Factors associated with dropout among patients in opioid maintenance treatment (OMT) and predictors of re-entry. A national registry-based study

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HIGHLIGHTS

• Both pre-treatment and in-treatment factors were associated with dropout from OMT.
• High levels of pre-treatment criminal offences were associated with dropout.
• Younger age and drug offences during treatment were strongly associated with treatment dropout.
• Drug offences during first OMT episode were associated with lower chance of treatment re-entry.
• Older age increased chances for re-entry.

ABSTRACT

Background: Retention in treatment is often highlighted as one of the key indicators of success in opioid maintenance treatment (OMT). Aims: To identify factors associated with long-term retention in opioid maintenance treatment and to analyse predictors of subsequent treatment episodes. Methods: Treatment retention and re-entry were examined for a national cohort of patients admitted to OMT in Norway in the period 1997–2003. Multivariate Cox regression models were used to investigate factors associated with treatment dropout 18 months after treatment entry. Results: The 18 month retention rate among patients admitted to OMT in Norway (n = 2431) was 65.8% (n = 1599). Dropout from OMT within 18 months was associated with younger age (HR 0.97 [0.96–0.98]), high levels of general pre-treatment criminal offences (HR 1.66 [1.32–2.09]) and having drug-related offences during the 30 days prior to dropout (HR 1.80 [1.36–2.38]). Of the patients who dropped out (n = 832), 42.7% (n = 355) were re-engaged in subsequent treatment episodes. Pre-treatment criminal offences were associated with increased odds for treatment re-entry, whereas being younger and having drug-related offences during the first OMT episode were associated with lower odds for re-engagement in OMT. Gender was not associated with treatment dropout and re-entry. Conclusion: High levels of pre-treatment criminal offences and drug offences during the 30 days prior to dropout were associated with treatment dropout. Efforts to increase support services to these patients may contribute to higher rates of retention in OMT.

1. Introduction

Retention in treatment is often highlighted as one of the key indicators of success in opioid maintenance treatment (OMT) (Ball & Ross, 1991; Bell, Burrell, Indig, & Gilmour, 2006; Judson et al., 2010; Zhang, Friedmann, & Gerstein, 2003), emphasising the fact that adequate long-term adherence to treatment services, both medical and psychosocial, is essential for therapeutic benefits to accrue. Treatment compliance for drug dependence is generally poor, and although retention rates are normally higher in maintenance treatment than in other forms of substance abuse treatment, patients differ in the nature and duration of their engagement with treatment (Bell et al., 2006). Premature discontinuation of OMT presents major challenges to successful treatment outcomes and unexpected dropouts are associated with a number of risk behaviours. Studies have shown that newly discharged methadone patients often relapse into more drug use...
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health status, social status or history of drug use. The data has been
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date of the incident and details of the offence. The OMT patient records in-
detailed information of all cases registered by the police, including the
Norwegian state to all citizens. The Norwegian crime statistics comprised
Statistics Norway) using the unique identi-

2. Materials and methods

Nationwide registers on all patients (n = 3221) who entered OMT in
the period September 15th 1997 until December 31st 2003 in Norway
were cross-linked with official data from Norwegian crime statistics (Sta-
tistics Norway) using the unique identification number assigned by the
Norwegian state to all citizens. The Norwegian crime statistics comprised
detailed information of all cases registered by the police, including the
date of the incident and details of the offence. The OMT patient records in-
cluded information on age and gender, and the exact date of treatment
entry and discharge. However, the register did not include data on general
health status, social status or history of drug use. The data has been
analysed previously, and a full description of the study settings and particip-
ants can be found elsewhere (Bukten et al., 2012; Havnes et al., 2012).

2.1. Study setting

In Norway, opioid maintenance treatment has been available at na-
tional level since 1998, and the system is based on specialised health
care services at regional centres. The Norwegian programme comprises
14 centres which are all subject to the same national guidelines and the
programme is integrated into the general health and social security systems (Skretting & Rosenquist, 2010; Waal, 2007). In the study
period, patients applied to OMT on a standardised form via their social
service centre, and applications were registered at the regional OMT
centre (Waal, 2007). The Norwegian model can be characterised as rehabilitation-oriented (Waal, 2007), consisting of both non-medical
interventions targeted at housing and other psychosocial aspects as well as the maintenance medication. The General Practitioner (GP)
plays an important and integrated role. In 2010, 68% of patients were
prescribed OMT medications by their GP although all treatment initia-
tions were conducted at the regional OMT centres prior to transfer to
GPs (Waal, Clausen, Håseth, & Lillevold, 2011). At the time of our obser-
vation period, the OMT programme could be considered as high thresh-
old and restrictive. The criteria for admission specified that patients
should be at least 25 years of age, dependent on heroin for several
years, and have experienced previous abstinence-oriented treatment, although interpretation of these criteria was not rigid (Waal, 2007).

New national guidelines, presented in 2010, are less strict and have
no age limit. Currently the only absolute criterion for admission to treat-
ment is opioid dependence, defined according to the ICD-10 or DSM-IV
criteria. Throughout the last decade, the number of patients on opioid
maintenance treatment in Norway has increased, and during 2010 it
exceeded 6000 patients (Waal et al., 2011), which includes approxi-
ately half of the estimated 8600–12,600 problematic opioid users in
Norway (Skretting & Rosenquist, 2010).

2.2. Participants and follow-up

The dataset included all patients (n = 3221) who entered OMT in
Norway from September 15th 1997 until December 31st 2003. The study
period, therefore, consisted of individual and varying observation periods; from individual inclusion dates until the last day of observa-
tion, i.e. the censoring date, December 31st 2003.

The stability of groups categorised according to retention could be
vulnerable to patients who started OMT late in the study. Hence, the ob-
servation of patients engaged in the first episode of OMT was restricted
to patients who had at least 18 months of continuous treatment (n =
1599) and patients who dropped (n = 832) out before reaching
18 months of continuous treatment. Those patients who had less than
18 months of treatment and the censoring date (31.12.2003) as their
last observation date (n = 790), were excluded from all analysis (Fig. 1).

A total of 2431 patients were included in the 18-month observation
period following the first OMT episode, including 33% (n = 805)
women and 67% (n = 1626) men. At entry to OMT, men were signifi-
cantly (P < 0.001) older (mean age 37.8, SD 6.5, range 22–60) than
women (mean age 35.5 SD 6.3, range 20–57). Some patients (n =
135) died between the start of treatment and the last day of observa-
tion. Their observation time was censored at the date of death (ceased
contributing to the person-days of follow-up).

2.3. Measures

“Treatment start” is the initiation of maintenance medication with
either methadone or buprenorphine. Treatment dropout is defined as
the first day of the period of discontinuing treatment in OMT. Termina-
tion of treatment could be either voluntary or involuntary. The absolute

![Fig. 1. Flow-chart of the Norwegian OMT-cohort (1997–2003).](image)
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