Research Article

Online Community Reinforcement and Family Training (CRAFT) for Concerned Significant Others in Rural Australia: A Randomized Controlled Trial

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Aims: To evaluate the effectiveness of an online delivery of Community Reinforcement and Family Training (CRAFT) in a rural Australian context.

Design: A randomized controlled trial (RCT) using a parallel-group, two-arm, superiority design, with a baseline assessment, and two follow-up assessments.

Setting: Rural Australians

Participants/Cases: 126 participants were enrolled and randomly assigned to either the CRAFT intervention (*n* = 64) or Waitlist (*n* = 62). At baseline, the mean age of participants was 51.08 years (*SD* = 10.88). Females comprised of 92.06% of the study. Most participants (86.4%) were born in Australia and 87.9% identified as White/Caucasian.

Intervention and Comparator: Participants were randomized (1:1) into the CRAFT or Waitlist groups. The CRAFT intervention consisted of 6 sessions of 60 minutes each, conducted over 6 weeks. Participants randomised to the waitlist received reading resources from the Center for Motivation and Change.

Measurements: The primary outcome was the psychological well-being of the participant. Psychological well-being scales included the DASS-21, SWLS, FS, and Brief-COPE.

Findings: Post-intervention scores found a statistically significant difference between the intervention and waitlist groups. This included in the intervention group, a decrease in depression scores (DASS-21), with an adjusted mean difference of -2.71 (95% CI: -5.36 to -0.06) between interventions and waitlist group, a significant increase in Satisfaction with Life scores (SWLS), with an

adjusted mean difference of 1.98 (95% CI: 0.45 to 3.50) and a significant increase in the use of problem-focused coping with an adjusted mean difference of 2.92 (95% CI: 1.33 to 4.51).
Conclusions: Online CRAFT for rural Australians decreased depression, increased life satisfaction and increased problem-focused coping.

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Introduction

Problematic substance use of a loved one (identified person, IP) can significantly impact the well-being of family and friends (hereafter referred to as concerned significant others, CSOs) [1]. CSOs often experience stress, worry, financial strain and disrupted family relationships related to the IP's substance use [2][3][4][5][6]. Further, CSOs tend to have higher prevalence of mental health conditions such as depression and anxiety [5][6]. Programs designed for CSOs are important to facilitate their own well-being, improve family functioning, and potentially reduce IP substance use [7][8][9]. However, access to CSO-specific services remains limited globally [10], and online resources rarely target CSO needs [7][11][12][13][14]. Within Australia, there is a significant gap in support services for CSOs, with only 8.1% of all substance treatment episodes provided to CSOs in 2022 [15][16]. This issue is exacerbated in rural areas where higher levels of substance use, poorer health and limited health service access are common [17][18][19][20].

Rural Australians face additional barriers when seeking support services for substance use. One barrier is the lack of services throughout rural Australia, with the majority (57%) of treatment services located in major cities [15]. The geographical distance between these limited services can mean significantly large travel distances for rural Australians, compounded by fewer transport options [21]. Additionally, living in a small community reduces anonymity and confidentiality, increasing hopelessness and shame when raising substance problems with local healthcare providers [11][21]. These challenges highlight the need to improve access to support services for CSOs in rural Australia.

Online services may help improve healthcare access for rural Australians. Online interventions for substance use have been shown to be highly satisfactory for both CSOs and individuals using substances [22][23][24]. However, many of these interventions focus on the IP [22][23][25] or do not specifically assess the mental health outcomes of the CSO [24]. Despite the growing evidence supporting

online interventions, there remains a need for online interventions specifically designed to support CSOs and address their unique concerns.

Community Reinforcement and Family Training (CRAFT) is an evidence-based intervention designed to support CSOs and to engage IPs into substance use treatment [26][27][28][29][30]. CRAFT was originally developed for CSOs of people using substances who were treatment resistant [31]. CRAFT has demonstrated cross-cultural effectiveness [26][27][28][32] and supports the CSO directly to improve their own psychological functioning [33]. Through personalised training and support, CSOs learn to effectively remove positive reinforcement for substance use while increasing positive reinforcement for non-using behaviour [34], ultimately aiming to help the IP enter treatment or reduce their substance use [35][36].

Face-to-face CRAFT trials in the United States of America (USA) and Europe have reported improved mental health, quality of life and relational functioning for the CSO, as well as reduced substance use of the IP [27][28][29][37][38][39]. However, online CRAFT adaptations have shown mixed impact on CSO treatment outcomes [38][40]. For example, Eek et al. (2020) delivered five online CRAFT modules, comprising of texts and short films with participants self-reporting reduced depression and emotional avoidance at six-week follow-up, but no significant differences were found for anxiety or stress. Similarly, Siljeholm et al. (2022) adapted the CRAFT intervention into a self-guided online format using reading materials and short videos. Using the DASS-21 and Satisfaction with Life Scale (SWLS), Siljeholm et al. (2022) found that while there was no reduction in depression, anxiety or stress, there was a reduction in the IPs substance use. A potential reason for a lack of mental health improvements in these studies may be due to the absence of practitioner interaction, relying instead on automated, self-guided delivery, limiting the applicability of findings to practitioner-facilitated models. Implementation of virtual face-to-face meetings with a practitioner would more closely align with a direct translation of the CRAFT intervention into the online format. As these studies were conducted in Sweden, further research is needed to evaluate the efficacy of CRAFT in other countries, such as the Australian context. Additionally, research is needed to assess the effectiveness of practitioner-delivered CRAFT in an online format. Lastly, existing studies have not explored the implementation of CRAFT in rural communities, highlighting the need for targeted studies in this setting.

The current study aimed to evaluate the effectiveness of an online practitioner delivery of CRAFT to CSOs in rural Australia. The current study is the first to evaluate CRAFT delivered online in Australia. This study addresses significant gaps in the literature by examining the psychological well-being of rural

Australian CSO's who completed CRAFT online, compared to those in a waitlist control group. The current study also overcomes the limitations of prior studies by directly translating the face-to-face CRAFT model into the online environment by preserving direct practitioner-participant contact through virtual meetings.

