Personality and substance use disorders in young adults

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Background There have been no studies of the co-occurrence of personality and substance use disorders in young community-dwelling adults.

Aims To examine the association between DSM–IV personality disorders and substance use disorders in a large representative sample of young community-dwelling participants.

Method Young Australian adults (n=1520, mean age=24.1 years) were interviewed to determine the prevalence of substance use disorders; 1145 also had an assessment for personality disorder.

Results The prevalence of personality disorder was 18.6% (95% CI 16.5–20.7). Personality disorder was associated with indices of social disadvantage and the likely presence of common mental disorders. Independent associations were found between cluster B personality disorders and substance use disorders. There was little evidence for strong confounding or mediating effects of these associations.

Conclusions In young adults, there are independent associations between cluster B personality disorders and substance use disorders.

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Substance use disorders are a major cause of death and disability. Numerous clinical studies indicate that there is an association between substance use and personality disorders, with evidence that personality pathology may influence both the aetiology and course of substance use disorders (Caspi *et al*, 1997; Skodol *et al*, 1999). Previous studies of the co-occurrence of these disorders have used clinical samples and relied on self-reported measures of personality, thus rendering the findings susceptible to both selection and information biases (DeJong *et al*, 1993; Brooner *et al*, 1997; Skodol *et al*, 1999). Furthermore, there have been no population-based surveys of these disorders in young adults. This represents a major gap in the literature, since it is in this population that substance misuse is most problematic (Farrell *et al*, 2001). We examined co-occurrence between clusters of personality disorder and substance use disorders in a large representative sample of young Australian adults.

METHOD

Sample

Between August 1992 and March 2003, an eight-wave cohort study of adolescent and young adult health in the state of Victoria, Australia was carried out. The cohort was defined in a two-stage cluster sample in which two classes were randomly selected from each of 44 schools drawn from a stratified frame of government, Catholic and independent schools (total number of students 60 905). School retention rates to year 9 in the year of sampling were 98%. One class from each school entered the cohort in the latter part of the 9th school year, corresponding to age 14–15 years (wave 1), and the second class 6 months later, early in the 10th school year, corresponding to age 15–16 years (wave 2). Participants were subsequently reviewed at a further four 6-month intervals during the teenage years (waves 3–6) with two follow-up waves in young adulthood at the ages of 20–21 years (wave 7) and 24–25 years (wave 8). This report concerns data collected in the eighth wave.

From a total sample of 2032 students, 1943 (96% of the sampling frame) participated at least once during the first six (adolescent) waves. In wave 8, 1520 young adults (78% of wave 1–6 participants) were interviewed between May 2001 and March 2003. Response rates are shown in Fig. 1. Reasons for non-participation at wave 8 were refusal (n=269), unable to contact person (n=147) and death (n=7).

Measures

Socio-demographic variables

The following variables were recorded: gender, country of birth, completion of schooling, possession of post-school qualifications, employment status, benefits status (receipt of government support), living arrangements, relationship status (currently having a boy-/girlfriend or living with a partner), and parental educational status (used as a marker of socio-economic status of the family of origin).

Personality disorder

The presence of DSM–IV personality disorder was assessed using the ICD–10 version of the Standardised Assessment of Personality (SAP; Pilgrim & Mann, 1990). The instrument has good interrater (kappa=0.76) and test–retest reliability (kappa=0.65; Pilgrim *et al*, 1993). The SAP is a semi-structured interview designed for use with a person who has known the individual for at least 5 years. All wave 8 participants were asked to nominate a friend, sibling or partner, with whom we could conduct an SAP interview. If the friend was unavailable or unable to be contacted, cohort participants were asked to name an alternative person. Of the 1520 participants at wave 8, 1145 interviews (75%) were conducted with nominated interviewees. There were 304 participants that refused to nominate a friend; 45 nominated people who refused to be interviewed or could not be contacted and 26 nominated people who were located but did not respond to requests for interviews. The majority of interviewees were female (n=891, 78%); they had known the participant for a median 10 years (interquartile range 5–18), had a median of 12 contacts per month (interquartile range 4–30) and were predominantly under 35

