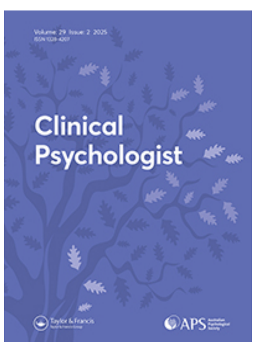

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Effectiveness of a therapeutic community for substance use: stage completion and time in treatment as predictors of outcome

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ABSTRACT

Objective: The optimal time and stage in treatment for improving psychological and substance-related outcomes in an Australian Therapeutic Community (TC) was investigated in the present study.

Method: The sample consisted of 96 adults who were receiving treatment for problematic substance use as part of the Odyssey House NSW residential program. Most participants were presented with polysubstance use and at least one psychiatric diagnosis. Psychological distress, quality of life and substance dependence were assessed at pre-treatment and as the resident progressed through the TC treatment stages.

Results: Earlier treatment stages were significantly associated with improvement in psychological distress, quality of life and substance dependence. Improvements in the three outcome measures were also significantly related to time in treatment (days), with the most notable gains occurring after three or 12 months.

Conclusions: The Odyssey House NSW residential program is efficacious in improving psychological distress, quality of life and substance dependence, with optimal changes occurring during the earlier stages of treatment and after 3 or 12 months. These improvements may be attributable to the program, individual factors, or retention biases. Future research should standardise the TC model, explore confounding variables and address high attrition rates.

KEY POINTS

What is already known about this topic:

(1) The prevalence of substance use disorders is increasing over time.
(2) Residential rehabilitation is an established treatment approach for substance use disorders.
(3) It is unclear whether duration in treatment, or progression through stages of treatment, is the better predictor of treatment outcome.

What this topic adds:

(1) Among the individuals seeking residential treatment for substance abuse, amphetamine-type stimulants (e.g. "ice") was the most common substance of concern.
(2) The optimal changes in treatment outcomes occurred within the first two treatment stages or within the first 3 months after entry to the program.
(3) Treatment gains were achieved irrespective of demographic differences between individuals participating in the program.

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Psychological distress; quality of life; substance dependence; substance use; substance use treatment; therapeutic communities

Introduction

Problematic substance use is a public health concern and a significant economic burden due to its association with higher morbidity, mortality, criminality, unemployment, and homelessness (Degenhardt & Hall, 2012; Karlsson & Burns, 2018). Worldwide, approximately 296 million individuals between 15 and 64 years old used substances in a 12-month period, representing a 23% increase in global substance use from 2011 to 2021 (United Nations Office on Drugs and Crime, 2024). This increase has also led to more individuals meeting the criteria for a substance use disorder, thereby increasing the need for access to appropriate

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treatment. In parallel, there has also been an overall significant increase in disease and death related to substance use over the last 15 years (Australian Institute of Health and Welfare, 2024; United Nations Office on Drugs and Crime, 2024). The cost of providing treatment for alcohol and other drug problems in Australia is immense, with the Australian government estimating it would spend $372.4 million from 2022 to 2026 on critical drug and alcohol treatment services and prevention programs (Australian Government Department of Health and Aged Care, 2022).

A well-established approach for treating problematic substance use is the Therapeutic Community (TC; McLellan et al., 1984). TCs are drug-free residential facilities where individuals progress through a hierarchy of stages, with the final stage reintegrating the client back into the wider community. Each treatment stage promotes abstinence and facilitates social, psychological, and behavioural change (De Leon & Unterrainer, 2020; Smith et al., 2006). The total number of treatment stages varies between TC programs depending upon their size and facilities, although three to four stages (from detoxification through to community re-integration and discharge) are the most common format (Malivert et al., 2012).

Unlike other treatment approaches, TCs are highly structured, endorse the community as the critical agent of change and emphasise holistic treatment with a fundamental principle of self-governed change (De Leon, 2022; De Leon & Unterrainer, 2020). TC programs in Australia typically incorporate a range of treatments and services, such as individual psychotherapy, vocational and educational training, and peer support groups, and take anywhere from 3 to 12 months or more to complete (De Leon & Unterrainer, 2020; Vanderplasschen et al., 2014). Research has shown that TCs can effectively reduce substance dependence and improve social functioning, employment, and prosocial behaviours (De Leon, 2010; Sacks et al., 2010; Shaver et al., 2023; Simpson & Sells, 1983). More specifically, current engagement in a TC program was associated with decreased psychological distress (Metrikin et al., 2003; Polimeni et al., 2010) and improved quality of life with greater satisfaction in health, social, spiritual and family domains (Bevanda et al., 2017). Hence, along with evaluating drug use outcomes, TC program effectiveness is commonly measured in terms of both quality of life and psychological functioning – as these factors are reliably associated with sustained recovery and reduced relapse risk (Armoon et al., 2022; Moe et al., 2024).

Thus far, evidence has been inconsistent for the optimal length of TC treatment that will produce clinically significant change (Malivert et al., 2012). Some researchers report that longer durations of 12 months or more are associated with greater improvements in mental health and substance dependence than shorter durations (De Leon, 2010; Moos et al., 1999). In contrast, Wexler et al. (1990) suggested optimal outcomes occur after 9 months and begin to decline after 12 months. Others argue that there is little difference between the outcomes of programs that are 12 months versus 6 months or less in length (McCusker et al., 1997; Nemes et al., 1999; Simpson & Sells, 1983). Adding to this conflicting evidence, Toumbourou et al. (1998) propose that stage completion within the TC hierarchical structure better predicts treatment outcomes. However, to date, this study is the only one to show that progressing to higher TC stages predicts future employment and reduced substance use. Further complicating the situation, several individual-level factors affect how long clients stay in TC treatment (e.g., Dacosta-Sánchez et al., 2021; Miles et al., 2008).

