



SUBSTANCE USE & MISUSE  
An International Interdisciplinary Forum

## Substance Use & Misuse

ISSN: 1082-6084 (Print) 1532-2491 (Online) Journal homepage: <http://www.tandfonline.com/loi/isum20>

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To cite this article: Anthony J. Arcuri, John Howard, Melissa Norberg, Jan Copeland & Barbara Toson (2011) Young Cannabis Users in Residential Treatment: As Distressed as Other Clients, *Substance Use & Misuse*, 46:10, 1335-1345, DOI: [10.3109/10826084.2011.580034](https://doi.org/10.3109/10826084.2011.580034)

To link to this article: <https://doi.org/10.3109/10826084.2011.580034>



Published online: 26 May 2011.



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ORIGINAL ARTICLE

## Young Cannabis Users in Residential Treatment: As Distressed as Other Clients

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Doubt remains about the need for residential substance user treatment for young cannabis users. Using a series of validated clinical tools, this study compared 1,221 primarily cannabis-, psychostimulant-, alcohol-, or opioid-dependent young people admitted to an urban/rural Australian residential treatment program between 2001 and 2007. Multinomial logistic regression revealed that the cannabis user group had poorer mental health than the opioid group, poorer social functioning than the alcohol drinking group, and comparably poor functioning otherwise but remained in treatment longer than the psychostimulant and opioid user groups. Residential treatment for primarily cannabis-dependent young people with complex and multiple needs can be supported.

**Keywords** cannabis, residential treatment, young people, mental health, psychosocial functioning

### INTRODUCTION

Cannabis is the most common drug for which young people present to specialist drug and alcohol user treatment<sup>1</sup> in Australia. In 2007–2008, 43.2% of young persons' (aged 10–19 years) treatment episodes at Australian drug and alcohol user treatment centers involved cannabis as the principal drug of concern, followed by alcohol

(34.2%), psychostimulants (i.e., meth/amphetamines, ecstasy, and cocaine; 10.4%), and opioids (3.7%). Of all treatment episodes for young people, 5.3% occurred in residential settings, compared with 29.8% in counseling, 22.6% involving information and education only, and 19.1% involving support and case management only. Primarily cannabis-using clients in this age group were less likely to receive residential treatment<sup>2</sup> (4.6%) than were primarily psychostimulant-using (amphetamines 11.1%, cocaine 9.1%, ecstasy 5.6%), opioid-using (heroin 5.5%, methadone 6.1%, other opioids 8%), or alcohol-using (4.9%) clients. Instead, they were among the most likely to have received information and education only (29.8%), second only to primarily ecstasy-using clients (38.4%) (Australian Institute of Health and Welfare, 2009).

Compared with young people in outpatient treatments, those in residential treatment have been found to have greater levels of problem severity. According to the available research, they have greater psychiatric impairment, drug-use-related problem severity, and cultural diversity and are more likely to be male and criminally involved, with more deviant peer groups and unstable living arrangements. In addition, they are more likely to have received prior drug user treatment, be failed academically, and be disengaged from education (Dennis, Dawud-Noursi, Muck, & McDermeit, 2003; Hser et al., 2001; Rounds-Bryant, Kristiansen, & Hubbard, 1999).

<sup>1</sup>Treatment can be briefly and usefully defined as a planned, goal-directed, temporally structured change process, of necessary quality, appropriateness, and conditions (endogenous and exogenous), which is *bounded* (culture, place, time, etc.) and can be categorized into professional-based, tradition-based, mutual-help-based (AA, NA, etc.) and self-help ("natural recovery") models. There are no unique models or techniques used with substance users—of whatever types and heterogeneities—which are not also used with nonsubstance users. In the West, with the relatively new ideology of "harm reduction" and the even newer Quality of Life (QOL) treatment-driven model, there is now a new set of goals in addition to those derived from/associated with the older tradition of abstinence driven models. Editor's note.

<sup>2</sup>The reader is asked to consider that the category "residential treatment" is an often used container concept that needs delineation. Treatment is implemented in a range of environments, ambulatory as well as within institutions that can include controlled environments. Treatment includes a spectrum of *clinician-caregiver-patient relationships representing various forms of decision-making traditions/models*; (1) *the hierarchical model in which the clinician-treatment agent makes the decision(s) and the recipient is compliant and relatively passive*, (2) *shared decision-making that facilitates the collaboration between clinician and patient(s) in which both are active*, and (3) *the "informed model" in which the patient makes the decision(s), techniques and services, types of staff, policies, types and levels of quality, and temporal considerations*. Editor's note.

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Among young people, cannabis use has been associated with impairments in a number of areas, including mental health (most notably psychosis, but also depression and anxiety), physical health, vocational and educational engagement, social and family functioning, and delinquent and criminal behavior (Budney, Moore, & Vandrey, 2008; Copeland, Gerber, & Swift, 2006; McLaren & Mattick, 2007). How these impairments compare with those of young people presenting primarily with alcohol-, psychostimulant-, or opioid-use-related problems remain unknown.

Such potential differences may be poorly understood in residential treatment settings, where young people often present with dysfunction in multiple domains. As treatment resources become scarce, there is likely to be growing pressure to query their need for expensive residential treatment. However, as the large Cannabis Youth Treatment (CYT) experiment (designed to test the effectiveness of five outpatient interventions for young cannabis users) has shown, many young cannabis users in outpatient settings require more intensive treatment, given the complexity of their presentations (Tims et al., 2002). Furthermore, the experiment demonstrated that there were no iatrogenic effects in group-based interventions for young cannabis users (Burlinson, Kaminer, & Dennis, 2006; Dennis et al., 2004), a finding which may generalize to residential settings given their group focus.

