment did not significantly moderate this reduction. Interestingly, larger improvements were evident in the therapist-delivered and computer-delivered SHADE groups by the post-treatment assessment, with participants reporting 12-point reductions in BDI-II scores at this assessment occasion. Although by the time of the 12-month assessment, these reductions were matched by the PCT (control) group, at the post-treatment assessment, participants in this treatment group had only reduced their BDI-II scores by an average of eight-points. This pattern of change in depression scores suggests a more immediate response to treatment among those participants in the therapist-delivered and computer-delivered SHADE therapy, albeit not statistically significant.

Post-treatment BDI-II scores have previously been linked with increased risk of relapse to AOD use (Curran et al., 2000), with scores of 14-19 on the BDI-II associated with 2.5 times the risk

of relapse to AOD use compared with scores of less than 14. BDI-II scores of 20 or greater are associated with 4.5 times the risk of relapse to AOD use over the longer term (Curran et al., 2000). In evaluating the post-treatment (three-month) BDI-II scores for participants in the study, PCT (control) group participants reported depression scores in the moderate range (i.e. above 20 on the BDI-II), as did participants in the therapist-delivered SHADE treatment group. Computer-delivered SHADE participants reported a level of 19 on the BDI-II at the post-treatment assessment and, although these differences were not statistically significant, it may be that those who received computer-delivered SHADE therapy were at post-treatment likely to be at reduced risk of relapse and continued morbidity for AOD use over the longer term according to these criteria.

Cognitive vulnerability to depression, as measured by the DAS, significantly decreased for the sample as a whole across the follow-up assessments. Closer examination of these rates of reduction revealed that those in the therapist- and computer-delivered SHADE treatment groups reported greater improvement more quickly on this domain, making reductions at post-treatment that were maintained through to 12-month follow-up assessment (20- and 23-point reduction over 12-months). Again, the PCT (control) group reported less improvement in cognitive vulnerability to depression compared to the therapist- and computer-delivered SHADE treatment conditions. These differences were not statistically significant, but the results were similar to those for reductions in BDI-II scores, indicating a steeper gradient of improvement among the therapist- and computer-delivered SHADE therapy participants relative to PCT (control),(i.e. seven-points at post-treatment for PCT, vs 17-point reductions for the computer- and therapist-delivered SHADE treatment groups).

BHS scores, an index of suicidality, also decreased significantly over the course of the study, with scores of nine or below indicating a high risk of suicide ideation. Whilst participants across the treatment groups were below this threshold at entry to the study (i.e. at high risk of suicidality), by the post-treatment assessment, all three groups were no longer in this increased risk category, and maintained a more hopeful outlook at each follow-up occasion. Importantly, participants were not hospitalised for suicidal ideation/behaviour over the course of the study, nor was anybody suspended from treatment due to acute suicidality.

Alcohol/other Drug Use Outcomes

Among people meeting criteria for hazardous use of alcohol at the initial assessment, reductions in the average daily use of alcohol were reported for the sub-sample as a whole over the course of the study. Treatment did not moderate this reduction at a statistically significant level, however there was a trend for computer-delivered participants to report a higher rate of improvement between baseline and post-treatment assessments relative to the other two treatment conditions. Some relapse occurred for both computer-delivered and PCT (control) groups at 6- and 12-month follow-up, however therapist-delivered participants maintained their reductions in alcohol use in a linear fashion across these follow-up timepoints.

Significant reductions in AUDIT total scores were found across the follow-up occasions, with all three groups reporting a similar pattern of reduction in scores between the initial, post-treatment, six- and 12-month assessments. In combination with the results for daily alcohol use reported above, this result potentially demonstrates the benefits of session one (a brief intervention) for people with comorbid depression and hazardous alcohol use, in combination with computer-delivered or supportive (non-specialist) treatment.

The alcohol outcomes observed in the study closely approximate those reported in the Project MATCH study, comparing alcohol use outcomes for people engaged in a brief motivational intervention versus cognitive behaviour therapy and a 12-step facilitation program (PMRG, 1997). That is, at the 12-month follow-up assessment, Project MATCH participants assigned to receive the brief motivational intervention reported equivalent alcohol use outcomes relative to their counterparts who received more intensive treatment. Consistent with the results of this study, Project MATCH participants with higher levels of psychiatric severity did not respond better to the more intensive CBT or 12-step treatment relative to the brief motivational intervention. Taken together, these findings suggest a potential benefit of brief interventions, in addition to assessment, even for people at the severe end of the depression and alcohol-using spectrum.

