

ASSESSING GENDER DIFFERENCES IN TREATMENT INTAKE CHARACTERISTICS AND OUTCOMES AT 1-YEAR: FINDINGS FROM THE ROSIE STUDY

The international literature indicates that men and women entering drug treatment differ in demographic characteristics, drug use histories, offending and psychosocial behaviour patterns. There are mixed findings on gender differences in treatment outcomes, with most large-scale studies showing no differences and other (smaller) studies favouring one gender over the other. To maximise the effectiveness of any treatment programme catering for both men and women, service providers must be aware of, and address any gender-based variations.

The aim of this paper is to determine whether any such variations exist among a cohort of opiate users in treatment in Ireland. To this end gender differences in the characteristics, problems and one year treatment outcomes of 285 opiate users who participated in the ROSIE Study (and completed interviews at the two time periods) are explored.

INTRODUCTION

Differences in addiction careers and patterns of drug use for women and men have frequently been reported in the literature. For example, it has been observed that women tend to start using alcohol and other drugs at a later age than men, and their boyfriend/partner or spouse often initiate them into use (Hser *et al*, 1987). Women report a shorter transition from drug use to addiction and generally enter treatment sooner than men (Grella & Joshi, 1999; Acharyya & Zhang, 2003; Hernandez-Avila *et al*, 2004).

In addition, there is accumulating evidence that the biological effects of drugs are not always the same for males and females (Acharyya & Zhang, 2003). For example, research suggests that there is a greater cardiovascular sensitivity to the effects of cocaine for women than for men (Lukas, *et al*, 1996).

Women drug users have been found to face more problems related to child-rearing, as they are usually the primary child-carer (Stewart *et al*, 2003). They also tend to have limited incomes, education and job skills (Hser *et al*, 2003; Green *et al*, 2002). Other research has reported significantly more psychiatric disorders; particularly affect disorders, among drug using women than men (Teesson *et al*, 2005). More specifically studies have found women have lower self-esteem, heightened anxiety, depression and self-destructive behaviour (Greenfield *et al*, 2007).

Male drug users have been found to be more criminally involved than women, especially when it comes to drug dealing (Gossop *et al*, 2000). They are also more likely than their female counterparts to have been incarcerated and under legal supervision (e.g. on probation).

Relatively few studies have examined treatment outcomes by gender. In the US findings from the Treatment Outcome Prospective Study (TOPS) indicate that post-treatment outcomes were not predicted by gender, with the exception of employment (Hubbard *et al*, 1989). Similarly the DATOS study (Acharyya & Zhang, 2003) found only minimal differences in outcomes between men and women in four drug treatment modalities (methadone, non-methadone outpatients, short-term inpatient & long-term residential). Another US study (Hser *et al*, 2003) found no overall gender difference in 1-year drug and alcohol treatment outcomes but did find gender-specific baseline predictors of treatment outcomes. The UK outcome study NTORS revealed that despite pre-treatment differences between men and women, the variables on which they differed were not strongly or consistently related to outcomes (Stewart *et al*, 2003).

Generally, findings from these large-scale outcome studies indicate similarities in outcomes between men and women despite differences in their characteristics and problems at intake to treatment.

Between 1998 and 2002 approximately 30% of the drug treatment population in Ireland were women (Long *et al*, 2005) and as of November 2007 there were 2,604 women receiving methadone treatment (30% of the methadone population) (HSE, 2008). However, gender is often ignored in Irish research, or only treated as a demographic variable. Consequently there is a dearth of research on the

relationship between gender and drug use problems, how gender influences treatment seeking behaviour and referral into treatment, and whether there are gender differences in treatment outcomes.

The gender differences in the characteristics and problems of drug users identified in the literature raises questions about the extent to which treatment services are able to meet the differing needs of men and women, and about possible differences in the relative effectiveness of treatment interventions. While it is beyond the scope of the ROSIE study to determine whether men and women have different treatment needs, gender differences in treatment intake characteristics and outcomes at one year will be explored in this paper.

METHODOLOGY

The ROSIE Study is the first large-scale, prospective, multi-site, drug treatment outcome study in Ireland. The primary aim of the study is to evaluate the effectiveness of treatment and other intervention strategies for opiate users.

Between September 2003 and July 2004, participants were recruited to the study and completed a comprehensive interview at service intake (or as soon as possible thereafter). These interviews were designed to obtain baseline data on drug use and other behaviours. As well as information on background and demographic characteristics, data was collected on patterns of drug use, living situation, education and training, income, offending behaviour and drug-related risk behaviour, along with an assessment of physical and mental health. Participants were re-interviewed 6 month, 1 year and 3 years after service intake. These follow-up interviews replicated many of the questions asked at Intake interview focusing primarily on behaviour in the three months prior to interview.