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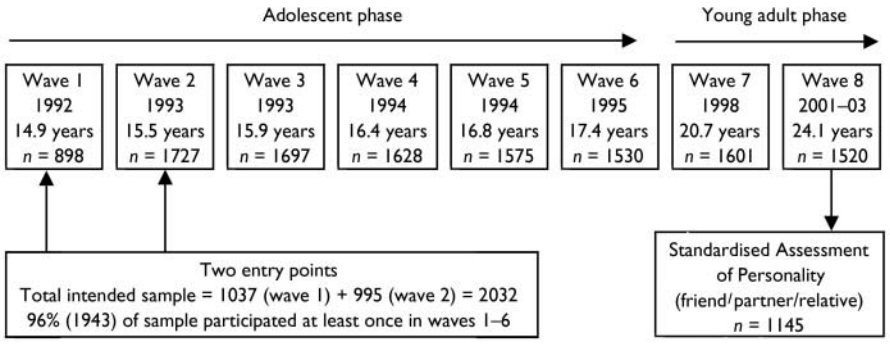

Fig. 1 Sampling and ascertainment in the Victorian Adolescent Health Cohort, 1992–2003.

years of age (n=1115, 97%). The interviewees were friends or partners (n=872, 76%), relations (n=253, 22%; e.g. sibling, cousin) or spouses (n=20, 2%). Trained research psychologists carried out all the SAP assessments as telephone interviews.

Behavioural/psychiatric measures

Common mental disorders. Depression and anxiety were assessed with the 12-item General Health Questionnaire (GHQ–12; Goldberg, 1972). The total scores were dichotomised at the cut-off point of 3/4 to identify a mixed depression–anxiety state at a lower threshold than syndromes of major depression and anxiety disorder, but where clinical intervention would still be appropriate.

Cannabis use. This was assessed by self-reported frequency of use in the previous 12 months. In the analysis, participants were dichotomised according to whether cannabis was used at least weekly.

Cannabis dependence (DSM–IV). This was assessed using the 12-month version of the Composite International Diagnostic Interview 2.1 (CIDI; World Health Organization, 1997). Only participants reporting weekly substance use were assessed.

Tobacco consumption. This was recorded using a 7-day retrospective diary. Daily smoking was defined as reported smoking on 6 or 7 days of the past week. Nicotine dependence was measured using the Fagerstrom Test for Nicotine Dependence (Heatherton *et al*, 1991) and was defined at a cut-off point of 3/4.

Alcohol use. This was assessed by self-reported frequency of use. Participants who reported drinking in the previous week were asked to record their consumption on each drinking day over Friday, Saturday and Sunday and the most recent drinking weekday. If appropriate, the weekday report was extrapolated to other drinking weekdays, enabling the estimation of total alcohol consumption for the week prior to the survey. Males consuming more than 430 g of alcohol per week were classified as hazardous drinkers (National Health and Medical Research Council, 2001); the corresponding figure for females was 280g.

Alcohol dependence (DSM–IV). This was assessed using the CIDI. Only participants reporting weekly alcohol consumption were assessed.

Amphetamine, ecstasy and cocaine use. Participants were classified as users if they reported using these substances in the past year.

Analysis

Data were collected from young people who were difficult to trace because of the high mobility of the age-group. Although the response was high and attrition low, a quarter of cohort members were not interviewed at wave 8 and a quarter of those who were interviewed did not have an assessment of personality disorder, leading to potential bias in summary measures at wave 8. To address this, we used the method of multiple imputation, with five complete data-sets created by imputation under a multivariate normal model (Schafer, 1997). This model incorporated all the outcome variables of interest measured at all waves of data collection, along with the fixed covariates gender, age, rural or urban residence, parental education and parental smoking (available for all participants). Univariate and multivariate logistic regression analyses were used to model associations, and Wald tests and related confidence intervals were used to assess statistical significance and precision, combining appropriately across the five imputed data-sets (Carlin *et al*, 2003). Analysis was performed with Stata version 8 for Windows.

