Drug use trajectories among young people with experiences of problematic tramadol use

Arve, Kristin; Johnson, Björn

Published in:
Drugs: Education, Prevention and Policy

DOI:
10.1080/09687637.2023.2263144

2024

Document Version:
Publisher's PDF, also known as Version of record

Drugs: Education, Prevention and Policy

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/idep20

Drug use trajectories among young people with experiences of problematic tramadol use

Kristin Arve & Björn Johnson

To cite this article: Kristin Arve & Björn Johnson (03 Oct 2023): Drug use trajectories among young people with experiences of problematic tramadol use, Drugs: Education, Prevention and Policy, DOI: 10.1080/09687637.2023.2263144

To link to this article: https://doi.org/10.1080/09687637.2023.2263144

DRUGS: EDUCATION, PREVENTION AND POLICY
https://doi.org/10.1080/09687637.2023.2263144

Taylor & Francis
Taylor & Francis Group

RESEARCH ARTICLE

Drug use trajectories among young people with experiences of problematic tramadol use

Kristin Arve and Björn Johnson

Department of Social Work, Lund University, Lund, Sweden

ABSTRACT

Aim: Non-medical use of prescription opioids, such as tramadol, is a major health concern globally. In Sweden, non-medical tramadol use among young people is widely recognized. This study explores the central components that characterize drug use trajectories among young people with experiences of problematic tramadol use. **Methods**: 24 qualitative interviews were conducted with 13 young people (aged 19–24) with self-reported experiences of problematic tramadol use. The concepts of drug, set, and setting from Zinberg's theoretical framework were applied to explore significant aspects of their drug use trajectories. **Findings:** Four themes corresponding to different stages in the young people's drug use trajectories, were identified: (1) initiating tramadol use; (2) developing continuous tramadol use; (3) expanding the drug repertoire and; (4) starting to lose control. Overall there was a progression toward more severe drug use over time, where self-medication and dependence dynamics, as well as peer influence and other environmental factors were significant. **Conclusion:** The study demonstrates that the drug use trajectories of young people with problematic tramadol use involve a complex interaction between the drugs' effects, personal circumstances, and environmental factors. Increasing the understanding of this process can be helpful in improving both preventive and therapeutic measures for this target group.

ARTICLE HISTORY
Received 16 May 2023
Revised 21 August 2023
Accepted 21 September 2023

KEYWORDS
Prescription drugs; drug use trajectories; young people

Introduction

Non-medical prescription opioid use among young people has become a growing concern around the world, including in North America, Europe, West Africa and the Middle East (Bashirian et al., 2014; Bassiony et al., 2015; European Monitoring Centre for Drugs & Drug Addiction, 2021b; Fuseini et al., 2019; Guarino et al., 2018; Ibrahim et al., 2017). In Sweden, tramadol is by far the most commonly used prescription opioid, with studies from an outpatient setting reporting a prevalence of tramadol use in about one-third of the young people enrolled (Holmstedt et al., 2020; Olsson et al., 2017). The non-medical tramadol use among young people in Sweden has received significant attention in recent years, and these studies describe this as a novel pattern of drug use (Holmstedt et al., 2020; Olsson et al., 2017;). Furthermore, several studies indicate that tramadol use often appears early on in young people's drug use trajectories (Bassiony et al., 2015; Holmstedt et al., 2020; Richert & Johnson, 2013), with one Swedish study reporting a median age of onset of 16 years (Holmstedt et al., 2020).

While most young people who use drugs recreationally do not continue their use later in life, some progress to severe drug use (Baggio et al., 2014; Svensson & Karlsson, 2018). There are different factors, such as underlying mental health issues or peer influence, that can contribute to the progression to more severe drug use (Biggar et al., 2017; Darke, 2013). The development of continuous drug use is also related to dependence dynamics, such as withdrawal relief (Darke, 2013; Svensson & Karlsson, 2018). Opioid use is in general associated with higher dependence liability and substance use severity compared to other types of drugs (Darke, 2013; Subramaniam & Stitzer, 2009). Moreover, socialization into "the drug milieu" gradually changes the individual's perception of themselves, their social context, and what behaviors are considered acceptable (Svensson & Karlsson, 2018).

Young adults are the age group that uses drugs most frequently and where problematic drug use is most common (Alley, 2014; Arnett, 2005; Guarino et al., 2018). This stage in life is marked by opportunities and identity development, but also by instability and a sense of being 'in between' adolescence and adulthood (Arnett, 2005). This article focuses on drug use trajectories among young adults in the age range of 18–24 with self-reported experiences of problematic tramadol use. *The aim of the article is to explore significant factors that characterize drug use trajectories among young people with experiences of problematic tramadol use.* Previous research on the non-medical use of tramadol has primarily used a quantitative approach, focusing on determining the prevalence and characteristics of users (Bassiony et al., 2015: Holmstedt

CONTACT Kristin Arve kristin.arve@soch.lu.se Department of Social work, Lund University,Lund, Sweden

et al., 2020; Olsson et al., 2017; Winstock et al., 2014). However, there is limited knowledge regarding young people's personal perspectives on their tramadol use and drug use trajectories, which will be addressed in this article.

Previous studies have identified various motives for non-medical tramadol use, including to feel euphoric and relaxed, relieve pain and emotional distress, stay alert, or improve sexual performance (Bassiony et al., 2015; Finsam, 2019; Fuseini et al., 2019; Ibrahim et al., 2017; Winstock et al., 2014). Unlike other opioids, tramadol has dual mechanisms of action that, in addition to sedative effects, can produce antidepressant and stimulating effects (Bumpus, 2020; Svensson & Karlsson, 2018). Tramadol and other prescription drugs can be perceived as more 'safe' and socially acceptable to use due to the fact that they are prescribed by doctors (Daniulaityte et al., 2012; Mui et al., 2014; Svensson & Karlsson, 2018). Historically, tramadol was considered to have fewer adverse effects compared to other opioids, but since the early 2000s, the risks of dependence, seizures, and even death have received greater attention (Boostani & Derekhsan, 2012; Shadnia et al., 2008; Tjäderborn et al., 2007). Non-medical use may also involve the use of significantly higher doses compared to when the drug is prescribed, which also increases the risks of side effects (Bumpus, 2020; Svensson & Karlsson, 2018). The risk of transitioning from non-medical prescription opioid use to heroin use has also been acknowledged in several studies (Compton et al., 2016; Guarino et al., 2018; Mars et al., 2014; Syverstsen et al., 2017).