Methods

Study design

This randomized controlled trial (RCT) used a parallel-group, two-arm, superiority design to assess the effectiveness, feasibility, and acceptability of an online CRAFT intervention. The trial was approved by the Charles Sturt University Human Research Ethics Committee (approval number H23769) and prospectively registered with the Australian New Zealand Clinical Trials Registry (ANZCTR, ACTRN12623000796684) on 26 July 2023 [41][42]. The protocol was published in BMC Psychiatry [43]. Written informed consent was obtained from all participants, and the study complied with the Declaration of Helsinki. This study was conducted and reported in accordance with the CONSORT 2010 guidelines for randomized controlled trials.

Participants

Adult CSOs were recruited from rural areas across Australia (operationalised as Modified Monash Model 2-7, 44) via paid Facebook and Instagram advertisements. Interested CSOs could register securely online or contact the study coordinator. Eligibility criteria is detailed in supplementary file A and the study protocol [41].

Screening

Potential participants were screened for eligibility by phone, during which they received information about the program, procedures, and outcome measures, and were informed of their eligibility immediately (supplementary file B). Ineligible CSOs were provided with local support resources. Eligible participants completed an online consent and baseline measure, then randomised to the intervention or waitlist group. CSO details were then provided to practitioners for scheduling of appointments.

Sample size

Sample sizes from previous RCTs on CRAFT were reviewed to inform the required sample size. An a priori power analysis with an alpha level (α) of 0.05, and a power level ($1 - \beta$ err probability) of 0.9, indicated that a total sample size of 116 participants was required. To allow for potential attrition, the study aimed to recruit a sample size larger than 116 participants. The final sample included 126 participants (intervention n = 64, waitlist n = 62). A post-hoc power analysis using G*Power 3.1.9.7 confirmed sufficient power of 0.98 ($1 - \beta$ err probability) to detect meaningful effects, with α = 0.05 and an estimated effect size of 0.15.

Randomisation and blinding

An independent statistician (KYA) randomized participants (1:1) into the CRAFT or Waitlist groups using STATA software (v18 MP) and the 'randomizr' package. The researchers responsible for participant screening (HG and NS) were blinded to the allocation sequence. Each participant was assigned an identification number and, after completing baseline assessments, was randomly allocated to either the CRAFT group or Waitlist group. The control group waited six weeks before receiving the intervention.

The program was delivered online by trained practitioners unaffiliated with the research, minimising the risk of researcher bias. Practitioners were blinded to participants' group assignment and were only provided with contact information for individuals due to commence sessions. They were not informed whether a participant had been allocated to the immediate intervention or waitlist condition.

Participants were informed only of their intervention start date as either within seven days (Group A – Intervention) or after six weeks (Group B – Waitlist Control), without being explicitly told which group they were assigned to. Unblinding was not anticipated to be necessary as the waitlist control design ensured all participants ultimately received the intervention.

Intervention procedure

Program

CRAFT was renamed the Family Empowerment Program for delivery.

Treatment for CSOs

The intervention included six 60-minute sessions over 6 weeks. Practitioners followed the Family Empowerment Program Brief Facilitator Guide [44], adapted from the original CRAFT materials [31] and created by JA (an accredited CRAFT therapist, supervisor, and trainer). The six sessions are summarised in Table 1 below.

Session #	Session summary
1	Introductions, program overview, participants share their story, completion of happiness scale, and goal-setting exercise
2	Review participants performance on practice task set in the first session, introduce and practice positive communication, plan first milestone conversation
3	Review first milestone conversation, conduct functional analysis of the IPs substance use, and plan second milestone conversation
4	Review second milestone conversation, complete functional analysis of the IPs healthy behaviours, discuss time out from positive reinforcement, and plan practice task for the week
5	Review planned activity from previous session, introduce and practice the problem-solving procedure, discuss how to allow for the natural consequences of substance use, and plan third milestone conversation
6	Review third milestone conversation, discuss encouraging IP into substance treatment, and conduct program review

Table 1. CRAFT session outlines

Participants could access two additional sessions for additional support and skill consolidation. Session summaries recorded date, length, action goal, and aspects of online delivery (i.e., sound/video quality and technical difficulties; see supplementary file C). Waitlist participants received reading resources from the Center for Motivation and Change [45] and after completing their post-waitlist measure, completed six CRAFT sessions.

Therapists

Eighteen provisional and accredited psychologists from across New South Wales, Victoria, and Queensland, attended a two-day CRAFT training course, provided by a certified CRAFT trainer and supervisor. Experiential sessions practicing CRAFT routines provided practitioners with the practical skills to deliver the program.

After training, ten practitioners proceeded with the online CRAFT intervention and a CRAFT accreditation process with an accredited CRAFT supervisor based in the USA. This included two online supervision sessions and structured assessment against the elements of CRAFT routines via de-identified audio-recorded CRAFT sessions between a practitioner and client. Practitioners received written feedback from the supervisor. Six practitioners successfully acquired accreditation during the project and delivered 629 sessions of CRAFT in total. The four practitioners who did not acquire accreditation delivered 22 sessions altogether.

Measures and assessment

Primary and secondary outcomes

An outcome evaluation was conducted within and between the groups. CRAFT participant outcomes were compared to a waitlist-control (reading material) group. The primary outcome was self-reported psychological well-being of the CSO. The secondary outcome was CSOs self-reported coping style.

Study measures

Psychological well-being was assessed at three time points. Baseline demographic data collected from CSOs included age, gender, ethnicity, living arrangements, financial support, education, relationship status, and relationship to the IP. Information on the IPs substance use (type, frequency, and mental health diagnosis) was also gathered.

Depression, Anxiety, and Stress Scale (DASS-21)

Developed in Australia, the DASS-21 [46] is a 21-item self-report questionnaire designed to assess depression, anxiety, and stress across three subscales. Each subscale is rated on a four-point Likert scale with higher scores indicating greater symptom severity. All DASS-21 subscales demonstrate high internal consistency (depression, $r = .88$; anxiety, $r = .82$; stress $r = .90$; total scale ($r = 0.93$; [47]). Consistent with

standard practice in DASS-21 reporting, mean scores were rounded to the nearest whole number for categorization into severity ranges [48].

