

# Anxiety and depression among opiate users who misuse substances during treatment

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## Abstract

**Objectives:** While treatment is known to improve drug and crime outcomes for opiate users, there is debate in the literature about the longitudinal effects of substance misuse and the comorbidity of mental health problems. We sought to describe and model anxiety and depression outcomes during opiate substance misuse treatment.

**Methods:** The first national, longitudinal treatment outcome study of 404 opiate users entering a new episode of inpatient or outpatient treatment and followed up at one and three years and assessed using the Maudsley Addiction Profile instrument.

**Results:** A total of 404 opiate users were recruited representing approximately 8.2% of all new treatments and 17% of all new methadone treatments at national level in Ireland in 2003. At three years 97% (n = 392) were followed-up. At one year, analysis revealed the odds of experiencing depression was between five and 15 times the odds for opiate users who also used cocaine than non cocaine using opiate users, but this had decreased at three years. At three years those who were drug free, that is, not in treatment and not using illicit drugs, were less likely to experience feeling hopeless about the future than those in treatment or those not in treatment and using, but they were also more likely to experience feeling tense. Those in treatment were more likely to feel lonely.

**Conclusion:** The concurrent misuse of cocaine and other substances during opiate treatment and the stage of the treatment pathway are associated with anxiety and depression among opiate users in treatment. These client factors need to be considered when implementing individualised treatment care plans.

**Key words:** Treatment; Opiates; Cocaine; Anxiety; Depression.

## Introduction

Woody and Blaine<sup>1</sup> were among the first to highlight an emerging literature describing correlations between psychological health symptoms and substance abuse disorders

among those entering treatment for drug misuse. For the general population, depression is one of the most prevalent psychiatric disorders,<sup>2</sup> while the most prevalent is anxiety.<sup>3,4</sup>

Unfortunately, studies of heroin users have highlighted higher rates of depression among these cohorts than the general population.<sup>5-9</sup> Further, there is extensive evidence of strong associations between a variety of mood, anxiety, conduct and antisocial disorders and substance misuse.<sup>10,11</sup> In fact, evidence suggests that psychological disorders and substance use disorders are highly prevalent and comorbidity between these is common. In particular, psychological disorders tend to be more common in people with substance use disorders than the reverse.<sup>12,13</sup>

Surrounding these high levels of anxiety and depression among those entering opiate abuse treatment is an immediate concern for morbidity, mortality and treatment outcomes. For both the general population and the opiate using population, strong evidence exists of a link between depression and suicidal tendencies.<sup>14-16</sup> Furthermore, illicit drug users have substantially higher mortality rates when compared to non-drug users.<sup>17,18</sup> Suicide contributes to this higher mortality rate, with some studies reporting 5% of opiate users' deaths attributable to suicide while other studies report over double this figure.<sup>17,19,20</sup>

While there has been much discussion on the links between substance misuse and anxiety and depression symptoms,<sup>12</sup> and between substance misuse and suicidal tendencies one of the more interesting aspects is the question of causality. Kessler<sup>21</sup> summarised a number of issues surrounding this when concluding that:

- Mental disorders lead to the onset and/or persistence of substance use disorders
- Substance use disorders lead to the onset and/or persistence of mental disorders
- There are common causes that may be either genetic or environmental that lead to the onset and/or persistence of both types of disorders
- Methodological factors (sampling, reporting, etc) may overestimate comorbidity.

Considering this summary, a problem in the analysis of this and similar data is that it is hard to distinguish the primary disorder.<sup>22</sup> As such, we take the approach of simply investigating whether continued substance misuse is associated with anxiety or depression, controlling for baseline levels of anxiety and depression where possible.

This paper provides a descriptive statistical analysis of the relationship between usage of heroin, non-prescribed methadone and benzodiazepines, cocaine, cannabis and alcohol and symptoms of anxiety, depression and suicidal tendencies as measured by the Maudsley Addiction Profile instrument.