Tramadol and other prescription opioids are commonly used in a polydrug context alongside more traditional illicit drugs (Daniulaityte et al., 2012; Holmstedt et al., 2020; Olsson et al., 2017; Subramaniam & Stitzer, 2009). Using more than one substance simultaneously or sequentially is associated with several increased risks (European Monitoring Centre for Drugs & Drug Addiction, 2021a). Darke (2013) points out that high levels of polydrug use predict higher risk of overdose, suicide, mental illness, and poorer treatment outcomes, regardless of the drug used. A study from an outpatient clinic in Sweden found that the young people who used tramadol in addition to cannabis had a higher prevalence of cocaine, benzodiazepines, and amphetamines than other young people enrolled (Holmstedt et al., 2020). There are several potential reasons behind polydrug use, including enhancing the desirable effects of the drugs, as well as reducing side effects and alleviating withdrawal symptoms (Gili et al., 2022). Kataja et al. (2019) also highlight the importance of social, cultural, and contextual factors, beyond the pharmacological properties of the drugs.

Overall, problematic use of prescription opioids is a global concern, whereas tramadol plays a dominant role in the Swedish context. Furthermore, it is evident that this novel pattern of drug use often occurs early in young people's drug use trajectories within a polydrug context (Holmstedt et al., 2020; Olsson et al., 2017; Richert & Johnson, 2013). Through interviews with young people regarding their personal experiences of problematic tramadol use and transitions in drug use, this study can contribute to an increased understanding of this phenomenon that may be useful for both preventive and therapeutic measures.

Theoretical approach

Drug use trajectories

The concept of drug use trajectories refers to the patterns and trajectories of drug use over time. This concept is often associated with the life course perspective, where it is used to describe how individuals' drug use changes during their lifespan (Hser et al., 2007). However, the concept has also been used to describe patterns and transitions in drug use among young people (Baggio et al., 2014; Bertrand et al., 2013; Syvertsen et al., 2017; White et al., 2001). The focus of many studies has been on various factors that explain or contribute to these changes. Drug use trajectories can vary widely between individuals – for example, some young people may experiment with drugs briefly and then stop using them, while others develop chronic patterns of drug use that persist over decades; some individuals stick to one or a few substances, while others develop extensive polydrug use. Further, different substances may dominate during different periods, and the extent of use can vary greatly. Earlier studies demonstrate how young people quickly move between different drugs and levels of usage intensity, where transitions are explained by non-exceptional circumstances in their everyday lives (Fast et al., 2010; Mayock, 2005).

We prefer the term drug use trajectories over the related concept of drug career. The development of individuals' drug use patterns is often not as "linear" as many career models or stage models imply, where drug use is depicted as an escalating process, from experimental use to compulsive use, sometimes interrupted by periods of abstinence and relapse (Faupel, 1991; Svensson & Karlsson, 2018). The term drug career may also evoke unwanted connotations of professional careers.

However, many studies of drug use trajectories and transition focus on shifts toward more harmful drug practices, such as the transition from prescription opioids to heroin injection (Mars et al., 2014; Syvertsen et al., 2017). Studies show that a wide range of circumstances contributes to these changes, including involvement in drug scenes and a marginalized life situation, as well as dependence dynamics and drug availability and cost (Fast et al., 2010; Mars et al., 2014; Mayock, 2005; Syvertsen et al., 2017). Furthermore, these studies demonstrate how these young people gradually push the boundaries of risk-taking and acceptability through their everyday experiences and social influences (Fast et al., 2010; Mars et al., 2014; Mayock, 2005).

Drug, set, and setting

We will use the concepts of drug, set, and setting as heuristic tools to explore various aspects that have been significant in young people's drug use trajectories. The concept of set and setting was originally formulated by psychologist and psychedelic advocate Timothy Leary in the early 1960s as a simple way to explain how the experience of psychedelic drugs is influenced by the user's mindset and social environment in which the drug use occurs (Hartogsohn, 2017). Psychiatrist Norman Zinberg expanded the concept of set and setting beyond the psychedelic realm in

his book "Drug, Set and Setting" (1984). According to Zinberg, there are three central factors that help us understand why a person uses a drug and how they experience its effects: the psychoactive and other pharmacological effects of the drug (or drugs) used, the user's personality and psychological mindset, and the physical and social environment. These three factors interact in complex ways.

Zinberg argues that the pharmacological effects of the drug and personal characteristics of the user tend to be overstated in relation to the importance of the setting. Zinberg's notion of setting includes both the immediate situation, such as the people present and the physical location, as well as the broader social and cultural context in which drug use is embedded. The wider beliefs, values, and norms of a particular social group can influence the way individuals within that group use drugs, including the rules and principles they follow when using them. The availability of different drugs is also important but always interacts with other social factors, such as which drugs are considered attractive. The concept of setting can also be used from a more process-oriented perspective by focusing on how factors in the social environment can change over time, for example when people move between different drug scenes, change their social circles, housing conditions, or sources of income (Moore, 1993).