The substantial heterogeneity in program characteristics most likely explains these discrepancies. While the above studies were set in TCs, the programs differed in structure, educational activities, client characteristics, and psychological treatments. This view is further supported by De Leon (2000), who reported that, within a TC environment, low-intensity programs were associated with better treatment outcomes than higher-intensity programs. In this context, low-intensity programs are those in which clients tend to have shorter stays, daily support groups, lower levels of responsibility, higher staff involvement and less intense forms of therapy. Adjusting program intensity could help determine the optimal treatment time; however, further research is needed to support these findings across different TCs (Horsfall et al., 2009), client populations and clinical characteristics. Still, considering the cost-benefit analysis, clarifying the optimal length of TC treatment is essential. For example, whilst residential TC treatment can provide a more intensive form of treatment for clients, engagement can also cause significant disruption to unavoidable commitments in their lives, such as employment and familial responsibilities. Moreover, TCs are expensive to run due to their long-term residential requirement and the extensive staffing required, further highlighting the need to establish the optimal length of TC treatment.

Due to this, there is a need to compare the contribution of stage completion and time in treatment to

the effectiveness of TC treatment. To investigate this, the present study will focus on an Australian-based TC operated by Odyssey House NSW. This not-for-profit organisation has been in operation for more than 45 years and provides residential and community services for those with alcohol or other drug problems (Odyssey House NSW, 2024). Residential rehabilitation at Odyssey House NSW is based upon the TC approach to substance use treatment (McLellan et al., 1984), in which residential clients progress through four treatment stages during their stay at the TC. The present study aimed to answer the following research questions:

(1) Does psychological distress, quality of life and substance dependence improve for Odyssey House NSW residential clients as they progress through each TC treatment stage?
(2) Do improvements in these treatment outcomes vary across the different TC treatment stages?
(3) Is there a relationship between the time spent in residential treatment and treatment outcomes when clients leave the program?

Method

Participants

Participants were drawn from a larger sample of 117 adults (78 males) who entered Odyssey House NSW residential treatment between July 2017 and August 2018 (Miller & Newton-John, 2020). Fifty-six clients of these residents were referred to Odyssey House NSW by community, medical, legal or other residential services. Others were self-referred (n = 39) or referred by friends and family (n = 19). All participants were over 18 years old and could read and write in English. All Odyssey House NSW residents are thoroughly screened during TC intake by the in-house clinical team; however, for the current study, individuals with a demonstrated inability to make informed decisions, including those with severe intellectual deficits, were excluded. For the present study, participants consisted of people from the larger sample who progressed past the pre-treatment stage of Odyssey House NSW (n = 96), as no treatment data was collected for those who left the residential program before this. Demographic characteristics between the final sample and the 21 participants who left treatment early were similar (Supplementary Materials document). The study was conducted in line with the ethics approval granted by the University of Technology, Sydney (UTS) Human Research Ethics Committee Australia (ETH18–2197), and all participants provided informed consent to use their data for research purposes.

Program description

Figure 1 shows the pathways clients enter and progress through TC treatment at Odyssey House NSW. The TC is viewed as the critical agent of change for helping individuals develop longer-term coping skills to manage their substance use and related issues. Residential clients transition to a higher TC treatment stage when they have attained the necessary skills and insights for their current stage (see Table 1 for more details on the activities and services delivered during each treatment stage) Reflecting the TC ethos of peer support and collective responsibility, the decision regarding readiness to progress to the next stage of treatment is made by staff as well as the members of the resident community themselves. Progression reviews are discussed during Community Meetings where all members of the TC are present. The residential program includes individualised support for mental and physical health needs, specialised peer support groups (e.g., gambling, domestic violence), parenting programs, and life-skills training. Odyssey House NSW also has a registered on-site school that offers remedial numeracy and literacy education and individual assistance in developing long-term vocational or educational plans.

Procedure

Data was collected for a larger project evaluating the Odyssey House NSW residential program (Miller & Newton-John, 2020). Within 6 weeks of entering treatment, eligible individuals were provided information on the research and the opportunity to participate. Between July 2017 and August 2018, 144 new clients were eligible for the evaluation, of which 117 consented to participate (recruitment rate = 81%). Demographic and treatment outcome data were routinely collected by a member of the on-site clinical team and then retrieved by UTS researchers from the Odyssey House NSW records database. UTS researchers worked on-site at Odyssey House NSW weekly during the evaluation period to provide staff and clients with research support.

