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Original Article

Improving treatment for people with cognitive impairment and substance misuse issues: Lessons from an inclusive residential treatment program pilot in Australia

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ABSTRACT

Background: Approximately half of the substance dependence treatment population is estimated to have a cognitive impairment, which reduces participation, retention, and post-treatment outcomes. Cognitive behaviour change approaches are less effective for this population and cognitive remediation strategies have been found to improve outcomes. Evidence on modified programs to remove environmental barriers for treatment seekers with disability does not exist.
Objective: A modified residential substance misuse treatment program in New South Wales, Australia, was piloted and evaluated to address this knowledge gap.
Method: Of 67 residents who received treatment during the evaluation period, 33 were screened as having cognitive impairment. Twelve residents took part in an interview and 10 staff in a focus group to understand their views of the pilot program. Resident characteristics and retention rates and themes about program benefits and challenges are reported.
Results: Treatment completion was up to five times higher for residents with cognitive impairment after the new program was implemented. The pilot program provided simplified written and visual materials and concrete examples and introduced a daily virtues program to embed new learning and support behaviour change. Resources to allow staff to engage more intensively with residents and provision of ongoing staff training were viewed as essential for program success.
Conclusions: Environmental adaptations, including a combination of conventional treatment modalities with accessible design and person-centred principles, removed barriers to treatment for residents with cognitive impairment. Creating a climate where respect, tolerance and peer support were normalised was likely to have been particularly beneficial for these residents.

It is estimated that approximately half of the people who receive treatment for substance dependence have a cognitive impairment related to a birth condition or acquired through injury or substance use.[1] Available research indicates participation and effectiveness of treatment are negatively impacted by cognitive impairment.[2,3] People with cognitive impairment may be less likely than others to complete treatment, which is one of the most consistent factors associated with a favourable treatment outcome.[4] Deficits in executive functioning are the most common problem observed in people with problematic substance use.[5] Problems include difficulty with planning, memory, problem solving and self-regulation[6] —all factors that affect daily functioning including the capacity to understand and apply concepts and skills delivered in substance

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treatment, such as drug refusal.[7,8] In this article, a social model of disability is used.[9] This model explains that disability is created by social barriers not impairments, and thus achieving equality for people with disability requires dismantling social (institutional, attitudinal, and environmental) barriers.[10] In the treatment context, then, it is not cognitive impairment itself that impacts on treatment outcomes but barriers that prevent equality of access to treatment.

Cognitive behaviour therapy is the basis of current substance misuse treatment in Australia and internationally and behaviour change involves treatment seekers analysing situational risks to reduced substance use. Residential rehabilitation programs provide treatment in a therapeutic environment, usually over 3–6 months. Abstinence is the key treatment approach and outcome focus, and psycho-educational groups are used to support residents to deal with cravings and understand triggers for substance use. There is limited evidence of adaptation of these programs to accommodate the diverse learning needs and cognitive capacities of residents. Motivational interviewing, a structured behaviour change process used extensively in substance misuse treatment,[11] relies on reinforcement of abstract concepts such as emotional regulation. Learning, problem solving, and planning are the key tasks of rehabilitation but people with cognitive impairment need more time to process content and learn and apply new information, impacting on engaging in standard treatment approaches.[2]

Cognitive remediation strategies are used to support people with cognitive impairment to identify compensatory techniques to improve memory or to employ memory aids.[12] With the high prevalence of cognitive impairment among people seeking treatment for substance use problems, it is important for treatment to adapt to and address their health needs. However, evidence of implementation and outcomes of cognitive remediation programs delivered within substance treatment settings is limited. A recent feasibility study found that cognitive remediation embedded in a standard rehabilitation centre schedule was achievable and resulted in some gains in executive functioning for residents with cognitive difficulties. Other cognitive remediation studies have demonstrated reduced substance use[13] and re-hospitalisation rates,[14] and achievement of functional behavioural goals.[15] However, these studies assess specific cognitive remediation interventions in a range of settings rather than people's experiences within a therapeutic milieu. The relationship between the environment and the person receiving treatment is critical in understanding what works for individuals.[16] Environment includes staff attitudes, which have been shown to influence treatment experiences and completion.[17]

