

ADDICTION TREATMENT-RELATED EMPLOYMENT BARRIERS: THE IMPACT OF METHADONE MAINTENANCE

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Keywords: employment, addiction treatment, methadone maintenance therapy, Vancouver, injection drug use

Conflicts of interest: **Dr. Julio Montaner** has received grants from, served as an ad hoc advisor to, or spoke at various events sponsored by; Abbott, Argos Therapeutics, Bioject Inc, Boehringer Ingelheim, BMS, Gilead Sciences, GlaxoSmithKline, Hoffmann-La Roche, Janssen-Ortho, Merck Frosst, Panacos, Pfizer, Schering, Serono Inc, TheraTechnologies, Tibotec (J&J), Trimeris.

ABSTRACT

Employment is commonly upheld as an important outcome of addiction treatment. To explore this attribution we assessed whether treatment enrolment predicts employment initiation among participants enrolled in a community-recruited Canadian cohort of people who inject drugs (IDU) (n=1579). Survival analysis initially found no association between addiction treatment enrolment and employment initiation. However, when methadone maintenance therapy (MMT) was separated from other treatment modalities, non-MMT treatment positively predicted employment transitions, while MMT was negatively associated with employment initiation. Sub-analyses examining transitions into temporary, informal and under-the-table income generation echo these results. Findings suggest that individual factors impacting employment transitions may systematically apply to MMT clients, and that, in this setting, the impact of treatment on employment outcomes is contingent on treatment type and design. Treatment-specific differences underscore the need to expand low-threshold MMT, explore MMT alternatives and evaluate the impact of treatment design on the social and economic activity of IDU.

1. INTRODUCTION

Employment is commonly upheld as an important outcome indicator in the context of addiction treatment and recovery (Magura, 2003; Platt, 1995). The emphasis on employment as an addiction treatment outcome reflects the assumption that in addition to providing a legal source of income, employment adds important structure and reinforcement to the lives of people who use drugs that discourages continued harmful use (Magura et al., 2004; Vaillant, 1988). Labor market engagement may also mark a crucial step in reducing the socio-economic vulnerability for those drug users who face such challenges. Because of the symbolic and real importance of employment to addiction treatment and recovery, an increased understanding of individuals' employment processes as they relate to their addiction treatment enrolment may inform how vocational objectives are integrated into treatment conceptualization, design and implementation.

Research over a number of decades has explored the relationship between addiction treatment and employment. Previous studies, for example, report correlations between employment and improved treatment outcomes (Vaillant, 1973), including positive associations between employment and longer term heroin abstinence (Hser et al., 2001), lower rates of substance use relapse (Castellani et al., 1997), enrolment in more comprehensive treatment programs (Lundgren et al., 2003) and improved duration of treatment (Reif et al., 2004). Literature has also focused on the impact of

treatment on employment, where it has been shown that there are some demographic and vocational characteristics associated with employment among treatment clients. These include race, gender, vocational training, age, lowered drug use, and a generalized expectation of success (Hermalin et al., 1990; Sterling et al., 2001). This last is a measure of optimism considered by Sterling et al. (2001) to be a potential indicator of employment acquisition behavior. The treatment-employment link has also been explored in the context of vocational rehabilitation (VR) (Magura et al. 2004). A recent study examined VR services (West, 2008), noting the inadequate provision of these services despite repeated calls for them and evidence of their cost effectiveness (Shepard & Reif, 2004).

Results from studies that examine employment as an outcome of treatment enrolment show a range of post-treatment employment success rates. These differences may reflect variation across different treatment modalities, substances, research designs and sampling strategies (Magura et al., 2004; Platt, 1995) that may limit the ability to generalize results to a broader treatment–employment link. Studies that examine employment outcomes generally lack non-treatment-enrolled individuals for comparison (Hubbard et al., 1989; Price et al., 1988), and longitudinal investigations of the impact of addiction treatment on employment among people who inject drugs (IDU) are commonly limited to a single follow up (Reif et al., 2004; Sterling et al., 2001). We therefore set out to test the hypothesis that enrolment in addiction treatment is

positively related to transitions into employment across different treatment modalities and different types of drug use. We compare the employment transitions of those enrolled in treatment to the transitions of IDU who are not enrolled among a long-term community-recruited cohort of IDU in Vancouver, Canada.