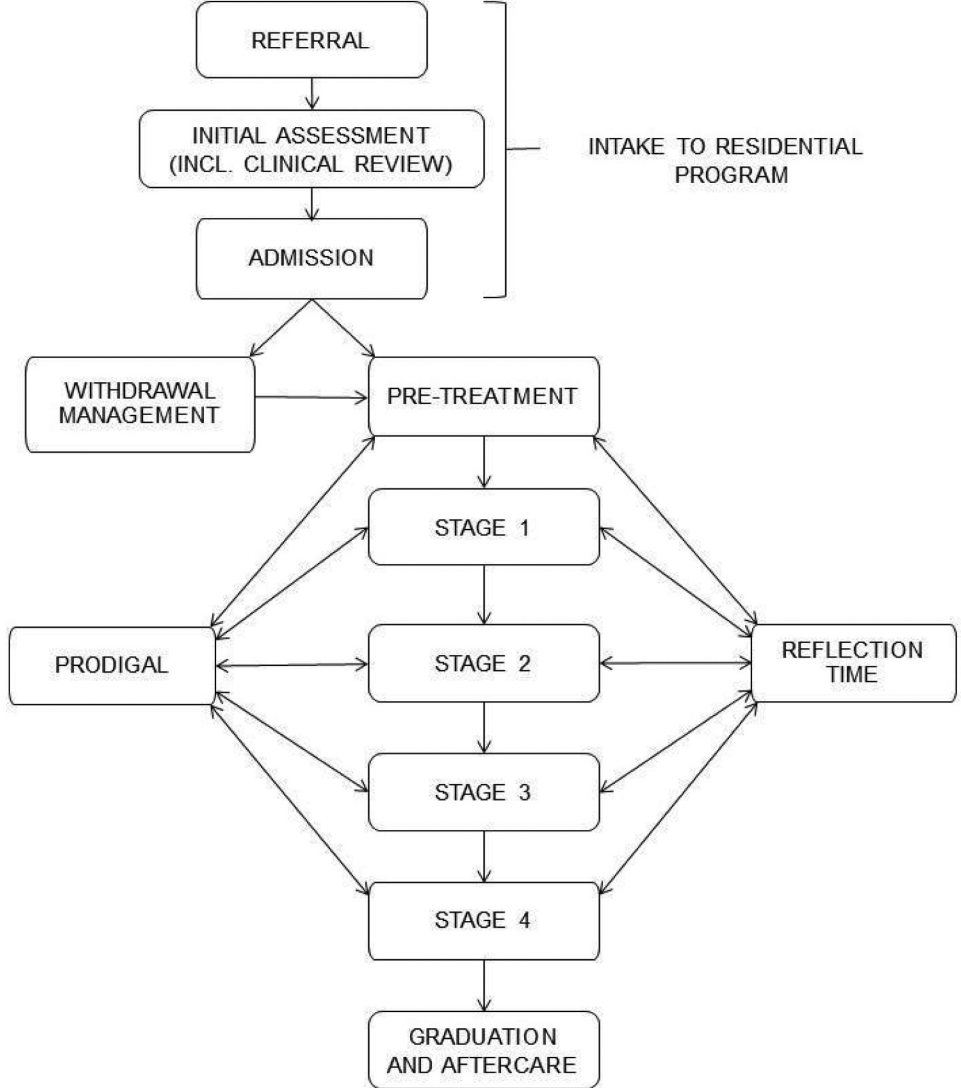

Figure 1. Treatment pathways for clients of the Odyssey House NSW residential program.

Table 1. Description of Odyssey House NSW treatment stages.

Treatment Stage	Stage description
Pre-treatment	Suitability for the residential program is assessed, and the person expresses a commitment to addressing their substance use problems. The new resident engages in peer support groups and adopts work responsibilities that contribute to the maintenance of the TC (e.g., kitchen and garden duties).
Stage 1	The resident engages in a daily routine which can include work responsibilities, peer support groups and educational classes. Residents develop communication skills to express emotions and concerns. Adherence to program rules and participation in group activities is demonstrated. Contact with family is re-established.
Stage 2	The resident maintains their daily routine from Stage 1, but with additional responsibilities including being mentoring Stage 1 and Pre-treatment residents and coordinating TC activities (e.g., kitchen shift, gardening work groups). The resident learns to manage increased stress levels, develop problem-solving skills, and rebuild family relationships. There is a deeper understanding of addiction and a greater ability to manage emotions.
Stage 3	The resident's responsibilities are increased by assigning them supervisory roles in which they manage departments and oversee the care of residents from lower stages. Residents are permitted leave from the TC for unsupervised home visits and other approved activities. Future education or career options after treatment completion can also be explored. The goal of this stage is to build further insight into the nature of their substance use and their perception of themselves or others to assist in building a meaningful life that supersedes substances.
Stage 4	Residents continue working for the TC while living outside of the OH NSW residential premises. This re-introduces the resident to the responsibilities of everyday life while remaining abstinent. To support this transition, vocational counselling, job readiness skills and individual therapy are offered.

Measures and materials

Kessler 10 Psychological Distress Scale (K10; Kessler et al., 2002)

The K10 is a brief measure of psychological distress over the last 4 weeks and consists of 10 items. Each item is rated on a five-point scale ranging from 0 ("never") to 5 ("all the time"), and total scores range between 10 and 50. Total K10 scores were categorised into normal, mild, moderate and severe levels of psychological distress using established cut-offs (Oakley et al., 2010). The K10 has demonstrated good internal reliability (α = .84) and concurrent validity for individuals with substance use disorders (Hides et al., 2007). Internal consistency in the baseline K10 scores of the full sample ($N = 117$) was very strong (α = .87; Miller & Newton-John, 2020).

8-item European Health Interview Survey Quality of Life Index (QoL8; Schmidt et al., 2006)

The QoL8 measured the participant's quality of life over the last 2 weeks. The eight self-report items are scored on a five-point scale ranging from 1 to 5, with higher total scores indicating better quality of life (range = 8–40). The QoL8 has demonstrated good internal reliability (α = .83) and moderate construct validity ($r = .36–.53$; Schmidt et al., 2006). In the full sample ($N = 117$), internal consistency was strong in baseline QoL8 scores (α = .76; Miller & Newton-John, 2019).

