



Cessation of cannabis use: A retrospective cohort study

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ABSTRACT

Given recent findings of a worldwide increase in cannabis use, a better understanding of the factors associated with cannabis use is needed. Most previous studies have focused on factors that predict the initiation of cannabis use, but less is known about factors associated with cessation. The present study is a retrospective cohort study of 6467 current or former cannabis users aged 15 to 46 years (mean age 22.5, $SD = 4.8$). Data were collected via an online survey advertised in social media. All analyzed participants had used cannabis for at least three years. Approximately 16.3% ($n = 1055$) of the sample population had not used cannabis in the previous 12 months and were classified as quitters; all others (83.7%, $n = 5412$) reported at least monthly use. Cessation was predicted by older current age, being female, nonmigrant status, less sensation seeking, using psychological treatment, more peer cannabis use during youth and more negative first experience with cannabis. An additional predictor was a nonincrease in the frequency of cannabis use in the first three years of use, indicating that trajectories of cannabis use are set early on and might be used to identify risk groups for early preventive measures.

1. Introduction

Cannabis was the most commonly used drug, in addition to alcohol and nicotine, in 2016, with approximately 192 million cannabis users worldwide (United Nations Office on Drugs and Crime, 2018). In recent years, changes in cannabis legalization policies have reduced risk perceptions in the population regarding cannabis' harmfulness (Mechtatie, 2018; Wen et al., 2019). In Germany, cannabis use has also increased during recent decades. Approximately 42.5% of Germans aged 18–25 years reported experiences using cannabis, and there was an increase from 15% to 27% in 12-month prevalence of cannabis use from 2008 to 2018, particularly in young men (Orth & Merkel, 2019).

For some, cannabis use is harmless, and there is evidence that experimentation with cannabis use in adolescence may not necessarily determine cognitive or mental health problems (Scott et al., 2018; Silins et al., 2017). However, frequent cannabis use is associated with adverse outcomes. Meta-analyses of longitudinal studies have shown that the use of cannabis is associated with psychiatric symptoms such as anxiety and depression (Kedzior & Laeber, 2014; Lev-Ran et al., 2013). Furthermore, a meta-analysis of 83 studies on the age of first psychosis in patients with psychotic disorders found that the mean age at onset of psychosis was 2.7 years younger for cannabis users compared to nonusers (Large et al., 2011). Cannabis use has also been linked to substance use disorders (Guttmanova et al., 2017), academic failure

(Arria et al., 2015; Fergusson et al., 2015), and involvement in delinquency (Tucker et al., 2006).

There are a number of known predictors for initiating cannabis use, including being male, previous substance use, family history of substance use disorder (Blanco et al., 2018), parental cannabis use disorder (Hill et al., 2018), sensation seeking (Crawford et al., 2003), peer use (Schmits et al., 2015) and antisocial behavior (Coffey et al., 2000). Factors that predict cannabis initiation are generally not predictors of quantity or the course of cannabis use, e.g., who decreases or increases cannabis use or who quits using it (Washburn & Capaldi, 2014). However, less is known about these factors and the few studies that exist suggest that whether consumers increase or decrease their cannabis use depends mainly on parental monitoring and drug availability (Gillespie et al., 2012). Furthermore, cessation seems to be associated with being female, of older age, married, and employed and having no prior substance use but not, for example, with age of onset (Aitken et al., 2000). A study with a representative German population sample indicated that over a period of 42 months, half of all cannabis users stopped their use spontaneously in their twenties, while others reported occasional or more frequent use of cannabis (von Sydow et al., 2001). In another German study, evidence showed that cannabis use was fairly stable over time, with repeated users (five times or more) being almost three times more likely to report repeated use in a 10-year follow up assessment (Perkonig et al., 2008). One study from the US

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analyzed trajectories of cannabis use over a period of approximately 29 years and found that quitters started as early as frequent users, but a gradual decline in frequency was already visible between late adolescence (Mean age = 16) and early adulthood (Mean age = 22), with cessation at mean age 32 (Brook et al., 2016).

Methodologically, cessation of cannabis use is difficult to investigate, and long observational study periods and elaborate designs are required. Cessation studies therefore usually examine small sample sizes and specific groups, such as students or patients. Predictors of cessation are rarely able to trace natural processes, and for ethical reasons, it is not possible to study intervention vs. control groups. A previous longitudinal study by Pollard et al. (2014), used data from 358 regular cannabis users aged 12–19 years at baseline to examine factors associated with an increase or decrease in cannabis use and with cessation across 6 years. The study of von Sydow et al. (2001) examined patterns of cannabis use across 4 years in a representative sample of 2446 adolescents and young adults, but 70% were nonusers at baseline. A total of 102 participants in the study did not want to answer questions about illicit drug use and were excluded. Due to the illegality, it is difficult to find participants who will report their cannabis use. Perkonig et al. (2008) examined a community sample of 3021 participants with a follow-up period of 10 years and approximately one-third were lifetime cannabis users. To our knowledge, Brook et al. (2016) conducted the most comprehensive study on different trajectories of the course of cannabis use. Their study examined a small US sample ($n = 548$) in New York counties but collected data in eight waves, with participants first studied at mean age 14 and last studied at mean age 43. Most of the participants reported lifetime cannabis use, and only 34.5% were classified as nonusers or experimenters. The authors themselves limited the generalizability because of the small sample size and recommended a reduction in the measurement intervals. Because of these limitations based on a bias due to illegality, small sample sizes and large intervals in the previous studies, we used a retrospective cohort design that enabled us to capture a large period of usage history for every year of usage and to survey a large number of cannabis users, who could answer questions anonymously.