Community Reinforcement Approach (CRA) recognises that building core life skills reduces relapse.[18,19] Research supports CRA use with treatment populations likely to need a modified approach. For example, a recent study showed that, by creating opportunities to rebuild or develop positive social, vocational and recreational behaviours and learn new coping strategies, CRA improved well-being for Indigenous Australians with drug and alcohol issues.[20]

This article describes a modified program, called REPIN,[1] piloted in a residential rehabilitation unit in New South Wales, Australia, which had previously reported treatment completion rates as low as 10% for residents with cognitive impairment[1]. The residential setting accommodated up to 16 men and women who had completed medically supervised withdrawal prior to admission and voluntarily agreed to the program. Treatment completion was defined as completing at least one practice trial [or 'prac'] in the community. All three authors were involved in the evaluation from April 2016–January2, 017.[2]

Program model

The REPIN pilot program was designed with content based on person-centred care approaches.[21] The focus was on involving the person in decisions about their potential, strengths, and support needs[22] and using universal design principles so treatment was accessible to all residents regardless of cognitive function. To our knowledge, these principles have not previously been incorporated into substance misuse treatment (see Table 1). Universal design is a teaching approach to optimise learning for all abilities by removing structural barriers.[23] Learning content was provided in multiple modalities to enable information retention suited to diverse learning needs.[24] Modified psycho-educational materials were incorporated into the program. A workbook developed in Canada for use with clients living with acquired brain injury and substance misuse issues as part of the SUBI Bridging Project (see https://www.subi.ca/) was adapted by Author B in consultation with its author [Dr Carolyn Lemsky, Clinicial Director, Community Head Injury Resource Services of Toronto]. All written materials were at elementary school reading ability level and had minimal abstraction. The workbooks were used to support a staged change process in which residents gained *awareness* of the impacts of substance misuse, *knowledge* of their own triggers and new *skills* to support *mastery* for relapse prevention. Residents prepared to re-enter the community during a seven-ten day 'prac', in partnership with family wherever possible, and attended community-based programs and engaged pro-social support networks. Based on their experiences during 'prac', they reviewed and amended their goals and self-assessed readiness to complete the program.

To reinforce new learning and reward progress, the workbook was accompanied by a relatable reference based on the learn-to-drive program in New South Wales. Residents received a coloured 'tag' when they completed the stages outlined above. A yellow 'L' tag based on the learner driver plate received after passing a road rules test matched the 'awareness' stage and was followed by a red then green tag that aligned to coloured licences held by Provisional drivers, matching acquisition of 'knowledge' and 'skills' stages. A black tag, matching acquisition of a full license, corresponded to 'mastery' and signified that the resident had acquired the skills to live substance-free.

REPIN employed new staff from disability services to complement those with backgrounds in drug and alcohol settings and provided training and supervision from a manager with experience working with people with intellectual disability. Staff were supported to adapt rules and expectations of the program to respond to executive functioning problems, including impaired short-term memory and impulse control. Prior to these adaptations, people who repeatedly forgot tasks or appointments or had difficulty participating in the shared living setting were often discharged from the program. Staff encouraged residents with cognitive impairment to develop self-management and memory techniques, such as visualisation, and used 'teachable' life skills such as vocational retraining and daily routines and tasks to retrain cognitive abilities. Consistent with the inclusive spirit of REPIN pilot program, these techniques and life skills are useful for all residents while also

[1] REPIN stands for receive, encode, process, and integrate information.

[2] Author A led the external research team and had a background in disability research and practice. Author B had a background in substance treatment and research and was instrumental in the design and implementation of REPIN. Author C, an accredited mental health social worker and specialised in drug and alcohol treatment for vulnerable groups, was employed to support resident participation and facilitate data transfer to the external evaluators.

Table 1
Barriers and adaptations for people with cognitive impairments (CI).