Research methods

A qualitative study was conducted using semi-structured interviews with 13 individuals aged 19–24 who have had experiences with problematic use of tramadol. There are different definitions of the term 'young people', in this study a delimitation has been made to those aged 18-24. The inclusion criterion for the participants was self-reported experience of problems related to tramadol use. Most of the participants were recruited through staff at treatment institutions and outpatient clinics in southern Sweden. Additionally, two participants without treatment experience were recruited: one through another participant, and the other through contacts of one of the author's colleagues. All participants gave informed consent to participate in the research. They were moreover assured that their responses would be handled confidentially and that their participation would not affect their treatment in any way. The research project was approved by the Swedish Ethical Review Authority (2020-04519).

The interviews were conducted between 2021 and 2022. Nine out of thirteen participants were interviewed two or three times each, which was an approach to obtain richer data (Hydén, 2016). In total, 24 interviews were conducted: thirteen face-to-face, eight online and video-based and three by telephone. Face-to-face interviews were conducted at a secluded space, primarily in the facilities where the participants were enrolled in treatment or in their homes. The mode of interviewing, as well as the place for the interviews, was based on practical considerations and the preferences of the participants. Both video-based interviews and telephone interviews have been found to be useful in qualitative research and are considered comparable to face-to-face interviews (Archibald et al., 2019; Trier-Bieniek, 2012). The interviews lasted between 28 and 64 minutes. The young people were asked about their overall history of drug use, although special attention was given to their use of tramadol. This included questions about initiation of use and transitions in drug use, as well as their motives behind their use. Additionally, they were asked about their experiences of attempting to quit the drug, which is addressed in another article. The interviews were recorded and transcribed verbatim. To protect their anonymity, pseudonyms were assigned to each participant, and any names and places that could identify them have been changed.

The data was analyzed using thematic analysis. The interview transcripts were read multiple times to become familiar with the data. The material was then coded to identify patterns and meaning, create structure, and reduce the amount of data being handled (Rennstam & Wästerfors, 2011; Terry et al., 2017). Interviews from each participant were also studied individually to gain an overall understanding of their drug use trajectories, with a focus on key events. The analysis was iterative, where themes gradually became more clearly defined (Terry et al., 2017). In selected quotes, some small adjustments were made to make the text more readable.

Participant characteristics

The participants consisted of 13 individuals aged 19–24 years old, of whom ten were male and two were female. Difficulty was encountered in recruiting female participants, which may be related to the general predominance of men among people who use drugs (European Monitoring Centre for Drugs & Drug Addiction, 2021a). The participants' experiences of tramadol use ranged from one to five years, and most of them had used the drug more or less daily. All participants had a history of polydrug use, and tramadol had been one of their primary drugs. Six of the participants eventually changed their main drug, four to stronger opioids like heroin. Three of the young people had been drug-free for one to two years at the time of the interviews, while the others had more recently quit drugs or had relapses. Only one participant was still using tramadol daily.

All but two of the participants had experienced interventions from social services and health care due to their drug use, although to a very varying extent. Eight of them were at the time receiving treatment for substance use problem in residential treatment center, and an additional three were enrolled in outpatient treatment. Three of the participants had come to Sweden as unaccompanied minors, with origins from Asia, while a large majority of the others had a Swedish background. There were a clear heterogeneity among the participants regarding socioeconomic background, where some could be described as marginalized, while others emphasized that they had had a supportive family and safe upbringing conditions. Most of the participants reported varying degree of mental health issues, especially problems with anxiety, and eight had diagnoses such as ADHD and PTSD. The majority of the participants had dropped out of school of whom some had been working thereafter, while others had been unemployed.

Table 1. Illustrative overview of the participants drug use trajectories.

Stage:	First stage	Second stage	Third stage
Milad	**Tramadol**	**Tramadol**, cannabis, cocaine, heroin	**Heroin**, benzodiazepines, cocaine (crack)
Alice	Cannabis, **tramadol**	**Tramadol**, pregabalin, cannabis, benzodiazepines, ecstasy, cocaine, amphetamine	**Tramadol**, pregabalin, cannabis, benzodiazepines, ecstasy, cocaine, amphetamine
Fredrik	**Cannabis, tramadol**	**Tramadol**, cannabis, buprenorphine, ecstasy	**Buprenorphine, fentanyl**, tramadol, **benzodiazepines**
Edvin	**Tramadol**	**Tramadol, cannabis**	**Tramadol, cannabis**
Amir	Alcohol, **cannabis, tramadol**	**Tramadol**, cannabis, alcohol, ecstasy, cocaine, LSD, magic mushrooms	**Cannabis**, alcohol, ecstasy, cocaine, LSD, magic mushrooms
Lucas	**Cannabis, tramadol**, alcohol.	**Tramadol**, cannabis, alcohol	**Tramadol, benzodiazepines**, cannabis, alcohol, pregabalin, cocaine, ecstasy, LSD
Emma	**Cannabis, benzodiazepines**, alcohol, ecstasy, cocaine	**Cannabis**	**Tramadol**, cannabis, alcohol
Simon	**Cannabis, oxycontintramadol**	**Tramadol, cannabis**	**Tramadol, benzodiazepines, cannabis**, pregabalin amphetamine, cocaine
Jack	ADHD medication (non-medical use), **cannabis**, tramadol	**Tramadol**, cannabis, benzodiazepines, ecstasy, cocaine, pregabalin.	**Heroin**, tramadol, cannabis, benzodiazepines, ecstasy, cocaine, pregabalin
Liam	**Cannabis**	**Tramadol, cannabis**, amphetamine	**benzodiazepines, cannabis**, tramadol, cocaineamphetamine
Ahmad	**Tramadol**	**Heroin, tramadol**	**Buprenorphine, amphetamine**, tramadol, heroin
Elias	**Cocaine**	**Cocaine, tramadol, benzodiazepines**, "Z-drugs"	**Cocaine, tramadol, benzodiazepines**, "Z-drugs"
Lina	**Alcohol, cocaine**	**Alcohol, tramadol,cocaine**	**Alcohol, tramadol, cocaine**, benzodiazepines

Table 1 below provides an illustrative overview of the young people's drug use trajectories. The different columns provide an account of the substances they used at various stages of their drug use, with the main drugs reported by the participants shown in bold. Other substances used in parallel are not in bold, and substances used only once or a few times are not included. Alcohol is only included if it was identified as a problem. It should be noted that the table is not intended to present a comprehensive picture, but rather an illustrative one based on the participants' descriptions.

