Cognitive impairment and treatment outcomes among people attending an alcohol intervention service for those aged 50+

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Abstract

Purpose: No studies have evaluated the relationship between cognitive impairment and alcohol treatment outcomes among older drinkers. This study sought to explore the extent of cognitive impairment among older adults seeking alcohol treatment, and examine the relationship between cognitive impairment, treatment retention and alcohol use following treatment.

Design/ methodology/ approach: The study used data from the Drink Wise Age Well programme; an alcohol intervention service for older adults (aged 50+). The Montreal Cognitive Assessment (MoCA) was used to screen for cognitive impairment; alcohol use was assessed using the Alcohol Use Disorders Identification Test (AUDIT).

Findings: 531 participants completed assessment at treatment entry. Over half the sample were male (57%), with a mean age of 60 years (SD: 7.09). Almost half (48.4%) had cognitive impairment at entry to treatment: 51.6% had normal cognitive function, 41.4% had mild cognitive impairment, 5.8% had moderate cognitive impairment and 1.1% had severe cognitive impairment. Cognitive impairment was not associated with increased treatment drop-out and was not predictive of alcohol use following treatment. Alcohol treatment was associated with a significant improvement in cognitive functioning.

Originality/ value: This study suggests there may be a significant amount of unidentified cognitive impairment among older adults attending alcohol treatment. Assessment and routine screening for cognitive impairment in drug and alcohol services may help in care planning and setting treatment goals; in the absence of routine screening opportunities for treatment planning and intervention may be missed.

Keywords: alcohol; cognitive impairment; alcohol treatment; older adults.

Introduction

The World Health Organisation has identified alcohol-related harm among older adults as an increasing concern (World Health Organisation, 2014). In the United Kingdom, older adults (aged 55-64) are more likely to exceed the recommended unit guidelines for alcohol than any other age group (National Statistics, 2020; Scottish Government, 2020; Welsh Government, 2019), and there are trends for increasing alcohol use among older adults in Europe (Hallgren, Hogberg, & Andreasson, 2010; Kelfve, Agahi, Mattsson, & Lennartsson, 2014) and the United States (Grant et al., 2017; Han, Moore, Sherman, Keyes, & Palamar, 2017).

Older adults may be more susceptible to the adverse effects of alcohol use due to age related physiological changes. The loss of lean body mass related to ageing can reduce the volume of alcohol distribution, resulting in an increased peak ethanol concentration with any given dose of alcohol (Pozzato et al., 1995; Vogel-Sprott & Barrett, 1984). In older adults, the activity of the enzyme alcohol dehydrogenase, which breaks down alcohol is significantly reduced (Sorock, Chen, Gonzalgo, & Baker, 2006), potentially increasing the amount of ethanol that reaches the bloodstream. These factors are likely to enhance tissue exposure to alcohol and make older adults more susceptible to the adverse consequences of alcohol use. As a result, older adults are at increased risk of experiencing problems in physiological, psychological and social functioning even at low levels of alcohol use.

It is well established that chronic heavy use of alcohol can lead to permanent damage to the structure and function of the brain (Harper, 2009). Cognitive impairment among heavy alcohol users is common; data suggests that 50-80% of people with chronic alcohol use will experience cognitive impairment (Bates, Bowden, & Barry, 2002), although for most people these impairments are likely to be subtle and transitory (Bates & Convit, 1999). Evidence indicates that cognitive functioning may improve following abstinence or significantly reduced alcohol use (Bartels et al., 2007; Stavro, Pelletier, & Potvin, 2013; Volkow & Wang, 1995), with most recovery occurring in the short term (> 1 month) (Fernandez-Serrano, Perez-Garcia, & Verdejo-Garcia, 2011; Stavro et al., 2013). Age, however, is a factor in susceptibility to permanent neuropsychological damage from alcohol use; alcohol dependence in older adults is often associated with cognitive impairment (Thomas & Rockwood, 2001), older adults show greater structural and cognitive changes in response to alcohol use (Bates, Labouvie, & Voelbel, 2002; Pfefferbaum, Sullivan, Mathalon, & Lim, 1997), and are less likely to recover from alcohol related cognitive impairment (Rourke & Grant, 1999).