Barriers to treatment for people with CI	REPIN pilot adaptations to address barriers
Group psycho educational sessions—written materials	• Simplified written material (universal design fonts and language at 12 years age level) to complement verbal instruction
Group psycho educational sessions—processes including number of topics and activities, participation and time frames	• Practicing skills, e.g., alcohol or substance refusal, before introducing concepts • Repetition and role play • Morning groups instead of afternoon • One activity/topic per group session • Relationship of substance use to cognition as a topic
Residential environment—routines	• Whiteboard timetable in common area
Residential environment—staff knowledge and behaviour	• Staff name tags worn at all times • Staff training to raise awareness of issues related to cognitive impairment—personal/social/behavioural impacts of CI • Repetition of instructions, reminders, providing notebooks for lists
Residential environment—responding to conflict via discharge	• Staff understanding and training to adapt responses to emotional regulation problems • Provision of 'Time out' space • Conflict mediation
Individual case management—case plans and expectations of self-management	• Detailed written case plans provided to residents • Single action case plans and detailed steps with practice sessions, e.g., phone calls to make appointments • Inclusion of family in goal setting
Time frame for program completion	• Based on individualised progress through program stages instead of set timeframe
Program process	• Defined via knowledge, skills, mastery stages with reviews at each stage to assess and identify individual progress • Achievements celebrated • Defined and specific goals for each stage
Program content—substance use, relationships, healthcare	• Scheduled exercise • Variety of recreational and social activities • Promotion of hobbies and new interests
Screening and assessment—substance use, mental health	• Cognitive function, compensatory strategies, relationship of substance use to cognition

removing environmental barriers for residents with cognitive limitations.

CRA was incorporated in novel ways. Residents were encouraged to try new coping strategies such as mindfulness, drumming, and regular exercise. In recognition that barriers to participation in employment and education can impact on recovery for people with cognitive impairment, residents received help with resume preparation and were linked into vocational training and courses, and there was an intentional focus on rebuilding self-esteem and confidence. Having a sense of spiritual orientation has been shown to improve treatment outcomes.[25] REPIN used a Daily Virtues program to introduce a spiritual element to treatment which aligned with motivational interviewing techniques. Two daily group sessions were used to help residents rebuild positive and meaningful personal frameworks and break down intangible concepts, such as integrity and dignity, into concrete and relatable examples. Each morning, residents reflected together on a specific virtue and discussed how it might be enacted in daily life and then regrouped that evening to share how they had practiced the virtue throughout the day. Bookending discussions like this helped residents keep the virtue in mind and reduced the risk that people with cognitive impairment would struggle to remember and thus disconnect or feel excluded from discussions.

Method

Developmental evaluation captures the dynamic process of program change.[26] The evaluation approach used in this study enabled the researchers to monitor emergent themes as the REPIN pilot program was being implemented into an existing service environment and with a new resident cohort andmostly, new staff. Ethics approval to conduct the evaluation was granted by UNSW Human Research Ethics Committee [HC161310].[3]

Convenience sampling was used to recruit resident and staff participants. REPIN was designed to offer *inclusive* rathern than *disability-specific* treatment, and a pragmatic approach was taken to identifying residents with cognitive impairment. The Addenbrooke's Cognitive Examination (ACE-R) measures attention/orientation, memory, verbal fluency, language, and visuospatial ability and has established reliability in dementia populations.[27] Despite its reliability has not being confirmed with a substance misuse population, Author B has previously used the ACE-R to estimate prevalence of cognitive impairment in the same treatment population[i]. Since the study purpose was not to investigate the cognitive functioning of individual residents and because a more suitable screening tool could not be sourced, ACE-R-AUS was deemed sufficiently fit for purpose to use in this study. It had the advantage of being able to be administered by a suitably qualified staff person (Author C) and this was an important consideration because resources for clinical cognitive assessments were not available. ACE-R scores of 83–88 indicate mild to moderate cognitive impairment and 82 or below, moderate to severe cognitive impairment. Residents with a score 88 or below were invited to given simple verbal and written information about the study and invited to participate.

Participants

Of 67 residents who entered the treatment program during the evaluation period, 33 (50%) were assessed as having a cognitive impairment with an ACE-R-AU score range of 63–85 (Table 2). All 33 residents consented to participate in the study. De-identified demographic data about all 67 residents was also accessed for research purposes. Eighteen residents with cognitive impairment agreed to be interviewed at a later date, but six changed their minds when approached during their residential period.