Only three studies have explored differences across drug types in the clinical profiles of young people in residential treatment; however, none of these explicitly examined cannabis use. In the first study, Hawke, Jainchill, and De Leon (2000) compared amphetamine-using and nonamphetamine-using clients from nine therapeutic communities across the United States and Canada and found that amphetamine users were older, had more psychopathology, and had more extensive drug use and criminal histories than those who had not used amphetamines. They also were more likely to be white, to have parents with higher education levels but greater drug use and mental illness, and to report histories of childhood maltreatment. In the second study, Clemmey, Payne, and Fishman (2004) compared 56 heroin-using adolescents with 93 nonheroin-using adolescents in short-term residential substance user treatment and found that the heroin group was older than the nonheroin group and more likely to be female and Caucasian. In addition, the heroin group showed greater impairment on measures of family functioning, health risk behavior, health status, criminal behavior, social functioning, and psychological distress than the nonheroin group.

Most recently, Subramaniam, Stitzer, Woody, Fishman, and Kolodner (2009) compared opioid-dependent adolescents with a combined group of alcohol or cannabis-dependent adolescents admitted to a predominantly residential substance user treatment program. They found that the opioid-dependent adolescents were more likely to be Caucasian and to have dropped out of school than the alcohol-/cannabis-dependent adolescents. In addition, the opioid group had greater substance use severity, a

greater number of co-occurring substance use disorders, and reported higher depressive symptoms than the alcohol/cannabis group. Both the groups, however, were equivalent in their rates of criminal behavior, risky sexual behavior, and current psychiatric disorders. Together, these studies suggest that opiate- and amphetamine-using young people in residential treatment may report greater dysfunction in a variety of domains compared with their peers who do not use these drugs.

To date, only one study has examined cannabis users in treatment as a distinct group. Urbanoski, Strike, and Rush (2005) studied Canadian adults across various treatment modalities whose principal drug of concern was cannabis, alcohol, cocaine, or opiate. They found that the cannabis group was younger than the other groups and more likely to be students, single, and to report legal system involvement. In addition, cannabis users were more likely to report extrinsic motivation for treatment, such as referrals from the police or legal system or pressure from family or school authorities.

The purpose of the current study was to extend these findings to an Australian context by examining characteristics such as physical and mental health, social and family functioning, sexual safety, and criminal behavior in a large sample of young people presenting to residential substance user treatment. Specifically, the current study aimed to compare the clinical profiles of young people presenting with cannabis as their primary substance of concern with those presenting with alcohol, psychostimulants, or opioids as their principal substance of concern.

## MATERIALS AND METHODS

### The Residential Treatment Program

At the time of the study, the Ted Noffs Foundation's Program for Adolescent Life Management (PALM) offered up to 3 months of residential treatment to substance-dependent young people aged between 14 and 18 years. Other entry criteria included the requirement that the young people not have unmanaged mental health conditions or significant histories of violent or sexual acting out that may be disruptive in a residential setting. PALM, based on a harm reduction philosophy and relapse prevention planning, provided 42 beds across two metropolitan and two rural locations in eastern Australia. PALM offered its residents a structured program incorporating living skills training, therapeutic, vocational/educational and creative group work; individual counseling; family work; journaling; and recreational activities. Each resident was provided with an individualized care plan tailored to their unique needs.

The available data (between 2002 and 2005) shows that most referrals to PALM were family initiated (24.7%) and self-initiated (24.3%), but referrals from the juvenile justice system were also common (20%), especially in the two rural settings (Arcuri & Howard, 2006). Youth, community health, and substance user services also provided a significant proportion of referrals to PALM (18.8%). However, it must be noted that "self" referrals may be

over-represented in these figures given that referral data were collected by noting who made the original telephone call to PALM. Thus, some young people who made the call may have been asked or coerced to do so by others (e.g., family, juvenile justice).

### The Participants

The sample initially comprised all 1,254 admissions to PALM between January 2001 and June 2007. Nine of these admissions were excluded from the sample due to missing data. Among the remaining sample of 1,245 admissions, the average age was 16.74 years, 71.8% were male, and 26% identified themselves as Indigenous Australians. As identified by the young person, cannabis was the most common substance of principal concern (553, or 44.4% of admissions), followed by psychostimulants (282, 22.7%), alcohol (209, 16.8%), and opioids (177, 14.2%). Psychostimulant presentations incorporated those relating primarily to meth/amphetamines (244, 19.6%), ecstasy (21, 1.7%), and cocaine (17, 1.4%). The remaining admissions, which involved either an inhalant (19, 1.5%) or a tranquillizer (5, 0.4%) as the substance of principal concern, were removed from the sample as their small numbers were not amenable to statistical analyses. As a result, the final sample comprised 1,221 admissions.

Admission to PALM required that the young person met the *Diagnostic and Statistical Manual of Mental Disorders 4th Edition* (DSM-IV) (American Psychiatric Association, 2000) criteria for dependence on his or her primary substance of concern. Therefore, all of the primarily cannabis-using young people in this study were cannabis dependent. In addition, it is noted that some admissions with cannabis as the primary substance of concern also had a psychostimulant, alcohol, and/or an opioid as a secondary substance of concern (40.5%, 49.3%, and 5.1%, respectively). Similarly, some admissions with a psychostimulant, alcohol, or an opioid as the substance of principal concern also had cannabis as a substance of secondary concern (69%, 64.2%, and 48.9%, respectively). However, the young people were not necessarily dependent on their substances of secondary concern.