A total of 44 agencies, providing approximately 54 services participated in the ROSIE Study. Agencies were purposively sampled to reflect the known geographical spread of provision and range of services in Ireland. Four types of services were included; methadone maintenance (n=215;53%), medically-supervised detoxification (n=81;20%), abstinence-based treatment (n=82;20%) and needle-exchange (n=26;7%).

Study Participants

A total of 404 participants completed ROSIE Study Intake interviews; 378 were commencing treatment for their opiate use (excluding the 26 individuals recruited in needle-exchange which is not considered treatment per se). Of these 378 participants 75% (n=285) completed 1-year follow-up interview; 209 (73%) men and 76 (27%) women. These 285 participants are the focus of this paper.

Data Analysis

In order to explore gender based variations in the data several approaches to the analysis were undertaken. To determine whether there were gender differences in treatment intake demographic and lifetime characteristics of participants, independent t-tests were conducted for continuous variables and chi-square tests for categorical variables (Table 1).

Paired t-test analyses were conducted within gender to determine treatment intake and one year follow-up comparisons in drug use and other key outcome variables. The p-values for this analysis is presented in Table 2 and Table 3 along with the mean difference (in days) in intake and follow-up frequency of each variable.

A general linear model for a repeated measures design with backward elimination was computed to further explore gender differences in treatment outcomes at one year. A total of 13 outcomes variable at one year covering outcomes in drug use, physical health, mental health, crime and social functioning were analysed. When modelling each of the 13 outcomes variables 8 covariates were controlled for, both for that variables individual effect on the outcome and its possible effect or interaction with another covariates. The covariates chosen to reflect key variables were gender, treatment intake modality, previous treatment, parent of child under 18 years, currently employed, health rating, prison history and finally the intake reading of the outcome variables being modelled at one year.

Missing data was handled by excluding the cases from the particular analysis. All analysis was conducted using SPSS. Shaded cell in the Tables indicate statistical significance.

RESULTS

a) Gender differences in intake demographic and lifetime characteristics

Table 1 shows that there were no statistically significant gender differences in age at service intake or age left school. Women were more likely than men to report being parents (70% compared to 50.5% $p<0.001$); with over half the women (59%) having primary childcare responsibilities compared with only 15% of men ($p<0.001$). Although women (27%) were proportionately more likely than men (19%) to report living with a drug user, the difference was not statistically significant.

Both men and women reported the use of a range of substances over their drug using careers, with fewer women than men having ever used non-prescribed methadone (80% compared to 90%, $p<0.05$) and cannabis (98.5% compared to 90%, $p<0.001$). The age of first use of heroin and non-prescribed methadone was similar for men and women. However men initiated the use of cocaine, benzodiazepines, cannabis and alcohol at a significantly younger age than women.

Analysis revealed that more men than women reported having an arrest history (81% compared to 58%, $p<0.001$). In addition, men (71%) were significantly more likely than women (34%) to have had a history of imprisonment ($p<0.001$).

Table 1 illustrates that there were gender differences in treatment modality at ROSIE intake interview; women were significantly more likely than men to be recruited to the ROSIE study from within methadone treatment (75% compared to 53%, $p<0.001$), and men were significantly more likely than women to be recruited from within abstinence based treatment (24% compared to 7%, $p<0.001$).

(b) Gender differences in intake drug use and drug use outcomes at one-year

Table 1 shows that there were no significant gender differences in the reported use of the seven target drugs at treatment intake. However men were proportionately more likely than women to have use heroin (81% compared to 74%) and cannabis (67% compared to 57%) in the preceding three months. Similar proportions of men (77%) and women (80%) reported polydrug use. In addition, there was no gender difference in reported injecting drug use; 76% of both men and women reported injecting in the three months prior to treatment intake.

Analysis also revealed that there were no statistically significant gender differences in the mean number of days participants reported the use of each of the seven target drugs at treatment intake. In other words, the frequency of use of all substances was similar for men and women (Table 2).

Treatment intake and one year follow-up comparisons presented in **Table 2** show that there were significant reductions in the mean number of days men reported using all drugs, except crack cocaine. For example, the mean difference in the number of heroin using days at treatment intake and one year for men was 26.5 (days).

For female participants there were no statistically significant differences in the reported frequency of crack cocaine and cannabis use. Moreover, there was a slight, albeit non-significant, increase (as indicated by the minus sign) in the mean number of days women reported the use of alcohol at one year, when compared with use at treatment intake

Both men and women reported significant reductions in the frequency of injecting drug use. For example, the mean difference in the number of drug injecting days at intake and one year was 15 days for women, and 10 days for men.