The table illustrates a significant heterogeneity in the young people's drug use trajectories. However, several common patterns can be discerned, such as tramadol being one of the first drugs used for most participants. These patterns will be further elaborated on in the following themes.

Results

The following section presents four themes that explore significant aspects in different stages of the young people's drug use trajectories.

"Everyone was taking it" – initiating tramadol use

Most participants reported initiating tramadol use early in their drug use trajectories, with three individuals reporting it as their first illicit drug. However, the most common scenario was to begin with cannabis use and then start using tramadol as well. The setting played a significant role in the initiation of tramadol use, with friends being the primary source of introduction to the drug. Tramadol was perceived as easy to access, for example through their cannabis dealer, as Fredrik described:

> With that [the cannabis use], you come into contact with criminal people, dealers. And other friends and so on. So then, sooner or later, you will come across other drugs as well. Because if you buy cannabis from a dealer, he always has, for example, tramadol, as well.

As the quote illustrates, the use of cannabis also introduced the young people to new social circles and connected them with the illicit drug market, where tramadol was also available. Some of the young people stated that they initially had been skeptical about using tramadol, but eventually changed their attitude due to social influence, as illustrated by Liam:

> I had no idea what it [tramadol] was in the first place, what it would feel like. […] I was thinking "It's not that dangerous". Everyone was taking tramadol, everyone I knew. They ate it like candy. I thought like "What the hell, I'll try one", you know. Then I felt like how nice it was.

Similarly with Liam, several of the young people described tramadol use as common and socially acceptable in their circles of friends, which contributed to their own perception of the drug as "not so dangerous". Furthermore, it became apparent that any concerns they had about tramadol were dismissed after the experience they had when using the drug. Even though most of the participants appeared to be in social circles where illicit drug use was common and socially acceptable, a few of the participants emphasized that most of their friends did not use drugs. Apart from social influence, the young people also reported self-medicating motivations for the initiation of tramadol use, as illustrated by Emma:

> Those who don't have anxiety and don't know how it feels, they probably don't understand what I mean when I say that it makes you completely anxiety-free. […] You felt no pain in your body, neither psychologically or physically. It was like walking on clouds. You felt good, you could think clearly again. You could sort of say "well, we'll take it another day". Like "it's cool, I can worry about it another day".

Apart from the alleviation of emotional distress, two participants reported initially using tramadol to relieve physical pain, although without a prescription. However, the fact that tramadol is a prescription drug contributed to a view of the drug as more acceptable and less dangerous than other

drugs on the illicit market, as Lina described: "*That you can get a prescription from a doctor and things like that, made me feel like it's more okay to try*".

After trying tramadol for the first time, it was mainly their experience of its effects that made it their drug of choice. However, setting aspects, such as the ease of use and the ability to hide the usage, also contributed to their preference of tramadol, as Amir explained:

> It's a tablet, it's easier to use. It's easier to carry it in your pocket. Because it doesn't smell, you just take it in your mouth, drink some water or juice. After 20 minutes you feel the effects. But cannabis and the other stuff… first you have to roll it. If you light it, it smells. You must have a place where you can smoke it. It's a little more difficult. But tramadol, it's easy to use.

The quote illustrates how tramadol is presented as advantageous since can be used in a simple and discreet manner, without requiring any rituals or equipment, as is associated with cannabis. This portrays tramadol as a drug that can be used 'anywhere' and at 'any time', rather than requiring a specific setting.

Overall, it appears that *setting* aspects, such as peer influence and ease of access played a central role in why most participants began using tramadol in the first place. Furthermore, self-medicating motivations appeared to be significant for the initiation.

"I Felt in my body that I needed something" – developing continuous tramadol use

Most of the young people in the study reported becoming immediately hooked on tramadol, which made them continue their use. They also mentioned personal characteristics or circumstances (*set*) where the use of tramadol catered to specific needs. In addition to many of them having psychiatric symptoms and diagnoses, several described themselves as anxious, overthinkers or having low self-esteem, where tramadol made them feel more confident in social interaction. Alice offered an example of this:

> I kind of felt like I could be myself. Because I overthink a lot otherwise, I'm a very nervous type of person. But I wasn't like that when I was taking tramadol. So, I could be myself, having no problem meeting new people, totally calm, you know. And comfortable, and happy and nice, and able to concentrate.

Several participants emphasized the dual effects of tramadol, which they described as an experience of calmness and well-being combined with increased energy. Some reported that the use of tramadol helped them cope with work or maintain concentration in school. Previous studies have found that tramadol can be used to improve sexual experiences (Fuseini et al., 2019; Ibrahim et al., 2017). However, this was only mentioned by one participant, as a "bonus effect".

Many of the young people stated that they began using tramadol daily almost immediately after initiation. It appeared that, instead of using tramadol occasionally initially, they started with regular use of low doses. It is noteworthy that even those who used tramadol as their first illicit drug began using it regularly right away. However, some others described how they gradually adapted to regular use, like Fredrik:

> When I tried tramadol for the first time, it really felt like a hole in my heart was being filled. I really felt that 'this is how you should feel when you feel good', sort of. So, it was…at the beginning, maybe the first half a year, we only used it on weekends, if there was a party and so on. But then it happens sooner or later that you started using it several days in a row. And then you felt bad, when you weren't taking it. So then it was easier to just go and buy a new chart, instead of quitting and feeling bad.