### Measures

Trained Adolescent and Family Counselors collected the self-report data during an assessment interview at a PALM unit immediately prior to each admission, via a structured form incorporating both original items and existing assessment tools with sound psychometric properties. The participants provided informed consent for the use of their data in research (no young people refused to lend their data to the research). The procedures were approved by and in accord with the Medical/Community Human Research Ethics Advisory (HREA) panel at the University of New South Wales.

*New South Wales Minimum Data Set for Drug and Alcohol Treatment Services* (NSW MDS DATS). The NSW MDS DATS is a data collection tool designed to provide consistent information about the clients of drug and

alcohol services in the state of NSW, Australia (Centre for Drug and Alcohol, 2005). For the purposes of the current study, the following NSW MDS DATS items were utilized: age in years, gender (male/female), Indigenous status (Indigenous vs. non-Indigenous), drug of greatest concern (cannabis, alcohol, opioid, psychostimulant), and employment status (student/employed vs. unemployed).

*Brief Treatment Outcome Measure (BTOM)*. The BTOM was designed to monitor substance user treatment outcomes (Lawrinson, Gerber, Copeland, & Indig, 2003). The BTOM collects information across a variety of areas, including drug use and dependence, health and psychological functioning, and social functioning. The BTOM's six-item Social Functioning Scale (scores range from 0 to 18; higher scores are associated with poorer functioning), along with the following items, was utilized in this study: "How many times in the last 3 months have you been arrested?" (a continuous variable); "Are you currently taking any psychiatric medication?" (yes/no); and "Have you had thoughts of ending your life in the last 3 months?" (yes/no). The BTOM demonstrates good 1 week test-retest reliability and acceptable concurrent validation with analogous scales from similar instruments (Lawrinson, Copeland, & Indig, 2005).

*Substance Dependence Diagnosis*. The Adolescent and Family Counselors used a checklist based on the DSM-IV (American Psychiatric Association, 2000) criteria for substance dependence to assess dependence on the identified primary drug of concern.

*Opiate Treatment Index (OTI)*. The OTI provides a comprehensive, standardized set of measures for the evaluation of opiate treatment (Darke, Ward, Hall, Heather, & Wodak, 1991). A number of OTI components were used in the current study. Physical health was measured using symptom counts in three areas: general health (15 items/symptoms), neurological health (9 items/symptoms), and gastrointestinal health (5 items/symptoms). Sexual behavior was measured in two areas: number of sexual partners in the last 3 months (0, 1, 2, 3–5, 6–10, >10 partners) and consistency of condom use in the last 3 months, with a regular partner (always vs. not always) and with a casual partner (always vs. not always). The OTI has demonstrated sound test-retest and internal reliabilities and adequate construct and concurrent validities (Darke et al., 1991).

*Brief Symptom Inventory (BSI)*. The BSI is a 53-item self-report inventory measuring current, point-in-time psychological symptom status across three indices of global distress and nine primary symptom dimensions: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoia, and psychoticism (Derogatis, 1992). For the current study, the participants' scores in the nine primary symptom dimensions and the Global Severity Index were calculated and then compared against the relevant norms for adolescent males and females to determine whether they reached the cut-off scores for clinically significant symptom reporting (Derogatis, 1992). The BSI has demonstrated good internal consistency (with mixed

results for the psychoticism dimension; Holden, Starzyk, McLeod, & Edwards, 2000) and adequate test-retest reliability (Derogatis, 1992; Kellett, Beail, Newman, & Frankish, 2003). Its content, construct, convergent, discriminant, concurrent, and predictive validities also have been demonstrated as adequate (Boulet & Boss, 1991; Derogatis, 1992).

*Family Assessment Device (FAD).* The general functioning scale of the FAD is a 12-item measure with scores ranging from 1.00 (healthy) to 4.00 (unhealthy), where mean scores greater than 2.00 indicate family “pathology” or dysfunction (Epstein, Baldwin, & Bishop, 1983). The general functioning scale of the FAD has demonstrated excellent psychometric properties and has been recommended for use as a brief measure of family functioning (Epstein et al., 1983; Miller, Epstein, Bishop, & Keitner, 1985; Ridenour, Daley, & Reich, 2000).

*Previous Treatment, Self-harm and Crime.* The original items used in this study involved the following: “Have you ever seen a mental health professional (e.g., psychologist/psychiatrist/social worker/school counselor)?” (yes/no); “Have you ever self-harmed (e.g., cut, burned)?” (yes/no); “Have you ever attempted to end your life?” (yes/no); “Have you ever been pregnant/caused a pregnancy?” (yes/no); and “What types of crime have you committed in the last 3 months? Please tick: property (e.g., stealing, break and enter); person (e.g., assault, assault and rob); drug supply (e.g., dealing); driving.”

*Retention.* Retention was calculated as the number of days at PALM, which included the young person’s first and last days at PALM. Young people generally were expected to stay at PALM for 90 days but in some cases could negotiate to leave after 60 days, if their therapeutic goals had been met within that time frame. Young people also could be discharged early due to disciplinary problems or of their own volition. PALM was funded primarily by various government departments (e.g., health, juvenile justice, and community services) and donations. In addition, young people were asked to contribute to the cost of treatment if they had access to an income or family support. Where the young people were unable to access such funds, any contribution was waived. Thus, the young people’s access to finance or insurance had no bearing on their ability to complete the program.