Twelve individual interviews were conducted via videoconference (n = 9) or in person (n = 3) by Author A. A purpose-designed, plain-English interview guide was used to obtain views on if and how REPIN differed from participant expectations or previous treatment experiences, good/not so good aspects of the program, and on any personal changes that had occured. Informed consent was gained by offering participants information in multiple formats and at several timepoints. Initial written information about the study was supplemented with a verbal explanation and, prior to their interview, eligible residents were asked to reaffirm consent

[3] Study materials available from the first author upon request.

Table 2
Resident characteristics.

Characteristic	Residents with cognitive disability[a] N = 33 (%)	Residents without cognitive disability N = 34 (%)
Gender		
Female	6 (18)	9 (27)
Male	27 (82)	25 (74)
Age		
18–30	14 (42)	10 (29)
31–42	13 (39)	14 (41)
43–54	3 (9)	8 (24)
55–66	3 (9)	1 (3)
67–78	0 (0)	1 (3)
Indigenous Status		
Aboriginal and Torres Strait Islander	10 (30)	6 (18)
Non-Aboriginal	23 (70)	28 (82)
Primary drug of concern		
Methamphetamine	16 (50)	12 (35)
Alcohol	9 (28)	16 (47)
Cannabis	5 (16)	3 (9)
Opioids	1 (3)	1 (3)
Polydrug use	1 (3)	0 (0)
Other	1 (3)	2 (6)
Age at leaving full-time education		
13 years	3 (9)	1 (3)
14–15 years	13 (39)	9 (26)
16–17 years	14 (42)	13 (38)
18+ years	3 (9)	11 (32)
Length of stay (in days)		
0–25	4 (12)	6 (18)
26–51	4 (12)	8 (24)
52–77	10 (30)	3 (9)
78–103	6 (18)	11 (32)
104+	4 (12)	2 (6)
Treatment completed	16 (49)	14 (41)
Treatment not completed	12 (36)	16 (47)
Treatment ongoing	5 (15)	4 (12)

[a] ACE-R score range was 63–85.

verbally and reminded that participation was voluntary. They were also asked to consent to audio recording of the interview. Interviews were 45 min to one hour duration and were professionally transcribed. Author C was available to help with technology in the case of videoconference interviews and 10 residents accepted her offer to sit in on interviews as a support.

All staff (n = 16) were invited to contribute to the evaluation by providing their perspectives on the implementation of REPIN. Ten staff, four managers and six residential workers, agreed to take part in a focus group. Two separate groups were convened (managers in one, direct workers in another) candour about personal challenges and organisational issues. Discussion prompts focused on disability training, resource implications and support needs and provision for residents with cognitive impairment. Demographic information about staff participants was not collected to prevent re-identification given the small workforce.

Data analysis

Demographic information on all 67 residents was de-identified and exported onto an Excel spreadsheet. Basic descriptive statistics were computed to compare residents with and without cognitive impairment (Table 2). Interview and focus group transcripts were professionally transcribed and uploaded to NVivo. Thematic analysis was undertaken to identify common and divergent perspectives of the program[28]. An inductive thematic approach was used, which involved open coding and constant comparison to identify patterns across the sample.[29] Themes about the change process for residents with cognitive impairment are reported elsewhere[32]. Author A reviewed the original codes and themes and extracted those which referred to the program model and inclusive strategies. These were organised into emergent themes and, through discussion with Author B, agreement was reached on final themes.

Results

Resident characteristics

Table 2 provides details on all 67 program residents who were admitted to the residential treatment program between April 2016 to January 2017. It compares the characteristics of residents with cognitive impairment (n = 33) and those without (n = 34). Both groups were similar in terms of age, gender and Indigenous status; however, differed slightly in the main drug of concern. Methamphetamines were the main drug of concern for residents with cognitive impairment (50%), whereas alcohol was the main drug of concern for residents without cognitive impairment (47%). Residents with cognitive impairment were more likely to have left high school by age 15 than those without[10,16] and less likely to have remained at high school to age 18.[3,11] Retention rates were similar across both groups. Residents with cognitive impairment were slightly more likely to complete the program than those without (49%, 37%). Almost half of all residents did not complete the program and there was no difference for those with and without cognitive impairment (47%, 48%). Prior to the implementation of REPIN, only 10% of residents with cognitive impairment completed treatment[i], so a retention rate approaching 50% is a substantial increase.