We emphasize employment transitions over other types of income generation following the predominant trend in the literature that focuses on employment's socio-economic and symbolic importance in the addiction recovery process (Magura et al. 2004; Platt 1995). However, other forms of income generation may also provide benefits for those engaged in addiction treatment. For example, temporary, informal or under-the-table work may provide considerable benefit to individuals enrolled in addiction treatment as a means of support, a way to avoid more serious criminal acts, or a gateway to formal employment (Blankertz et al., 2004). This type of income generation may be easier to obtain than a regular job, more flexible and therefore supportive of enrollment in addiction treatment, and more accessible for those with a criminal record (Blankertz et al., 2005). Further, by moving into a formal job, individuals in receipt of social assistance may stand to lose medical or other benefits that may cover the costs of methadone or addiction treatment (Zanis et al., 2001; Blankertz et al., 2005), making informal income generation a more desirable option. This is the case for many individuals who access government drug plans attached to social assistance in British Columbia (BC Ministry of Social Development, 2009). We therefore also explore

whether enrollment in treatment predicted transitions to temporary, informal or under-the-table work.

2. MATERIALS AND METHODS

The Vancouver Injection Drug Users Study (VIDUS) is an open prospective cohort study of people who use injection drugs, recruited through self-referral and street outreach from Vancouver's Downtown Eastside (DTES) since May 1996. Described in detail previously (Wood et al., 2001), individuals were eligible to enter the study if they reported having injected illegal drugs at least once in the previous month, resided in the greater Vancouver region at enrolment and provided written informed consent. At the time of enrolment, and semi-annually thereafter, study participants provide blood samples which are tested for human immunodeficiency virus [HIV] and hepatitis C virus [HCV] and complete an interviewer-administered questionnaire. In addition to gathering demographic data, the questionnaire elicits information about substance use, income sources, HIV risk behavior, and enrolment in addiction treatment. Participants are given a stipend (\$20 CAD) at each study visit. The study has been approved by the University of British Columbia/Providence Health Care Research Ethics Board.

The current analysis uses socio-demographic, drug use, income and health data to examine the relationship between treatment enrolment and transitions into

employment for 1,579 participants who were enrolled in the study between 1 June 1996 and 31 May 2005. An employment transition was derived from questionnaire items about income sources. Respondents were asked, "In the past six months, what have been your sources of income?" A respondent was considered employed if one of their sources of income in the six months prior to interview was having a regular job. This measure was differentiated from temporary, casual, social assistance-based and non-legal forms of income generation as measured by separate response options. A response indicating income from regular work therefore measures non-temporary formal employment in the mainstream labor market. Individuals were identified as having made an employment transition, the primary endpoint of analyses, if they indicated income from a regular job in the six months prior to interview and had not indicated a regular job as a source of income at the previous follow-up period. Some study participants reported employment at their baseline interview, making it impossible to determine if this self-report of employment income represents a legitimate employment transition or if study participation began in the middle of an employment spell. The observations that comprised these spells of employment were therefore dropped from analyses to avoid issues of left-hand censoring. For example, if a study participant reported employment at baseline and their first four follow-ups, but did not report employment for the fifth follow-up, they contribute only those observations that occur after their left-hand-censored employment spell ended, i.e. from the fifth follow-up

onward. While the exclusion of these spells represents a loss of information, the resultant bias from assuming that these observations represent instances of our outcome of interest was deemed to be greater. Excluding individuals employed at baseline avoids the inflation of the main outcome of interest that would occur if all those baseline observations in which a participant reports employment were classified as employment transitions.