Statistical analyses of these figures were not possible due

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Table 1: Heroin usage and psychological health symptoms

	Using heroin at:	Intake		One year		Three years	
		No	Yes	No	Yes	No	Yes
<b>Mean days experienced anxiety symptoms in last 90</b>	Feeling tense	38.3	37.2	18.3	26.3	26.6	35.1
	Suddenly scared	16.7	15.7	7.2	11.9	10.5	16.8
	Feeling fearful	20.3	19.8	10.1	18.8	15.2	22.4
	Nervousness or shakiness inside	22.6	19.3	10.2	13.4	15.7	17.1
	Spells of terror or panic	13.9	8.1	6.1	10.3	4.8	10.1
<b>Mean days experienced depression symptoms in last 90</b>	Feeling hopeless about the future	19.4	32.1	11.8	33.6	13.6	28.6
	Feeling of worthlessness	22.3	31.6	10.9	28.8	13.6	27.2
	Feeling no interest in things	17.9	36.6	15.1	39.3	17.1	32.3
	Feeling lonely	29.8	35.3	19.0	30.6	17.3	31.2
	Thoughts of ending your life	10.2	8.8	1.1	5.9	2.9	8.6
<b>Suicide</b>	Thought seriously about committing suicide in last three months (six months at intake)	24.5%	24.6%	6.0%	23.3%	7.2%	16.5%
	Attempted suicide in last three months (six months at intake)	9.6%	10.6%	0.7%	5.6%	2.6%	5.3%

to significant data issues rendering the assumptions necessary to perform the tests invalid. A modelling approach is taken to investigate for risk factors and associations between drug usage and anxiety, depression and suicidal variables controlling for gender, age and baseline experience of each psychological symptom. The model is analysed at both the one-year and three-year follow-up outcome points.

## Methods

For the 10-month period between September 2003 and July 2004, 404 opiate users new to treatment completed baseline interviews for the ROSIE opiate treatment outcome study in Ireland (see [www.nuim.ie/rosie](http://www.nuim.ie/rosie) and [www.nacd.ie/publications/treatment\\_rosie\\_summary.html](http://www.nacd.ie/publications/treatment_rosie_summary.html) for full details of the study design and execution). A structured questionnaire assessed a range of participant characteristics.

The main outcome measures were drug-using behaviour, physical and mental health, social functioning and crime. The research instrument contained some additional questions specifically added for the study and the validated outcome measures from the published Maudsley Addiction Profile (MAP) instrument.<sup>23</sup>

The MAP is a brief, multidimensional instrument for assessing treatment outcome for people with drug and/or alcohol problems. It has eight subscales measuring across health risk, health problems, relationship conflict, employment and crime outcomes. It has been shown to be reliable with good test-retest results. Average intra-class correlation coefficients across the eight substances are 0.94 and 0.81. In addition to lifetime measures, data were collected on current drug use with reference to level of use within the 90 days prior to the intake interview.

Recruitment occurred in both inpatient (hospitals, residential programmes and prisons) and outpatient settings (community and health board clinics, and general practitioners), across four modalities; methadone (53%, n = 15),

supervised detoxification programmes (20%, n = 81), abstinence-based programmes (20%, n = 82) and needle exchanges (7%, n = 26). The study design did not include random allocation of subjects to treatment but for integrity of baseline measurements all subjects recruited were new treatment episodes.

Prior to commencing baseline interviews potential subjects were given an information sheet detailing the research and the study requirements and each subject was asked to sign a consent form. Individuals were not financially reimbursed at baseline interview. For the purposes of this analysis, only those who were interviewed at intake, one year post intake (one year) and three years post intake (three years) and not in needle exchange were considered for the sample (n = 271; 71.7%).

All field workers received training in the administration of the instrument. In addition, regular (approximately six months initially) and comprehensive quality assurance audits were carried out on the database to ensure accuracy. This involved a complete audit of the data entered on all key questions and an additional random selection of 10% of all questionnaires entered were fully audited for accuracy and consistency. Results of these data audits were provided to the funder on a regular basis. Finally the study and its instrument received ethical approval from the Ethics Committee of the National University of Ireland at Maynooth.

Links between drug usage and experiencing psychological health symptoms were investigated. Following a descriptive statistics analysis, we modelled the probability of experiencing a symptom controlling for age, gender and baseline days usage of the particular drug under scrutiny. This modelling approach was considered at both one year and three years.