Cognitive impairment often goes undetected by substance misuse professionals and by self-report (Wadd et al., 2013). As a result, there have been calls from policy makers and professional bodies (National Institute for Health and Care Excellence, 2011; Royal College of Psychiatrists, 2014; . Scottish Government, 2018), and from academic researchers (Alarcon, Nalpas, Pelletier, & Perney, 2015; Davies et al., 2005; Marceau, Lunn, Berry, Kelly, & Solowij, 2016; Rao, 2016) to implement routine screening for cognitive impairment in drug and alcohol services. It is posited that screening for cognitive impairment would help to inform clinical decision making and improve treatment planning, as well as facilitating therapeutic engagement and the tailoring of interventions (National Institute for Health and Care Excellence, 2011; Royal College of Psychiatrists, 2014).

Research suggests that there may be a high prevalence of cognitive impairment in mixed- aged samples as well as among older people attending drug and alcohol treatment (Alarcon et al., 2015;

Allan, Kemp, & Golden, 2012; Monds et al., 2017). Research in mixed-age samples suggests that cognitive impairment may be associated with poorer treatment outcome (Fals-Stewart, 1993; Fals-Stewart & Lucente, 1994; Grohman & Fals-Stewart, 2003) and increased treatment drop out (Donovan, Kivlahan, Kadden, & Hill, 2001). Whilst the impact of cognitive impairment on treatment outcomes have been evaluated in mixed aged samples, to our knowledge no research has examined the impact of cognitive impairment on treatment outcomes in a sample of older adults.

This study uses routinely collected data from an alcohol treatment service for older adults (aged ≥50 years) to explore the extent of cognitive impairment among older adults seeking alcohol treatment, and examine the relationship between cognitive impairment, treatment retention and alcohol use following treatment. It is hypothesised that: i) older people with cognitive impairment at the start of treatment will have poorer treatment outcomes (i.e. more likely to drop-out of treatment, greater level of alcohol use) than older people without cognitive impairment, and ii) there will be a reduction in cognitive impairment following alcohol treatment.

Method

Study design and setting

This study used data from the Drink Wise Age Well alcohol intervention service. The service was designed to provide comprehensive support to meet the needs of older adults experiencing alcohol-related harm. Assessments were designed to be age-sensitive and to identify issues particularly relevant to older adults; for example, screening for cognitive impairment, and assessing the risk of falls, elder abuse and alcohol-medication interactions. Interventions were designed to meet the needs of older adults (e.g. adapted for cognitive impairment, focused on life-stage issues)(Seddon et al., 2019).

Psycho-social support provided by the service was based on the principals of cognitive behavioural therapy, solution focused therapy and motivational interviewing. The approaches used were not manualised but adapted and applied as appropriate to each individual case. The service did not provide pharmacotherapy, and attendance at the service was voluntary. Although some clients remained in service for up-to twelve months, contact with the service averaged approximately eight sessions over a duration of three months.

Drink Wise Age Well operated in five areas across the United Kingdom (England: Sheffield and Devon, Scotland: Glasgow, Wales: Cwm Taf, and Northern Ireland: Western Health and Social Care Trust Area). Referral to the Drink Wise Age Well service was by self-referral, from drug and alcohol services and from health and social care services (e.g. hospital, housing, general practitioner).

Participant recruitment

Study participants were older adults attending the Drink Wise Age Well alcohol intervention service between June 2015 and November 2017. Clients were included in this study if they completed screening for cognitive impairment at admission to treatment.