Severity of Dependence Scale (SDS; Gossop et al., 1995)

The SDS was used to assess psychological dependence on alcohol or drugs over the last 3 months. The SDS consists of five items rated on a four-point scale from 0 to 3, with higher scores indicating greater dependence on the substance of concern (range = 0 to 30). Good reliability (α = .80–.90) with high internal consistency and moderate criterion validity have been reported for the SDS in an Australian population (Gossop et al., 1995). Internal consistency for baseline SDS scores was acceptable in the full sample of 117 participants (α = .67; Miller & Newton-John, 2019).

Data analysis

All data analyses were performed on the data of the final sample of 96 participants using IBM Statistical Package for the Social Sciences (IBM Corp, 2019). Baseline and outcomes data were collected during routine procedures within the Odyssey House NSW TC program structure. Therefore, a formal sample size calculation was not undertaken before beginning the study. A sample size of 96 would give >0.8 power for an effect size of 0.3 (Cohen's D) for change over time (paired) in a continuous variable. Indicators for statistical and clinical significance were assessed during analyses. Clinical significance was tested using a two-standard deviation solution (Jacobson & Truax, 1992). Estimated marginal means were also calculated and reported for all analyses. For all analyses, data were assumed to be completely missing at random. Non-parametric analyses were employed as these are less reliant on assumptions of normality and more robust against unbalanced designs and missing data (Homish et al., 2010).

Treatment outcomes

Generalised Estimating Equations (GEE) were used to estimate the probability of outcome scores correlated with improvements between pre-treatment and each treatment stage. GEEs are an extension of Generalized Linear Models (suited to correlated non-independent data, such as repeated measures and time series) (Zeigler et al., 1998). GEEs estimate the effects of the average population to determine the probability of correlations between dependent and independent variables (Garson, 2013). An exchangeable correlation structure was used for the GEEs as it displayed the smallest quasi-likelihood information criteria and, hence, the best fit. Contrasts were used to estimate the change in outcome scores between treatment stages. A similar regression model was also used to estimate the relationships between time in treatment (i.e., number of days) and scores for each outcome measure at program exit.

Results

Table 2 shows the number of participants who progressed into each treatment stage Eighty-four of 96 participants who continued past the pre-treatment stage had left Odyssey House NSW by Stage 4 (88%). In all analyses involving treatment outcomes, missing data were treated as invalid and excluded.

Participant characteristics

In the final study sample ($n = 96$), participants were between 18 and 63 years of age ($M = 33$, $SD = 9$), most were born in Australia ($n = 83$, 86.5%), and all identified English as their preferred language. Nearly 70% of participants engaged in polydrug use before entering treatment at Odyssey House NSW ($n = 65$). Figure 2 displays the primary and secondary substances of

Table 2. Treatment stage completion, highest level of education and self-reported psychiatric diagnoses of 96 participants in the current study.

Demographic Characteristic	*n*	%
Treatment stage progression		
Stage 1	96	100.0%
Stage 2	63	65.6%
Stage 3	32	33.3%
Stage 4	15	15.6%
Highest Education Level Completed		
Primary School	1	1.0%
High School before Year 10	20	18.1%
High School, Year 10	17	17.7%
High School, Year 12	12	12.5%
TAFE	38	39.6%
University	8	8.3%
Psychiatric Diagnoses[a]		
Depression	38	39.6%
Anxiety	23	24.0%
Bipolar	6	6.3%
Schizophrenia	3	3.1%
Post-Traumatic Stress Disorder	4	4.2%
Other diagnosis	9	9.4%

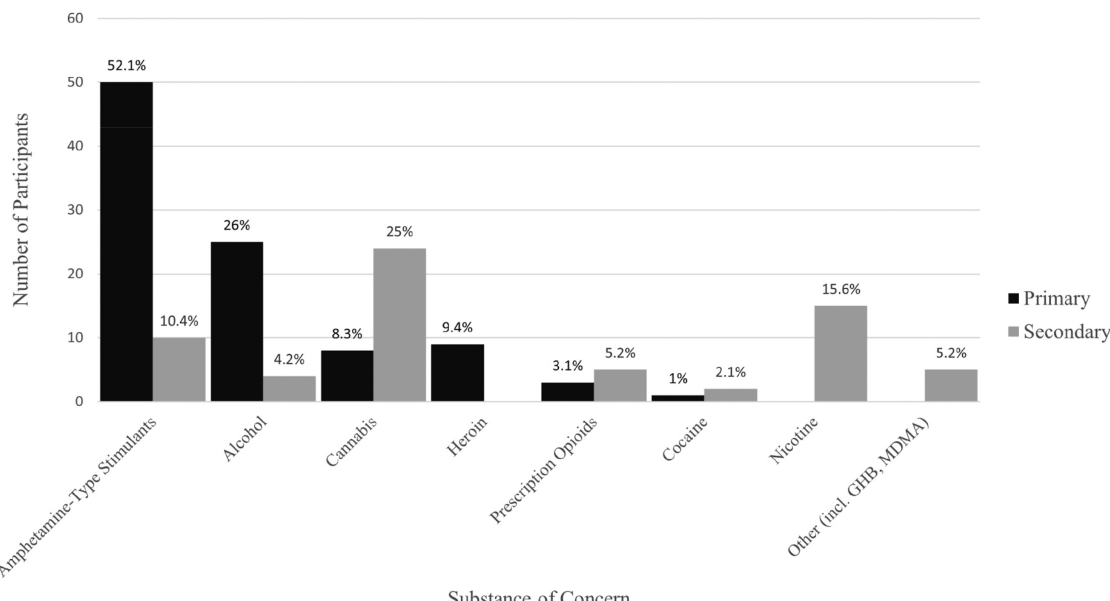

Figure 2. Primary and secondary substances of concern identified by participants at admission to the Odyssey House NSW residential rehabilitation program. Data labels show the percentage of the overall sample for each substance.

concern reported by the 96 participants. For most participants, it was their first admission to Odyssey House NSW ($n = 83$, 86.5%), and over half reported a criminal history ($n = 57$, 59.4%). Table 2 displays participants' highest levels of education and self-reported psychiatric diagnoses. More than 50% had completed their senior high school studies or equivalent, and 40% held tertiary qualifications. Approximately half reported at least one previous psychiatric diagnosis, the two most common being Depression and Anxiety (Table 2).