We identified individuals reporting regular employment and individuals enrolled in different modalities of addiction treatment, including methadone maintenance therapy (MMT), detoxification services, residence in a recovery house, attending a treatment centre, seeing a counsellor or participating in a Narcotics Anonymous program. We assessed socio-demographic, drug use and health differences between individuals who report employment over the course of the study period from those who do not. We then tested whether enrolment in any form of treatment positively predicts a transition into regular employment using a multivariate discrete-time survival analysis (Allison, 1984; Beck, Katz & Tucker, 1998; Jenkins, 1995) with repeated failures to address the occurrence of multiple transitions into employment by the same person over the course of the study, and time-varying covariates, controlling for socio-demographic characteristics, drug use, HIV and HCV serostatus. We accounted for serial correlation over time by including time dummy variables corresponding to a count of the number of consecutive observations an individual is not

in employment (Allison, 1982; Beck; Katz & Tucker; 1998); dummies took on a value of 1 if a spell outside employment lasted a given number of observations, 0 if an individual was in employment, and reset each time an individual moved out of employment. Within-individual or unit correlation was addressed by adjusting standard errors for multiple observations per individual and including a previous job variable reporting the cumulative number of prior transitions into employment. We subsequently tested for treatment modality-specific variations in the effect of addiction treatment on employment transitions by conducting analogous multivariate analyses that separated MMT from all other forms of treatment. We subdivide different treatment modalities in this way following a previous group of evaluation studies of vocational rehabilitation strategies that were classified along these lines (Magura and Staines, 2004). We then replicated analyses using time-lagged treatment variables to determine whether or not treatment enrolment in one observation predicts an employment transition at the subsequent observation.

Treatment variables were binary indicators of treatment enrolment (yes vs. no) in the six months prior to interview. Additional variables in the models included age, gender (female vs. male), Aboriginal ancestry (yes vs. no), marital status (married or common law vs. other), HIV seropositivity (yes vs. no) and HCV seropositivity (yes vs. no). Drug-use indicators, referring to behaviors in the six months prior to interview, were frequent heroin injection (\geq daily vs. $<$ daily), frequent cocaine injection (\geq daily vs.

< daily), a combined variable of frequent injection of other drugs including speedballs – a combination of heroin and cocaine – and methamphetamine (\geq daily vs. < daily), and frequent crack use (\geq daily vs. < daily). We include different types of drugs as explanatory variables because of drug-specific patterns of use, psychoactive properties and health and social impacts (Nutt et al., 2007; Tyndall et al., 2003) as well as research demonstrating that treatment enrollment and ongoing drug use often co-occur (Preston, Umbricht & Epstein, 2000).

Sub-analyses evaluated whether enrollment in treatment predicted transitions into temporary, informal or under-the-table work. Temporary, informal or under-the-table work was defined here to include, for example, casual labor, volunteering, or under-the-table construction, and to exclude activities more commonly associated with street-based survival such as can and bottle recycling, panhandling or washing car windshields (DeBeck et al., 2011). Apart from the exclusion of the previous job transition variable and the inclusion of a covariate indicating receipt of social assistance (yes vs. no), analyses were identical to those for employment transitions. Because in many cases having income from a regular job renders individuals ineligible for most forms of social assistance, this variable was only examined in analyses of temporary, informal or under-the-table work. Time dummies for all analyses are suppressed in the reporting of results for ease of interpretation and because of the lack of focus on time to

employment in the current analysis. All analyses were conducted using Stata version 11 (Statacorp, College Station, TX).

