Drug and Alcohol Dependence 128 (2013) 37–44

Contents lists available at SciVerse ScienceDirect

Drug and Alcohol Dependence

journal homepage: www.elsevier.com/locate/drugalcdep

Predictors of a favourable socio-economic situation in middle age for Swedish conscripts with self-reported drug use

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ARTICLE INFO

Article history:
Received 2 March 2012
Received in revised form 12 July 2012
Accepted 27 July 2012
Available online 1 September 2012

Keywords:
Epidemiology
Risk and protective factors
Drug use
Socio-economic outcomes

ABSTRACT

Background: Risk and protective factors for adverse outcomes among drug users in the general population have been identified. This study considers whether some of these factors predict favourable socio-economic situations in middle age.
Methods: A 37-year follow-up of 49,411 Swedish male conscripts 1969/70, born 1949–1951. Based on self-reports at conscription, 36,191 living subjects in 2006 were divided into users of certain dominant drugs ($n = 3946$) and non-users ($n = 32,245$). Individual data from conscription and national registers were linked. Using logistic bivariate and multivariate regression, odds ratios (ORs) for the categories of dominant-drug users, compared with non-users, were computed for outcomes in 1990 and in 2006: education ≥12 years, being in work, and having a disposable income above the median. The ORs were calculated after considering familial, social and individual risk and protective factors, with separate analyses being performed for drug-use categories.
Results: Small changes were observed in the ORs for the outcomes in 1990 and 2006. After adjustment for protective and risk factors, users of the various dominant drugs had increased ORs with an education ≥12 years but lower or non-significantly different from non-users for the other outcomes. The ORs decreased with severity of drug use. Among drug users, high intellectual ability, having a father from highest SES group, and communication with parents were among the factors that increased the probability of favourable socio-economic outcomes, especially when several protective factors were involved.
Conclusions: Protective factors increase the probability of favourable outcomes, but least among individuals with severe drug use.

1. Introduction

For 2009, the global annual prevalence of illicit drug users was estimated at 3.3–6.1% of people aged 15–64 years of age (United Nations Office on Drugs and Crime, 2011). Cannabis is the most frequently used drug with an estimated global annual prevalence rate of 2.8–4.5%, in North America 10.7%, in Europe 6.8% (European Monitoring Centre for Drugs and Drug Addiction, 2010), and in Sweden 2.3% (16–84 years) (Statens folkhälsoinstitut, 2011), while the prevalence of users of other drugs is 1.9% or lower (United Nations Office on Drugs and Crime, 2011). In 2006, 11.8% of Swedish conscripts reported life-time use of cannabis, 1.8% of sedatives, 1.5% of amphetamines and ecstasy, and lower rates of use of other drugs (Guttormsson, 2007). Longitudinal epidemiological studies have shown that advanced drug use before late adolescence is associated with lower educational level, academic failure, and lower income (Fergusson and Boden, 2008; Lynskey and Hall, 2000; Merline et al., 2004; Newcomb and Bentler, 1986; Schuster et al., 2001). Many general population studies of drug users have focused on factors that increase the risk of adverse outcomes, and some on factors that decrease the risk directly or through interaction with risk factors (Brook and Brook, 1990; Newcomb and Felix-Ortiz, 1992). Risk and protective factors for the initiation and continuation of drug use have been identified in familial, behavioural, environmental and psychological domains, during both childhood and adolescence (Beyers et al., 2004; Brook and Brook, 1990; Hawkins et al., 1992). Some important protective factors are: early parental attachment (Brook and Brook, 1990), good adaptation to school, social norms and values in society (Hawkins et al., 1992), and high individual competencies, such as good physical health, high emotional control and intellectual ability (Masten and Coatsworth, 1998; Stenbacka, 2000; Stenbacka and Leifman, 2001).

Increased knowledge of factors early in life that predict favourable socio-economic outcomes among young men with various dominant-drug use is valuable for enhancing the theoretical

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0376-8716/$ – see front matter © 2012 Elsevier Ireland Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.drugalcdep.2012.07.013

and empirical basis for a supportive environment during upbringing and in schools, and for framing prevention strategies. In this 37-year longitudinal study of about 50,000 18–20 year-old Swedish men, the overall aim was to assess factors that predicted favourable outcomes in youth who had reported drug use in adolescence. We assessed the extent to which the men achieved higher education, had employment, and had disposable income above the median of the cohort, in relation to type of drug reported and various socio-economic and behavioural characteristics.