Satisfaction with Life Scale (SWLS)

The SWLS [49] is a five-item self-report measure assessing global life satisfaction. Scores can range from 5 to 25 with higher scores indicating higher levels of satisfaction. The SWLS has demonstrated moderate temporal stability [50] and good to high internal consistency, with six separate studies revealing the coefficient alphas ranging from 0.79 to 0.89 [51].

The Flourishing Scale (FS)

The FS [52] is an eight-item self-report measure designed to assess social-psychological well-being. Scores can range between 8 and 56, with higher scores indicating higher levels of well-being, psychological resources, and strengths [52]. The FS has demonstrated high internal consistency (α =.87) and moderately high temporal stability (.71; [52]). The FS also strongly positively correlates with other well-being scales such as Ryff Scales of Psychological Well-being and Ryan's Basic Need Satisfaction in General scale [52].

Brief Coping with Problems Experienced (Brief COPE)

The Brief COPE [53] is a 28-item scale designed to evaluate coping strategies that individuals employ in everyday situations. The 14 coping strategies can be categorised into three distinct types: problem-focused coping, emotion-focused coping, and avoidant coping [54]. Scores for each subscale were computed by summing the corresponding items with higher scores indicating a greater preference for each coping style. The three coping categories have strong internal consistency (e.g., reported as α = 0.72-0.84 for caregivers of individuals with dementia, [54]).

See supplementary file D for further measure details.

Data collection procedure

Data was collected at three points. For both intervention and waitlist group, CSOs completed an informed consent form and baseline outcome measure (OM1) before randomization and practitioner assignment, ensuring pre-intervention data consistency. The baseline assessment collected demographic details and baseline measures of the primary and secondary outcome variables, with all outcome measures re-

administered at post-treatment (outcome measure 2 [OM2]) and follow-up assessments (outcome measure 3 [OM3]) to track changes over time (Table 2). See supplementary file E for further information about outcome measure administration. Data was collected using the online Question-Pro platform. Completion of the measures took approximately 15 to 30 minutes.

<table>
<tr><th>Time point
Approx. weeks</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th><th>17</th><th>18</th></tr>
<tr><td>Intervention</td><td rowspan="2">Screening</td><td rowspan="2">Outcome Measure 1 (Baseline)</td><td colspan="6" rowspan="2">Intervention: CRAFT</td><td rowspan="2">Outcome Measure 2 (approx. 1 week post completion for intervention group)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td rowspan="2">Outcome Measure 3 (approx. 1 week post intervention completion for waitlist group)</td></tr>
<tr><td>Waitlist</td><td colspan="6">Waitlist: reading material</td><td colspan="8">Receive CRAFT intervention</td></tr>
</table>

Table 2. Data collection timepoints

Note. *CRAFT involved six sessions over six weeks, however participants were offered up to an extra two sessions if needed. If participants took longer than six weeks to complete the program, OM2 (intervention) or OM3 (waitlist) were adjusted accordingly. If consent and baseline measures were not completed, SMS reminders were sent after two days. If still incomplete, participants were contacted by phone to offer assistance. Follow-up reminders were sent via SMS or email on days 1, 3, 7, 11 and 14 over a two-week period. Participants who completed all three surveys received a Prezzee gift card of $120. Previous research has shown that payment for surveys can significantly improve retention rates* [55][56].

Data analysis procedure

Descriptive statistics including means and standard deviations (SD) for continuous variables and frequencies and percentages for categorical variables were calculated to describe the baseline characteristics of the study participants. Change in the primary and secondary outcomes for each

participant over time are presented using Spaghetti plots (supplementary file F), while the changes in mean score are displayed in a line plot.

Linear mixed-effects models were used to analyse treatment effects, incorporating baseline outcome scores, time, treatment group, and a time-by-treatment interaction as fixed effects, with participants included as a random effect. See supplementary file G for a detailed description of the analysis procedure.

Treatment effects were reported as the adjusted mean difference between groups with 95% confidence intervals (CIs). Additionally, Cohen's d effect sizes [57] were calculated at each time point, defined as the adjusted mean difference between groups divided by the pooled baseline SD of the outcome. Effect sizes were interpreted as small (0.2), medium (0.5), or large (≥0.8). All data cleaning were conducted using STATA software (Version 18 MP), and all descriptive and analytical statistics were conducted using R-programming language in the Google Colab platform.

The dataset presented in this article is not readily available as it contains information that could compromise the privacy of research participants. Requests to access de-identified datasets should be directed to the corresponding author and will be considered on a case-by-case basis.

Results

Participants

Recruitment occurred between November 2023 and September 2024, with final follow-up data collected in January 2025. A total of 192 participants submitted an expression of interest, of whom 159 were able to be contacted and screened for eligibility. Ultimately 126 were enrolled and randomly assigned to either the CRAFT intervention (n = 64) or Waitlist (n = 62; see Figure 1).