All summary statistics are explained when necessary. Logistic regression was performed controlling for the effects of the covariates age, gender and frequency of experiencing symptom at treatment intake. All two-way interactions were

Table 2: Non prescribed benzodiazepine usage and psychological health symptoms

	Using non prescribed benzodiazepines at:	Intake		One year		Three years	
		No	Yes	No	Yes	No	Yes
Mean days experienced anxiety symptoms in last 90	Feeling tense	29.4	47.2	20.3	26.9	26.3	40.5
	Suddenly scared	12.2	19.9	6.7	17.9	10.5	20.0
	Feeling fearful	16.8	24.0	12.1	20.1	15.3	26.0
	Nervousness or shakiness inside	16.0	24.4	9.5	18.8	14.1	21.7
	Spells of terror or panic	8.7	9.4	5.1	17.7	4.6	13.4
Mean days experienced depression symptoms in last 90	Feeling hopeless about the future	25.7	33.4	17.4	34.9	15.1	33.3
	Feeling of worthlessness	25.2	33.8	14.4	33.3	13.4	35.0
	Feeling no interest in things	26.5	39.8	21.3	40.7	18.2	37.9
	Feeling lonely	29.2	40.6	21.5	32.8	18.8	35.4
	Thoughts of ending your life	5.6	12.6	1.9	8.1	3.1	11.3
Suicide	Thought seriously about committing suicide in last three months (six months at intake)	17.0%	32.4%	9.3%	29.7%	5.5%	25.9%
	Attempted suicide in last three months (six months at intake)	7.8%	13.8%	1.4%	8.2%	2.5%	7.2%

considered initially in these logistic regression models with backwards selection used to determine significant terms with a p-value of < 0.05 termed significant.

The final analysis conducted for this paper investigated three treatment outcome groups that were defined at three years. The first outcome group consisted of all those not in treatment and completely free from illicit drugs at three years including prescribed methadone; the second outcome group consisted of those in treatment at three years; and the final group consisted of those not in treatment and using illicit drugs. The purpose of this final analysis was to investigate whether there were any differences between these three treatment outcome groups across each of the five subcategories of anxiety and five subcategories of depression symptoms.

All statistical analysis was conducted using SPSS (version 14.0) for Microsoft Windows.

## Results

The mean age of the sample at intake was 27.4 years (SD = 5.7). The gender grouping was 72% male and 28% female, with no significant difference between age for males and females. Of the sample, 81% had used heroin in the last 90 days at intake, 47% had used methadone, 45% had used benzodiazepines and 45% had used cocaine.

### Heroin usage

From *Table 1*, we can observe the relationship between usage of heroin and the mean number of days clients experienced anxiety, number of days experienced depression symptoms, and proportions experiencing suicidal tendencies at the three time points of the study. At one year reductions were observed for both users and non-users of heroin. However, while the average number of days experiencing anxieties reduced for both users and non-users the reduction among users was less. Also, among users the mean days clients experienced spells of terror and panic

increased marginally. At three years, an increase in the average reported days experienced is noticeable for both users and non-users.

In terms of depression symptoms, the main pattern of note is that the frequency of experiencing depression is much higher among users than non-users at each of the three time points with the single exception of thoughts of ending ones own life at intake. At intake, little difference is evident between users and non-users in terms of the proportion reporting having thought seriously about committing suicide or attempting suicide in the last six months. However, at both one year and three years a much smaller proportion of non-users are reporting these symptoms than users.

### Non-prescribed benzodiazepines

*Table 2* presents the breakdown of anxiety, depression and suicidal tendencies into subcategories across time and usage of benzodiazepines. Similar patterns are displayed across the anxiety and depression symptoms over time with those using non-prescribed benzodiazepines experiencing anxiety and depression symptoms more frequently than non-users at each time point and in each subcategory.

### Cocaine usage

From *Table 3*, we can see that while differences in the frequency of anxiety symptoms are for the most part small at each time point, there are similarities in that with the exception of spells of terror or panic at intake, those using cocaine report a higher frequency of experiencing symptoms than non-users. In terms of experiencing symptoms of depression, the differences between users and non-users were more pronounced.