3. RESULTS

Observations for the current analysis come from 1,579 individuals enrolled in the VIDUS over nine years between 1 June 1996 and 31 May 2005. Of these, 580 (36.7%) were female, 428 (27.1%) self-identify as having Aboriginal ancestry, and the median age of participants at baseline was 32.6 years (interquartile range [IQR]: 25.6-40.1). The baseline characteristics of the sample are included in Table 1. In addition to global descriptive statistics, we stratify baseline sample information by whether or not individuals report an employment transition over the course of the study period to assess whether there are systematic differences at the point of enrollment between those who successfully engage with the labor market and those who do not. Those who were female, of Aboriginal ancestry, enrolled in MMT, daily users of crack, and HIV or HCV positive at baseline were less likely to report an employment transition during the study period. Tests were also conducted to determine if there were systematic differences between individuals who did and did not report income from employment at baseline. Results (not displayed) were similar to the tests for systematic differences between those who do and do not report employment over the course of the study period reported in Table 1: individuals who were female ($p < 0.001$), of Aboriginal ancestry

($p=0.023$), unmarried ($p=0.023$), enrolled in MMT ($p=0.050$), HIV seropositive ($p<0.001$) and HCV seropositive ($p=0.041$) were less likely to report employment.

Figure 1 around here

Table 1 around here

Participants contributed a total number of 14,868 observations during the follow-up period; 1394 (88.3%) participants had at least one follow-up interview and the median number of follow-up visits was 9 (IQR: 4-16). The median follow up observation time was 5.2 years (IQR: 1.9-8.2). The number of participants who reported having a job at any point during follow-up was 467 (29.2%), and the total number of transitions into employment from non-employment, excluding left-hand-censored employment spells, was 787. Figure 1 compares the total employment rate, or the percentage of individuals who report income from a regular job in the six months prior to follow up, to the employment entry rate, or the percentage of participants who report no income from a regular job in the previous follow up and income from a regular job in the six months prior to the current follow up. The percentage of VIDUS participants who indicated that they had employment at any given follow-up period ranged from 4.9% to 14.1%, while those reporting employment entry fluctuated between 2.9% to 8.3% over the course of the observation period.

In the initial analysis examining whether addiction treatment was associated with a transition into employment, results displayed for Model 1 in Table 2 indicate that

treatment was not significantly associated with a transition into employment (adjusted odds ratio [AOR]=1.07, 95% confidence interval [CI]: 0.91-1.25). Variables significantly and negatively associated with the dependent variable include age (AOR=0.97, 95% CI: 0.96-0.98), female gender (AOR=0.48, 95% CI:0.39-0.59), HIV-positive serostatus (AOR=0.45, 95% CI: 0.35-0.57), HCV-positive serostatus (AOR=0.67, 95% CI: 0.53-0.86), frequent injection heroin use (AOR=0.60, 95% CI: 0.50-0.73), frequent injection cocaine use (AOR=0.67, 95% CI: 0.54-0.82), frequent crack cocaine use (AOR=0.53, 95% CI: 0.42-0.66) and frequent use of other injection drugs (AOR=0.57, 95% CI: 0.39-0.84). Variables significantly and positively associated with employment transitions include previous employment transitions (AOR=1.84, 95% CI: 1.65-2.05) and marital status (AOR=1.41, 95% CI: 1.17-1.71). Aboriginal ancestry failed to reach statistical significance.

Subsequent analysis (Model 2) that separates out MMT from other forms of treatment shows that while non-MMT types of treatment have a positive and significant association with employment transitions (AOR=1.69, 95% CI: 1.40-2.04), MMT has a significant and negative association with movement into a regular job (AOR=0.73, 95% CI: 0.59-0.91). Additionally, when analyses differentiate between treatment modalities, Aboriginal ancestry becomes significantly and negatively associated with movement into a job (AOR=0.76, 95% CI: 0.62-0.93). Odds ratios for all remaining variables remained nearly identical in statistical significance, direction and magnitude.