RESULTS

Characteristics of the study sample

The mean age of participants was 24.1 years (s.d.=0.61); 51% (n=1000) of the sample were female and 14% (n=264) were of non-Australian birth; 31% (n=596) had parents with no qualifications, 38% (n=730) had at least one parent with a certificate/diploma and 32% (n=617) had at least one parent with a degree.

Prevalence and socio-demographic correlates of personality disorders

The overall prevalence of DSM–IV personality disorders was 18.6% (95% CI 16.5–20.7). The prevalence of sub-categories and clusters of DSM–IV personality disorders is shown in Table 1.

Cluster C personality disorders had the highest prevalence, although confidence

Table 1 Estimated prevalence of DSM–IV personality disorder in 1943 participants

	%	95% CI
Cluster A disorder		
Paranoid	6.6	5.2–8.1
Schizoid	2.3	1.5–3.2
Schizotypal	0.9	0.5–1.3
Any cluster A	8.3	7.0–9.6
Cluster B disorder		
Antisocial	3.1	1.9–4.2
Borderline	3.5	2.7–4.4
Histrionic	2.4	1.7–3.1
Narcissistic	3.6	2.5–4.7
Any cluster B	8.1	6.8–9.4
Cluster C disorder		
Obsessive–compulsive	5.8	4.8–6.9
Avoidant	4.6	3.6–5.6
Dependent	1.0	0.5–1.5
Any cluster C	9.8	8.3–11.3
Any personality disorder	18.6	16.5–20.7
More than one personality disorder		
Cluster A and B	1.5	0.9–2.2
Cluster A and C	1.4	0.8–2.0
Cluster B and C	1.4	0.6–2.1
Cluster A, B and C	1.6	0.9–2.3
More than one cluster	5.9	4.7–7.2

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intervals for the three clusters of personality disorder all overlapped. Almost a third of those diagnosed with a personality disorder met criteria for more than one cluster.

There was little evidence of association between participant age, gender, non-Australian birth or parental education and a diagnosis of any personality disorder. However, a diagnosis of cluster A personality disorder was more prevalent among females (OR=1.6, 95% CI 1.0–2.4) and less prevalent among those not born in Australia (OR=0.52, 95% CI 0.28–1.0).

Associations between personality disorders and substance use disorders

The prevalence of substance use and dependence is shown in Table 2. Associations between clusters of personality disorder and substance use disorders are displayed with and without adjustment for the co-occurrence of other clusters.

As gender and Australian birth were possible confounders, all estimates were also adjusted for these factors. No first-order interactions with gender were identified.

Adjustment for the presence of other clusters of personality disorder abolished any significant association between a cluster A or C diagnosis and any category of substance misuse. However, associations between all four categories of substance use and a cluster B diagnosis remained robust when adjusted for the other clusters of personality disorder.

We next examined the role of possible mediators of the association between cluster B personality disorders and substance use disorders. In order to identify which measures to include in the analysis, we first assessed univariate associations between any personality disorder (given the extent of cluster overlap) and common mental disorder (as measured by GHQ–12), relationship, educational and work status. All domains showed clear associations with the diagnosis of any personality disorder. Specifically, personality disorder was more prevalent in participants with common mental disorders (OR=1.9, 95% CI 1.4–2.7), in those not in a relationship (OR=1.4, 95% CI 1.1–1.9), with incomplete schooling (OR=1.8, 95% CI 1.4–2.5), without post-school qualifications (OR=1.6, 95% CI 1.1–2.4), in those receiving government benefits (OR=2.1, 95% CI 1.4–3.3) and in those currently not working (OR=1.8, 95% CI 1.2–2.6). There was a weak indication that those not living at home (OR=1.3, 95% CI 0.96–