### Alcohol usage

*Table 4* presents some quite interesting results in terms of alcohol (for a more indepth analysis of alcohol usage

Table 3: Cocaine usage and psychological health symptoms

	Using cocaine at:	Intake		One year		Three years	
		No	Yes	No	Yes	No	Yes
<b>Mean days experienced anxiety symptoms in last 90</b>	Feeling tense	31.5	44.6	20.8	26.4	29.1	37.1
	Suddenly scared	13.3	18.9	9.1	10.1	12.8	16.3
	Feeling fearful	19.4	21.0	13.7	15.1	17.4	23.5
	Nervousness or shakiness inside	18.5	21.4	11.3	13.4	16.3	16.8
	Spells of terror or panic	9.9	8.5	7.5	10.0	6.6	10.1
<b>Mean days experienced depression symptoms in last 90</b>	Feeling hopeless about the future	24.9	34.7	19.4	29.8	17.1	35.5
	Feeling of worthlessness	24.8	34.9	17.2	15.6	17.2	31.8
	Feeling no interest in things	25.9	41.2	22.6	39.2	21.8	34.3
	Feeling lonely	29.3	40.7	22.8	29.3	22.1	31.3
	Thoughts of ending your life	7.8	10.4	2.3	6.9	4.9	8.6
<b>Suicide</b>	Thought seriously about committing suicide in last three months (six months at intake)	17.3%	33.1%	11.7%	23.2%	8.6%	24.1%
	Attempted suicide in last three months (six months at intake)	9.8%	11.6%	2.7%	3.7%	3.0%	7.5%

Table 4: Alcohol and psychological health symptoms

	Using alcohol at:	Intake		One year		Three years	
		No	Yes	No	Yes	No	Yes
<b>Mean days experienced anxiety symptoms in last 90</b>	Feeling tense	32.1	40.9	23.4	19.9	30.7	30.3
	Suddenly scared	17.1	14.2	12.2	5.8	13.0	14.0
	Feeling fearful	18.6	21.3	17.6	9.4	17.7	19.8
	Nervousness or shakiness inside	16.4	22.4	13.9	9.0	14.6	18.8
	Spells of terror or panic	7.4	10.2	9.5	6.2	6.6	8.1
<b>Mean days experienced depression symptoms in last 90</b>	Feeling hopeless about the future	27.4	30.1	22.9	20.1	18.4	23.5
	Feeling of worthlessness	26.0	32.3	20.4	17.3	18.1	22.4
	Feeling no interest in things	26.9	36.6	25.4	27.3	22.1	16.9
	Feeling lonely	35.2	33.5	25.2	22.4	23.2	24.6
	Thoughts of ending your life	5.2	11.6	3.7	2.7	4.1	7.5
<b>Suicide</b>	Thought seriously about committing suicide in last three months (six months at intake)	15.9%	31.2%	14.7%	11.8%	7.5%	16.7%
	Attempted suicide in last three months (six months at intake)	9.8%	10.6%	2.6%	2.5%	1.9%	6.5%

among the cohort see Stapleton and Comiskey<sup>24</sup>). At first glance, there appears to be little pattern present in the Table. However, upon closer scrutiny some patterns become apparent.

In terms of anxiety-related symptoms, at intake there is a tendency for alcohol users to experience higher frequency of anxiety than non-users with the exception of experiencing feelings of being suddenly scared. This phenomenon is reversed at one year with non-users reporting a higher average number of days experiencing each anxiety symptom than users. At three years, there is little difference between users and non-users.

In terms of having serious thoughts of suicide, a much higher proportion of users reported experiencing these thoughts than non-users at intake and at three years with levels at one year differing minimally.

#### Modelling outcomes and controlling for age, gender and baseline drug usage

Having observed these trends linking the different drug categories and levels of anxiety and depression across time, we next sought to identify significant risk factors associated with each anxiety and depression subcategory at one year and three years. It was not possible to carry out a modelling

Table 5: Odds of experiencing and factors for, anxiety, depression and suicide at one year by drug usage