2. Methods

2.1. Subjects

This study included 49,411 (97.92%) males, born 1949–1951, taken from the 50,465 Swedish males who were compulsory conscripted into military service July 1, 1969–June 30, 1970. The socio-economic outcomes were measured in 1990 (at 39–41 years of age of the subjects), and in 2006 (at 55–57 years). By 2006, 3100 subjects had died and 13 had an erroneous date of death reported; these subjects were excluded from the study. After further excluding conscripts with missing data on variables other than drug frequency, the final cohort consisted of 36,191 men. All conscripts were asked to answer two questionnaires about familial, social, individual factors and use of licit and illicit drugs. The response rate was 98%. The proportion of conscripts who reported having ever had used any non-medically prescribed drug was 11%. The possibility that some conscripts may have underreported drug use to avoid criminal prosecution is estimated to be low as the information remained confidential. Bivariate analyses covering drug users alive in 2006 with missing data ($n = 801$) and drug users included in the study showed no large differences in odds ratios for favourable socio-economic outcomes. However, the exclusion of a small proportion of conscripts with missing data and deceased subjects, possibly contributed to a small underrepresentation of conscripts with severe drug use. Linkages of individual data from the Military Service Conscription Register (1969/70), the Longitudinal Integration Database for Health Insurance and Labour Market Studies (LISA) and the Swedish Hospital Discharge Register (1969–2004) were performed by Statistics Sweden, using Swedish unique personal identification numbers. These numbers were then replaced by study-specific numbers to ensure that no individual could be identified. The study was approved by the Regional Ethical Review Board at the Karolinska Institute in Stockholm.

2.2. Measures

2.2.1. Drug users by type of dominant drug. Questions about drug use included naming a dominant drug and life-time frequency of drug use. Of the 36,191 conscripts, 32,245 (89%) reported that they had never used drugs, while 3946 (11%) specified a drug when asked "Which drug have you most frequently used?" The response alternatives were divided by type of dominant drug: cannabis ($n = 3160$, hasch/marijuana), stimulants ($n = 127$, amphetamines, Phenedrine, Preludin/Ritalina), opioids ($n = 78$, Morphine/Palphium, opium, heroin came to Sweden around 1973), hallucinogens ($n = 215$, LSD, mescaline, similar, other), and sedatives/hypnotics ($n = 366$, e.g., Mebumal, Nembutal, Mebroban, Restensil).

2.2.2. Life-time frequency of drug use. The question about life-time drug frequency included the response alternatives: 1 time, 2–4 times, 5–10 times, 11–50 times, and >50 times. In this study, frequent drug use was defined as a drug frequency of >10 times, thus excluding subjects who were experimental users (Yamaguchi and Kandel, 1984).

2.2.3. Risk and protective factors. Based on earlier research, twelve variables were chosen to represent risk and protective factors within the familial, social, intrapersonal, inter-relational and substance-use domains (Brook and Brook, 1990; Hawkins et al., 1992; Masten and Coatsworth, 1998; Newcomb and Felix-Ortiz, 1992) for socio-economic outcomes in middle age. Included risk factors were father's frequent alcohol consumption, having divorced parents, any contact with the police or juvenile authorities, a psychiatric diagnosis (excluding drug and alcohol) at conscription (by a psychiatrist who diagnosed any disorder among the referred conscripts in accordance with the International Classification of Diseases 8th revision, ICD-8, (World Health Organisation, 1967), smoking, and risky alcohol consumption. Levels of consumption were calculated on the basis of self-reported quantity and frequency of beer, wine and spirits consumption. A consumption of ≥168 g of pure alcohol/week was considered as a risk factor, which is consistent with the definition of risky consumption of alcohol by the Swedish National Institute of Public Health (Andréasson and Allebeck, 2005).

The presumed protective factors were having a father from Social Group I (proprietors, private entrepreneurs and high-salary employees in the private and public sectors), rather than Social Group II (other salaried employees and small entrepreneurs) or Social Group III (blue-collar workers; Upmark et al., 1999), close parental attachment, good relations with teachers, having few peers, emotional control above average (assessed by psychologists on a 5-point scale, representing a standard distribution of 7%, 24%, 38%, 24% and 7%, with a regular check on the reliability of the assessments; Stenbacka, 2000), and high intellectual ability (7–9 on a stanine scale, >110 IQ; David et al., 1997), with values transformed from the results of four tests measuring verbal, logic, inductive and technical abilities on stanine scales (Agrell, 1972; David et al., 1997).