### Data Analysis

In this secondary analysis of an existing dataset, the group of admissions with cannabis as the primary substance of concern was compared with each of the psychostimulant, alcohol, and opioid groups on the following domains: demographic characteristics, physical and mental health, engagement in employment or education, social and family functioning, criminal behavior, and retention in treatment. Comparisons of the groups by demographic characteristics were analyzed using Pearson chi-square tests for categorical variables, and an independent samples *t*-test examined potential age differences; alpha level was set at .05 for these tests. Comparisons involving either pretreatment functioning/experiences or retention were achieved using

multinomial logistic regressions. Gender, age, Indigenous status, and PALM unit location (i.e., either metropolitan or rural; the great majority of, but not all, admissions were to units in the young people’s general areas of residence) were controlled for their potential to predict the substance of primary concern (Catalano, Hawkins, Wells, Miller, & Brewer, 1990). As partial adjustment for the number of multiple comparisons, an alpha level of .01 was adopted.

## RESULTS

In this section, for ease of expression and brevity, young people who were primarily dependent on cannabis are referred to as “the cannabis group”; young people who were primarily dependent on opioids are referred to as “the opioid group”; and so on.

### Demographics

The cannabis group was more likely to be male (82.1%) than the psychostimulant group (58.9%),  $\chi^2(1, N = 835) = 52.7, p < .001$ ; the alcohol group (74.2%),  $\chi^2(1, N = 762) = 6.0, p < .05$ ; and the opioid group (57.6%),  $\chi^2(1, N = 730) = 44.2, p < .001$ . In addition, the cannabis group was younger ( $M = 16.6$  years,  $SD = 1.1$ ) than the psychostimulant group ( $M = 16.86$  years,  $SD = 0.95$ ),  $t(641.3) = 3.5, p < .001$ , and the opioid group ( $M = 16.96$  years,  $SD = 0.98$ ),  $t(328.7) = 4.1, p < .001$ . Furthermore, the cannabis group was more likely to have been admitted to a rural PALM unit (32.2%) than the psychostimulant group (22%),  $\chi^2(1, N = 835) = 9.5, p < .005$  and the opioid group (14.7%),  $\chi^2(1, N = 730) = 20.4, p < .001$  but more likely than the alcohol group to have been admitted to a metropolitan unit (67.8% vs. 59.8%),  $\chi^2(1, N = 762) = 4.3, p < .05$ .

### Multivariable Statistics

Table 1 provides a summary of all multinomial logistic regression analyses (with descriptive statistics). In addition, significant differences between the cannabis group and the other groups are reported below. All such differences reported are adjusted for gender, age, Indigenous status, and location of PALM unit and include 99% confidence intervals.

*Cannabis Group Versus Opioid Group.* Differences between the cannabis group and the opioid group were evidenced in several areas. First, the odds of being in the opioid rather than the cannabis group increased by a factor of 1.35 with each additional symptom of gastrointestinal ill-health. In contrast, the cannabis group demonstrated poorer mental health than the opioid group. Regarding the BSI scores, compared with the opioid group, the odds of being in the cannabis group were greater by a factor of 2.33 if anxiety was clinically significant, 2.27 if depression was clinically significant, 2.08 if hostility was clinically significant, 2.38 if interpersonal sensitivity was clinically significant, 2.78 if phobic anxiety was clinically significant, 2.63 if psychoticism was clinically significant,