Knowledge of the predictors associated with cessation of cannabis use is of preventive importance from two perspectives. On the one hand, conditions can be identified that may help users to quit. On the other hand, individuals can be identified at an early stage who, due to a risk profile, have an increased probability of becoming frequent users. Based on previous findings of initiation and the mentioned cessation studies, membership in the cessation group may be associated with intrapersonal, socioenvironmental, and substance-specific variables.

2. Methods

2.1. Data source

We conducted a retrospective cohort study in March and April 2018. For recruitment, an anonymous German-language online questionnaire was advertised on social media (Facebook). Filtering procedures determined the individual length of the questionnaire. The aims of the study were explained on the study website, where participants gave their consent via a click on a button ‘Yes, I want to participate now’. Cookies and IP address blocking were used to discourage multiple participation. Respondents could win a voucher with a value of € 50 after completing the questionnaire. The target group of the Facebook advertisement was defined as people living in Germany aged between 18 and 35. Ethical approval was granted by the ethics committee of the German Psychological Society (Deutsche Gesellschaft für Psychologie,

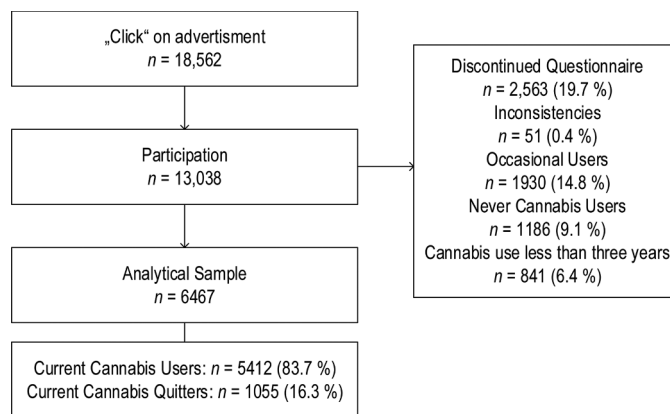


Fig. 1. Flowchart for participants selected in the analytical sample.

DGPs). Additionally, the study was registered in the German Clinical Trials Register (DRKS00014307).

2.2. Sample

A total of 13,038 respondents answered the online questionnaire. They were classified as current users (at least monthly cannabis use in the last 12 months) or current quitters (no cannabis use in the last 12 months). Participants who had never used cannabis ($n = 1186$) or current occasional users (cannabis use in the previous 12 months but ‘less than once a month’, $n = 1930$) and those who had been using cannabis for less than three years ($n = 841$) were excluded from the analysis (see Fig. 1). Due to the programming of mandatory questions, there were no incomplete data except for respondents who discontinued the questionnaire or for individual technical errors that disabled consistent completion. Thus, discontinued and inconsistent questionnaires were excluded. The final sample was $n = 6467$ participants with histories of 3 or more years of cannabis use from first initiation.

2.3. Measures

All measured variables are also shown in Appendix Table A.1.

2.3.1. Intrapersonal variables

Standard demographic characteristics, such as current age and gender, were measured by single items. Cultural influences were measured with the question of whether mother or father was born in Germany (No = migration background). To assess education status, participants were asked about their highest educational degree (‘no qualification’, low/middle/high secondary education: ‘Hauptschule’/‘Realschule’/‘Abitur’, ‘apprenticeship’, ‘university degree’). Variables that are known to predict substance use, such as sensation seeking and ADHD, were also included. Sensation seeking was measured by using the 2-item version of the Sensation Seeking Scale – Form V (SSS-V; $\alpha = 0.85$; Stephenson et al. (2003)). ADHD diagnosis at least once in the lifetime was measured by a single self-reported item, ‘Have you ever been diagnosed with ADHD?’ (‘yes’, ‘no’), and psychological treatment by ‘Have you ever been in psychotherapeutic/psychiatric treatment?’ (‘yes’, ‘no’).

2.3.2. Social-environmental variables

Characteristics of the social environment were measured by ‘Was cannabis regularly used in your family?’ (‘yes’, ‘no’, ‘I don’t know’) and

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