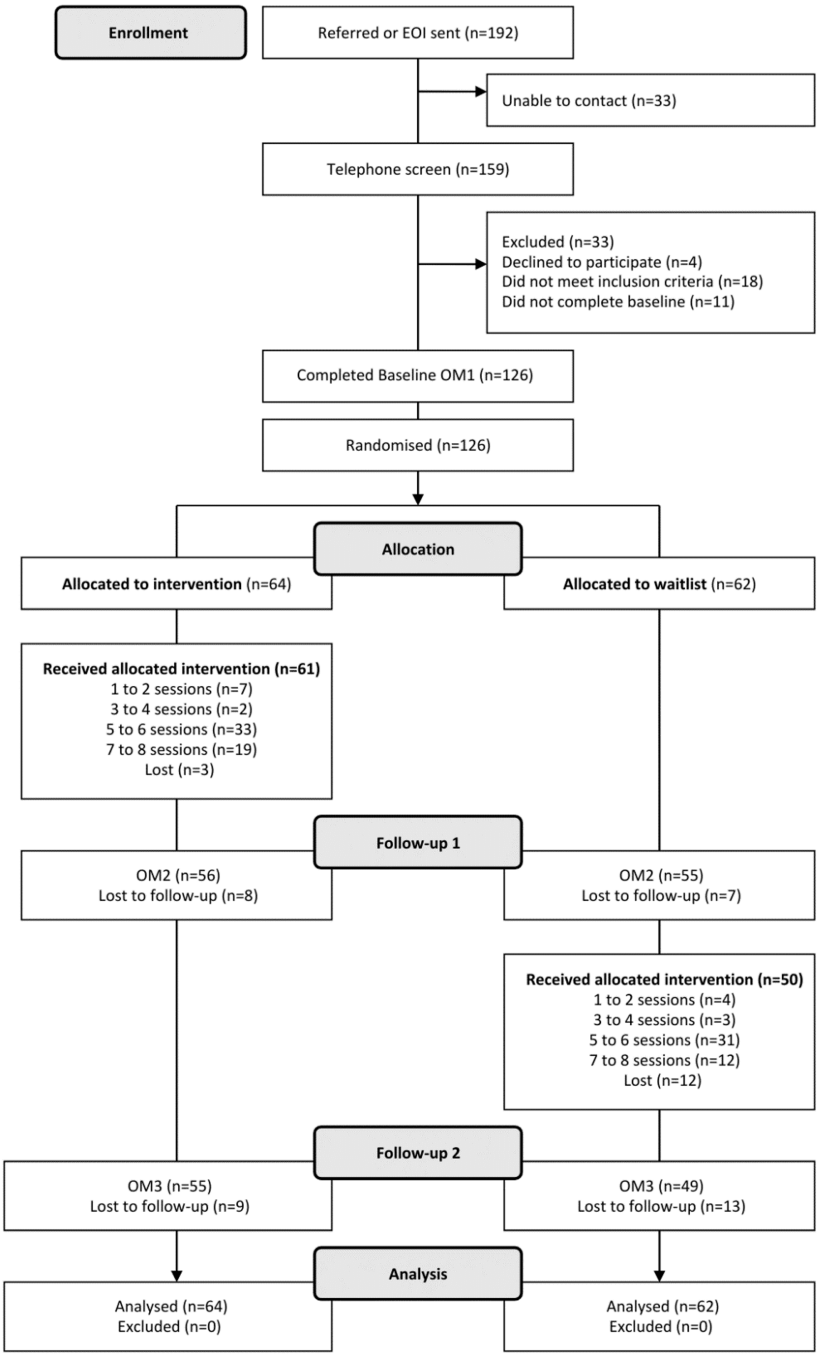

Figure 1. Flowchart summarizing the RCT process for participants

One hundred and eleven participants completed OM2 (intervention n = 64, waitlist n = 62), with an overall retention rate of 88.1% (intervention 87.50%, waitlist 88.71%). At OM3, 104 participants completed the assessment (intervention n = 55, waitlist n = 49), with an overall retention rate of 82.54% (intervention

86%, waitlist 79%). The minimum number of sessions completed was 0, and the maximum 8. Ninety-three of the 126 (73.8%) participants completed six or more sessions. Participants completed an average of 5.17 sessions, with 6 sessions constituting full program completion and an optional two additional sessions offered for follow-up.

Characteristics of the participants

The intervention and waitlist groups were homogenous at baseline with respect to sex, age, ethnicity, marital status, education status, employment status, and relationship with the person with the substance problem. A series of t-tests were run to compare the intervention and waitlist groups; no significant differences were found between the groups.

At baseline, the mean age of participants was 51.08 years (*SD* = 10.88), with 51.44 years (*SD* = 11.36) in the CRAFT group and 50.71 years (*SD* = 10.45) in the Waitlist group. Females comprised 93.7% of the CRAFT group and 90.3% of the Waitlist group. The majority (86.4%) were born in Australia (82.5% in the CRAFT group and 90.3% in the Waitlist group). Additionally, 87.9% identified as White/Caucasian (88.9% in the CRAFT group and 86.9% in the Waitlist group; Table 3).

More than two-thirds (69.6%) were married or in a relationship (62.5% in the CRAFT group and 77.1% in the Waitlist group). A total of 86.4% had attained tertiary education (84.1% in the CRAFT group and 88.7% in the Waitlist group). Nearly half (48.4%) of both groups were employed full-time. Regarding their relationship with the person experiencing substance use issues, 41.3% were parents (mothers or fathers) of the IP, with 45.3% in the CRAFT group and 37.1% in the Waitlist group (Table 3).

Variables	CRAFT intervention *n* (%)	Waitlist *n* (%)	Total *n* (%)
Age (mean [SD])	51.44 (11.36)	50.71 (10.45)	51.08 (10.88)
Gender			
Males	3 (4.7)	5 (8.1)	8 (6.35)
Females	60 (93.7)	56 (90.3)	116 (92.06)
Others	1 (1.6)	1 (1.6)	2 (1.59)
Country born			
Australia	52 (82.5)	56 (90.3)	108 (86.4)
Not Australia	11 (17.5)	6 (9.7)	17 (13.6)
Ethnicity			
First Nations Australians	2 (3.2)	5 (8.2)	7 (5.65)
Pacific Islander	0 (0)	1 (1.6)	1 (0.81)
White/Caucasian	56 (88.9)	53 (86.9)	109 (87.9)
Multiple ethnicity	5 (7.94)	1 (1.6)	6 (4.84)
Prefer not to say	0 (0)	1 (1.6)	1 (0.81)
Marital status			
Never married	7 (10.9)	6 (9.8)	13 (10.4)
Married/in relationship	40 (62.5)	47 (77.1)	87 (69.6)
Formerly married	16 (25)	7 (11.5)	23 (18.4)
Other	1 (1.6)	1 (1.6)	2 (1.6)
Education status			
Did not complete high school	2 (3.2)	2 (3.2)	4 (3.2)
Completed high school	8 (12.7)	5 (8.1)	13 (10.4)
Tertiary education	53 (84.1)	55 (88.7)	108 (86.4)
Employment status			