TABLE 1. Descriptive statistics and multinomial logistic regression analyses

		Cannabis	Opioid	Alcohol	Psychostimulant	Opioid vs. Cannabis		Alcohol vs. Cannabis		Psychostimulant vs. Cannabis	
						OR <sup>a</sup>	99% CI	OR <sup>a</sup>	99% CI	OR <sup>a</sup>	99% CI
Symptoms of physical ill-health <sup>b</sup>											
General health	Mean (SE)	6.2 (0.1)	6.9 (0.2)	5.8 (0.2)	7.7 (0.2)	1.02	0.92–1.13	0.92	0.84–1.01	1.15*	1.05–1.25
Neurological health	Mean (SE)	3.5 (0.1)	3.7 (0.2)	3.7 (0.2)	4.5 (0.1)	1.00	0.87–1.14	1.04	0.93–1.17	1.19*	1.06–1.32
Gastrointestinal health	Mean (SE)	1.6 (0.1)	2.6 (0.2)	1.6 (0.1)	2.2 (0.1)	1.35*	1.14–1.60	1.00	0.86–1.17	1.16*	1.01–1.34
Clinically significant psychological distress <sup>c</sup>											
Anxiety	%	20.0%	17.4%	18.5%	34.1%	0.43*	0.20–0.92	0.78	0.41–1.45	1.32	0.79–2.23
Depression	%	27.4%	22.3%	22.0%	33.6%	0.44*	0.22–0.89	0.64	0.36–1.14	0.87	0.52–1.44
Hostility	%	23.9%	19.0%	21.4%	35.0%	0.48*	0.24–0.99	0.85	0.48–1.53	1.20	0.72–1.99
Interpersonal sensitivity	%	17.9%	12.4%	17.3%	24.9%	0.42*	0.18–0.98	0.87	0.46–1.65	1.03	0.59–1.81
Obsessive-compulsive	%	36.8%	31.4%	24.9%	47.9%	0.64	0.35–1.17	0.53*	0.31–0.91	1.29	0.82–2.04
Paranoia	%	17.5%	15.7%	11.6%	23.5%	0.58	0.27–1.25	0.54	0.26–1.10	0.97	0.55–1.71
Phobic anxiety	%	19.3%	11.6%	17.3%	24.9%	0.36*	0.15–0.83	0.75	0.40–1.42	0.91	0.52–1.59
Psychoticism	%	25.3%	17.4%	20.8%	28.6%	0.38*	0.18–0.79	0.67	0.37–1.21	0.77	0.45–1.29
Somatization	%	20.5%	25.6%	17.3%	35.8%	0.77	0.39–1.54	0.70	0.37–1.35	1.36	0.80–2.31
Global severity	%	25.5%	21.5%	22.0%	34.1%	0.42*	0.21–0.86	0.70	0.39–1.27	0.90	0.54–1.52
Engagement in mental health treatment											
Ever seen a mental health professional	%	74.4%	74.3%	78.9%	76.9%	1.09	0.63–1.87	1.38	0.82–2.33	1.16	0.73–1.85
Currently taking psychiatric medication	%	21.7%	12.1%	18.3%	21.0%	0.43*	0.22–0.86	0.71	0.41–1.24	0.82	0.50–1.33
Self-harm and suicide											
Suicidal ideation in last 3 months	%	43.1%	32.6%	37.9%	49.1%	0.46*	0.28–0.77	0.69	0.44–1.08	0.97	0.64–1.45
Ever attempted suicide	%	36.3%	37.9%	38.0%	48.6%	0.83	0.50–1.39	0.95	0.60–1.50	1.31	0.86–1.98
Ever self-harmed	%	37.5%	32.0%	44.1%	46.8%	0.66	0.36–1.18	1.25	0.80–1.98	1.28	0.83–1.96
Family dysfunction <sup>d</sup>	%	80.0%	74.8%	76.6%	81.3%	0.65	0.33–1.26	0.81	0.45–1.46	0.95	0.53–1.70
Social functioning <sup>e</sup>	Mean (SE)	9.2 (0.2)	8.7 (0.3)	8.4 (0.3)	10 (0.2)	0.93	0.86–1.01	0.92*	0.86–0.99	1.03	0.97–1.10
Studying or in employment	%	37.5%	32.0%	44.1%	46.8%	0.49*	0.28–0.86	1.50	0.94–2.38	0.96	0.63–1.49
Sexual behavior											
Number of sex partners in last 3 months	Mean (SE)	1.7 (0.1)	1.5 (0.1)	1.7 (0.1)	2 (0.1)	0.96	0.77–1.20	1.04	0.87–1.24	1.22*	1.03–1.43
Been pregnant or caused pregnancy	%	20.2%	31.0%	30.1%	41.6%	1.61	0.84–3.08	1.53	0.88–2.68	2.79*	1.69–4.60
Consistent condom use in last 3 months											
Regular partner	%	35.5%	24.5%	35.4%	19.3%	0.65	0.24–1.76	1.06	0.51–2.19	0.51	0.24–1.10
Casual partner	%	45.2%	48.0%	34.9%	41.8%	1.10	0.35–3.46	0.66	0.29–1.50	1.13	0.54–2.38
Crime in previous 3 months											
Arrests last 3 months	Mean (SE)	1.7 (0.1)	2.2 (0.2)	2.1 (0.2)	2.0 (0.3)	1.10*	1.01–1.19	1.07	0.99–1.16	1.08*	1.01–1.17
Property crime	%	43.1%	53.7%	40.0%	47.5%	1.93*	1.19–3.13	0.90	0.58–1.40	1.51*	1.01–2.27
Person crime	%	26.6%	26.9%	41.0%	32.2%	1.18	0.70–2.01	2.01*	1.28–3.16	1.51	0.98–2.33
Drug supply crime	%	20.3%	20.0%	11.2%	21.4%	1.35	0.75–2.44	0.51*	0.27–0.98	1.28	0.78–2.10
Driving crime	%	26.4%	15.4%	27.8%	31.9%	0.60	0.32–1.11	1.10	0.68–1.78	1.52	0.98–2.35
Days at PALM	Mean (SE)	44.7 (1.4)	35.9 (2.4)	46.9 (2.3)	39.6 (2)	0.99*	0.98–1.00	1.00	0.99–1.01	0.99*	0.99–1.00

<sup>a</sup>ORs calculated from multinomial logistic regression models adjusting for other predictors (gender, age, Indigenous status, and PALM unit).

<sup>b</sup>As measured by the adapted Opiate Treatment Index.

<sup>c</sup>As measured by the Brief Symptom Inventory.

<sup>d</sup>As measured by the Social Assessment Device.

<sup>e</sup>As measured by the Social Functioning Scale, where scores range from 0 to 18, and higher scores indicate poorer functioning.

\*Significant at  $p < .01$ .

and 2.38 if the global severity was clinically significant. In addition, the odds of being in the cannabis rather than the opioid group were 2.33 times greater if the young person was taking psychiatric medications on admission and 2.17 times greater if the young person experienced suicidal ideation in the 3 months prior to admission.

Although there were no significant differences between the two groups in family or social functioning or in sexual behavior, the odds of being in the opioid rather than the cannabis group were 2.04 times greater if the young person was unemployed (as opposed to a student or employed) and 1.93 times greater if the young person had committed a property crime in the 3 months prior to admission. Furthermore, with each additional arrest in the 3 months prior to admission, the odds of being in the opioid rather than the cannabis group increased by a factor of 1.10. Finally, in relation to retention, the odds of being in the cannabis rather than the opioid group increased by a factor of 1.01 with each additional day stayed at PALM.