Through expressions like "we only used on weekends", it becomes evident that Fredrik's tramadol use initially was limited to a social setting. However, in accordance with many of the young people, he found it hard to quit once starting to use tramadol regularly, due to the withdrawal symptoms. They also reported that they needed to take higher doses to achieve the same effect due to increased tolerance, as described by Ahmad:

> The first week I took like 2-3 [tablets]. Then I bought it myself and could take it whenever I wanted. At first one…then you want to take more, the body gets used to it. You want to get this feeling that you got the first time. That's why you take more, because it doesn't work anymore. Then two becomes three, three becomes four…

As Ahmad, several of the young people reported that they kept raising the dosage, ending up on daily doses significantly higher than when the drug is prescribed (Boostani & Derakhsan, 2012). Many of them associated their use of higher doses with increasing side effects and other problems linked to their drug use. Simultaneously, some described how they used different strategies to keep their tolerance down, or set up limits of a maximum dose, like Emma:

> I never went over five pills a day. Because I told myself when I started with it, that "If I feel like I need more than five pills a day, then I don't want to do it anymore. Then it has been going too far".

Many of the young people stated that their tramadol use quickly turned into dependence, with the focus shifting from recreational use to maintaining a "normal state", like Liam described: "*It was more like I took them because I had to, otherwise I felt bad*". In addition to the more distinct withdrawal symptoms, some expressed a more diffuse feeling of discomfort when they were not taking the drug, like Milad: "*I felt in my body that I needed something, like I had lost something*".

In summary it appears that most of the young people rapidly developed a pattern of continuous tramadol use, where the effects of the drug and dependence dynamics (*drug)*, as well as personality and mental state (*set)*, were significant factors.

"Boosting the kick" or "switching in between" – expanding the drug repertoire

All the young people in the study reported engaging in polydrug use to varying degrees. Many of them continued to smoke cannabis alongside their tramadol use, and additionally, a few started with cannabis after their onset of tramadol. Several emphasized that these drugs complement each other, as they experienced that cannabis intensifies the effects of tramadol. "*I am boosting the kick*", as Edvin put it. Cannabis

was commonly referred to as a "basic drug" that they kept using throughout their drug use trajectories, as Alice described: "*Cannabis has always kind of been there, it feels like kind of a basic thing*. However, others stated that they did not prefer cannabis and had only used it to a limited extent, or had reduced their use when they started using other drugs.

The young people also reported how they eventually began to use additional substances occasionally alongside the regular use of their primary drugs. This was greatly influenced by aspects in the setting, such as financial factors and which drugs were available. While they had their clear drugs of choice, they used additional substances in party settings, when they could afford it, or when offered by friends, as Lucas explained:

> If I had to decide, I bought benzos and tramadol. And if I could afford it, I bought cannabis too. If my friends had cocaine or amphetamines or ecstasy or LSD or whatever, I took that too. Then it didn't matter that much, it was more fun to try something else that I didn't want to buy myself.

Many of the young people expressed this type of experimental use of different types of drugs that came their way randomly. In contrast, benzodiazepines, often played a more significant role in their drug use patterns. Several of them reported that they used benzodiazepines as a substitute to tramadol to relieve emotional distress, although they generally preferred tramadol. The main reason behind this was that benzodiazepines made them feel disorientated compared to tramadol, where they could stay focused without visible effects. Alice gave a typical description of this experience:

> The other [drugs] have been a bit of a substitute when I couldn't get hold of tramadol […] Because it's kind of the same effect. But I haven't liked benzos so much, because it kind of makes you crazy, you don't remember things. And then Lyrica [pregabalin], the same thing, somewhat the same effect, it alleviates the anxiety. But I haven't liked the other stuff as much as tramadol. Because it [tramadol] is not so clearly noticeable. If I take benzos, you can see it on me, you know, you get all drowsy and stuff like that. But you don't get that from tramadol, I can still be sharp, and I can focus and I can fix things I need to do, without being really high.

Some of the young people reported deliberately alternating between tramadol and benzodiazepines, "*you switched a little in between*" as Simon put it. He did this to keep the tolerance, and thus the costs, down. Another participant, Lucas, alternated between tramadol and benzodiazepines to avoid constipation from daily tramadol use, but also expressed awareness of the risk of combining these drugs: "*I was quite aware of not using them simultaneously to avoid respiratory depression*" . There were also examples where the young people used benzodiazepines to quit tramadol but ended up being addicted to benzodiazepines instead.

The price and availability of specific drugs sometimes also led to changes in their drug use patterns. Liam explained that "*Benzos was also much cheaper than tramadol. So, it turned out that I switched over to that*". While tramadol in general was described as an easily accessible drug, some reported that its availability decreased during certain periods, such as during the Covid-19 pandemic. Simon described:

> Then when corona came and things like that, it was difficult to get [tramadol] into the country. No one had tramadol, there was basically nothing. There were only amphetamines and cocaine. So it was that you had to start taking that instead. But that's not so nice.

The participants' drug use trajectories often, reflected a progression in their drug use, as Jack described: "*First hashish and then it became pills… then it became powder and so on and so on*". However, they usually did not abandon a drug when starting with a new one, but rather added more and more substances to their drug use repertoire.

Overall, it was evident that the young people's patterns of drug use were not only driven by individual factors (*set)* and properties of the drugs (*drug*), but were also shaped by the social context in which they found themselves *(setting)*.

"The first thing I thought of was drugs" – starting to lose control

Several participants reported that they eventually turned to more extensive drug use, often characterized by higher doses of tramadol and the use of multiple substances. While their tramadol use had initially facilitated their studies or work, it eventually began to have a negative impact on their daily life, such as causing them to drop out of school. They reported how obtaining and using drugs became the central focus in their lives, as Amir described: "*Every morning when I woke up, the first thing I thought of was drugs*". For some participants, this development occurred in parallel with an increasingly marginalized life situation, such as becoming homeless. At the same time, others emphasized their advantages regarding living conditions and family support as protective factors. However, most of them found themselves in a social setting where drug use was a central activity. Alice described what a day could look like during the most intense period as follows:

> Woke up, took tramadol, lay in bed basically all day, because I felt like crap so I kind of didn't want to do anything. Then meet some friends, smoke [cannabis], take something else. Later in the evening, a lot of people came home to me and my ex. And then it was kind of a party. So cocaine and tramadol and Lyrica [pregabalin] and benzos and whatever.