Measures

This study used routinely collected data from assessments at intake and discharge from treatment, including demographic information, data on alcohol use, and data on cognitive functioning. Clients were discharged from service when they had achieved their treatment goals; thus there was no set timeframe to the follow-up assessment at discharge.

Assessments were administered by Drink Wise Age Well practitioner staff. Staff were trained alcohol practitioners with backgrounds in nursing, social care and counselling. Additional training was undertaken by all staff in completing the Montreal Cognitive Assessment.

Alcohol use was assessed using the Alcohol Use Disorders Identification Test (AUDIT). A score of 8 and above indicates hazardous use of alcohol, with scores of 20+ indicating possible alcohol dependence (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). The assessment also included questions about the number of drinking days in the past month, the number of units consumed on a typical drinking day, age of first use, age first experienced alcohol related problems, and previous alcohol treatment.

Cognitive impairment was assessed using the Montreal Cognitive Assessment (MoCA). The MoCA is a 30-item scale designed to detect cognitive impairment. It has been found to be effective in identifying cognitive impairment among people who misuse alcohol and drugs (Copersino et al., 2009; Copersino et al., 2012), as well as being validated for use among older adults (Luis, Keegan, & Mullan, 2009). A score of ≥26 indicates normal cognitive function (Nasreddine et al., 2005). The scale has been found to demonstrate high test-retest reliability, good internal consistency and high levels of sensitivity and specificity in detecting cognitive impairment (Nasreddine et al., 2005). The MoCA can also be used to classify the degree of cognitive impairment from severe (scores of 0-9), moderate (scores of 10-17), mild (scores of 18-25) and normal cognitive functioning (scores of ≥26)("MoCA: Montreal Cognitive Assessment,"). Screening for cognitive impairment using the MoCA was done by trained Drink Wise Age Well practitioner staff. All staff completed standardised training and workshops on how to administer the MoCA.

Adapting alcohol treatment for people with cognitive impairment

There is a lack of guidance on how to adapt alcohol treatment for people with cognitive impairment. Recommendations from a study examining alcohol-related cognitive impairment in older people (Wadd et al., 2013) were used to inform treatment adaptations. Examples of ways treatment was adapted include: using a calendar/diary and telephone calls to remind clients of appointments, using written notes about treatment sessions and goals, flexibility in the length of treatment sessions, providing information in different ways (e.g. verbally, in writing and using diagrams), setting small goals, providing clients with a photograph of their alcohol practitioner, and ensuring that alcohol practitioners reintroduced themselves at each treatment session (Drink Wise Age Well, 2020). All

staff received training on how to adapt treatment interventions. Adaptations were not standardised and were applied as appropriate on a case-by-case basis.

Ethical approval

Participants provided written consent for their anonymised data to be shared with the research team. Ethical approval was granted by the University of Bedfordshire's Research Ethics Committee.

Data analysis

Data were analysed using SPSS version 22 statistical software. Cases with missing data were excluded from analysis. An alpha level of $p< 0.05$ was set for all statistical tests.

An independent samples t-test was used to examine if there were differences in the level of alcohol use (weekly alcohol units) for participants with cognitive impairment vs. those with no impairment at entry to treatment. The weekly alcohol unit score was calculated by multiplying the number of days drinking in the past 28 by the number of units consumed on a typical drinking day and dividing by 4, to provide a 'weekly alcohol unit' score.

Paired samples t-tests were used to examine change in cognitive impairment. Independent samples t-tests were used to examine if cognitive impairment at entry to treatment was associated with the number of days in treatment, and if cognitive impairment was associated with treatment drop-out.

Multiple linear regression was used to examine if cognitive impairment at entry to treatment was associated with alcohol use (weekly alcohol units) at treatment exit. Age and alcohol use (weekly alcohol units) at treatment entry were entered into the model as covariates.

Results

Participants (see table I)

A total of 531 participants completed assessment at entry to treatment; 56.5% (n= 300) were male and 43.5% (n= 231) were female. The mean age was 59.67 (SD: 7.09, range 49-80 years). Two-hundred and forty-six participants had not exited treatment at the time of study, meaning 179 participants were included in the analysis of change in cognitive impairment.