Variables	CRAFT intervention *n* (%)	Waitlist *n* (%)	Total *n* (%)
Full time	31 (48.4)	30 (48.4)	61 (48.41)
Part time	20 (31.3)	26 (41.9)	46 (36.51)
Not working	4 (6.3)	0 (0)	4 (3.17)
Unemployed and looking for work	0 (0)	1 (1.6)	1 (0.79)
Other	8 (12.5)	5 (8.1)	13 (10.32)
Prefer not to say	1 (1.6)	0 (0)	1 (0.79)
CSOs relationship with IP			
Partner/spouse	17 (26.6)	22 (35.5)	39 (30.95)
Mother/Father	29 (45.3)	23 (37.1)	52 (41.27)
Child/son/daughter	9 (14.1)	7 (11.3)	16 (12.7)
Sister/brother	4 (6.25)	6 (9.7)	10 (7.94)
Aunt/uncle	2 (3.1)	0 (0)	2 (1.59)
Friend/other	2 (3.1)	4 (6.5)	6 (4.76)
Prefer not to say	1 (1.6)	0 (0)	1 (0.79)
Gender of IP			
Male	40 (62.5)	48 (77.4)	88 (69.84)
Female	21 (32.8)	13 (21)	34 (26.98)
Other	2 (3.1)	1 (1.6)	3 (2.38)
Prefer not to say	1 (1.6)	0 (0)	1 (0.79)

Table 3. Baseline characteristics of study participants

Impacts of CRAFT intervention on mental health outcomes

The regression analysis assessing the impact of the CRAFT intervention on mental health outcomes revealed a significant decrease in depression, and significant increase in life satisfaction and problem-

focused coping at six weeks compared to the waitlist group. However, no significant differences were observed between the two groups in anxiety, stress, emotion-focused coping, avoidance coping, or flourishing scores during the same period (Table 4).

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	CRAFT intervention, *M* (*SD*)	**Waitlist *M* (*SD*)**	**Adjusted mean difference (95% CI)**	**Standard effect sizes Cohen's *d***
DASS depression score				
OM1	13.28 (10.01); n = 61	14.00 (10.46); n = 61		
OM2	9.33 (7.57); n = 54	11.82 (8.66); n = 55	**-2.71 (-5.36, -0.06)***	**-1.97 (-3.89, -0.04)***
OM3	9.77 (8.69); n = 53	9.24 (8.21); n = 45	1.60 (-1.14, 4.35)	1.16 (-0.83, 3.16)
DASS anxiety score				
OM1	8.59 (7.89); n= 61	8.93 (7.03); n = 62		
OM2	6.07 (6.11); n = 54	7.67 (6.27); n = 55	-0.85 (-2.61, 0.91)	-0.62 (-1.89, 0.66)
OM3	6.07 (7.19); n = 53	5.09 (5.21); n = 46	0.82 (-9.44, 2.58)	0.59 (-0.69, 1.87)
DASS stress score				
OM1	17.44 (8.49); n = 61	18.29 (8.48); n = 62		
OM2	14.00 (7.07); n = 54	16.04 (7.31); n = 55	-1.90 (-4.22, 0.42)	-1.38 (-3.06, 0.31)
OM3	13.13 (8.50); n = 53	14.13 (8.59); n = 46	-1.28 (-3.61, 1.04)	-0.93 (-2.62, 0.76)
Life satisfaction				
OM1	18.75 (6.54); n = 63	19.44 (7.15); n = 61		
OM2	20.98 (6.15); n = 55	20.15 (6.79); n = 55	**1.98 (0.45, 3.50)***	**1.43 (0.33, 2.54)***

	CRAFT intervention, *M* (*SD*)	**Waitlist *M* (*SD*)**	**Adjusted mean difference (95% CI)**	**Standard effect sizes Cohen's *d***
OM3	21.37 (6.68); n = 54	22.21 (6.47); n = 48	0.38 (-1.14, 1.91)	0.28 (-0.83, 1.38)
Problem focused coping				
OM1	20.74 (4.58); n = 63	20.08 (4.63); n = 61		
OM2	22.71 (5.48); n = 56	19.33 (5.86); n = 55	**2.92 (1.33, 4.51)****	**2.12 (0.97, 3.27)****
OM3	20.07 (5.22); n = 54	21.44 (5.25); n = 48	-1.43 (-3.02, 0.15)	-1.04 (-2.19, 0.11)
Emotion focused coping				
OM1	25.95 (4.72); n = 63	25.50 (5.19); n = 60		
OM2	26.00 (5.39); n = 56	24.55 (5.80); n = 55	0.92 (-0.35, 2.19)	0.67 (-0.26, 1.59)
OM3	25.37 (5.17); n = 54	24.50 (5.15); n = 48	0.54 (-0.73, 1.81)	0.39 (-0.53, 1.31)
Avoidance coping				
OM1	14.76 (3.21); n = 63	14.44 (3.62); n = 61		
OM2	13.04 (2.86); n = 56	13.82 (3.72); n = 55	-0.87 (-1.82, 0.08)	-0.63 (-1.32, 0.05)
OM3	13.41 (3.07); n = 54	13.19 (2.83); n = 48	-0.01 (-0.96, 0.94)	-0.01 (-0.70, 0.68)
Flourishing				

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	CRAFT intervention, *M* (*SD*)	Waitlist *M* (*SD*)	Adjusted mean difference (95% CI)	Standard effect sizes Cohen's *d*
OM1	42.73 (7.61); n = 63	42.55 (8.98); n = 62		
OM2	45.36 (5.76); n = 56	43.31 (7.72); n = 55	1.40 (-1.24, 4.04)	1.01 (-0.90, 2.93)
OM3	43.15 (8.96); n = 54	45.39 (6.00); n = 49	-0.37 (-3.01, 2.27)	-0.27 (-2.18, 1.64)

Table 4. The impact of CRAFT intervention on mental health outcomes

Note. *Statistically significant adjusted mean differences (95% CI excluding zero) are shown in* ***bold****.*

**p < 0.05; **p < 0.001*

At baseline, participants in both the intervention and waitlist group recorded depression scores within the extremely severe range. Between OM1 and OM2, mean depression scores decreased in both the intervention and waitlist groups. However, the intervention group showed a significantly greater reduction in depression compared to the waitlist group, moving from the extremely severe to the moderate range, with an adjusted mean difference of -2.71 (95% CI: -5.36, -0.06, Cohen's d = -1.97, p = 0.045). After the waitlist group received treatment, their scores similarly decreased to fall within the moderate range, while the intervention group showed a slight increase in depression scores at OM3 from their OM2 values. However, by OM3, the difference between the intervention and waitlist groups was no longer significant, indicating that improvement in symptoms remained stable six weeks post-program completion (see Figure 2).