2.2.4. Favourable socio-economic outcomes. Favourable socio-economic outcomes for education, work and income were assessed in 1990 and 2006. The data were extracted from the Longitudinal Integrated Database for Health Insurance and Labour Market Studies (LISA), administered by Statistics Sweden, which started in 1990 and is updated each year by the transmission of annual data from national registers; it covers all subjects 16 years or older in the Civil Register in Sweden the previous December. Data on educational level cover years prior to 1990. Higher education is associated with lower premature mortality (Pensola and Martikainen, 2004), and better physical and psychological health (Ringbäck et al., 2008). In this study, a high educational level was defined as having at least 12 years of education (1990 $n = 16,730$, 2006 $n = 17,427$). Being in work is considered a favourable occupational status (1990 $n = 34,289$, 2006 $n = 31,398$). It gives access to higher income and increased independence (Ringbäck et al., 2008). The data were based on information reported to the Swedish tax agency, and register-based statistics on the labour market (working ≥ one hour/week during November). High income gives access to an increased material standard, benefits health, and contributes to lower stress (Geyer et al., 2006). A favourable income was defined as a disposable income above the median (in the year 2006 ≥median) of the cohort of 49,411 subjects (1990 $n = 18,447$; 2006 $n = 18,435$), calculated as the individual part of the household/family disposable income, including all income exempted and not exempted from taxation after deduction of taxes and other negative transfers.

2.2.5. Follow-up data. Information about inpatient care with drug diagnoses during follow-up was extracted from the National Hospital Discharge Register, which for 1972–1982 covers almost all inpatient care in Stockholm and Uppsala counties, and from 1983 to 1986 about 85%, and since 1987, 98–99% of all hospitalisations in Sweden. The following drug diagnoses, based on the Swedish versions of the ICD-8 1969–1986, ICD-9 1987–1996 and ICD-10 1997- (World Health Organisation, 1967, 1978, 1992), were used: ICD-8: 304,00 – 304,70, 304,88, 304,99, 965,00, ICD-9: 304, 965A, 968F, 969G, 969H, ICD-10: F11.0-6 – F16 0-6, F18.0-6 – F19.0-6, O35.5, P04.4, T40.0-3, T40.5-40.9, T43.6, Z71.5, X42.

2.3. Statistical analyses

Spearman's correlation coefficients were used to measure associations between the outcome variables. The correlations (all $p < .0001$) between education and work were $r_s = 0.05$ in 1990 and $r_s = 0.10$ in 2006, between work and disposable income $r_s = 0.15$ and $r_s = 0.30$, respectively, and between education and disposable income $r_s = 0.27$ and $r_s = 0.32$, respectively. For drug users, the correlations were somewhat higher.

Chi^2 tests were performed to establish whether different categories of dominant-drug users differed from non-users on the background variables. Logistic regression was used to calculate the odds ratios (ORs), with 95% confidence intervals (95% CIs), for favourable socio-economic outcomes in 1990 and in 2006. Comparisons of outcomes were made between drug users compared to non-users at conscription in bivariate analysis, between categories of dominant-drug drug users and non-users, after adjustment for risk and protective factors, and for users with a drug frequency >10 times, and for those with a drug use diagnosis during follow-up. Among the drug users, an analysis was performed to establish whether the presumed protective factors decreased the impact of risk factors and predicted favourable socio-economic outcomes. Both the relations between the number of protective and risk factors and possible interactions were analysed. Bivariate analyses including drug users with missing data ($n = 801$) were performed to establish whether their ORs for favourable socio-economic outcomes differed from those of the drug users included in the study.

3. Results

3.1. Background

The opioid users did not differ significantly from the non-users on any of the protective variables (Table 1). Cannabis users had a higher proportion of subjects with a father from Social Group I ($p < 0.05$), and sedative/hypnotics users of having ≤5 friends ($p < 0.05$) than non-users. Cannabis, hallucinogen and sedative/hypnotics users had higher proportions of subjects with high intellectual ability ($p < 0.05$). Familial, individual and substance-use risk factors were more common among the drug users ($p < 0.05$) (see Table 1).