The majority of participants were referred to treatment with the Drink Wise Age Well service by drug and alcohol services (n= 196, 36.9%), while a quarter of the sample (24.9%; n = 132) self-referred to treatment; the remaining participants were referred from various health and social care services (e.g. hospital, housing support, general practitioner).

Alcohol use characteristics at treatment entry

At entry to treatment participants reported a mean AUDIT score of 24.35 (SD: 9.43, range 0-40), with a mean of 17.61 (SD: 11.10) drinking days in the past month and 17.81 (SD: 14.61) units on a typical

drinking day. In the United Kingdom, one unit of alcohol is defined as 10 millilitres (8 grams) of pure alcohol.

The mean age for first use of alcohol was 17.27 (SD: 5.41) years, with the mean age for first experiencing problems with alcohol being 39.82 (SD: 14.14, range 13 - 76) years. 45.3% of participants had a late onset alcohol problem (i.e. after the age of 40).

An independent samples t-test was used to examine if there were differences in the level of alcohol use (weekly alcohol units) for participants with cognitive impairment vs. those with no impairment at entry to treatment. The results indicate there was no significant difference in the level of alcohol use at entry to treatment between participants with or without cognitive impairment [t(511)= -.374, p = .71, 95% CI -16.90 – 11.50].

INSERT TABLE I HERE

Cognitive Impairment at entry to treatment

The mean MoCA score at treatment entry was 24.53 (SD: 4.16, range 5 – 30); 51.6% (n= 274) were classed as having normal cognitive function, 41.4% (n= 220) had mild cognitive impairment, 5.8% (n= 31) had moderate cognitive impairment and 1.1% (n= 6) had severe cognitive impairment.

An independent samples t-test was used to examine if cognitive impairment at entry to treatment was associated with the number of days in treatment. The results indicate there was no significant association between cognitive impairment and duration in treatment [t(422) = 1.482, p = .13, 95% CI -5.20 – 37.05].

Change in cognitive impairment between treatment entry and exit (see table II)

Paired samples t-tests were used to examine changes in cognitive impairment. There was found to be a significant overall improvement in cognitive impairment of 1.12 points for the 179 participants screened at both treatment entry and exit [t(178)= -5.959, p < .001, 95% CI: -1.49, -0.75].

257 participants (48.4%) were found to have some degree of cognitive impairment at entry to treatment. Of these, 92 participants had been discharged from treatment and completed MoCA screening at the time of this study. The results indicate that for these 92 participants there was a significant improvement of 1.8 points between treatment entry and exit [t(91)= -5.638, p < .001, 95% CI: -2.42, -1.16].

INSERT TABLE II HERE

Cognitive impairment and treatment drop-out

Overall, 12.8% (n= 68) of participants dropped-out from treatment. To examine if cognitive impairment was associated with treatment drop-out an independent samples t-test was used to compare the level of cognitive impairment for participants that dropped-out vs. participants that continued to engage in treatment. The results indicate there was no significant association between cognitive impairment and treatment drop-out [Mean, participants retained in treatment: 24.62 (SD: 4.02); Mean, participants that dropped-out of treatment: 23.94 (SD: 5.06); $t(79.9)= 1.06$, $p = .29$, 95% CI -.599 – 1.95]

Cognitive impairment and alcohol use following treatment

Multiple linear regression was used to examine if cognitive impairment at entry to treatment was associated with alcohol use at treatment exit. Age and alcohol use at treatment entry were entered into the model as covariates. The model explained 19.3% of the variance and was a significant predictor of alcohol use at exit from treatment [$F(3, 288)= 23.01$, $p < .001$]. Age [B= -.674, $p = .04$] and alcohol use at treatment entry [B= .215, $p < .001$] were significant predictors of alcohol use at treatment exit; cognitive impairment at entry to treatment was not a significant predictor of alcohol use at treatment exit [B= -.621, $p = .30$].