Treatment outcomes

Psychological distress

An Ordinal Logistic GEE indicated that, compared to pre-treatment, each treatment stage was significantly related to improvement in K10 scores (all $p < .001$; Figure 3). Compared to pre-treatment, the population odds of a participant being in a more severe category of psychological distress during Stages 1, 2, 3 and 4 were 0.34, 0.13, .067 and .048 times less likely. As shown in Figure 3, the percentage of participants who scored in the normal

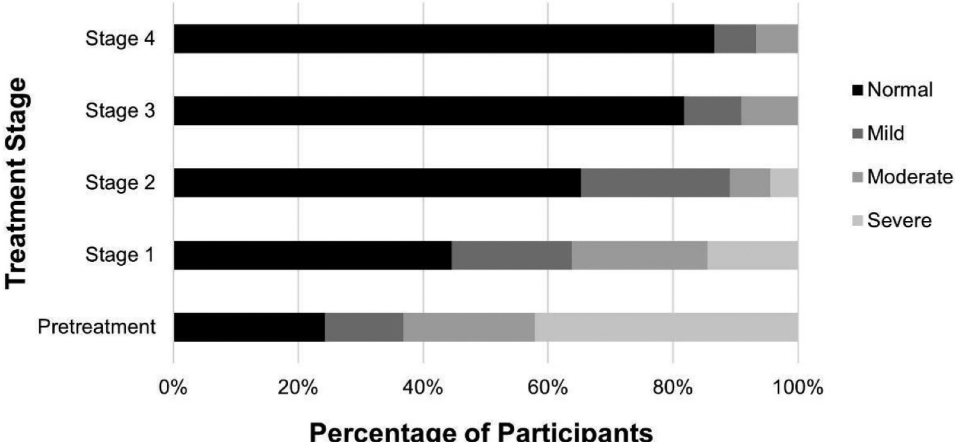

Figure 3. The cumulative percentage of participants per treatment stage in each psychological distress category of the K10. Percentages are based on estimated marginal means for K10 scores.

range for psychological distress increased from 24% at pre-treatment to over 40% in stage 1. This increased to over 60% in Stage 2 and then over 80% in Stages 3 and 4. On average, the participants' level of psychological distress improved significantly from Stages 1 to 2 ($p = .002$, b=0.56). There were no significant differences in psychological distress scores between Stages 2 to 3 or Stages 3 to 4.

Quality of life

Each treatment stage was significantly associated with a high probability of change in the participant's QoL8 score compared to pre-treatment (linear GEEs all $ps < .001$). As displayed in Figure 4, quality of life improved as participants progressed through each treatment stage. Similar to psychological distress, on average, participants' quality of life improved significantly from Stages 1 to 2 ($p = .004$, b = -1.94). However, no significant difference in QoL8 scores was found between Stages 2 to 3 or Stages 3 to 4.

Substance dependence

Data showed significant improvements in SDS scores from pre-treatment to Stage 1 ($p = .026$) and from pre-treatment to Stages 2 to 4 (all $ps < .001$). As shown in Figure 4, substance dependence was found to significantly decrease from Stages 1 to 2 ($p < .001$, $b = 2.94$) and Stages 2 to 3 ($p < .001$, b = 4.68). No significant difference was found between SDS scores at Stages 3 and Stage 4.

Time spent in treatment

Length of stay in the program ranged from 35 to 774 days ($M = 196$, $SD = 146$), not including the eight participants who were still completing the program when data collection ceased. Due to the small sample size, there was not adequate power to analyse time in treatment as a categorical variable. However, results have been graphed with treatment time as categorical to visualise the observed effects better. Categories for time in treatment were determined based on the threshold theory (Simpson et al., 1999).

K10 scores were significantly associated with time in treatment, with the odds of being in a lower K10 category increasing by 0.2% for each day in treatment (95% CI: –.004 - –.001, $p < .01$). In Figure 5, raw K10 scores are used to depict this result. An improvement in K10 scores was evident for participants who left treatment after 3 months, compared to those who left treatment before 3 months [Figure 5]. These gains plateaued between 3 to 12 months, after which further improvements were observed for participants who left treatment after 12 months (Figure 5). A significant relationship was also found between QoL8 scores and time in treatment ($\beta = .01$; $CI = .004–.016$, $p < .001$). As shown in Figure 5, improvements in QoL8 scores slowed once participants had spent more than 3 months in treatment. However, further gains were observed for participants who left after 12 months of treatment. Finally, a linear relationship between SDS scores and days in treatment was found ($\beta = –.017$, $CI = –.022$ - $–.013$, $p < .001$), indicating that substance dependence reduced the longer a participant remained in treatment (Figure 5).