Participants meeting criteria for problematic use of cannabis were also selected for closer analysis. Although they commenced the study using lower average levels relative to the other treatment conditions, cannabis users in the therapist-delivered SHADE treatment reported a consistent pattern of reduction in cannabis use over the follow-up assessment period. Computer-delivered SHADE treatment participants also reduced over the assessment period, but did not reduce at the same rate (i.e. five vs three-points at post-treatment, seven vs two at six-months and six vs four at 12-months). PCT (control) group participants eventually made similar reductions at the 12-month assessment (i.e. four-point daily reduction), as a group they reported higher levels of cannabis use at post-treatment and six-month assessments relative to baseline.. These reductions in cannabis use were statistically significant for the main effect of time, but the differences noted across the treatment groups did not meet the significance threshold. Despite important reductions in daily levels of cannabis use, 12-month levels remained high across the treatment conditions, with participants continuing to use between 3 and 13 times daily. This was particularly the case for those in the computer-delivered condition, although the level of use among this group at baseline was almost twice that of the therapist-delivered group. This is in contrast to levels of alcohol use, which dropped to within recommended safe drinking guidelines by the 12-month follow-up assessment across treatment groups. It is unclear why this occurred. A similar result was reported by Baker et al. (in press, January 2005), where at 12-month follow-up, cannabis use remained above the hazardous threshold of once weekly use (range 4.12-8.53 use occasions per day) and alcohol use dropped to within recommended safe drinking levels. The difficulty in shifting cannabis use to low levels and the unique combination of cannabis use and depression (other mental health) comorbidity warrants further attention.

A major treatment goal in therapist- and computer-delivered SHADE therapy was the reduction of hazardous AOD use. To explore this, an aggregate score of hazardous use days in the month prior to survey was calculated for each follow-up assessment. A significant reduction in this aggregate score was found for the whole sample over the follow-up period, indicating overall reduced levels of hazardous use of substances occurred. Closer inspection of the data indicates that, although not statistically significant, hazardous AOD use fell uniformly for the therapist-delivered SHADE participants and those in the PCT (control) group. Whilst those in the computer-delivered SHADE treatment reported identical reductions in hazardous use days at the 12-month follow-up relative to the therapist-delivered SHADE participants, this group did not report a steady decrease in hazardous use days across the follow-up period.

A range of additional AOD use outcomes was assessed over the course of the study, including poly-drug use and abstinence rates at 12-month follow-up. A significant main effect of time

was found for poly-drug use, with results indicating the sample as a whole reported decreased poly-drug use over the initial and follow-up assessments.

Despite an emphasis in treatment on harm reduction, abstinence rates were recorded at each assessment timepoint. No significant differences existed in the rates of abstinence from alcohol across the follow-up phases, however a non-significant trend indicated that those in the computer -delivered SHADE treatment reported higher rates of abstinence from alcohol at post-treatment relative to the other two conditions (26% versus 5-17% abstinence). This trend had vanished by the six-month assessment, woith all three groups reported equivalent rates of abstinence from alcohol (17-19%), which was maintained through until the 12-month follow-up assessment.

Abstinence rates for cannabis were similar across treatment conditions at the 12-month follow-up assessment (i.e. 64-74%), participants achieved and maintained this rate abstinence rate from the post-treatment assessment. Interestingly, abstinence rates were much higher for cannabis than for alcohol at each assessment timepoint, and rates of people using below the 'safe' threshold for cannabis use (i.e. once weekly use) were much lower than they were for alcohol use. This observation likely reflects the very clear harm reduction goals in Australia that are available to guide the safe consumption of alcohol, whereas for cannabis use, although a harm reduction approach is encouraged, the only clear guideline available is to become abstinent from this drug. Importantly, abstinence seemed to be a realistic goal for many cannabis users in the study, and rates of use above the 'safe' threshold were no higher for cannabis use than they were for alcohol use.