	Heroin	Non prescribed methadone	Non prescribed benzodiazepines	Cocaine	Cannabis
	Odds (95% CI)	Odds (95% CI)	Odds (95% CI)	Odds (95% CI)	Odds (95% CI)
Feeling tense	1.3 (0.81, 2.16)	1.2 (0.58, 2.39)	1.30 (0.72, 2.32)	1.44 (0.79, 2.62)	0.35 (0.12, 0.99) <sup>a</sup>
Suddenly scared	1.3 (0.88, 1.84)	0.1 (0.03, 0.31) <sup>a</sup>	7.65 (2.61, 22.4) <sup>ad</sup>	1.14 (0.72, 1.81)	1.52 (1.05, 2.19)
Feeling fearful	1.9 (1.25, 2.92)	0.1 (0.02, 0.44) <sup>a</sup>	0.98 (0.96, 1.00) <sup>d</sup>	1.29 (0.74, 2.23)	1.08 (1.01, 1.16) <sup>ac</sup>
Nervousness or shakiness inside	2.5 (1.06, 6.00) <sup>a</sup>	0.27 (0.07, 1.03) <sup>b</sup>	1.63 (1.03, 2.59)	0.98 (0.96, 1.00) <sup>d</sup>	1.86 (1.27, 2.73)
Spells of terror or panic	1.4 (0.97, 1.95)	0.26 (0.07, 0.86) <sup>a</sup>	0.98 (0.96, 1.00) <sup>d</sup>	1.10 (0.70, 1.71)	1.38 (0.98, 1.95)
Feeling hopeless about the future	4.6 (3.00, 7.12)	2.61 (1.30, 5.20)	3.37 (1.94, 5.86)	9.63 (2.63, 35.20) <sup>a</sup>	2.16 (1.36, 3.43)
Feeling of worthlessness	3.1 (1.21, 8.00)	2.29 (1.18, 4.43)	2.76 (1.61, 4.72)	6.94 (1.99, 24.10) <sup>a</sup>	1.01 (1.00, 1.03) <sup>d</sup>
Feeling no interest in things	3.8 (2.38, 5.95)	2.43 (1.19, 4.95) <sup>a</sup>	2.51 (1.41, 4.46)	14.95 (3.91, 57.23) <sup>a</sup>	1.62 (0.99, 2.63) <sup>e</sup>
Feeling lonely	2.2 (1.33, 3.51)	1.13 (1.01, 1.27) <sup>c</sup>	1.61 (0.88, 2.91)	5.12 (1.27, 20.58) <sup>a</sup>	1.02 (1.00, 1.04) <sup>d</sup>
Thoughts of ending your life	1.5 (1.21, 1.91)	0.18 (0.07, 0.44) <sup>a</sup>	0.44 (0.20, 0.93) <sup>a</sup>	2.74 (1.36, 5.50) <sup>a</sup>	1.05 (1.00, 1.09) <sup>c</sup>

<sup>a</sup> Significant gender by drug usage at 1 year interaction. <sup>b</sup> Borderline significant gender by drug usage at 1 year interaction. <sup>c</sup> Significant interaction between age and drug usage at 1 year. <sup>d</sup> Significant baseline days experienced symptoms and drug usage at 1 year interaction. <sup>e</sup> Borderline significant drug usage at 1 year main effect.

approach on suicidal tendencies due to the small numbers experiencing these symptoms.

For anxiety and depression, a binary variable was calculated which indicated whether a subject experienced the particular symptom or not at one year and three years. To investigate links between depression and drug usage, a logistic regression approach was thus taken where experiencing a particular subcategory of anxiety or depression in the last 90 days at one year and at three years was modelled controlling for age, gender and baseline days experienced the particular symptom of interest at intake and investigating significance of drug usage at the particular time point of interest. The initial models that were considered included all possible interactions between factors and variables with non-significant interactions eliminated using a backward selection process.

### Outcomes at one year

Table 5 provides a summary of the model fitting process in terms of each drug type considered and each subcategory of anxiety and depression at one year, with odds ratios presented along with their 95% confidence intervals. Significant odds ratios are highlighted in bold. In terms of heroin, we can see that there was a significant effect of heroin usage on the odds of feeling fearful and feelings of terror or panic. Heroin usage also had a significant effect on the odds of each depression symptom at one year.

Use of non-prescribed methadone had a significant effect on the odds of nine of the 10 subcategories under consideration, however, it should be noted that the direction of the effect differed across subcategories.

Benzodiazepines had a mixed effect on the odds of suffering the different anxiety symptoms with usage having a negative

effect on two subcategories and a positive effect on two other subcategories. In terms of depression, with the exception of thoughts of ending their lives where usage reduced the odds of experiencing this symptom, benzodiazepine usage increased the odds of experiencing depression.