Some of the young people describe situations or periods where they combined drugs in an uncontrolled way, leading to various drug-related incidents. However, in the chaotic situation they found themselves in, they did not care about the risks, as illustrated by Lina:

> I was so sad and I kind of didn't care about myself and my health and stuff either. So, I mixed [substances] and kind of lost control. And woke up in hospital. […] It wasn't that I wanted to die, but I lost control completely and….several times in a short period of time. Waking up in jail…and then I had been mixing like benzos, alcohol, tramadol and cocaine. And so it was… I was in a pretty bad state, you could say.

Similar to Lina, several of the young people emphasize the severity of their drug use and its consequences when looking back. Some of them reported experiences of overdoses,

including seizures induced by tramadol or a combination of substances. For example Liam, who explained: "*You are not aware of what you have in the system. And then things like that happen*". These examples also relate to the concept of *set*, as they portray their former selves as careless and "out of control".

Some participants eventually transitioned from tramadol to stronger opioids such as heroin, buprenorphine and fentanyl. Like other drugs, they were introduced to these substances through drug-using peers. Once they started using stronger opioids alongside tramadol, their tolerance increased, and they no longer experienced the same effects from tramadol. Milad stated "*After I got hooked on heroin, tramadol no longer worked for your body*". Consequently, they primarily used the stronger opioids instead. Participants who transitioned to heroin reported experiencing a strong dependence that could not be compared to tramadol or other drugs. Jack remarked "*Once you've tried heroin, there's no drug that comes close to it*". In addition to heroin having a special position among those who had used the drug, it also held a distinct status among others, who portrayed it as the only drug they would never use. Liam's statement illustrates this:

> It has always been "no". I never wanted to try it [heroin]. Because I know, if you'd like it, then you're kind of stuck. Because I know how I was on tramadol. I loved it, even though I hated it. But no…I have more self-respect…I would never take something like that. Never in my life.

The quote indicates that heroin use goes beyond what is considered "acceptable drug use". Similarly to heroin, injecting drugs was highlighted as a boundary that they did not want to cross. For instance, Elias differentiated himself from the injecting heroin users that he met in residential care, saying: "*They're real horse-junkies, you know. I've never taken a syringe in my entire life.*[…]. *It's a whole other level*".

It is worth noting that the young people, despite their extensive experiences with drug use, only reported occasional experiences of injecting drugs. Alice stated that she injected amphetamine once, which made her feel that she had crossed a line that she had intended not to pass: "*I have always told myself that smoking and pills, well…but injections, absolutely not!*"

However, it is important to note that not all participants followed a pattern of using more and more drugs. Some describe periods where they rather took a step back to less intensive drug use or abstinence. Nevertheless, for most of them, there was a progression toward more severe drug use over time, even though they emphasized that they maintained certain limits. It is evident that this development has occurred through an interplay of dependence dynamics (*drug*), changing attitudes (*set*), as well as *setting* aspects.

Discussion

We have explored drug use trajectories among young people with experiences from problematic tramadol use. As previous studies have found (Bassiony et al., 2014; Holmstedt et al., 2020; Richert & Johnson, 2013), tramadol often entered early into the drug use trajectories of young people, with some even using it as their first illicit drug. However, in many cases, tramadol use followed a period of cannabis use, consistent with another study conducted in Sweden (Holmstedt et al., 2020). The initiation of tramadol use commonly occurred in a social context where the influence from drug-using peers was significant. Non-medical tramadol use seems to have been common and socially acceptable in their social circles, contributing to a perception that "everyone was using it". A study by Mui et al. (2014) suggests that peer influence plays a significant role in the initiation of prescription drug use by providing exposure, access to the drug, motivation to use and a setting to start using. Previous studies demonstrate that young people generally associate prescription opioid use with relatively low risk compared to other drugs, as they are also prescribed by doctors (Daniulaityte et al., 2012; Mars et al., 2014).

Consistent with prior research, the young people in the study used tramadol for various reasons, including feeling euphoric and relaxed, relieving emotional distress, and staying alert in school or at work (Bassiony et al., 2015; Finsam, 2019; Fuseini et al., 2019; Ibrahim et al., 2017). However, the primary motive highlighted by most participants was to alleviate anxiety and other emotional distress. Although mental health issues are widespread among young people with problematic drug use in general, earlier research conducted in an outpatient setting in Sweden did not find a higher prevalence of mental health issues among people who use tramadol specifically (Herrnsdorf et al., 2022; Holmstedt et al., 2020; Olsson et al., 2017). Nevertheless, it is worth noting that most of the young people in the study can be considered to have had a high severity of drug use and were in residential treatment, which is also associated with a higher incidence of mental health issues (Bertrand et al., 2013; Richert et al., 2020). Substance use can serve as self-medication for underlying mental health issues, but can also exacerbate psychiatric symptoms (Grubb, 2019; Richert et al., 2020). Darke (2013) describes how self-medication can be a driving force in drug stage progression, where underlying mental health issues and dependence dynamics, such as withdrawal relief, interact. Most of the young people in the study described experiencing a dependence on tramadol, where their motivation for use shifted toward maintaining a "normal state".