Other outcomes

On several of the remaining outcome variables in the study, therapist- and computer-delivered SHADE treatments reported a similar pattern of improvement across the follow-up occasions, which was different from that observed in the PCT (control) group, although these differences were not statistically significant. For example, general functioning (as measured by the GAF) improved by the post-treatment assessment and was maintained for both therapist- and computer-delivered SHADE treatment conditions across the follow-up occasions, while over the same time period, PCT (control) group functioning gains were not maintained. This effect was significant for the main effect of time, but there was no significant impact of treatment on this observation.

Treatment utilisation was also similar across the treatment conditions and follow-up assessment timepoints, and covered use of psychiatric medication, AOD treatment (methadone, AOD counseling, Alcoholics/Narcotics Anonymous etc.), general practitioner visits, psychiatric hospitalisations and visits to mental health specialists (Psychiatrists, Psychologists and Mental Health Teams). In general, treatment utilisation was low across the treatment groups, potentially reflecting the difficulty with which this population accesses care for their conditions.

Therapeutic Alliance

At baseline (following completion of session one, which was common across treatment conditions and conducted face-to-face), no significant differences existed between treatment groups and their therapists on any of the therapeutic alliance subscales of therapeutic bond, confidence in therapy, client initiative and client openness. This changed across the course of therapy, however these changes seem to reflect the differences in the type of treatment offered to participants in the study. For example, client initiative was rated significant more highly by

clients and therapists involved in PCT (control) treatment than therapist-delivered SHADE treatment at session five, which is logical given the onus in PCT is on the client to take the lead and direct the agenda for therapy sessions. Interestingly, no differences existed between participant ratings of client initiative between computer-delivered SHADE and PCT (control) treatment at any of the assessment occasions. This may be suggestive of increased empowerment and enhanced problem solving skills associated with the "self-help" nature of computer-based SHADE treatment and potentially the same may apply to PCT (control) treatment. Participants did rate the therapeutic bond significantly lower for the computer-delivered SHADE treatment relative to the therapist-delivered SHADE and PCT (control) conditions, however average ratings on this subscale ranged from 6.13 (computer-delivered group) through to 6.84 (therapist-delivered group) indicating a moderate-strong agreement that the therapeutic bond in treatment was strong. Significant differences in therapist ratings of alliance emerged on the subscale of confidence in therapy, in favour of therapist-delivered SHADE over the other treatment conditions. Again, average responses for each treatment group indicated therapist were at least moderately confident in the therapy they were providing or overseeing (in the case of computer-delivered treatment) however it seems that the different approach in PCT and the different modality of computerised treatment may have threatened their confidence mildly.

Limitations

Several limitations exist with this study that are worthy of mention. The observations reported above, relating to the patterns of change observed across several key outcomes as a function of treatment allocation, did not reach statistical significance and should be considered with caution. Replication of this study is required to further explore these observations.

It is also possible that the patterns of change associated with the study are due to a high level of motivation for change among the self-referred study participants, and therefore may not accurately represent the treatment attendance and outcomes among a less-motivated sample. Given that people with comorbid depression and AOD use problems are not ordinarily located within treatment services (Kavanagh et al., 2000), it may be that these study participants do at least partly represent the group of people with this comorbidity within the community.

Finally, recruitment and retention of participants at the rural site was problematic, with recruitment targets well below the goal of 180 participants and retention at follow-up assessments lower than for the urban site. This made rural/urban comparisons difficult for this study, so it is not clear what the impact of these interventions may be within the settings for which computer-based treatment in particular has potential utility. A range of different recruitment and retention strategies were used at the rural site, and local clinicians and Team Leaders were engaged and consulted throughout the study (i.e. attending project meetings etc.). However it may be that these strategies were not sufficient to recruit and retain according to targets in a rural setting. This needs to be explored further.

Notwithstanding these limitations, the results of the study show promise for the benefits of integrated psychological treatment for depression and AOD use comorbidity, and is worthy of further exploration.

Discussion of existing research

Very little previous research has been conducted on the benefits of integrated psychological treatment, targeting both mental health and substance use problems, among people with

comorbidity, especially depression and comorbid substance use problems. Daley et al. (1998) recruited 23 people with comorbid depression and cocaine dependence, and randomised participants to receive motivational interviewing or treatment as usual in conjunction with antidepressant medication across the treatment conditions. In line with the results of the current study, Daley et al. (1998) reported that participants who received the motivational intervention reported greater abstinence rates at 90-day follow-up than did the control group, and a decrease in the severity of depressive symptoms over the same time period. These differences were not maintained at the 12-month follow-up.