Cocaine usage displayed little connection with the odds of experiencing anxiety symptoms at one year when we controlled for age, gender and baseline days experienced symptoms, with the exceptions of experiencing nervousness or shakiness inside where usage decreased the likelihood of experiencing symptoms. However, cocaine usage increased the odds of experiencing each symptom of depression that was measured for the cohort. Further, these significant effects were present as interactions with gender indicating that the effect of cocaine usage on the odds of experiencing depression changed depending on the gender of the client. Finally, we can see from Table 5 that in terms of depression, cannabis usage increased the odds of experiencing each subcategory.

### Outcomes at three years

Table 6 provides a summary of the model fitting process in a similar way to Table 5 but at three years. Again, significant odds ratios are highlighted in bold in the Table. From Table 6, we can see that heroin usage increased the odds of experiencing each symptom of depression.

Using non-prescribed methadone increased the odds of feeling tense, suddenly scared, nervousness or shakiness inside and spells of terror or panic at three years. For the latter three subcategories this was the reverse of what was observed at one year. However, methadone usage at three years appeared to have a calming effect, in that it reduced

Table 6: Odds of experiencing and factors for, anxiety, depression and suicide at one year by drug usage

	Heroin	Non prescribed methadone	Non prescribed benzodiazepine	Cocaine	Cannabis
	Odds (95% CI)	Odds (95% CI)	Odds (95% CI)	Odds (95% CI)	Odds (95% CI)
Feeling tense	0.9 (0.74, 1.10)	1.36 (1.00, 1.84)	0.91 (0.72, 1.14)	1.06 (0.99, 1.14) <sup>d</sup>	0.94 (0.77, 1.16)
Suddenly scared	1.5 (1.00, 2.13)	2.07 (1.16, 3.71)	1.69 (1.11, 2.57)	0.23 (0.06, 0.78) <sup>a</sup>	1.67 (1.14, 2.44)
Feeling fearful	1.4 (0.94, 2.22)	0.97 (0.94, 0.99) <sup>b</sup>	1.77 (1.10, 2.87)	0.19 (0.04, 0.75) <sup>a</sup>	1.41 (0.91, 2.18)
Nervousness or shakiness inside	1.1 (0.69, 1.58)	1.18 (1.02, 1.35) <sup>c</sup>	1.43 (0.90, 2.26)	1.28 (0.75, 2.18)	1.62 (1.07, 2.45)
Spells of terror or panic	2.1 (1.07, 4.07) <sup>a</sup>	1.15 (1.04, 1.28) <sup>c</sup>	1.57 (1.10, 2.25) <sup>b</sup>	2.48 (0.92, 6.63) <sup>e</sup>	1.01 (1.00, 1.03) <sup>b</sup>
Feeling hopeless about the future	2.6 (1.75, 3.99)	1.94 (1.01, 3.74)	2.79 (1.76, 4.44)	2.84 (1.63, 4.92)	1.48 (0.96, 2.30)
Feeling of worthlessness	2.0 (1.30, 3.07)	1.38 (0.70, 2.69)	3.33 (2.10, 5.27)	2.46 (1.40, 4.30)	1.46 (0.94, 2.27)
Feeling no interest in things	2.1 (1.33, 3.27)	2.02 (1.00, 4.07)	2.36 (1.43, 3.88)	1.48 (0.81, 2.69)	1.08 (0.67, 1.71)
Feeling lonely	1.9 (1.23, 3.07)	1.55 (0.76, 3.15)	3.43 (1.00, 11.71) <sup>a</sup>	1.98 (1.07, 3.67)	3.78 (1.35, 10.57) <sup>a</sup>
Thoughts of ending your life	1.4 (1.07, 1.88)	1.17 (1.06, 1.30) <sup>bc</sup>	1.75 (1.28, 2.39)	2.54 (1.01, 6.35) <sup>a</sup>	2.13 (1.12, 4.02) <sup>a</sup>

a Significant gender by drug usage at 3 years interaction. b Significant days experiencing symptoms at intake by drug usage at 3 years interaction. c Significant age by drug usage at 3 years interaction. d Borderline significant age by drug usage at 3 years interaction. e Borderline significant gender by drug usage at 3 years interaction.

the odds of feeling fearful among the cohort. Cocaine had an effect on the odds of experiencing symptoms of depression, with increased odds for users in four of the five subcategories. All five were increased but four were of statistical significance. Finally, cannabis usage was found to increase the odds of experiencing four of the five anxiety subcategories.