At baseline, participants in both the intervention and waitlist groups recorded life satisfaction scores in the slightly dissatisfied range. While both groups saw an increase in life satisfaction between OM1 and OM2, the intervention group exhibited a significantly greater improvement in life satisfaction compared to the control group, with the average score shifting into the neutral range for the intervention group (adjusted mean difference = 1.98; 95% CI: 0.45, 3.50, Cohen's d = 1.43, p = 0.011). After receiving the

intervention, the waitlist group saw further improvements in life satisfaction from OM2 to OM3, reaching levels comparable to the intervention group. The intervention group also continued to see small improvements at OM3. By OM3, there were no significant differences between the groups, with both groups reporting scores in the 'slightly satisfied' range, suggesting that improvements in the intervention group were sustained six weeks post program completion (see Figure 2).

Additionally, the intervention group demonstrated a significantly greater increase in problem-focused coping from baseline to OM2 compared to the Waitlist group, who exhibited a slight decline in problem-focused coping during this period. This result indicates an increase in use of problem-focused coping after undergoing CRAFT (adjusted mean difference = 2.92; 95% CI: 1.33, 4.51, Cohen's d = 2.12, $p < 0.001$). However, the increased use of problem-focused coping in the intervention group was not maintained at the second follow-up, where levels of problem-focused coping reduced to below their baseline level. The waitlist group similarly exhibited an increase in problem focused coping following their receipt of the intervention (i.e., between OM2 and OM3), however there was no significant difference between the intervention and waitlist group at OM3 (see Figure 3).

No significant group differences were found over time for anxiety, stress, emotion-focused coping, avoidant coping, or social-psychological well-being. Anxiety and stress scores decreased over time for both groups. Initially, both the intervention and waitlist groups recorded anxiety scores within the severe range. Anxiety scores in the intervention group dropped to the moderate range post-intervention (OM2) and remained stable at follow-up (OM3). The waitlist group demonstrated reductions in anxiety from baseline to OM2 while awaiting the intervention. Following the intervention, they exhibited further reductions in anxiety from OM2 to OM3, indicating continued improvement after receiving the intervention. By the final follow-up (OM3), the waitlist group's anxiety levels had also fallen to the moderate range, aligning with the intervention group's levels after they completed the intervention.

Both groups showed a reduction in stress across all three time points. Initially, stress levels for both groups were in the extremely severe range. By the first follow-up (OM2), scores had decreased to the severe range for both groups and continued to decline further by OM3, although they remained in the severe range (see Figure 2).

Emotion-focused coping saw minimal changed in both groups across all time points. Avoidant coping decreased following receipt of the intervention in both groups (i.e., OM2 for the intervention group and OM3 for the waitlist group; see Figure 3). Finally, social-psychological well-being (flourishing scores) increased in both groups following receipt of the intervention. The intervention group exhibited a

marked decrease in social-psychological well-being from OM2 to OM3, suggesting that immediate improvements did not persist at 6-week follow-up (see Figure 3).

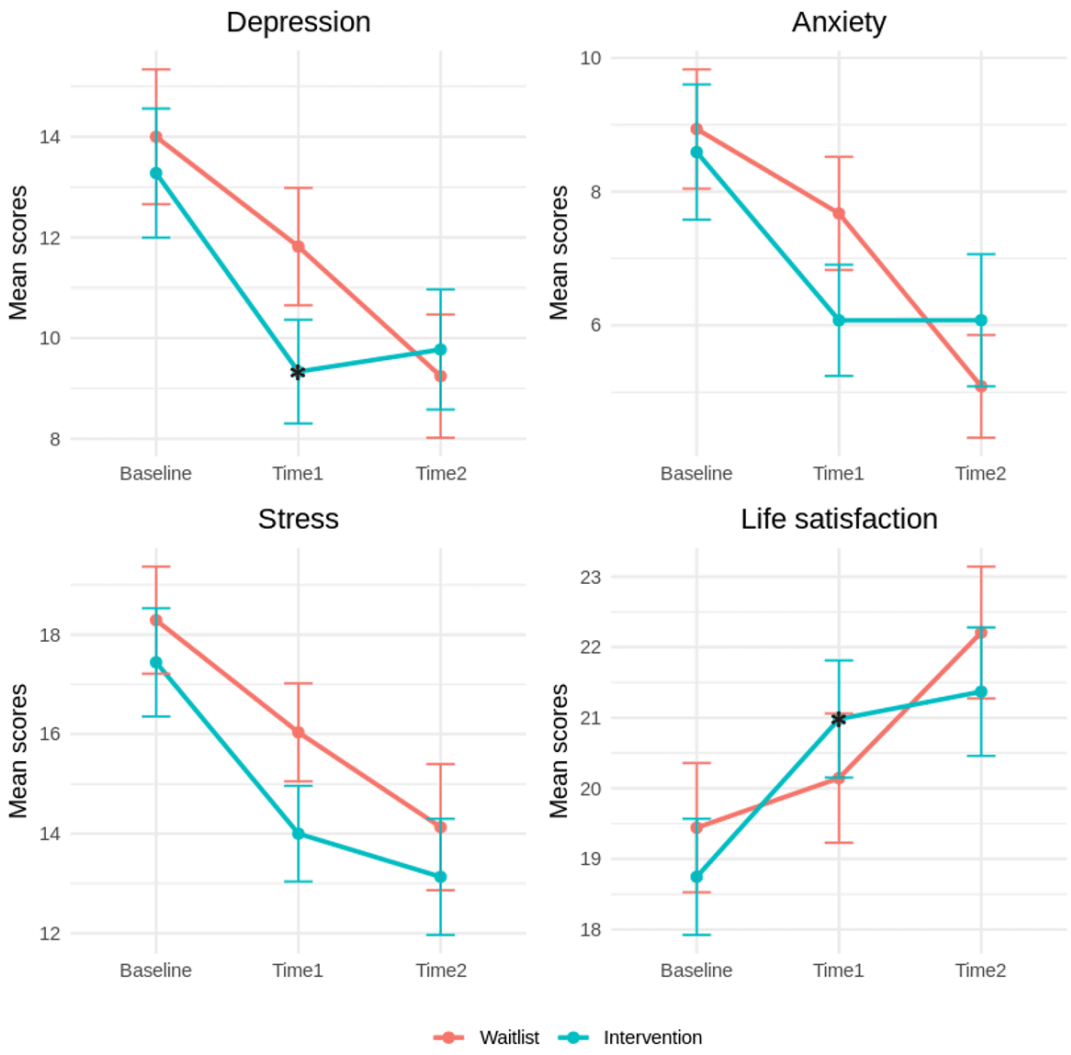

Figure 2. Changes in depression, anxiety, stress and life satisfaction scores over time.