Themes

Three themes were identified: 1) practising inclusion; 2) gaining confidence and skills; and 3) resourcing intensive support. Each theme, related program area and supporting evidence from staff and residents are summarised in Table 3.

Table 3
Themes.

Theme 1: Practising inclusion			
Key findings	Link to program element	Evidence from residents	Evidence from staff
• Individualised support to achieve goals and willingness to make adjustments; treating mistakes as "teachable moments"; encouraging help seeking behaviour	Person-centred approach (e.g., motivational interviewing)	*All the staff members are really helpful. We all get assigned a staff member each to work on a personal plan* *It's easy to ask for help here. You don't feel like you're dumb, I guess.*	*Showing respect and empathy.* *We jump in that way.*
• Simplified written information and images (e.g., visual aids, video feedback, mind maps, role-plays, role-modelling and demonstrations) and use of relatable examples that to connect to everyday life • Staff training to recognise and develop strategies to address resident distractibility.	Universal design (e.g, daily virtues, workbooks, group discussions).	*I find the books that we get for each stage, it's really cool, because you get to really focus and you get to really be in-depth with yourself and complete those books, (and) I find them really helpful* *I always knew I was having trouble with my memory. They're teaching me new ways to use different parts of my brain to get around it.* *They slow it down and break everything down. They don't want you to miss nothing.*	*We are asking the same (questions) but in a more accessible manner (using) more white space, more branched out*
• Groupwork sessions provided a safe space for residents to share feelings without judgment	Daily Virtues Program	*The virtue is basically explained on the card and you memorise them for the day. Today's virtue was commitment, and ... to me it is just being committed to being human and to my family* *Every second of the day you're thinking of things that are relating back to the virtue and it just helps*	*The biggest surprise and success has been the (Daily) Virtues Program.*
Theme 2: Gaining confidence and skills			
• Staff modelling respectful and open communication • Promoting self-awareness and practicing emotional regulation	CRA (e.g., create opportunities to practice pro-social skills in informal settings)	*I've had previous anger issues. I try and get on top of that (by) taking a deep breath or counting to ten. I find it all helps if you just think about it before you say things.* *If I'm angry, I know there's other options than to go use, or drink.*	*Hearing people's stories [proves]the people getting through it are doing really, really well*
• Support to discover new interests and prepare to generalise newly acquired skills to cope with boredom inside residential treatment to community life. • Residents felt validated when staff praised them for walking away from conflict or acting in a way that embodied a daily virtue	CRA (making healthcare appointments, going to the gym, taking daily exercise and group outings)	*I think we just learn to be bored, if that makes sense. Learn to figure out what to do when we're bored without using drugs.* *It's all based on the fact we're all in the same boat and we're all here to help each other. We all understand, to an extent, what each other is going through.*	*It's also important to focus on when they leave.* *It's something I've noticed everybody tends to do. No one pussyfoots around or is too scared to approach someone to see what's going on with them*
Theme 3: Resourcing intensive support			
• Staff levels to meet individualised learning support needs	Funding barrier to disability inclusion	*Maybe a bit more one-on-one support would be good for me, during groups…Some things they talk about go straight over my head and I don't want to ask in group, because I feel embarrassed.*	*tThe program's basically under-funded*" *we're trying to do something different, special, (and that) requires more intensive resources*
• Staff concerns about balancing different learning abilities so asto minimise disengagement by residents either with or without cognitive impairment			*You've got a couple of people without cognitive impairment who help the people who have a cognitive impairment (and) if you have too many without cognitive impairment, they get bored and irritated.*
• Non-disclosure of ACE-R scores could potentially undermine timely responses to individual learning needs			*It all comes down to what they divulge to us in regard to what we know about them* *We can sort of tell who might be struggling, so we offer one-on-one support to help them*

Discussion

Typically, residential substance treatment programs use a one-size-fits-all model. Recognising the relationship between the rehabilitation environment and the functioning of individual residents was key to the person-centred practice applied in the REPIN pilot program. While studies suggest that specific cognitive remediation interventions can reduce substance use impacts for people with cognitive impairment,[12,13,15] the way treatment environments can be modified had not been explored. This is the first study to describe participants' experiences of a substance treatment setting designed to be inclusive and accessible for people with cognitive impairment.