Discussion

This study suggests there may be a significant amount of cognitive impairment among older adults attending alcohol treatment, with almost half of all participants entering treatment found to have some degree of impairment. Research suggests that alcohol-related cognitive impairment is often not identified by substance misuse professionals or by self-report (Wadd et al., 2013), and many cases of alcohol-related cognitive impairment go undetected (Thomson, Cook, Touquet, & Henry, 2002).

The identification of cognitive impairment among people attending alcohol treatment provides opportunities for intervention and is necessary to inform effective treatment planning, to adapt alcohol treatment interventions and to administer thiamine for those at risk of thiamine deficiency. A significant number of people with alcohol-related cognitive impairment have the potential to recover either substantially or completely if it is identified early and managed effectively. Previous research among people with alcohol related brain damage suggests that in general, one quarter of people will experience a full recovery, one quarter will experience significant recovery, one quarter will experience slight recovery and one quarter will experience no recovery (Smith & Hillman, 1999). It is posited that there is a two-year window for recovery after initial diagnosis of alcohol related brain damage (Cox, Anderson, & McCabe, 2004), suggesting that early identification and intervention may be crucial in improving longer-term outcomes for those with alcohol related cognitive impairment.

This study found a significant improvement in cognitive function following alcohol treatment. This is in line with findings from mixed-age studies which demonstrate improved cognitive performance

following abstinence from alcohol, or greatly reduced drinking (Bartels et al., 2007; Stavro et al., 2013; Volkow & Wang, 1995). Alcohol treatment is in itself an effective intervention for alcohol related cognitive impairment but, paradoxically, alcohol treatment is less likely to be successful if cognitive impairment has not been identified so that adaptations, such as those made in this study, can be made to take account of cognitive deficits.

Previous research in mixed-aged samples has found cognitive impairment to be associated with poorer treatment attendance (Bates, Pawlak, Tonigan, & Buckman, 2006; Copersino et al., 2012), increased likelihood of treatment drop-out (Donovan et al., 2001) and poorer treatment outcome (Fals-Stewart, 1993; Fals-Stewart & Lucente, 1994; Grohman & Fals-Stewart, 2003). Research suggests that cognitive impairment may have a negative impact on alcohol treatment processes and therapeutic change mechanisms including: less treatment relevant information being remembered (Godding, Fitterling, Schmitz, Seville, & Parisi, 1992), lower readiness to change (Le Berre et al., 2012), lower self-efficacy (Bates et al., 2006), and reduced insight and denial of addiction (Rinn, Desai, Rosenblatt, & Gastfriend, 2002).

This study found no association between cognitive impairment, alcohol use following treatment or treatment drop-out, despite the fact that research suggests that older adults are less likely to recover from alcohol-related cognitive impairment (Rourke & Grant, 1999). It is possible that the treatment model used in the Drink Wise Age Well service may have contributed to the observed results. The Drink Wise Age Well service was specifically designed to meet the needs of older adults; the service was based upon an outreach model that included home visits, alcohol practitioners had smaller caseloads and the focus was on person centred care. Staff were trained how to screen for cognitive impairment, how to adapt treatment for people with cognitive impairment, and time was taken to ensure that work progressed at a pace suitable to the client. This model of screening for cognitive impairment and adapting treatment, may have helped facilitate therapeutic engagement and contributed to the achievement of successful outcomes in this study.