Table 2 Associations between substance use measures and clusters of personality disorders[1]

	Prevalence		Cluster A personality disorder			Cluster B personality disorder			Cluster C personality disorder		
	%	95% CI	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI	*P*
Unadjusted for other clusters											
Cigarette smoking											
Daily	27	25–29	1.6	1.0–2.5	0.05	2.7	1.8–3.9	<0.001	1.3	0.91–1.8	0.15
Nicotine dependence	9	8–11	2.1	1.3–3.4	0.002	2.8	1.6–4.9	<0.001	2.0	1.2–3.3	0.01
Alcohol											
Hazardous drinking previous week	12	10–13	1.4	0.79–2.5	0.24	1.9	1.2–3.0	0.01	1.1	0.63–1.8	0.85
Dependence (DSM–IV)	14	12–15	1.6	0.96–2.5	0.07	1.8	1.0–3.3	0.06	1.4	0.75–2.5	0.30
Cannabis											
Used at least weekly	12	10–14	1.3	0.70–2.4	0.41	1.9	1.1–3.3	0.03	1.1	0.60–2.1	0.72
Dependence (DSM–IV)	6	5–7	1.2	0.58–2.4	0.65	2.4	1.1–5.3	0.03	1.1	0.27–4.3	0.91
Other illicit substances in the past year											
Amphetamines	12	10–14	1.8	1.02–3.0	0.04	2.4	1.5–3.9	<0.001	1.3	0.65–2.5	0.46
Cocaine	9	7–10	1.4	0.80–2.4	0.23	2.1	1.4–3.0	<0.001	1.2	0.73–2.1	0.40
Ecstasy	19	17–21	1.8	1.0–3.2	0.04	1.9	1.0–3.6	0.04	1.1	0.61–2.1	0.68
Adjusted for other clusters											
Cigarette smoking											
Daily	27	25–29	1.1	0.61–2.1	0.68	2.6	1.6–4.1	<0.001	1.0	0.67–1.4	0.81
Nicotine dependence	9	8–11	1.4	0.74–2.6	0.30	2.2	1.2–4.2	0.01	1.4	0.87–2.4	0.16
Alcohol											
Hazardous drinking previous week	12	10–13	1.2	0.59–2.3	0.64	1.9	1.1–3.2	0.02	0.83	0.46–1.5	0.52
Dependence (DSM–IV)	14	12–15	1.3	0.74–2.2	0.39	1.6	0.87–3.0	0.12	1.1	0.59–2.1	0.74
Cannabis											
Used at least weekly	12	10–14	1.0	0.42–2.5	0.95	1.9	0.93–3.9	0.07	0.91	0.49–1.7	0.76
Dependence (DSM–IV)	6	5–7	0.80	0.34–1.9	0.60	2.7	1.1–6.8	0.03	0.80	0.20–3.2	0.73
Other illicit substances in the past year											
Amphetamines	12	10–14	1.3	0.71–2.4	0.38	2.3	1.3–4.1	0.008	0.92	0.43–2.0	0.82
Cocaine	9	7–10	1.1	0.60–1.9	0.79	2.0	1.2–3.2	0.006	1.0	0.59–1.7	0.99
Ecstasy	19	17–21	1.6	0.79–3.1	0.20	1.7	0.77–3.8	0.18	0.84	0.43–1.7	0.62

1. Odds ratios are from multivariate logistic regression models adjusted for gender and non-Australian birth.

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1.7) were more likely to be diagnosed with a personality disorder.

We assessed the confounding effects of gender and non-Australian birth and the potential mediating effects of common mental disorder, relationship, educational and work status, by adding each variable to the multivariate model sequentially. Confounding and mediating effects were inferred on the basis of change in the estimated association between each substance use measure and cluster B personality disorder (Table 3).