Table 19 compares the results of this study with those obtained in the only other study to examine integrated treatment for depression and substance use comorbidity (i.e. Brown et al., 1997).

Table 19 Comparison of changes in key outcome measures between the current study participants, those in the Brown et al. (1997) study of simultaneous treatment for depression and alcohol use problems who received a single-focussed AOD treatment.

	Changes Relative to Initial Assessment			
	Post-treatment (19 days post-initial)	Three-months follow-up	Six-months follow-up	12-months follow-up
BDI-II scores				
Brown et al. CBT-D	12.1	-	-	-
Brown et al. Control	9.6	-	-	-
Therapist-delivered SHADE	-	12.33	15.43	13.55
Computer-delivered SHADE	-	12.44	11.32	10.71
PCT (control)	-	7.50	9.50	10.29
Daily drinking levels				
Brown et al. CBT-D	-	7.98	7.84	-
Brown et al. Control	-	7.27	3.24	-
Therapist-delivered SHADE	-	5.43	6.23	6.43
Computer-delivered SHADE	-	8.64	6.52	6.32
PCT (control)	-	3.74	4.76	2.82
Abstinence rates*				
Brown et al. CBT-D	-	47	47	-
Brown et al. Control	-	33	13	-
Therapist-delivered SHADE	-	5	17	16
Computer-delivered SHADE	-	26	17	18
PCT (control)	-	17	19	19

* Reports actual abstinence rates at each assessment, not changes in abstinence rates from initial assessment

Brown et al. (1997) offered simultaneous CBT treatment for depression to a random sample of people with alcohol use problems who were undergoing inpatient treatment for their problematic alcohol use (n=35). Participants who received the additional CBT for depression (CBT-D) reported a 12-point reduction in BDI-II scores between initial and post-treatment assessments (19 days later), while control group participants (who received a group relaxation treatment with equivalent clinician contact) reported a BDI-II reduction of 9.6 over the same

time period. In a similar result to the current study, this reduction in depressive symptoms was significant over time, but not according to treatment allocation.

Participants in the current study, who were allocated to the PCT (control) condition, reported a eight-point decrease in BDI-II scores between initial and three-month/post-treatment assessments, with computer- and therapist-delivered SHADE participants reporting higher reductions over the same time period of 12.44 and 12.33 respectively. At the end of the 12-month follow-up period, PCT (control) group participants reported similar reductions in depressive symptoms as in the computer -delivered condition, with therapist-delivered treatment participants reporting a slightly higher reduction of 14-points on the BDI-II. At all assessment timepoints, participants in the therapist-delivered SHADE treatment reported at least equal reductions in depression scores as the Brown et al. (1997) treatment group, with computer-delivered participants closely following this pattern of change and always above the change in BDI-II scores recorded by the Brown et al. (1997) control group. Participants in the PCT (control) condition did not report the same improvement in depression, even when comparing outcomes for the Brown et al. (1997) control group, and only surpassed the changes that this control group made at the 12-month assessment timepoint. Importantly, the PCT (control) group had much less therapist contact than did the Brown et al. (1997) controls who had simultaneous group treatment for alcohol use and a group relaxation treatment matched for clinician time with the active CBT-D treatment condition, and computer-delivered SHADE treatment had even less therapist input again.

In consideration of the results of these two studies, therapist- and computer-delivered SHADE may offer a promising alternative to the more resource intensive Brown et al. (1997) treatment, and may produce superior results for depression over the longer term. Further, the PCT (control) treatment may offer a similar benefit for depression as did the Brown et al. (1997) group alcohol and relaxation treatments, using arguably less clinician and other resources to achieve similar results over a longer follow-up period.