Table 1 Pre-Treatment Characteristics & Problems by Gender

| Variable | % or Mean (sd) | | P value |
|--|-----------------|------------------|---------|
| | Male (n=209) | Female (n=76) | |
| Demographics | | | |
| Age | | | |
| 18-25 years | 39.7 | 44.7 | ns |
| 26-35 years | 53.1 | 42.1 | |
| 36-45 years | 4.8 | 10.5 | |
| > 45 years | 2.4 | 2.6 | |
| Mean age | 27.6 (5.9) | 28.1 (6.8) | ns |
| Age left school | 15.1 (1.8) | 15.4 (1.5) | ns |
| Parent | 50.5 | 70.0 | <0.01 |
| Primary childcarer | 15.2 | 59.4 | <0.001 |
| ^a Homeless | 7.8 | 9.5 | ns |
| ^a Living with drug user(s) | 19.1 | 26.8 | ns |
| Drug use history | | | |
| Heroin | 99.0 | 98.7 | ns |
| Age first use | 18.2 (4.0) | 19.0 (5.9) | ns |
| Methadone | 90.0 | 79.7 | <0.05 |
| Age first use | 20.6 (5.4) | 21.0 (5.8) | ns |
| Cocaine | 92.8 | 85.5 | ns |
| Age first use | 18.9 (3.7) | 21.9 (5.4) | <0.001 |
| Benzodiazepine | 88.9 | 82.9 | ns |
| Age first use | 18.4 (4.5) | 20.1 (5.8) | <0.05 |
| Cannabis | 98.5 | 90.0 | <0.001 |
| Age first use | 14.1 (2.9) | 15.2 (4.1) | <0.05 |
| Alcohol | 93.3 | 93.0 | ns |
| Age first use | 13.4 (2.4) | 14.5 (2.3) | <0.01 |
| Injecting drug use | 75.8 | 76.3 | ns |
| Age first injected | 20.6 (4.4) | 21.1 (5.8) | ns |
| ^b Drug use at Treatment Intake | | | |
| Heroin | 81.4 | 73.7 | ns |
| Methadone | 45.4 | 47.4 | ns |
| Cocaine powder | 44.5 | 44.7 | ns |
| Crack cocaine | 16.7 | 15.8 | ns |
| Benzodiazepines | 43.6 | 44.7 | ns |
| Cannabis | 66.8 | 57.1 | ns |
| Alcohol | 58.2 | 55.6 | ns |
| Poly drug use | 76.6 | 80.3 | ns |
| Injecting | 42.0 | 43.4 | ns |
| Criminal history | | | |
| Ever arrested | 80.8 | 57.7 | <0.001 |
| Ever in prison | 71.2 | 33.8 | <0.001 |
| Offending at Treatment Intake | | | |
| ^b Acquisitive crime | 30.3 | 33.8 | ns |
| ^b Drug selling/dealing | 31.4 | 27.3 | ns |
| ^a Legal problems | 52.5 | 30.6 | <0.001 |
| Treatment history | | | |
| Previous drug treatment | 88.9 | 82.9 | ns |
| Age first treatment | 21.2 (5.6) | 21.8 (6.5) | ns |
| Previously on methadone | 55.8 | 61.8 | ns |
| ROSIE treatment modality | | | |
| Methadone treatment | 52.6 | 75.0 | <0.001 |
| Detox treatment | 23.0 | 18.4 | |
| Abstinence treatment | 24.4 | 6.6 | |

^a Refers to situation at the time of Intake interview. ^b Refers to behaviour in the three months prior to intake interview.

Table 2 Drug Use: Intake differences by gender & changes at 1-year within gender

| Drugs | Intake/Follow-up difference in mean number of day | | Intake Gender Differences |
|-----------------|---|------------------|---------------------------------|
| | Male (n=209) | Female (n=76) | |
| | Mean days | Mean days | P value |
| Heroin | 26.5 | 30.9 | ns |
| Methadone | 7.8 | 13.4 | ns |
| Benzodiazepines | 11.9 | 6.5 | ns |
| Cocaine | 2.9 | 7.4 | ns |
| Crack | 0.8 | 3.4 | ns |
| Cannabis | 10.2 | 6.3 | ns |
| Alcohol | 5.2 | -0.2 | ns |
| Days IV | 10.3 | 15.0 | ns |

c) Gender differences in intake offending and crime outcomes at one year

Comparisons by gender of pre-treatment involvement in crime are presented in Table 1. Women were proportionately more likely than men to report having committed an acquisitive crime (34% compared to 30%) and men were proportionately more likely than women to report having dealt drugs (31% compared to 27%). Although the gender differences in reported involvement in acquisitive crime and drug selling were not statistically significant, men were significantly more likely than women to report having legal problems at treatment intake (52.5% compared to 31%, $p < 0.001$).