*Cannabis Group Versus Alcohol Group.* There were no differences between the cannabis and opioid groups in the measured symptoms of physical ill-health. Among the mental health variables, only one difference was observed: compared with the alcohol group, the odds of being in the cannabis group were greater by a factor of 1.89 if the obsessive-compulsive BSI score was clinically significant. No differences were found in family functioning, unemployment, or sexual behavior, but with each unit increase in the BTOM's Social Functioning Scale scores (indicating poorer social functioning), the odds of being in the cannabis rather than the alcohol group increased by a factor of 1.09.

Among the criminal behavior variables, two group differences emerged. The odds of being in the alcohol rather than the cannabis group were 2.01 times greater if the young person had committed a crime against person(s) in the 3 months prior to admission. In contrast, the odds of being in the cannabis rather than the alcohol group were 1.96 times greater if the young person committed a drug supply crime during the 3 months prior to admission. There were no differences between the two groups relating to retention in treatment.

*Cannabis Group Versus Psychostimulant Group.* The psychostimulant user group showed poorer physical health than the cannabis user group across all three symptom domains measured. The odds of being in the psychostimulant rather than the cannabis user group increased by a factor of 1.15 with each additional symptom of general ill-health, 1.19 with each additional symptom of neurological ill-health, and 1.16 with each additional symptom of gastrointestinal ill-health. In contrast, there were no differences between the two groups in any of the measures of mental health, family or social functioning, or unemployment.

The psychostimulant user group indicated poorer sexual safety than the cannabis group in two of the four variables measured. The odds of being in the psychostimulant rather than the cannabis user group were 2.79

times greater if the young person had ever caused a pregnancy or been pregnant. With each shift to a higher category of number of sex partners in the 3 months prior to admission, the odds of being in the psychostimulant rather than the cannabis group increased by a factor of 1.22.

Criminal behavior was more common in the psychostimulant than the cannabis user group for two of the five variables measured. The odds of being in the psychostimulant rather than the cannabis user group increased by a factor of 1.08 with each additional arrest and were 1.51 times greater if the young person had committed a property crime, in the 3 months prior to admission. Finally, the odds of being in the cannabis rather than the psychostimulant group increased by a factor of 1.01 with each additional day stayed at PALM.

## DISCUSSION

The aim of this study was to investigate selected demographic and clinical characteristics of Australian young people in residential substance user treatment who are primarily dependent on cannabis in relation to young people primarily dependent on another substances. In keeping with the respective trends of young substance users in the Australian general population, the primarily cannabis-using participants in this study were younger than their primarily psychostimulant- or opioid-using peers (Australian Institute of Health and Welfare, 2008). In addition, consistent with young people entering substance user treatment in Australia, males were more highly over-represented among the cannabis-dependent young people than among those dependent on psychostimulants, alcohol, or opioids (Australian Institute of Health and Welfare, 2009). Compared with the findings of Urbanoski et al.'s (2005) study of the clinical profiles of primary cannabis users versus primary alcohol, cocaine, and opiate users (across treatment modalities), the current research showed similar results regarding the increased likelihood of male gender (compared with the opioid users) and the younger age of cannabis users.

With respect to pretreatment functioning, consistent with the findings of previous research (as reviewed by Budney et al., 2008; Copeland et al., 2006; McLaren & Mattick, 2007), the cannabis-dependent young people in this study presented with concurrent difficulties in a number of areas, including physical health, mental health, suicidal ideation and behavior, family and social functioning, vocational and educational engagement, sexual safety, and criminal behavior. In a number of these domains, dysfunction was more pronounced for the cannabis-dependent young people than for the alcohol- and opioid-dependent participants and at similar levels as for the psychostimulant-dependent young people.

However, cannabis-dependent young people had less physical ill-health impairment than their opioid- and psychostimulant-dependent peers. This finding may be expected given that the effects of cannabis on these health areas have not been clearly established

(McLaren & Mattick, 2007), whereas the adverse effects of psychostimulants and opioids on physical health have been demonstrated (Darke, Kaye, McKetin, & Duffou, 2008; Vincent, Shoobridge, Ask, Allspo, & Ali, 1998; Williamson, Darke, Ross, & Teesson, 2009). Although cannabis-dependent individuals had less impairment in physical health than opioid- or psychostimulant-dependent individuals, their physical health was nevertheless impaired.

In relation to mental health, the most striking finding was that the cannabis-dependent young people were significantly more distressed than their opioid-dependent counterparts across multiple domains (including anxiety, depression, hostility, interpersonal sensitivity, phobic anxiety, psychoticism, and suicidal ideation). Although methodologies differed across studies, the current results are in contrast to Clemmey et al.'s (2004) finding that young opioid users in residential treatment were more psychologically distressed than nonopioid users and Subramaniam et al.'s (2009) finding that opioid-dependent adolescents had higher depressive symptoms and a similar profile of psychiatric disorders as compared with cannabis-/alcohol-dependent adolescents in treatment. Furthermore, previous research has suggested that young opioid users show high rates of psychiatric comorbidity (as reviewed by Burns, Martyres, Close, & Boldero, 2004; Mills, Teesson, Darke, Ross, & Lynskey, 2004). On closer inspection of this literature, however, it appears that the "young" opioid users sampled were aged up to 30 years. It is possible, then, that the effects of heroin on mental health may emerge later than the effects of cannabis use, which commonly is initiated earlier (Australian Institute of Health and Welfare, 2008).