* Statistically significant adjusted mean differences

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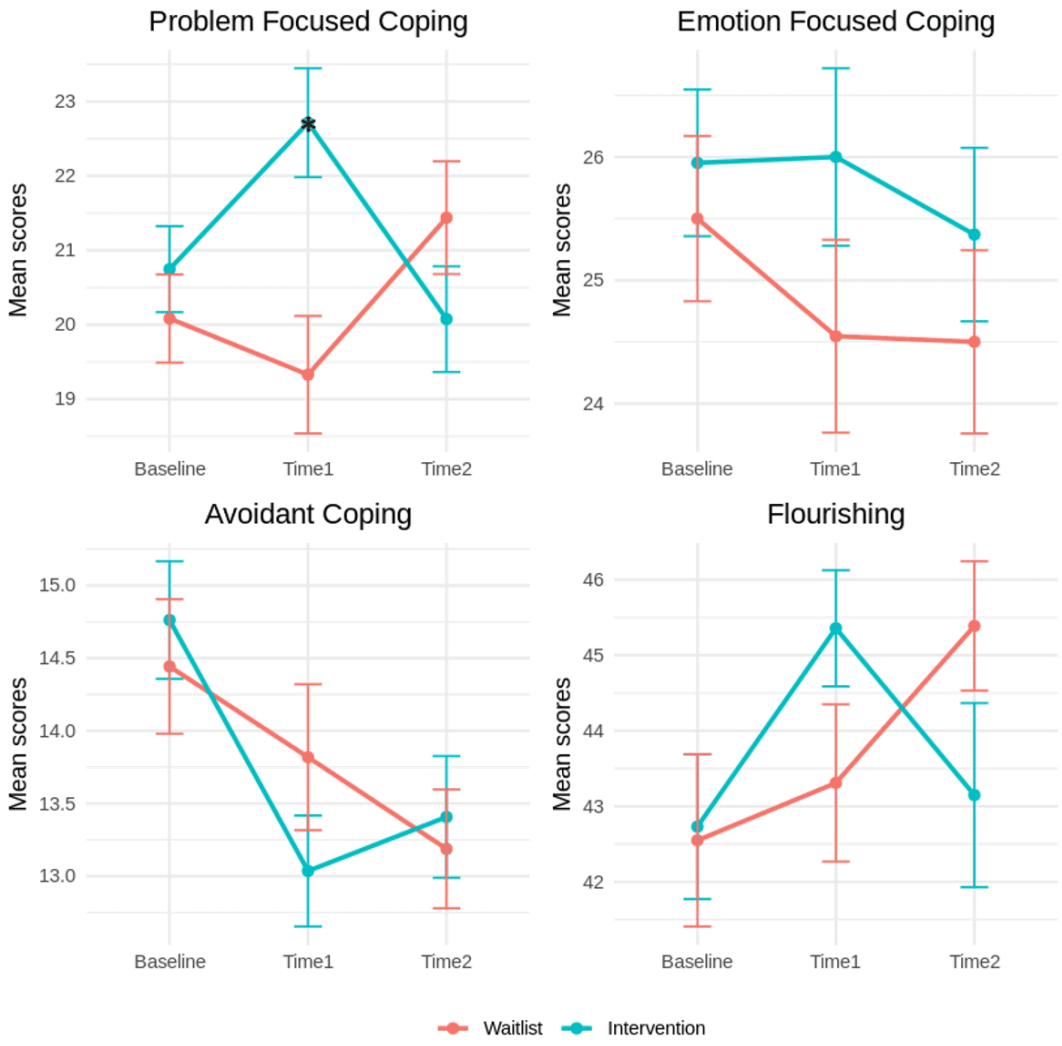

Figure 3. Changes in problem focused coping, emotion focused coping, avoidant coping and flourishing scores over time.

* Statistically significant adjusted mean differences

Discussion

Main findings

To our knowledge, this is the first study to evaluate the effectiveness of an online practitioner delivery of CRAFT on mental health outcomes for rural Australians. At baseline, CSOs reported elevated levels of stress, depression, and anxiety, and low levels of life satisfaction. Following six online CRAFT sessions,

participants reported a significant decrease in depression, and a significant increase in life satisfaction and problem-focused coping. These improvements were sustained at six-week follow-up, with no significant different between intervention and waitlist groups after both had received the program. These results highlight the effectiveness of online CRAFT in improving and maintaining psychological well-being among rural Australian CSOs.

Consistent with previous research, this study found that CSOs affected by a loved one's substance use experience high levels of stress, depression, and anxiety, and low levels of life satisfaction [5][6]. These findings underscore the need for targeted interventions to support CSOs' mental health. Notably, the results from this study indicate that online therapist-led interventions are well-positioned to meet this need. Similar to previous online CRAFT trials that relied solely on videos and reading materials [38][40], this study indicated that the reading materials received by the waitlist participants were insufficient to improve CSO psychological health. Instead, a therapist-led intervention was necessary to produce meaningful improvements.

While CRAFT has been shown to effectively improve the psychological well-being of CSOs [58][59][60], previous research has primarily been conducted in the USA and Europe. This study extends the evidence base by demonstrating CRAFT as an effective support intervention for rural Australians. These findings substantiate the applicability of CRAFT in the Australian context, contributing to a broader understanding of its potential effectiveness beyond the USA and Europe. By demonstrating the intervention's positive impact in the rural Australian setting, the study highlights CRAFT's potential for addressing the unique challenges faced by CSOs in diverse cultural and geographical contexts. It further suggests that online CRAFT could be a valuable program in global regions where access to traditional face-to-face services is limited or where rural and remote communities face distinct barriers to support.