As indicated in Table 19, the reduction in the number of daily drinks in the Brown et al. (1997) study for those engaged in the CBT-D and alcohol treatments was superior at the six-month assessment compared to the relaxation control group counterparts. In comparison, the relaxation control participants in Brown et al. (1997) reported similar reductions to CBT-D participants at three-months, but this was not maintained over the follow-up period. This reduction may be due to the intensive alcohol detoxification and partial inpatient rehabilitation program in which all Brown et al. (1997) clients participated, and perhaps suggests an additional benefit for longer-term drinking outcomes of the CBT-D adjunctive treatment. Only those in the computer-delivered SHADE treatment reported similar reductions in daily drinking levels as those in the CBT-D condition at the three-month follow-up, and these were still evident at the 12-month follow-up assessment. Therapist-delivered SHADE treatment matched the reductions in daily drinking of both computer-delivered SHADE treatment and the Brown et al. (1997) CBT-D group by the six-month assessment, and maintained this through to the 12-month follow-up. PCT (control) participants did not keep pace with any of these reductions in alcohol use over the follow-up assessments, and only matched the Brown et al. (1997) control group at the six-month assessment (not maintained to 12-months).

Based on the results of these studies, it seems that those in the CBT-D and therapist- and computer-delivered SHADE therapy groups report superior improvements in problematic alcohol use over time and relative to control treatments that do not employ CBT and

motivational interviewing strategies for depression and alcohol use. It may be that the additional focus on depression and alcohol use comorbidity were the key components in this seemingly improved result. Why this might be the case is not clear, and certainly more research to test these issues, at least for alcohol and depression comorbidity appears warranted. Perhaps this indicates some benefit of the computer-delivered SHADE treatment for depression and alcohol users for these outcomes, particularly given the reduced clinician input required for computerised treatment programs.

Abstinence rates in the Brown et al. (1997) study were higher at each follow-up occasion for the CBT-D and alcohol treatment group compared to all other treatments. This could be related to the content of treatment in the current study, which emphasised a harm reduction approach to AOD use, as opposed to advocating for a goal of complete abstinence from alcohol. The results of the current study also indicated that non-abstinence did not necessarily impact on depression scores, given the high levels of reduction in symptoms over time, and the interesting finding that changes in alcohol use were not significantly associated with changes in depression over the course of the study.

The results of this study confirmed the previous research suggestions that people with comorbid depression and AOD problems are not able to access treatment within mental health and substance use treatment services (Arendt & Munk-Jorgenson, 2004; Kavanagh et al., 2000; Westermeyer, Eames, & Nugent, 1998; Williams, 1999). Referrals to the study were sought from a range of sources, including treatment services, general practices, and the general community via media advertisements. Advertising through the print and television media was implemented approximately 12-months into the recruitment phase of the SHADE study, following poor referral rates from the available mental health, primary care and substance use treatment services. At the end of the recruitment phase, just 5% of the final sample was sourced from treatment services, while the remainder self-referred from the general community following a media campaign. Treatment participation rates remained low throughout the course of the SHADE study, with no significant changes in treatment utilisation detected over time, nor as a function of treatment allocation. It seems that integrated treatment for depression and substance use problems was useful, potentially filling an important gap in clinical services, at least in the Hunter Region of New South Wales.

CONCLUSIONS AND FUTURE DIRECTIONS

This is the first study of its kind to develop and evaluate the efficacy of a clinically integrated psychological intervention for comorbid depression and AOD use problems. In addition, the results indicate that the computer-based and therapist-delivered SHADE treatments could be regarded as producing similar benefits for people with comorbid depression and AOD use problems. While the results of this study are encouraging, clearly more work is required in this important area.

In summary, the results suggest that an integrated psychological treatment, which simultaneously targets depression and problematic AOD use, produces potentially important gains across several depressive and substance use domains that seem to be maintained over time. This is regardless of the mode of delivery of treatment, via a therapist or computer-based program. Further, these results are in general support of the findings of Brown et al. (1997), which indicated the importance and benefit of simultaneously addressing depression when present during treatment for alcohol use disorders. It may be that an integrated therapy such as was offered in computer- or therapist-delivered SHADE treatment, produces better outcomes for depression, and potentially alcohol use, over a longer period of time than did the simultaneous adjunctive CBT-D run alongside an intensive treatment for alcohol use problems (as per Brown et al., 1997).

It also seems that PCT (control) supportive intervention produced some improvements in depression and alcohol use that were similar to those reported in the Brown et al. (1997) relaxation control, with less clinician contact time, and no inpatient/intensive treatment phase for alcohol. The efficacy of this intervention for alcohol in this comorbid group has important implications for mental health and primary care services who could offer this minimal intervention as a first-step in treatment. Additional research is required to further test these possible benefits.