Table 2 around here

When identical analyses were conducted with time-lagged treatment enrolment variables, all those individuals who did not have at least one follow-up interview were excluded from analyses, as were those observations that came after a missed follow-up interview. This resulted in a reduced sample size of 1,326 individuals contributing 11,167 observations. Despite this reduction in statistical power, results demonstrate the same relationship observed between treatment enrolment and transitions into employment (data not shown). When all kinds of addiction treatment are included in a single variable, the relationship between the two is not significant (AOR=1.15, 95% CI: 0.93-1.42). When MMT is separated from all other forms of treatment combined, MMT is significantly and negatively related to employment transitions (AOR=0.75, 95% CI: 0.58-0.99) and non-MMT addiction treatment is significantly and positively related to employment transitions (AOR=1.89, 95% CI: 1.47-2.43). All other covariates remain similarly associated in direction, magnitude and significance as in previous models, with the exception of marital status, which is not significant in the first lagged model but becomes significant in the second, and Aboriginal ancestry, which does not reach statistical significance in either model.

In sub-analyses that examine the relationship between treatment enrollment and transitions into temporary, informal or under-the-table work, a total of 13,840 observations from 1565 individuals were included in analyses. As with employment transition models, spells of income generation from temporary, informal or under-the-

table sources that began at baseline were not included in the sample. The number of participants who reported any income from temporary, informal or under-the-table sources during follow-up was 716 (45.8%), and the total number of transitions, excluding left-hand-censored spells, was 1,312. Results suggest that, unlike models predicting employment transitions, enrollment in any type of addiction treatment is significant and positive (AOR=1.15, 95% CI: 1.03-1.31). However, when treatment modalities are examined separately, we see that a strong positive association between non-MMT treatment enrollment and transitions into temporary, informal or under-the-table income generation (AOR=1.34, 95% CI: 1.13-1.57) drives this result. MMT enrollment is not associated with transitions into temporary, informal or under-the-table work (AOR=1.08, 95% CI: 0.94-1.24). The result of a strong positive association for non-MMT forms of treatment and transitions to temporary, informal and under-the-table work and no association for MMT persists in models estimated with lagged treatment indicators (results not displayed). In both models, receipt of social assistance is significant and positive (AOR=1.31, 95% CI: 1.07-1.61 in the combined treatment model; AOR 1.34, 95% CI: 1.09-1.64 in the separated treatment model).

4. DISCUSSION

Descriptive statistics suggest lower levels of employment among VIDUS participants than in other drug using populations (Platt, 1995). The comparison of

employment rates and employment entry rates of the one-third of participants reporting employment in Figure 1 indicates that it is not the same individuals who reported income from a regular job over time. VIDUS participants who engage with the labour market represent a dynamic sub-group within the study population that move in and out of employment.

Findings from multivariate analyses initially showed no association between treatment enrolment and employment transitions. However, when a distinction was made between MMT and other addiction treatment modalities, it became clear that the relationship between addiction treatment and employment outcomes for IDU in this setting was contingent upon the type of addiction treatment: enrolment in non-MMT forms of treatment increased the odds of making an employment transition, while MMT enrolment had the inverse effect. This mode-specific association was echoed in analyses of transitions into temporary, informal and under-the-table work, which had no association with MMT enrollment but also saw a strong positive association with non-MMT forms of addiction treatment.

This finding is not consistent with other evaluations showing that MMT had either a neutral or positive effect on employment outcomes (Sees et al., 2000; Gibson, Flynn & McCarthy, 1999; Joseph, Stancliff & Langrod, 2000). While the data presented here do not provide a sufficient basis to definitively account for this counterintuitive finding, a range of possible explanations exist. The observed systematic differences in

employment outcomes might plausibly be related to individual level characteristics or circumstances that either inhibit transitions to employment and systematically apply to those individuals enrolled in MMT, or lead to both MMT enrollment and non-employment. For example, in contrast to abstinence-based forms of treatment, MMT is geared towards stabilized maintenance (Ward, Mattick & Hall, 1994) and aimed at reducing the major risks, costs and harms associated with untreated opiate addiction (Ward, Hall & Mattick, 1999; Rosenbaum et al., 1996; World Health Organization, 2001). It may therefore be a part of the early stages of addiction treatment and rehabilitation, and the initiation of labor market activity might not be expected to follow MMT enrollment in the same way that it would for other treatment modalities. Difficulties finding the correct methadone dosage (Backmund et al., 2001) could delay transitions into employment. Given the long observation period of the current study, however, we suspect that any resultant delay would not produce the treatment mode-specific differences observed here. Additionally, methadone has been shown to impair cognitive performance (Darke et al., 2000), and may impact capacities to undertake work. Elsewhere, explanations for differences in labour market outcomes among people with substance use disorders, such as lower education levels, work histories or motivation (Svilkis et al, in press) may be disproportionately prevalent among those enrolled in MMT. As with non drug-using populations (Dooley, Fielding & Levy, 1996), individuals may also have differing capacities related to physical or mental health that