Online interventions for substance use have been shown to reduce psychological distress at levels that are comparable to face-to-face intervention groups [61][62]. However, previous studies examining CRAFT in an online format have generally shown poorer outcomes compared to CRAFT delivered face-to-face. However, those studies were limited by mode of delivery, using self-directed delivery methods rather than interactive, practitioner-led sessions [38][40]. The unique contribution of the current study is the finding that the provision of CRAFT in a practitioner-facilitated online capacity is an effective and acceptable alternative to in-person delivery. The positive outcomes observed in mental health outcomes in the current study underscore the potential of online CRAFT interventions to foster significant

improvements in overall psychological well-being. These promising results highlight the importance of exploring the underlying mechanisms that drive these improvements.

The observed improvements across depression, life satisfaction and problem-focused coping may reflect broader psychological changes. Specifically, improvements in problem-focused coping could have contributed to reduced depressive symptoms, which in turn may have enhanced overall life satisfaction. Previous research has shown negative correlations between problem-focused coping style and depressive symptoms [27][29][38][39], and negative correlations between depression and life satisfaction [23][63]. Together, these patterns suggest that strengthening adaptive coping strategies may play a key role in improving mental health and subjective well-being among CSOs. Future research could explore the causal relationships between coping strategies, depression, and life satisfaction in CSOs, as well as the long-term impact of interventions like CRAFT on these interconnected outcomes.

Study Limitations

While this RCT provides robust evidence and valuable insights, it is important to consider certain limitations to fully contextualize the study's findings. Recruitment relied on Facebook and Instagram, limiting the sample to active users of these platforms. Females comprised 92.06% of the current study's sample. Although Facebook and Instagram have a relatively balanced gender distribution globally [64], the overrepresentation of females in our sample may indicate a potential limitation in recruitment. Alternatively, the gender imbalance may partly reflect the reality that women are more often the primary support person for individuals experiencing substance use issues, as corroborated by global and Australian data [65][66][67][68][69]. However, this finding also underscores the need for further research to better understand the experiences and perspectives of male support persons, whose voices remain underrepresented in this study.

Furthermore, the sample was not representative of employment levels or education levels of the rural Australian population. Participants were more likely to be employed (84.92% vs 59.48%; [70]) and highly educated, with 86.4% having completed tertiary education compared to the national average of 47.1% [71]. Further research should aim to diversify recruitment to improve generalizability, for example, family members of people entering substance treatment could be offered CRAFT routinely and the outcomes evaluated.

One implementation challenge was the inconsistency in the intervals between participant's sessions, which may have impacted the effectiveness of the intervention. While some participants attended

sessions weekly, others followed a fortnightly schedule or attended as availability allowed, leading to substantial variation in program duration. Most participants completed the program within ten weeks, however three required five, eight, and nine months, respectively. Importantly, both the waitlist and intervention groups were supported by the same practitioners, which helped minimise any potential differences between the groups related to practitioner rapport-building, skill, or variations in session scheduling.

Future Research Directions

Building on the present study, future research could explore whether the observed effects persist beyond the current six-week follow-up period. Extended follow-up assessments, conducted at three-, six- and 12-months post-intervention could track the long-term effects of the CRAFT intervention. This could help determine the durability of outcomes and whether additional support is needed.

Future research could investigate the generalisability of these results to other rural settings globally, and in urban Australia. Research could explore the effectiveness of online CRAFT in rural areas world-wide, contributing to a broader understanding of applicability.

Exploring the cost-benefit of delivering CRAFT in rural settings would provide valuable insights into its economic viability and support broader implementation. Such analysis could help assess whether the psychological benefits to CSOs demonstrated in this study translate into broader economic benefits.

While RCTs provide valuable evidence on the effectiveness of interventions, they do not capture participant experiences. This study highlights CRAFT's impact on mental health but lacks insight into which aspects of the CRAFT program participants perceived as challenging or beneficial. The researchers are currently in the process of analysing qualitative data from the participants, exploring participant perspectives to better understand the program's impact and areas for improvement. The findings of which will be reported in a future publication.

Conclusion

Online delivery of CRAFT to rural Australians was effective in reducing symptoms of depression, enhancing life satisfaction, and increasing the use of problem-focused coping strategies. The findings from this study contribute to the global evidence base for CRAFT and demonstrate that an online practitioner-led format is an effective approach for supporting CSOs well-being.

Glossary

- **Concerned Significant Other (CSO):** Family members, partners, ex-partners, or friends of those with an alcohol and/or drug problem [1].
- **Identified Person (IP):** The individual using substances, often reluctant to seek treatment for their substance use [1].
- **Rural Australians:** The Modified Monash Model is used by the Department of Health and Aged Care to define whether a location is classified as metropolitan, rural, remote, or very remote [72]. Categories range from MM1 (major city) to MM7 (very remote). For this project, rural Australians were considered anyone who lives in MM2 to MM7.

Notes

Running head: Online CRAFT for CSOs in rural Australia

Statements and Declarations

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Conflicts of Interest

None to declare

Author contributions

Heidi Gray: Data Curation (lead), Formal Analysis (equal), Investigation (lead), Methodology (supporting), Project Administration (equal), Visualisation (lead), Writing – Original Draft Preparation (lead), Writing – Review & Editing (lead). **Nicola Ivory:** Formal Analysis (supporting), Supervision (supporting), Writing – Original Draft Preparation (equal), Writing – Review & Editing (equal). **Nicole Snowdon:** Data Curation (supporting), Investigation (support), Project Administration (equal), Supervision (supporting), Writing – Original Draft Preparation (equal), Writing – Review & Editing (equal). **Kedir Ahmed:** Analysis (equal), visualisation (supporting), Writing – Original Draft Preparation (equal), Writing – Review & Editing

(equal). **Matt Thomas:** Supervision (supporting), Writing – Review & Editing (equal). **Julaine Allan:** Conceptualization (lead), Formal Analysis (supporting), Funding Acquisition (lead), Methodology (lead), Project Administration (lead), Supervision (lead), Writing – Original Draft Preparation (equal), Writing – Review & Editing (equal).

Clinical Trial Registration Details

Charles Sturt University Human Research Ethics Committee (approval number H23769), registered with the Australian New Zealand Clinical Trials Registry (ANZCTR, ACTRN12623000796684).

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Declarations

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Potential competing interests: No potential competing interests to declare.