Summarising the results across the two time points, we can see that the results for anxiety have a tendency to be inconsistent across time, with some subcategories experiencing no effect of particular drug usage at one year with an effect at three years, or in some instances a reverse of effect of drug usage was evident.

However, the results for depression related symptoms were much more consistent with the vast majority of subcategories found to have an increase in odds of experiencing if the particular drug being analysed was used. These results were generally carried over from the one year analysis to the three year analysis, strengthening the link between drug usage and depression related symptoms among the cohort.

#### Treatment status at three years and further analyses

The significant results for the final analysis for the three treatment outcome groups, not in treatment and not using; in treatment; and not in treatment and using are displayed in Table 7.

From Table 7 we can see that, in terms of depression symptoms, clients that are not in treatment and not using illicit drugs are less likely to experience feeling hopeless about the future than those in treatment or those not in treatment and using. However, those using illicit drugs and not in treatment are less likely to experience feeling tense than either of the other groups. Finally, it appears from this analysis that those clients in treatment are more likely to experience feelings of

loneliness than clients not in treatment. Further details on the treatment pathways for these three outcome groups are provided by Comiskey and Stapleton.<sup>25</sup>

#### Discussion

This article has sought to establish if associations exist between usage of a variety of illicit substances and symptoms of anxiety and depression among a cohort of opiate users. The symptoms experienced by the clients, while not providing evidence of a clinical diagnosis, do provide insight into the mental health of clients. In this regard, while the results of this analysis are limited in that it is not possible to make clinical diagnoses, it is important in that it provides an insight into the mental wellbeing of the opiate users in this study.

Further, these results provide an insight into the associations between mental health and substance misuse among opiate users in an Irish context. The key results are now discussed under the two categories of anxiety and depression.

#### Anxiety

The analyses of associations between substance usage and experiencing anxiety symptoms among clients in this study were mixed. There was evidence of an association of substance usage and experiencing symptoms of terror or panic at three years. This indicates that for this particular anxiety symptom, this cohort follows similar trends to other cohorts of substance users which report increased anxiety symptoms among substance users.<sup>23,26</sup>

For the remaining anxiety symptoms, there were substantial inconsistencies in the results for this cohort across substance categories, across anxiety sub-categories and across time points.

As such, it is not possible to make any conclusions on

Table 7: Treatment status at three years and significant associations with anxiety and depression

		Not in treatment and illicit drug free (and also not on prescribed methadone)	In treatment	Not in treatment and using illicit drugs	X2 (p-value)
Feeling tense	Yes	29 (70.7%)	134 (68.7%)	21 (50.0%)	5.85 (p = 0.05)
	No	12 (29.3%)	61 (31.3%)	21 (50.0%)	
Feeling hopeless about the future	Yes	12 (28.6%)	93 (47.7%)	26 (59.1%)	8.34 (p = 0.02)
	No	30 (71.4%)	102 (52.3%)	18 (40.9%)	
Feeling lonely	Yes	15 (35.7%)	105 (54.1%)	17 (39.5%)	6.54 (p = 0.04)
	No	27 (64.3%)	89 (45.9%)	26 (60.5%)	

these remaining anxiety symptoms and their associations with substance usage.

### Depression

Patterns of association between substance use and depression symptoms were evident among the cohort. Overall, the odds of experiencing depression of some kind at one year or three years were generally higher among users than non-users for each substance and, in particular, for heroin and cocaine usage. Unfortunately, information on the historical mental health of the clients prior to baseline was unavailable and as such it is impossible to decipher whether drug usage in this instant is a result of experiencing depressive symptoms or whether the depressive symptoms occurred as a result of drug usage.

Comorbidity of severe substance usage and depressive symptoms is well documented<sup>16,7,23</sup> and our analyses appear to support this argument in an Irish context. However, the potential for confounding of client characteristics, the historical mental health of clients and other factors should be taken into account. Notwithstanding this, there does appear to be enough evidence of association between depressive and anxiety symptoms and substance usage. In light of these findings, those providing treatment of substance addiction in Ireland should consider these important factors and provide support from mental health professionals to those entering and in drug treatment. This in turn may lead to better outcomes for those utilising the treatment system.

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