The finding that almost half of older adults attending alcohol treatment in this study had some degree of cognitive impairment is concerning, especially as cognitive impairment has been associated with increased depression (Panza et al., 2010) poorer quality of life (Teng, Tassniyom, & Lu, 2012), and has been found to have a significant effect on daily living, causing considerable distress (Wadd et al., 2013). Screening and intervention for cognitive impairment may therefore have wider benefits beyond facilitating recovery in cognitive function; contributing to improved quality of life and increased mental well-being. Nevertheless, whilst there are clear benefits to cognitive screening, identifying cognitive impairment also has the potential to cause distress. Dementia is the most feared illness among those over the age of 55 years (Brunet et al., 2012). If screening for cognitive impairment is to become routine within drug and alcohol services it is important that drug and alcohol practitioners are sufficiently trained. Staff engagement with screening for cognitive impairment is maximised where staff have the technical skills to administer and discuss the results of screening and where there are specific pathways to respond to client need (Madoc-Jones et al., 2020). Training should encompass screening and assessment, identification, care management, risk issues, and local care pathways. Training should also highlight the potential for improvement and recovery, and staff should be skilled in communicating screening results in a sensitive and professional manner.

Recommendations for routine screening in drug and alcohol services are rarely implemented in practice, despite evidence to suggest that screening for cognitive impairment within substance misuse services is acceptable to older adults (Wadd et al., 2013). This hesitancy may be related to a lack of guidance on how to adapt alcohol treatment for people with cognitive impairment. If and how this is currently done largely depends on the capacity of the service and the skills and expertise of practitioners. If screening is to become routine as advocated by both NICE (National Institute for Health and Care Excellence, 2011) and the Royal College of Psychiatrists (Royal College of Psychiatrists, 2014) there needs to be a clear pathway on how interventions for alcohol use can be adapted. In the current study, staff received training both on screening for cognitive impairment and in how to adapt interventions; staff then used their professional experience to tailor treatment on an individual basis. It is likely that outcomes may be further optimised if adaptations to treatment accord with the type and severity of cognitive deficits. For example, those with deficits in short-term memory recall may require different adaptations to treatment to those experiencing deficits in visuospatial ability. Further research is needed to establish how to do this effectively.

This study has several strengths; to our knowledge, this is the first study to examine the impact of cognitive impairment on older adults in alcohol treatment. It is possible that the adaptions made to treatment may have resulted in the positive outcomes in this study (i.e. no greater treatment drop out, no association between cognitive impairment and the level of alcohol use at treatment exit). However, the absence of a control group means we cannot conclude this for certain. In this study, adaptations to treatment were not standardised; treatment was instead tailored on an individual basis, and the time to follow-up assessment at discharge from treatment varied between participants. It is suggested that future research examines the impact of screening and adapting treatment for cognitive impairment for people in alcohol treatment. This would also allow full examination of a range of potential confounding factors; something that was not possible to achieve in the current study. This study used routinely collected data; of the 531 participants assessed at entry to treatment, only 179 had exited treatment at the time of the study, resulting in a smaller sample size for analyses of change over time. It is possible that this smaller sample size may have reduced statistical power to detect significant differences. It is also important to note that although this study found statistically significant changes in cognitive functioning associated with treatment, it is unclear if the change in the level of functioning is clinically significant. Research is needed to understand what represents clinically significant change in cognitive functioning in alcohol treatment populations.

Higher-risk use of alcohol is common among older adults in the United Kingdom (National Statistics, 2020; Scottish Government, 2020; Welsh Government, 2019), and there are trends for increasing higher-risk use worldwide (Grant et al., 2017; Hallgren et al., 2010; Han et al., 2017; Kelfve et al., 2014). In line with this we can expect to see increases in the level of alcohol related cognitive-impairment. This study suggests there may be a significant amount of cognitive impairment among older adults attending alcohol treatment.

Drug and alcohol services are uniquely placed to identify cognitive impairment and to intervene, and there have been calls from national and international drug policy for the implementation of routine screening for cognitive impairment within drug and alcohol services (National Institute for Health and Care Excellence, 2011; NSW Ministry of Health, 2015; Royal College of Psychiatrists, 2014; .

Scottish Government, 2018). In the absence of routine screening, opportunities for treatment planning and intervention may be missed.

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