Equally, the therapist- and computer-delivered SHADE treatments may also be less resource intensive than the CBT-D and alcohol treatment combination offered in the Brown et al. (1997) study, which included partial inpatient treatment and detoxification for alcohol. The efficacy of the computer-based SHADE treatment is of particular interest in light of these particular issues, given this treatment used an average of 12 minutes of face-to-face clinician time per session compared with around 60 minutes in clinician-delivered SHADE therapy and/or PCT (control) treatment. This makes computer-based treatments such as the one trialed here an important tool for non-AOD specialists treating people with this comorbidity.

Computer-delivered treatments

Therapist- and computer-delivered SHADE treatments seemed to result in similar patterns of positive change across many of the outcome variables assessed over time, indicating the two different modes of providing integrated treatment for depression and AOD use comorbidity perform similarly well. In particular, computer-based therapy produced similar or better improvements in the following key outcomes: poly-drug use, BDI-II scores (depression), BHS scores (hopelessness and suicidality), hazardous use of substances, AUDIT scores (hazardous alcohol use) and quantity/frequency of cannabis use. Therapeutic alliance ratings from both the participant- and therapist-perspectives were also similar over the course of treatment.

No previous research has examined the use of computer-based therapy among a group with comorbid depression and AOD use, nor with a sample reporting severe levels of depression at initial assessment and concurrent heavy use of alcohol or cannabis. Alternatively, three studies have trialled computerised CBT among people with single conditions such as hazardous alcohol use (Hester & Delaney, 1997), and depression (Proudfoot et al., 2004; Selmi et al., 1990), although outcomes were not evaluated against a clinician-delivered control condition in all but one case. Thus, a comparison between the outcomes of this study and those of the above research groups is possible across some common outcomes, as is displayed in Table 20 below.

As indicated in Table 20, the level of change in depression scores over time was similar across therapist- and computer-delivered SHADE treatments in the current study, and the Proudfoot et al. (2004) and Selmi et al. (1990) computerised treatments, ranging between 11 and 15 points on the BDI-II at the post-treatment assessment. These reductions were maintained at the six-month assessment across the three studies. In each study, these reductions are equivalent or better than a control treatment that either matched for therapist contact and content of treatment (i.e. the current study and Selmi et al., 1990) or a minimal-treatment control group (i.e. the current study and Proudfoot et al., 2004). In the current study, this is despite initial levels of depression in the severe range of symptoms and concurrent heavy use of alcohol/other drugs. Importantly, these reductions were maintained over a longer-term follow-up period than ever previously examined (12-months post-treatment). Notwithstanding that these reductions in BDI-II scores were not statistically significant for treatment allocation within the current study, these results are arguably of considerable clinical importance.

Table 20 Comparison of changes in key outcome measures between study participants and those in the Hester and Delaney* (1997), Proudfoot et al.+ (2004) and Selmi et al.+ (1990) studies of computer-based treatment for either depressive or alcohol-use conditions.

	Changes Relative to Initial Assessment		
	Three-months post-initial	Six-months follow-up	12-months follow-up
BDI-II scores			
Proudfoot et al. computer treatment	15.30	15.25	-
Proudfoot et al. control (GP treatment)	11.20	14.91	-
Selmi et al. computer treatment	11.09	15.6	-
Selmi et al. therapist treatment	11.54	9.80	-
Computer-delivered SHADE	12.44	11.32	10.71
Therapist-delivered SHADE	12.33	15.43	13.55
PCT (Control)	7.50	9.50	10.29
Daily drinking levels			
Hester and Delaney computer treatment	3.10	2.07	-
Hester and Delaney control (wait list)	1.13	-	-
Computer-delivered SHADE	8.64	6.52	6.32
Therapist-delivered SHADE	5.43	6.23	6.43
PCT (Control)	3.74	4.76	2.82

* Computer-based therapy for alcohol use problems
+ Computer-based therapy for depression

Comparing the outcomes for alcohol use across different treatment modalities and research projects yields important support for computer-based SHADE treatment. That is, computer-delivered treatment in the current study resulted in superior reductions in the quantity and frequency of alcohol use than in the Hester and Delaney (1997) study over the follow-up assessment time period. In fact, PCT (control) group participants reduced their alcohol use over time at a similar rate as those in the computer-based treatment for Hester and Delaney (1997). These results for alcohol use remain encouraging and worthy of closer scrutiny and replication.