Although psychostimulants have been noted for their adverse impact on various mental health domains among regular users (Darke et al., 2008; Vincent et al., 1998), and although Hawke et al. (2000) found more severe psychopathology among young psychostimulant than among nonpsychostimulant users in residential treatment, in this study the primarily cannabis- and psychostimulant-dependent young people demonstrated similar mental health profiles. This is not surprising in relation to psychoticism, which has been consistently and causally<sup>3</sup> linked to cannabis use (Cohen, Solowij, & Carr, 2008; Hall, 2006; McLaren, Lemon, Robins, & Mattick, 2008; Moore et al., 2007). However, in the current study, symptoms of hostility were as heightened in the cannabis-dependent young people as they were among the young people manifesting psychostimulant or alcohol dependence. This contrasts with anecdotal and research findings suggesting that aggressive behaviors are more likely to be associated with psychostimulant and alcohol

presentations (Boles & Miotto, 2003). These findings suggest that the full spectrum of mental health needs of cannabis-dependent young people accessing residential treatment is as great, if not greater, than those of opioid-, alcohol- and psychostimulant-dependent young people. Despite these findings, the cannabis group was no more likely than the other groups to have previously seen a mental health professional, which may indicate that barriers to seeking and/or receiving mental health treatment are more pronounced for young cannabis users.

In relation to social and family functioning, the cannabis group was equivalent to the other groups, except that it demonstrated poorer social functioning than the alcohol user group. Yet, the cannabis group was more likely to be engaged in employment or education than was the alcohol group. This later finding was also demonstrated in Urbanoski et al.'s (2005) study. It appears that either the factors that contribute to poor social functioning may not affect vocational and educational functioning or cannabis' effects on vocational and educational functioning may be slower to progress. Given that the majority of cannabis treatment seekers report social problems (Copeland, Swift, & Rees, 2001), further exploration of the factors that lead to impaired social functioning is greatly needed so that existing interventions can be tailored to more adequately address the needs of young people attempting to reduce or quit cannabis.

Regarding sexual practices, the current study found that the cannabis group reported fewer sexual partners and pregnancies than the psychostimulant user group. This finding persisted even after controlling for age and may be related to previous findings linking psychostimulant use with increases in (risky) sexual activity (Baskin-Sommers & Sommers, 2006; McElrath, 2005; Volkow et al., 2007). The current study also showed that the sexual safety of the cannabis group was equivalent to those of the alcohol user group and the opioid group, a finding that was consistent with a previous research (Subramaniam et al., 2009).

The present study showed that the cannabis-dependent young people were less criminally involved than their peers, except that they were more likely to have committed drug supply crimes than the alcohol user group, which may be expected given alcohol's legal status. The relatively low criminal involvement of the cannabis user group is consistent with some previous research (e.g., Clemmey et al., 2004; Hawke et al., 2000), but contrary to Urbanoski et al.'s (2005) finding that primary cannabis users were more likely to report legal system involvement than primary alcohol, cocaine, or opiate users and Subramaniam et al.'s (2009) finding that criminal behavior was equivalent in their opioid and cannabis/alcohol user groups. However, it is important to note that, in the current study, "number of arrests in the 3 months prior to admission" was not a strong predictor of membership in the opioid group or the psychostimulant group compared with the cannabis group (i.e., although statistically significant, the odds ratios were close to 1.0).

<sup>3</sup>The reader is referred to Hills's criteria for causation that were developed in order to help assist researchers and clinicians determine if *risk factors* were causes of a particular disease or outcomes or merely associated. (Hill, A. B. (1965). The environment and disease: associations or causation? *Proceedings of the Royal Society of Medicine*, 58, 295–300.) Editor's note.

Despite the cannabis-dependent young people's heightened difficulties in a number of domains and thus their potential for leaving treatment early due to the weight of such dysfunction, they were retained in treatment for longer than the psychostimulant- and opioid-dependent young people. The CYT experiment also demonstrated high rates of treatment retention among young cannabis users, albeit in nonresidential modalities (Dennis et al., 2002). Many other client and program characteristics, however, also may have impacted young people's retention in residential treatment (Orlando, Chan, & Morral, 2003). Again, in interpreting these findings, it should be noted that, although significant, retention was not a strong predictor: the odds ratios were extremely close to 1.0 when the cannabis user group was compared with the opioid and psychostimulant user groups.

Despite the fact that people may have discharged from the program for various reasons, it is important to note that young dependent cannabis users remained in treatment for an average of 45 days. Thus, a residential setting may provide a sufficient "dose" of treatment in which cannabis-related problems can be adequately addressed. Given that retention is highly predictive of treatment outcomes for young people in residential treatment (Hser et al., 2001; Orlando et al., 2003), one might speculate that at least in this sample of young people, residential treatment outcomes for cannabis-dependent young people would be at least equivalent to those of their opioid-, alcohol-, and psychostimulant-dependent peers.

## SUMMARY

In summary, like all young people entering residential treatment, a primarily cannabis-using young person would likely have used a variety of drugs in addition to cannabis. They may present in diminished physical health, but less so than a young opioid user or especially a young psychostimulant user. They may possess a range of psychological difficulties, much greater than an opioid user and equally as impaired as a psychostimulant or alcohol user entering treatment. More so than a young opioid user, the young cannabis user may present with thoughts of suicide and scripts for psychiatric medication.