The associations between cluster B personality disorders and substance use outcomes were only slightly reduced as additional covariates were added to the logistic regression model, indicating little evidence for strong confounding or mediating effects. The most consistent effects were a weakening of associations with tobacco use measures and cannabis dependence upon adjustment for educational and work status variables.

DISCUSSION

Main findings

In this cross-sectional study, approximately 19% of young Australian adults met DSM–IV criteria for a personality disorder. This prevalence is higher than that reported in previous community surveys of all adults. However, it is consistent with the observation that the overall prevalence of personality disorders diminishes with increasing age (Maier *et al*, 1992; Jackson & Burgess, 2000; Samuels *et al*, 2002). Personality disorder was associated with a number of indices of social disadvantage (incomplete schooling, having no qualifications, not working and receiving government benefits) and also the likely presence of common mental disorder. In multivariate logistic regression models adjusted for gender and non-Australian birth, all three clusters of personality disorder were associated with some form of substance use or dependence. In keeping with the results of other epidemiological surveys, a large proportion of participants with a personality disorder met criteria for more than one disorder. In the light of this, in order to examine the independence of the associations between clusters of personality disorder and substance use disorders, we adjusted for the effects of Axis II comorbidity. Adjusting for the presence of other clusters of personality disorder abolished any significant association between cluster A or C disorders and any category of substance use (Table 2). However, associations between all four categories of substance use and cluster B personality disorders remained robust.

Previous literature

This is the first epidemiological study of personality disorders and substance use disorders in a sample of young community-dwelling adults. Previous surveys have not focused on young adult populations and this is an important gap in the literature, given that substance dependence is most prevalent in the younger population. For example, in the Office for National Statistics survey of psychiatric morbidity in England and Wales, 15% of participants aged 16–24 years reported using a drug in the past year, compared with 6% of those aged 25–34 and only 1% of those aged 45–55 (Farrell *et al*, 2001).

Earlier studies of adult clinical populations have indicated cross-sectional associations between cluster B personality disorders and alcohol, cocaine and cannabis use (Rounsaville *et al*, 1991; DeJong *et al*, 1993; Skodol *et al*, 1999; Grant *et al*, 2004). We have confirmed these findings in a young adult, non-clinical sample and have found strong independent associations between cluster B personality disorders and cigarette smoking. Despite the high community prevalence of personality disorders and the devastating impact of cigarette smoking on public health, surprisingly little research has examined whether there is an association between the two.

Only one other epidemiological survey of the full range of DSM–IV personality disorders and substance use disorders has previously been published (Grant *et al*, 2004). Despite the use of a large representative sample, that study had a number of methodological weaknesses. The authors

Table 3 Association between substance use measures and cluster B personality disorder, with sequential adjustment for possible confounders and mediators[1]

Adjustment	Cigarette smoking		Alcohol		Cannabis		Other illicit substances		
	Daily OR (95% CI)	Dependence OR (95% CI	Hazardous[3] OR (95% CI)	Dependence OR (95% CI)	At least weekly OR (95% CI)	Dependence OR (95% CI)	Amphetamine OR (95% CI)	Ecstasy OR (95% CI)	Cocaine OR (95% CI)
No adjustment	2.7 (1.8–4.0)	2.9 (1.7–4.9)	1.9 (1.0–3.5)	1.9 (1.0–3.5)	2.0 (1.1–3.5)	2.6 (1.2–5.7)	2.5 (1.6–4.0)	2.1 (1.4–3.1)	2.0 (1.1–3.7)
Gender and non-Australian birth	2.7 (1.8–3.9)	2.8 (1.6–4.9)	1.9 (1.2–3.0)	1.8 (1.0–3.3)	1.9 (1.1–3.3)	2.4 (1.5–3.9)	2.4 (1.5–3.9)	2.1 (1.4–3.0)	1.9 (1.0–3.6)
High GHQ–12 score (>3)	2.6 (1.7–3.8)	2.7 (1.5–4.7)	1.8 (1.1–3.0)	1.7 (1.0–3.1)	1.8 (1.0–3.2)	2.3 (1.1–4.9)	2.4 (1.5–3.8)	2.0 (1.4–3.0)	1.9 (1.0–3.5)
Relationship status	2.5 (1.7–3.7)	2.7 (1.5–4.8)	1.8 (1.1–2.9)	1.7 (0.93–3.0)	1.8 (1.0–3.0)	2.2 (1.1–4.6)	2.3 (1.4–3.7)	2.0 (1.3–2.9)	1.8 (1.0–3.4)
Educational and work status[2]	2.1 (1.5–3.1)	2.2 (1.1–4.1)	1.7 (1.0–3.0)	1.6 (0.89–2.7)	1.9 (0.92–3.8)	1.9 (0.92–3.8)	2.0 (1.2–3.4)	1.9 (1.3–2.8)	1.8 (0.91–3.6)