Table 3 illustrated that not only were men more likely to report drug dealing than women at treatment intake, they reported dealing drugs on significantly more (mean) days than women (14.7 days versus 7.2 days). Looking at the frequency of individual acquisitive crimes (e.g. theft from a person, theft of a vehicle, theft from a vehicle) analysis revealed that the only gender difference was in the frequency of shop-lifting. Women reported committing theft from a shop/commercial property on significantly more (mean) days than men at treatment intake (15.8 days compared to 2 days).

Treatment intake and one year comparisons shows that there were significant reductions in the mean number of days women reported both drug dealing and shop lifting. Among men there was a significant reduction in the mean number of drug dealing days at one year.

Table 3 Crime & Health Outcomes: Intake differences by Gender, & changes at 1-year within Gender

| Outcome variable | Intake/Follow-up difference in mean number of day | | Intake Gender Differences |
|-------------------------------------|---|------------------|---------------------------------|
| | Male (n=209) | Female (n=76) | |
| | Mean | Mean | P value |
| Crime | | | |
| Drug selling | 9.3 | 6.6 | <0.05 |
| Theft from shop/commercial property | 1.3 | 9.8 | <0.001 |
| Health | | | |
| Suddenly scared for no reason | 6.6 | 7.7 | ns |
| Feeling fearful | 8.2 | 0.1 | ns |
| Feeling hopeless about future | 8.6 | 7.2 | ns |
| No interest in things | 6.2 | 4.5 | ns |
| Poor appetite | 11.4 | 13.6 | ns |
| Nausea | -2.21 | 2.8 | ns |
| Stomach pains | 1.8 | -3.14 | ns |
| Overnight in hospital | 0.5 | -0.23 | ns |
| Seen G.P. | -1.2 | -1.36 | ns |

(d) Gender differences in intake health symptoms and health outcomes at one year

Analysis revealed that there were no significant gender differences in the reported frequencies (measured in mean days) of the individual health symptoms or in the frequency of reported contact with health services at treatment intake (Table 3).

Treatment intake and one year comparisons showed that there were significant reductions in the mean number of days men experienced two anxiety-related symptoms (suddenly scared for no reason, and feeling fearful) and one depressive symptom (feeling hopeless about the future). For women there was a significant reduction in the mean number of days they experienced one anxiety related symptom—feeling fearful.

In terms of physical health both men and women reported a significant reduction in the mean number of days they experienced a poor appetites. Although not statistically significant there was a increase in the mean number of days men reported experiencing nausea and women reported experiencing stomach pains at one year. Finally, women reported a significant increase in the mean number of days they had contact with a general practitioner.

In spite of 13 outcome variables being modelled and controlling for covariates only 2 variables demonstrated significant gender effects, cannabis use and drug dealing.

Firstly, the use of cannabis at one year demonstrated significant gender by treatment modality effects. Men recruited within the methadone modality used cannabis on significantly more mean days than women (44.4 compared to 28.3) at one year. Conversely women used cannabis on significantly more mean days than men within the detoxification modality (30 compared to 20.5) and the abstinence modality (5.6 compared to 0.05). Secondly, drug dealing at one year demonstrated a significant gender effect; men reported dealing drugs on significantly more mean days than women (5.6 compared to 0.05).

SUMMARY AND IMPLICATIONS

The data presented in this paper examines gender differences among a sample of opiate users at treatment intake and one year follow-up. The findings and their implications are summarised below.

Do women present to treatment with a different profile of problems than men?

Many of the findings were consistent with international research which shows that women present to treatment with a different profile of problems to men (Stewart *et al*, 2003; Chatham *et al*, 1999; Powis *et al*, 1996;).

The women on the ROSIE study were significantly more likely than the men to be parents, and to have primary responsibility for child care. Child care responsibilities often emerges in the literature as a barrier to women accessing treatment (Ref). However, there is evidence to support the contrary; rather than inhibiting treatment seeking, having children may service to promote woman's access to treatment (Klein, 1996). Regardless, it is vital that drug treatment programmes accommodate women's child care needs and adequately address parenting issues. It is important to note that women's greater responsibility for child care may interfere with their ability to access residential treatment or other inpatient facilities.