inhibit their ability to seek and find employment. Finally, the common presence of concurrent and on-going drug use by individuals enrolled in MMT (Barnas et al., 1992; Demaria, Sterling & Weinstein, 2000) may preclude transitions into employment or temporary, informal or under-the-table income generation.

Examining the range of potential individual-level explanations is beyond the scope of the current analysis. Nevertheless, it is notable that the systematic variation in outcomes across addiction treatment modalities was observed while controlling for indicators of high-intensity drug use and for HIV- and HCV- seropositivity. Results indicate the important negative association between these individual-level factors and employment transitions. However, these and many other person-specific variables are consistent across settings, and therefore do not fully explain the discrepancy between results from the current study and previous evaluations. Further, these findings suggest the possibility of influences on labour market transitions over and above individual-level explanations. Given previous reports of issues related to compliance with MMT treatment guidelines and retention in British Columbia (Nosyk et al., 2010), MMT-specific systemic or programmatic barriers in this setting may plausibly account for the results observed here.

One such potential barrier is the possibility that individuals who are on social assistance and enrolled in MMT face an “unemployment trap” (Neale & Kemp, 2009), whereby terminating social assistance likewise terminates publicly funded access to

MMT. The significant association between social assistance and transitions into temporary, informal or under-the-table income generation provides some preliminary evidence of this type of disincentive to formal work. Exploring the potential existence of an “unemployment trap” related to social assistance-linked medical benefits may be a fruitful area for future research.

Potential interference between employment-related activity and MMT dispensing policies represents another plausible systemic barrier to employment among individuals enrolled in MMT. In British Columbia, methadone is predominantly dispensed in single doses under the supervision of a pharmacist (Anderson & Warren, 2004) and, in most cases, requires daily attendance at a single methadone dispensing pharmacy. These characteristics potentially limit the geographical and time flexibility required in job search or work initiation processes. These programmatic features may also increase the likelihood that individuals will be forced to disclose their treatment status, subjecting them to the consequences of the stigma of having a history of opiate addiction (Murphy & Irwin, 1992) from potential employers, whether or not active opiate use is ongoing. The stigmatization of people who use drugs has been previously identified as a major obstacle to employment (Crisp et al, 2000). While similar programmatic barriers may exist for other treatment modalities examined in this study, MMT is differentiated from these in that the inability or failure to obtain and consume an appropriate methadone dose results in the initiation of withdrawal symptoms

(Ward, Hall & Mattick, 1999). In this setting, it is also generally taken daily on a long-term basis, during which adherence to regulations may prove to be more consequential to labor market outcomes than other forms of addiction treatment.

Rules governing the provision of MMT in British Columbia are intended to prevent individuals from diverting methadone for either inappropriate use by MMT clients or use by individuals for whom it was not prescribed (Ritter & Di Natalie, 2005). However, these precautions must be weighed against the potential impact that methadone dispensing regulations have on the ability of MMT-enrolled individuals to engage in the treatment and rehabilitation process generally, and on their ability to seek, obtain and maintain employment in particular. While policies may reduce methadone diversion, they may also reduce treatment retention and increase mortality by increasing the population of untreated opioid users (Varenbut et al., 2007). A balance therefore needs to be sought between measures to reduce and prevent methadone diversion and ensuring ease of access to treatment enrolment and retention (Fountain et al., 2000) that facilitates social and economic functioning among IDU.