In summary, this study suggests that participants with severe, current depressive and AOD use problems will attend and report benefits from a computer-based integrated psychological treatment that are similar in magnitude to those reported by participants in an equivalent clinician-delivered treatment and across several previous studies of computer-based treatment for single conditions (i.e. depression- or alcohol-use only). These benefits include improvements in depressive-, AOD use, and general functioning outcomes.

The promising results are particularly important, considering the computer-delivered intervention used an average of 12 minutes face-to-face clinician time per session compared with approximately one hour of face-to-face therapy among the therapist-delivered equivalents and the PCT (control) supportive intervention. In this study, check-in sessions were conducted by a qualified psychologist. The content of these 12-minute check-in sessions included standard risk assessment and education/clarification strategies (e.g. suicide risk, revising homework tasks, creating a plan for completing homework etc.) which arguably could be carried out by many health professionals or primary care workers with minimal mental health, substance use or comorbidity-specific training. The impact of a non-psychologist check-in session on results has not yet been examined, nor has the importance of this check-in session in producing the above improvements been tested specifically. Given the potential of computerised psychological treatment to improve access and outcomes among people with comorbidity, these issues are certainly worthy of further exploration in future research.

In Australia, 67% of people with mental health problems do not access treatment for their conditions (Andrews et al., 1997; NSWHealth, 2000). Together with evidence that the majority of these prefer to manage on their own, including a substantial proportion with comorbid conditions (Andrews, Issakidis, & Carter, 2001), the potential for computer-based "self-help" treatments is promising. For people with comorbid depression and AOD use problems in particular, who report increasing difficulties accessing treatments when sought, computer-based therapy means easier access to evidence-based treatment (Marks, 1999). This could result in more people seeking treatment for their condition, or receiving treatment in an earlier phase of their disorder. Potentially, this could prevent conditions like alcohol misuse, other problematic substance use and depression from becoming more chronic and disabling, relieving the disease burden on mental health services and the community (Marks, 1999).

Future Directions

Several new projects have commenced, arising directly from the current research project. These are as follows:

1. **Long-term follow-up of study participants** (funded): In 2007, the research group secured funding from the National Health and Medical Research Council (NHMRC) project grants scheme to conduct 24- and 36-month follow-up assessments of the study participants. Twenty-four month follow-ups had already commenced unfunded, however funding will ensure that these activities will continue over the next 12-months.

2. **Dissemination of computer-based treatment into Drug and Alcohol Services**: During 2007-2008 the research team has commenced negotiations with the Drug and Alcohol Clinical Service at the Central Coast Area Health Service, NSW, to develop a model for the dissemination of multimedia treatments into clinical practice. Two Doctoral-level clinical psychology students have been engaged to conduct the trial, which will monitor the ways in which the SHADE (and other) computer-based treatment is used by the clinicians of the service, how clients respond to and engage with computer-based treatments, and the impact this has on treatment outcomes (including waiting lists, clinician time, AOD outcomes etc.). Data collected will be qualitative and quantitative in nature, with baseline data schedule for collection in November 2008. From here, we will develop a dissemination plan for Drug and Alcohol services, and approach NSW Health and other funding bodies for the resources to disseminate SHADE and other computer-based packages more widely in NSW.

3. **Translation of the computer-delivered SHADE treatment onto a web-based platform** (currently unfunded): It is planned to adapt the computer-based SHADE treatment into a web-based program that is easily accessible over the Internet. It is hoped that this will increase the accessibility of the evidence-based treatment program and can facilitate ongoing research with the target group. The 10-week program will appear as is, but will also be adapted into "skill modules" that participants can complete around the themes of:
    - Story so far (case formulation, identifying problem areas)
    - Improving motivation (MI)
    - Getting moving again (pleasant events scheduling)
    - Managing AOD (cravings, refusal skills, etc.)
    - Changing your thoughts (cognitive therapy, schema therapy)
    - Allowing and letting be (mindfulness)
    - Worrying productively (anxiety-based CBT) - NEW
    - Solving problems
    - Getting healthy inside and out (diet, exercise) – NEW
    - Staying well (relapse prevention)

    The research team is currently investigating funding options, and seeking grants/other funding to support this activity and these plans.

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