In addition, the young primary cannabis user may emerge from a context of family and social dysfunction, without engagement in employment or education. Although social functioning may be poorer than a young alcohol user, they may be more likely to be in school or have a job than a young opioid user entering treatment. The young cannabis user may have engaged recently in sexually risky behaviors and an associated pregnancy, but would be much less likely to have done so than a young psychostimulant user. They may have recently been arrested, but less often than an opioid or psychostimulant user, and have engaged in multiple criminal behaviors, but less variously than the users of other substances. Finally, their length of stay in residential treatment may be over 6

weeks, around a week longer than a psychostimulant user and 10 days longer than an opioid user.

## Study's Limitations

Researching young people who use substances is rarely clear-cut. Thus, some methodological limitations should be considered when interpreting this study's findings and implications. First, many of the young people in this study were polysubstance users and thus did not "cleanly" fit into a particular substance group. However, the current study was concerned with young people who used cannabis primarily, and not necessarily exclusively; where cannabis-dependent young people also used other substances, their use of these substances was of less concern to them than was their cannabis use and not necessarily at levels of dependence. In addition, the level of polysubstance use noted in the current study is comparable to that reported in other treatment studies (e.g., Subramaniam et al., 2009) and thus appears representative of young people who seek treatment. Second, the measures of the young people's functioning were based solely on self-reports, which may or may not have influenced the validity of the data, and with the exception of the BSI and FAD are yet to be validated with young people. In addition, as with all multivariate analyses, variance in the participants' psychosocial functioning may be explained, perhaps better, by unexplored factors that a qualitative study might identify.

While acknowledging the limitations, and although some of the inconsistencies in research findings between this and other studies may be due to methodological differences, taken as a whole the findings of this study highlight to substance user treatment program developers, managers, and clinicians that young people presenting with cannabis dependence may have difficulties as significant as those manifesting dependence on substances traditionally regarded as "harder" (i.e., psychostimulants and opioids). Therefore, there is no reason not to admit young people to residential treatment where the primary substance of dependence is cannabis and other indications for residential placement exist, such as depleted community support; inability to maintain participation in education, training, or employment; exacerbated mental health concerns; and involvement<sup>4</sup> in criminal activity. Furthermore, the results reinforce the importance of comprehensively assessing and addressing the mental health, family, social, educational, and vocational needs of young cannabis users entering residential treatment.

## Declaration of Interest

Anthony Arcuri and John Howard are former employees of the Ted Noffs Foundation. The Ted Noffs Foundation is a consortium partner of the National Cannabis

<sup>4</sup>The reader is asked to consider that a critical issue for determining whether a specific treatment ideology, model, technique, etc. is indicated or contra-indicated is related to the underpinnings for its selection criteria: theory, evidence-informed, "principles of faith", tradition, budget, policies, law, etc. Editor's note.

Prevention and Information Centre (NCPIC), of which Anthony Arcuri, John Howard, Melissa Norberg and Jan Copeland are employees. The NCPIC and its employees derive no financial or other benefit from the Ted Noffs Foundation. Barbara Toson has no conflict of interest.

## RÉSUMÉ

### **Titre: Les jeunes usagers de cannabis en traitement résidentiel: aussi affligé que d'autres clients?**

Un doute persiste quant à la nécessité pour le traitement résidentiel d'utilisation de substance pour jeunes consommateurs de cannabis. Grâce à une série d'outils cliniques validés, cette étude a comparé 1,221 jeunes que utiliseront principalement du cannabis, psychostimulants, alcool ou des opioïdes admis dans un du programme de traitement résidentiel dans les zones urbaines ou rurales de l'Australie entre 2001 et 2007. Régression logistique multinomiale a révélé que le groupe de cannabis avaient une moins bonne santé mentale que dans le groupe opiacés, les plus pauvres du fonctionnement social que le groupe de l'alcool, et comparablement le fonctionnement plus pauvres autrement, mais il est resté dans le traitement plus longtemps que les groupes des psychostimulants et des opiacés. Le traitement résidentiel pour le jeunes principalement dépendant au cannabis avec des complexes et multiples besoins peut être supporté.

**Mots-clés:** cannabis, traitement résidentiel, les jeunes, la santé mentale, le fonctionnement psychosocial

## RESUMEN

### **Título: Jóvenes consumidores de cannabis en tratamiento residencial: tan afligidos como los otros clientes?**

Persisten dudas acerca de la necesidad de tratamiento residencial para el consumo de sustancias psicoactivas por parte de jóvenes consumidores de cannabis. Utilizando una serie de instrumentos clínicos validados, éste estudio comparó principalmente a 1,221 jóvenes dependientes al cannabis, a los psicoestimulantes, al alcohol, o a los opiáceos, admitidos a un programa de tratamiento residencial australiano en área urbana/rural, entre los años 2001 y 2007. El análisis de regresión logística multinomial reveló que el grupo con dependencia al cannabis tenía peor salud mental que la del grupo de los opiáceos, peor adaptación social que la del grupo del alcohol, y por el contrario comparativamente pobre funcionamiento, aunque permanecieron por mayor tiempo en tratamiento que los grupos dependientes a los psicoestimulantes y opiáceos. El tratamiento residencial principalmente para jóvenes dependientes al cannabis con necesidades complejas y múltiples puede ser apoyado.

**Palabras clave:** cannabis, tratamiento residencial, jóvenes, salud mental, funcionamiento psicosocial.

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## GLOSSARY

**Adolescent and Family Counsellor:** Qualified and trained counsellor, with background in psychology, social work, or alcohol and other drug studies.

**Outpatient:** Non-residential treatment.

**PALM (Program for Adolescent Life Management):** Residential treatment program for young people with substance dependence.

**Treatment episode:** Admission to and then discharge from a treatment.

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