Discussion

The aim of the present study was to compare the contribution of stage completion and time in treatment to the effectiveness of TC treatment at Odyssey

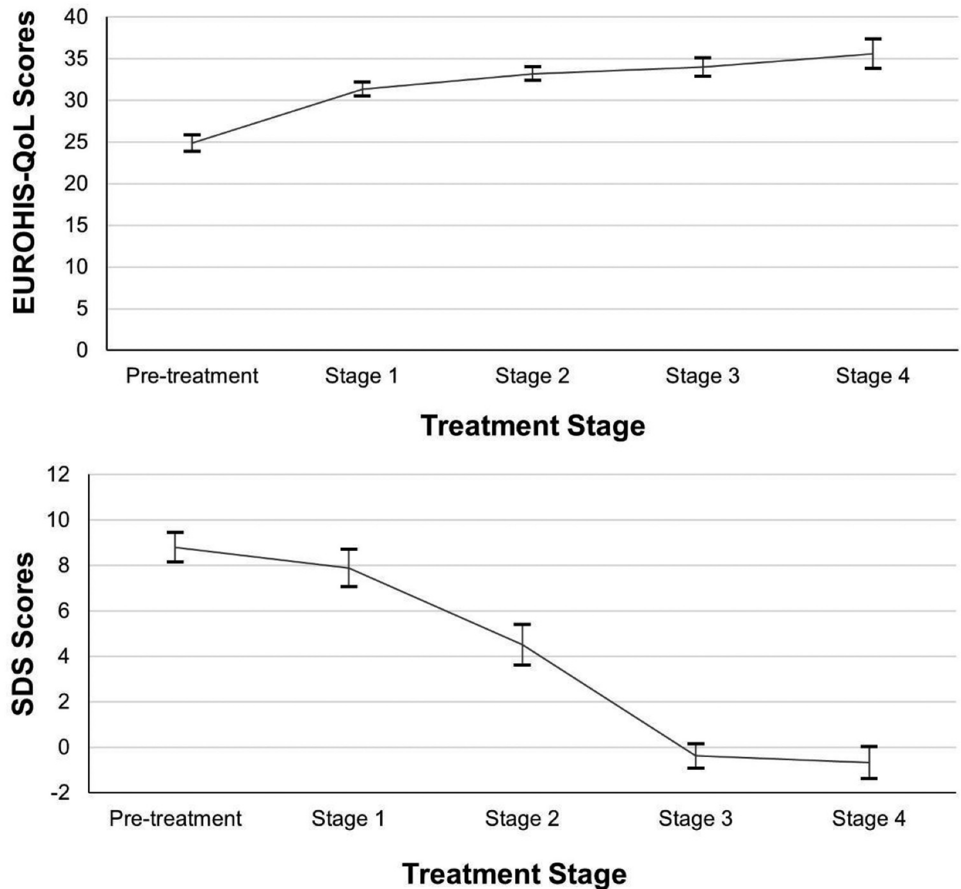

Figure 4. Estimated marginal means for quality of life (top) and substance dependence (bottom), categorised by treatment stage. Vertical bars denote 95% confidence intervals.

House NSW. Though the efficacy of TCs for treating substance use has previously been assessed (e.g., Bevanda et al., 2017; De Leon, 2010; Malivert et al., 2012; Polimeni et al., 2010), evidence is still mixed for the optimal length of TC treatment needed to improve client outcomes. Findings from the present study will help future research to distinguish between improvements in client outcomes due to progression through TC stages versus time spent in treatment. Concerning the first research question, there was a statistically significant probability that, compared to pre-treatment, each treatment stage improved the outcomes of Odyssey House NSW residential clients. These findings align with previous research showing that TC treatment effectively improves clients' quality of life, psychological distress, and substance dependence (Bevanda et al., 2017; De Leon, 2010; Polimeni et al., 2010; Shaver et al., 2023) and suggests that these improvements are associated with each stage that the client progresses through while in TC treatment.

For the second research question, statistical comparisons revealed that most improvements in clients' psychological distress, quality of life and substance dependence occurred by the second TC stage. Some benefit was found for clients who completed the third TC stage, but no further improvements in treatment outcomes were evident by the fourth TC stage. These findings align with other research that has tested the predictive power of stage completion within the TC model of treatment (Toumbourou et al., 1998), albeit with different outcome measures. Yet, it should be noted that the time spent in each treatment stage is not standardised within and across TCs. Residents progress through each TC stage at different rates, making comparisons between participants and programs difficult (De Leon, 2010). Fortunately, findings for the third research question indicate most improvement in psychological distress, quality of life and substance dependence occurred either 3 months or 12 months after entering the TC program at Odyssey House NSW. These results are consistent with other studies that have found the most optimal outcomes in programs with shorter durations (e.g., 6 months and less; McCusker et al., 1997; Nemes et al., 1999) or longer