Non-medical prescription opioids are commonly used in a polydrug context alongside well-established illicit drugs (Daniulaityte et al., 2012; Subramaniam & Stitzer, 2009). The majority of the young people in the study reported combining tramadol and cannabis, which is consistent with findings from other Swedish studies (Herrnsdorf et al., 2022; Holmstedt et al., 2020). The findings also demonstrate how the majority of the participants eventually added more and more substances to their drug use repertoire such as benzodiazepines, cocaine, amphetamines and ecstasy. Similar patterns of polydrug use among young people who use tramadol has been found in other Swedish studies as well (Holmstedt et al., 2020; Olsson et al., 2017). Unlike these studies, the current study also explores the transitions to using of a wider range of substances.

The findings show that the young people in many cases attributed different meaning to tramadol and other substances that they used simultaneously or sequentially. While

many of the young people highlighted tramadol as their drug of choice, benzodiazepines were often presented as a substitute in order alleviate anxiety. Cannabis, on the other hand was commonly referred to as a 'basic drug' present throughout their drug use trajectories, as well as a "booster" of the effects from tramadol. Finally, substances like cocaine, amphetamines and ecstasy, were mainly associated with a 'party setting' and used more occasionally. Lalander (2001) suggests that substances that are associated with partying may protect the user from more extensive use, unlike substances that are not tied to a specific setting. In contrast, the participants portrayed tramadol as a drug that could easily be used in different contexts, without visible effects.

Even though many of the participants clearly distinguished between their regular drug use of primary drugs and occasional use of "whatever drug that came their way", several reported an eventual escalation of their drug use, characterized by extensive polydrug use. They described experiencing a loss of control over their drug use, which was often linked to various drug-related incidents caused by a mix of substances. Consistent with findings from a study by Järvinen and Ravn (2011), the loss of control included both temporarily losing control during 'a bad trip', and a more general loss of control over their life situation.

Biggar et al. (2017) suggest that the social setting may have a greater impact on the progression to heavier drug use than the specific substances themselves. They explain that entering an illicit drug subculture provides opportunities to use different illicit drugs and contributes to positive attitudes to the substances used in that setting. In the present study it became apparent that the young people's boundaries for what they considered as risky or acceptable drug use changed over time, where they eventually engaged in drug practices that they previously had condemned. Earlier studies have shown how young people, through everyday interaction with other people who use drugs and involvement in drug scenes, learn to appreciate or dismiss different drug use practices and change their perceptions of risk, resulting in transitions in drug use (Fast et al., 2010; Mayock, 2005).

Some of the young people associated the increased severity of drug use with a more marginalized life situation, such as becoming homeless. Fast et al. (2010) highlight how early and ongoing experiences of marginalization and social exclusion, contribute to transitions to more harmful drug use practices. However it is worth noting that other participants emphasized that they have had stable living conditions and a supportive family, both earlier in life and alongside their drug use.

For some of the participants, the progress to more severe drug use was associated with the transition to stronger opioids, such as heroin. As with other drugs, they were introduced to these substances by drug-using peers. However, they also reported that tolerance increase played a significant role in this transition. Several studies suggest that non-medical prescription opioid use is a strong risk factor for initiating heroin use, which carries additional severity and risks (Compton et al., 2016; Guarino et al., 2018; Mars et al., 2014; Syverstsen et al., 2017). Nevertheless, it should be noted that most young people who use prescription opioids will not progress to heroin use (Compton et al., 2016). In line with a study from Mayock (2005) several participants expressly distanced themselves from heroin use and drug injection, pointing this out as a line they did not want to cross.

The drug use trajectories of the young people in the study show similarities with the progression of drug use described in drug career- or stage models (Faupel, 1991; Svensson & Karlsson, 2018). However, they are not as linear as these models imply and involve a complex interaction of factors related to *drug*, *set* and *setting*. Notably, several participants reported using tramadol daily almost immediately after initiation, unlike the gradual progression described in career models (Faupel, 1991; Svensson & Karlsson, 2018). Their early initiation of regular opioid use also indicates a severity and pattern of drug use that is typically associated with people further ahead in their drug use trajectories. While many of them initially perceived tramadol as 'not so dangerous', they rather emphasize the seriousness of the drug when looking back at their use. It should be noted, however, that the young people in the study were mainly recruited in a treatment context and, in general, had a high drug use severity. This means that their drug use trajectories may not be representative of young people who use tramadol in general.

Conclusion

This study illustrates the complexity of young people's drug use trajectories, where the drugs' effects, personal circumstances, and environmental factors interact. Problematic tramadol use usually occurs in a polydrug setting where the motives behind the use vary depending on type of drug and stage of drug use. The study highlights the significance of self-medication and dependence dynamics in young people's progression toward more severe drug use, as well as the importance of peer influence and other environmental factors. The results may enhance our understanding of young people's own perspectives of their drug use and its progression, which can be valuable in improving treatment interventions for this target group. Furthermore, the results emphasize the importance of addressing problematic tramadol use in preventive efforts, as well as ensuring that young people with mental health issues receive appropriate care at an early stage, in order to prevent self-medication with illicit drugs.

Funding

This work was supported by The Swedish Research Council for Health, Work Life and Welfare (FORTE)

ORCID

Kristin Arve http://orcid.org/0000-0001-8975-2249
Björn Johnson http://orcid.org/0000-0002-1601-2706

References

Alley, E. S., Ryan, T., & Sternberg, K. V. (2014). Predictors of readiness to change young adult drug use in community health settings. *Substance Use & Misuse*, *49*(3), 253–261. https://doi.org/10.3109/10826084.2013.825920

Archibald, M. M., Ambagtsheer, R. C., Casey, M. G., & Lawless, M. (2019). Using zoom videoconferencing for qualitative data collection: Perceptions and experiences of researchers and participants. *International Journal of Qualitative Methods*, *18*, 160940691987459. 1609406919874596. https://doi.org/10.1177/1609406919874596

Arnett, J. J. (2005). The developmental context of substance use in emerging adulthood. *Journal of Drug Issues*, *35*(2), 235–254. https://doi.org/10.1177/002204260503500202