The men on the ROSIE study reported greater drug involvement and longer drug using careers than the women; they initiated cocaine, benzodiazepines, cannabis & alcohol use at a significantly younger age than their female counterparts. Although women had shorter drug using careers than the men there were no significant gender differences in pre-treatment drug use. The women were as likely as the men to report the use of all target drugs in the preceding three months, Moreover, there was no gender difference in the frequency of reported use (measured in mean days) of these drugs. Furthermore, the women were as likely as the men to be injecting drug users and polydrug users.

Similar to the findings of other studies the men on the ROSIE study were more likely to have been in prison, to have been arrested and to have had legal problems at treatment intake. Males involvement in the criminal justice system may influence their routes into treatment, and their motivation for accessing

treatment. In addition, gender differences were observed in levels of involvement in the two pre-treatment crime variables; men dealt drugs on more days than women, and women committed theft from on shop on more days than men. These findings have been replicated in the international research.

Are there gender differences in treatment outcomes?

Both the men and the women on the ROSIE study showed substantial reductions in drug use at one year; significant reductions in the frequency of use (measured in mean days) of heroin, methadone, benzodiazepines and cocaine were observed. In addition the mean number of days men and women reported injecting drug use reduced at one year. However, some gender differences were observed in drug use outcomes. Although there were reductions in cannabis and crack use among women, the differences were not statistically significant. In addition analysis revealed that women recruited within both the detoxification and the abstinence modality used cannabis on significant more mean days than men at one year.

On the other hand, although there were significant reductions in cannabis use among men, within the methadone modality men use cannabis on more mean days than women at one year. Research suggests that cannabis use rates among methadone maintained clients are high (Calsyn *et al*, ??). The available evidence suggests that it only marginally effect treatment outcomes (Seivewright, 2003) demonstrating a weak association with psychosocial problems at post-treatment follow-up (Epstein & Perston, 2003). However, research does indicate that opiate-dependent cannabis users are more likely to be involved in drug dealing than non-cannabis users (Budney *et al*, 1998)

There was a gender difference in outcome for alcohol consumption. Although similar proportions of men (58%) and women (56%) reported alcohol use at treatment intake and there was no gender difference in the frequency of alcohol use, women's reported alcohol use increased slight at one year. In contrast there was a significant reduction in the mean number of days men reported drinking. Alcohol consumption has important health implications for drug users. High rates of hepatitis B and C among injecting drug users is know to elevate the risk to health of excessive drinking. Alcohol also increases the risk of overdose when used with other sedative drugs (Gossop *et al*, 2002) including methadone (Man *et al* 2004). This is of particular concern as women in the ROSIE study were more likely to be in methadone treatment and research shows that the threshold for fatal methadone overdose is lowered by alcohol, especially for females. Suggesting that female methadone maintained clients who use alcohol may be a elevated risk of fatal overdose (Oliver *et al*, 2007). The poor outcomes for alcohol consumption among women on the ROSIE study highlights a need for treatment services, in particular methadone services providers to continuously assess and actively target drinking behaviour.

Some improvement were observed in the physical and mental health complaints of ROSIE study participations at one year, but there were some gender variations in the extent of there changes. Men reported greater reductions in the frequency of anxiety and depression related health symptoms, despite there being no significant gender difference in the frequency of these symptoms at treatment intake.

Reductions in offending behaviour were more marked for women than men. This gender difference in crime outcome may in part related to differences in the pattern of criminal behaviour between men and women in the ROSIE sample. At treatment intake women were more likely than men to commit an acquisitive crime and less likely to reported involvement in drug dealing. As in other studies the most commonly committed acquisitive crime was shop lifting (Stewart *et al*, 2003). There were significant reductions in women's involvement in both shoplifting and drug dealing at one year.

Conversely men reported a greater involvement in drug dealing at treatment intake. Although there was a significant reduction in reported drug dealing among men at one year, they remained more involved in dealing drugs than women.

CONCLUSION

As in other studies, what is most striking is the similarities in outcomes for men and women on the ROSIE study, given the differences in their characteristics at treatment intake. The lack of association between pre-treatment gender differences in problems and treatment outcome has been described as the

‘gender paradox’ (Fiorentine et al, 1997).

It is important that treatment programmes are able to respond to the needs of their client group. The extent to which treatment services in Ireland are actually tailored to the differing needs of men and women, as indicated by pre-treatment characteristics, has yet to be explored. Nonetheless the results of the ROSIE study are encouraging in that the men and women who participated reported substantial reductions in their drug use at one year. Some improvements were also observed in health related symptoms, and reductions in offending behaviour were reported.

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