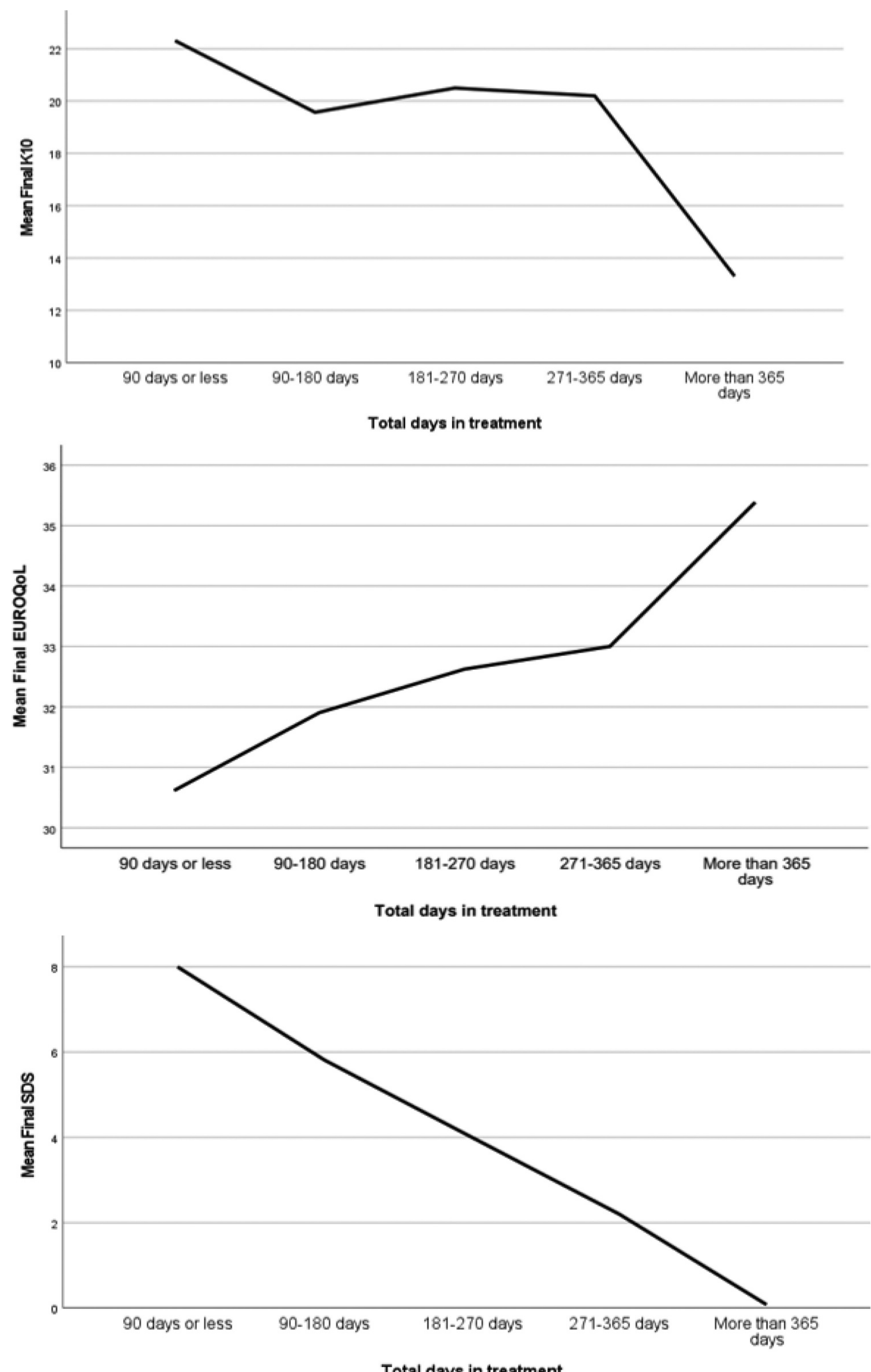

Figure 5. Estimated marginal means for quality of life, substance dependence and psychological distress, categorised by days in treatment. Days in treatment indicate the participant's time of exit from the Odyssey House NSW program.

durations (e.g., over 12 months; De Leon, 2010; Moos et al., 1999). It seems likely that maximal gains happen at these early (3 months post-entry) and late (12 months post-entry) time points because they are consolidation periods (Malivert et al., 2012). It takes a few months for residents to adapt to the structured TC environment, to adjust to abstinence, and to engage in the therapeutic activities of the program.

As can be seen in Table 1, it is also around this time that residents take on additional responsibilities to support the running of the TC and are given mentorship roles with new residents to the community – reflecting and reinforcing the "community as method" philosophy of this intervention. Having achieved those initial changes, individuals who remain in treatment by 12 months will have had sufficient time to fully embed their new coping skills, establish their healthier social support networks, and reconnect with vocational or educational opportunities. Findings from these prior studies, along with those from the present study, contrast with results from other studies, such as Wexler et al. (1990). The latter study found that the most optimal outcomes occurred when the program duration was 3 to 9 months.

Optimising the length of TC treatment

The present study is one of the first to directly compare stage completion and time in treatment within a TC targeted at substance use. Inconsistent evidence for the optimal length of TC treatment in prior research may be due to the overt focus on time in treatment, typically indexed by the number of days. This is understandable, as TC stages can be difficult to quantify due to differences in TC structures, clients' readiness for treatment and the criteria used to assess client transitions between treatment stages. Despite these limitations, several core elements define the TC approach to substance use (De Leon & Unterrainer, 2020) and prior research suggests that these types of TCs improve the treatment outcomes of clients in the long term (e.g., de Andrade et al., 2019; Magor-Blatch et al., 2014). The present findings indicate that examining stage completion in addition to time in treatment can help to identify the active ingredients that lead to better client outcomes. For instance, in the present study, the second TC stage of Odyssey House NSW was associated with the largest improvements in treatment outcomes, which corresponds to the point at which the client has begun to take on extra responsibilities, consolidate skills from earlier stages and rebuild family connections (Table 1). This is significant in terms of clinical significance as the aim of treatment is to provide a "dose" that yields a balanced cost-benefit analysis. Given that drug and alcohol rehabilitation services are chronically underfunded in Australia (Leung et al., 2023), these findings are even more compelling. They provide direction for other services to consider the length of their TC interventions and review whether optimal treatment gains can be achieved over a shorter period of time.