A key finding was that the implementation of universal design principles made the program materials inclusive of all rehabilitation residents, which extends knowledge about the use of these techniques to remove communication barriers for people with disability[24] by applying them to learning within a treatment context. Applying a disability-informed approach to a rehabilitation setting is novel and required flexibility and openness to allow program elements to be fine-tuned along the way. The high level of approval among staff and residents for universal design in program elements such as the coloured tags, may reflect their relatability and impact on self-esteem, particularly for people with cognitive impairment who are less likely to have experienced recognition as successful learners in the past.[30] A person-centred and strengths-based design were highly favoured by staff and residents. Both participant groups attributed the disability knowledge and skills of the program manager as instrumental to instilling a sense of teamwork among staff which was then generalised into a culture of collaboration between residents and staff alike. Creating a climate in which respect, tolerance and peer support were normalised was likely to have been particularly beneficial for residents with cognitive impairment who, like people with intellectual disability in general, experience social exclusion.

The pilot program created a treatment environment that was disability inclusive and acceptable—a critical factor in treatment retention.[17] Staff attitudes and understanding of disability were central to removing institutional barriers and creating a therapeutic setting that was flexible and adapted to differences in cognitive functioning.[23] The intentional focus on inclusion of people with cognitive impairment in treatment and emphasis on staff support for new skills and strategies to assist them to respond to cognitive difficulties was critical to program delivery. Program activities and daily routines provided a structured environment within which cognitive impairment was recognised as a contributing factor in residents learning to cope with difficult emotions, manage interpersonal conflicts, and communicate feelings constructively. Embedding a person-centred approach created a positive culture that was attuned to individual needs and their progress through stages paced to need rather than set duration.[20] The program attempted to address problems identified in the research literature such as one-size-fits-all psycho-educational groups, reliance on cognitive processing to support behaviour change activities and lack of opportunities to practice skills and strategies designed to reduce drug and alcohol consumption.

The chief barrier to success was resourcing, includes sufficient staffing and staff training to address intensive treatment support needs for those with cognitive limitations. Staff could envisage ways that the program could be developed and improved but lacked the time and resources to do so. Given that treatment completion is the most reliable indicator of a reduction in substance use, robust evidence that supports the need for adequate resourcing of accessible treatment that achieves this goal is warranted.

Limitations

The evaluation was conducted over a short timeframe with a small number of residents and in the context of real time implementation of the pilot program. A key limitation was the quality of data collected on individual outcomes such as relapse prevention. Incomplete data reduced reliability and made reporting individual treatment outcomes unwise. The use of a convenience sample introduced sample bias, and a decision by particular residents and staff not to take part may have influenced results. It is noted that fewer than half of eligible residents took part in an interview and the views of residents without cognitive impairment were not sought. Notwithstanding these limitations, the accounts of how adapted residential treatment impacted on a small number of treatment seekers and evidence of improved retention rates provides useful guidance for future program implementation and evaluations. Given the challenges with implementing evidence-based practices, such accounts have practical utility.

Conclusion

The study addresses a knowledge gap about treatment approaches designed to respond to the interaction of disability and substance misuse. The lessons learnt from an innovative pilot program implemented in New South Wales, Australia, are likely to be applicable to drug and alcohol rehabilitation treatment in other contexts. The program has potential to be scaled up to address the wider problem of the prevalence of, and poorer outcomes for, people with cognitive impairment in residential drug and alcohol treatment. The main implementation barriers encountered related to resource allocation to ensure the program could operate as intended.

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Conflicts of interest

The authors have no conflicts of interest to declare.

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