Any programmatic adjustment that decreases the amount of time spent on and the mobility restrictions associated with participating in MMT could have potentially positive impacts on the labor market participation of MMT-enrolled IDU. These adjustments could include the broader implementation of low-threshold programs for patients who demonstrate the ability to assume responsibility for the care and

safeguarding of methadone, expanding the hours of service of methadone dispensing pharmacies or increasing the flexibility of MMT clients to take their dosage through multiple pharmacies through the implementation of an electronic tracking system. Further research is needed to confirm the potential benefit of these approaches.

While not examined in the current study, alternatives to MMT, such as buprenorphine or extended-release naltrexone, may also have the potential to improve labor market outcomes. Buprenorphine has been shown to be effective with thrice-weekly doses, has lower risk of overdose or diversion and has been associated with increased occupational stability across individuals of both high and low socio-economic status (Mattick et al., 2008; Parran et al., 2010; Johnson et al., 2000). Similarly, extended-release naltrexone can be administered once every four weeks and preliminary evidence suggests that it may decrease the incidence of opioid overdose and improve adherence issues encountered with daily oral naltrexone (Comer et al., 2006; Hulse, Comer & Sullivan, 2009). However, the limitations of these potential alternatives should also be acknowledged. Widespread use of buprenorphine is restricted in the current study context by its price and availability, and more generally in its limited appropriateness for heavier users (Hariri, 2008; Byrne & Wodak, 2007). Extended-release naltrexone is only suitable for individuals having completed detoxification (Hulse, Comer & Sullivan, 2009). It is also currently unavailable in Canada. Nevertheless, these alternatives represent options for addiction treatment that warrant further exploration, in part

because they may facilitate improved labor market outcomes by virtue of the fact that it is not necessary to take them at a specified location on a daily basis.

The results of the current study represent a finding of systematic differences in treatment outcomes in a specific context among a prospective, non-random sample and as such may not be generalizable to the broader treatment-enrolled or injection drug-using population. Other limitations include potential recall or social desirability biases, as all non-serological data used in the study are based on self-report. Finally, while longitudinal data allow for the examination of employment patterns over time, individual participants may self-select into different treatment modalities and as such may be at a particular stage of the addiction cycle. Results therefore do not imply direct causal links between a particular treatment modality and employment transitions, but rather indicate systematically different outcomes between those individuals who have self-selected into different treatment types, which may be subject to further confounding by factors not examined in the current analysis.

The findings described here nevertheless suggest that transitions to employment among IDU in this setting are conditioned by the type of addiction treatment: non-MMT treatments are positively associated with transitions into employment, while MMT is negatively associated with successful labor market engagement. A range of plausible explanations may account for this counterintuitive finding. Individual-level factors that act as barriers to employment may be systematically more prevalent among

those enrolled in MMT. Alternatively, the social assistance structure in British Columbia may produce unemployment traps that act as disincentives to employment initiation among MMT clients. Finally, methadone dispensing regulations may increase the difficulty and potential sensitivity of the negotiation of new employment. These findings underscore the continued need to evaluate barriers to employment that disproportionately affect MMT clients, the impact of treatment design on the social and economic activity of IDU, and alternatives to MMT, such as buprenorphine or extended-release naltrexone, in order to facilitate positive treatment outcomes.

ACKNOWLEDGEMENTS

The authors thank the study participants for their contribution to the research, as well as current and past researchers and staff. We would specifically like to thank Deborah Graham, Peter Vann, Caitlin Johnston, Steve Kain, and Calvin Lai for their research and administrative assistance. The study was supported by the US National Institutes of Health (R01DA011591). Lindsey Richardson is supported by doctoral awards from the Pierre Elliott Trudeau Foundation and the Social Sciences and Humanities Research Council of Canada. Thomas Kerr is supported by the Michael Smith Foundation for Health Research and the Canadian Institutes of Health Research.

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