GHQ–12, General Health Questionnaire.
1. Odds ratios from univariate and multivariate logistic regression analyses.
2. Measures added to the model were: early school leaving, post-school qualifications, current working status and receipt of government support.
3. Hazardous drinking in past week.

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did not use a recognised assessment of personality disorder, they failed to examine associations between personality disorders and specific categories of substance misuse and they did not control for potential confounders. In contrast, we used a reliable assessment of personality disorder based on an interview with a friend, partner or relative nominated by the participant (thereby reducing the risk of mental state biasing assessment). We explored associations with specific drugs, rigorously examined possible confounding and mediating effects using logistic regression, and handled the problem of missing data using multiple imputation.

Methodological considerations

The study relied on self-reported measures of substance use, leading to possible underreporting. Nevertheless, this approach is standard in addictions research (Del Boca & Noll, 2000) and our use of diaries minimised the problem of recall bias for some measures. In addition, although we measured a range of indices of social disadvantage, some aspects of this domain (family size, income and housing tenure) were not captured. We used multiple imputation to adjust for potential biases and loss of precision resulting from missing data. This is a complex procedure, which relies on modelling assumptions about the reasons for data being missing. The underlying statistical theory, as well as simulation studies, provide assurance that the method works well even when these assumptions are not met exactly (Schafer & Graham, 2002). To optimise the performance of the method, all variables that were used in the final analysis, as well as a number of other variables potentially related to the missing data patterns, were included in the imputation model.

Association between cluster B personality disorders and substance use disorders

Potential mediators of the association between cluster B personality disorders and substance use included social disadvantage and the presence of common mental disorders. However, in the logistic regression model, when we sequentially adjusted for common mental disorders, relationship, educational and work status, there was little change in the size of associations and hence little evidence to support the occurrence of such mediating effects. The GHQ–12 is a screening instrument and it is conceivable that if we had used designated measures for detecting depression and anxiety, we would have detected subtle mediating effects.

On balance, it seems likely that the characteristics of high novelty-seeking and low harm-avoidance present in those with cluster B personality disorders predispose them towards substance misuse (Cloninger *et al*, 1988; Caspi *et al*, 1997; Verheul, 2001). However, given the cross-sectional nature of these data, we cannot examine the direction of causality between personality disorders and substance use in this young adult population. We anticipate that longitudinal data from this cohort will help to further elucidate the causal pathways between personality disorders and substance misuse in young people.

CLINICAL IMPLICATIONS

- Personality disorders are prevalent among young adults living in the community.
- Young adults with personality disorders are at increased risk of having a substance use disorder. This is not explained by increased social disadvantage or concurrent common mental disorders.
- The nature of the causal pathway between personality disorders and substance misuse is unclear and requires further investigation.

LIMITATIONS

- The cross-sectional nature of the data means that we were unable to examine aetiological associations between personality and substance use disorders.
- Our reliance on a screening measure for common mental disorders could explain our failure to detect a mediating effect on the associations.
- The study relied on self-reported measures of substance use, leading to possible underreporting.

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