A further instance in which stage completion provided detail on client progress in the present study was the earlier stages of treatment. It is likely that the significant improvements during pre-treatment and the first TC stage are due in part to the normal adjustments of establishing abstinence and the stability and support provided by the TC environment. Whilst the lack of a comparison or control group within this study limits the assessment of natural factors (and the significant change in SDS scores would be expected given that the TC is an abstinence-based program), the strong effect of the outcomes indicates that part of the change is likely attributable to the TC treatment approach, too. Of relevance, most of the sample were experiencing severe substance dependence and psychological distress at TC admission. High attrition during pre-treatment and the first TC stage may have resulted from the intersection of these factors combined with the focus of each stage on solidifying the client's commitment to their recovery and establishing a daily routine. Supporting this, Goethals et al. (2017) report that higher motivation, engagement and responsivity were associated with retention and improved treatment outcomes. Furthermore, TC residents with a possible psychiatric diagnosis have a greater probability of exiting treatment early (Dacosta-Sánchez et al., 2021; Vergara-Moragues & González-Saiz, 2020). Thus, improvement in outcomes during early TC stages may indicate that the clients with more severe pathology, poorer motivation and lower engagement are exiting treatment earlier than other residential clients. This is potentially a limitation in the present study, given that almost one-fifth of participants left treatment before entering the first TC stage. It is also worth noting that there were no demographic differences found between those completing treatment earlier (180 days or less) versus those who completed treatment later (180 days or more). Hence, future research examining TC outcomes that specifically addresses the issue of responder demographic profiling – identifying at program entry who is most likely to benefit from the treatment – is an important next stage of investigation.

Though this high attrition may have led to some sampling bias in early improvements, some researchers argue that highly distressed residents drop out earlier in treatment due to difficulty engaging in TCs and developing a sense of belonging (Metrikin et al., 2003). Therefore, clients who progress to the second stage may represent the people who are most ready and likely to engage in structured treatment like the TC approach to substance use. In favour of this, Miles et al. (2008) found that clients' understanding of the TC

approach and level of comfort with receiving peer support predicted treatment retention. During the first 3 months of treatment, clients who scored lower on these two dimensions tended to leave the TC. However, by nine to 12 months, this trend had reversed, with clients who scored higher on TC understanding and level of comfort with receiving peer support tending to leave the TC. Discrepancies in the optimal treatment time across studies may also be due to differences in participant characteristics (e.g., nominated primary drug of concern, psychiatric diagnoses). For instance, opioid and cocaine use has been associated with larger improvements in mental health and dependence in comparison to alcohol use (McCracken & Black, 2005; Turner & Deane, 2016). Likewise, McLellan et al. (1984) found that participants with either low *or* high severity of substance dependence at admission to treatment benefited more from treatment that was less than 6 months. In contrast, longer programs were more helpful for those with moderate severity. Finally, most participants in the current study reported amphetamine-type stimulants as their primary drug of concern, which has similar impacts to opioids and cocaine (Australian Institute of Health and Welfare, 2024).

The present study's findings are promising and support the effectiveness and optimal length of TC treatment. One of strengths of this study is its ecological validity – the data were collected by a clinical team as part of routine program administration, thus reflecting the research's "real world" application. However, high attrition rates in pre-treatment and between treatment stages could indicate that the observed changes could reflect outcome data that is missing-not-at-random. In addition, high attrition is a widespread issue in research on substance use treatment (Goethals et al., 2017; Malivert et al., 2012; Vanderplasschen et al., 2014). Despite this, individual evaluations of TCs contribute to the evidence base and provide opportunities to improve further the effectiveness of programs run within TCs. Moreover, we found no significant differences in participant demographics between clients who progressed to the program versus those who dropped at the pre-treatment stage. Another limitation of the present study was the below acceptable internal consistency found for the substance dependence measure (i.e., the SDS), which may have been driven by participants with a primary substance of alcohol. However, the SDS was completed for the same primary substance throughout each study assessment point. Given that more than 70% of the sample had engaged in polydrug use before entering the TC, this could indicate that a more generalised measure of substance dependence would have been more appropriate for the current study. It is also worth noting that these data were collected in 2017–2018, with corresponding differences in the economic climate between then and now. Issues such as cost of living pressures may be a further influence on how well participants are able to engage and remain in treatment over the long term. Nevertheless, the present findings suggest that more standardisation of the TC treatment model would help build greater consistency between studies of TC effectiveness and enhance avenues for future research and evaluation.

Conclusion

Like other residential rehabilitation programs run within TCs, the Odyssey House NSW program improved its clients' psychological distress, quality of life, and substance use and dependence as they progressed through treatment. The optimal changes in outcomes occurred within the first two treatment stages, after 3 months or after 12 months of participation in the program. The clinical significance of the finding that major treatment gains can be obtained without clients necessarily completing all stages of the program has already been recognised by recent changes to the Odyssey House NSW service delivery model. In response to these findings, Odyssey House NSW has revised their residential program format, including introducing mental health recovery groups earlier to support retention and the development of a three-month Foundations of Recovery program as part of a stepped-recovery plan model. Reducing the length of treatment where possible also decreases disruption to clients' lives and enables TCs to treat more individuals within a given period. Given the individual variability between TC participants, treatment outcomes observed in the present study may not be generalisable beyond the Odyssey House NSW program. Still, the current findings support funding allocation to organisations running TCs for substance use. The holistic and responsive approach of TCs to problematic substance use ensures people receive intensive treatment when needed, and this treatment can be tailored to the individual. Future TC research would benefit from further consideration of individual dynamics, such as symptom severity or relapse history, and other treatment process factors (such as program content and sequencing of content) that lead to the best treatment outcomes, as well as investigating methods for reducing TC attrition rates.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, TNJ, upon reasonable request.

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