Baggio, S., Studer, J., Deline, S., N'Goran, A., Dupuis, M., Henchoz, Y., Mohler-Kuo, M., Daeppen, J.-B., & Gmel, G. (2014). Patterns and transitions in substance use among young Swiss men: A latent transition analysis approach. *Journal of Drug Issues*, *44*(4), 381–393. https://doi.org/10.1177/0022042614526996

Bashirian, S., Barati, M., & Fathi, Y. (2014). Prevalence and factors associated with tramadol abuse among college students in west of Iran: An application of the theory of planned behavior. *Avicenna Journal of Neuro Psych Physiology*, *1*(1), 26–30. https://doi.org/10.17795/ajnpp-20314

Bassiony, M. M., Salah El-Deen, G. M., Yousef, U., Raya, Y., Abdel-Ghani, M. M., El-Gohari, H., & Atwa, S. A. (2015). Adolescent tramadol use and abuse in Egypt. *The American Journal of Drug and Alcohol Abuse*, *41*(3), 206–211. https://doi.org/10.3109/00952990.2015.1014959

Bertrand, K., Brunelle, N., Richer, I., Beaudoin, I., Lemieux, A., & Menard, J. M. (2013). Assessing covariates of drug use trajectories among adolescents admitted to a drug addiction center: Mental health problems, therapeutic alliance, and treatment persistence. *Substance Use & Misuse*, *48*(1-2), 117–128. https://doi.org/10.3109/10826084.2012.733903

Biggar, R. W., Jr, Forsyth, C. J., Chen, J., & Burstein, K. (2017). The poly-drug user: Examining associations between drugs used by adolescents. *Deviant Behavior*, *38*(10), 1186–1196. https://doi.org/10.1080/01639625.2016.1246022

Boostani, R., & Derekhsan, S. (2012). Tramadol induced seizure: A 3-year study. *Caspian Journal of Internal Medicine*, *3*(3), 484487.

Bumpus, J. A. (2020). Low-dose tramadol as an off-label antidepressant: A data mining analysis from the patients' perspective. *ACS Pharmacology & Translational Science*, *3*(6), 1293–1303. https://doi.org/10.1021/acsptsci.0c00132

Compton, W. M., Jones, C. M., & Baldwin, G. T. (2016). Relationship between nonmedical prescription-opioid use and heroin use. *The New England Journal of Medicine*, *374*(2), 154–163. https://doi.org/10.1056/NEJMra1508490

Daniulaityte, R., Falck, R., & Carlson, R. G. (2012). "I'm not afraid of those ones just 'cause they've been prescribed": Perceptions of risk among illicit users of pharmaceutical opioids. *The International Journal on Drug Policy*, *23*(5), 374–384. https://doi.org/10.1016/j.drugpo.2012.01.012

Darke, S. (2013). Pathways to heroin dependence: Time to re-appraise self-medication. *Addiction , 108*(4), 659–667. https://doi.org/10.1111/j.1360-0443.2012.04001.x

European Monitoring Centre for Drugs and Drug Addiction. (2021a). *European Drug Report 2021: Trends and Developments*. Publications Office of the European Union.

European Monitoring Centre for Drugs and Drug Addiction. (2021b). *Non-medical use of medicines: health and social responses*. https://doi.org/10.2810/679602

Fast, D., Small, W., Krüsi, A., Wood, E., & Kerr, T. (2010). I guess my own fancy screwed me over': transitions in drug use and the context of choice among young people entrenched in an open drug scene. *BMC Public Health*, *10*(1), 126. https://doi.org/10.1186/1471-2458-10-126

Faupel, C. E. (1991). *Shooting dope: Career patterns of hard-core heroin users*. University Press of Florida.

Finsam. (2019). *Tramadol Maria Malmö: Största problemdrogen efter cannabis är tramadol – ökad förståelse av ett nytt drogmönster på Maria Malmö*. [Tramadol Maria Malmö: The biggest problem drug after cannabis is tramadol - increased understanding of a new drug pattern at Maria Malmoe]. Retrieved from https://www.finsamimalmo.se/portals/finsam/FinsamDokument/Slutrapport%20Tramadol%20Maria%20Malmö%20projektetet.pdf

Fuseini, A. G., Afizu, A., Yakubu, Y. H., & Nachinab, G. (2019). Facilitators to the continuous abuse of tramadol among the youth: A qualitative study in Northern Ghana. *Nursing Open*, *6*(4), 1388–1398. https://doi.org/10.1002/nop2.353

Gili, A., Lancia, M., Mercurio, I., Bacci, M., Nicoletti, A., Pelliccia, C., & Gambelunghe, C. (2022). Patterns of prescription medicine, illicit drugs, and alcohol misuse among high-risk population: A factor analysis to delineate profiles of polydrug users. *Healthcare , 10*(4), 710. https://doi.org/10.3390/healthcare10040710

Grubb, L. K. (2019). Personal and socioeconomic determinants in medication-assisted treatment of opioid use disorder in adolescent and young adults. *Clinical Therapeutics*, *41*(9), 1669–1680. https://doi.org/10.1016/j.clinthera.2019.07.019

Guarino, H., Mateu-Gelabert, P., Teubl, J., & Goodbody, E. (2018). Young adults' opioid use trajectories: From nonmedical prescription opioid use to heroin, drug injection, drug treatment and overdose. *Addictive Behaviors*, *86*, 118–123. https://doi.org/10.1016/j.addbeh.2018.04.017

Hartogsohn, I. (2017). Constructing drug effects: A history of set and setting. *Drug Science, Policy and Law*, *3*, 205032451668332. 2050324516683325. https://doi.org/10.1177/2050324516683325

Herrnsdorf, E. A., Holmstedt, A., & Håkansson, A. (2022). Tramadol misuse in treatment-seeking adolescents and young adults with problematic substance use–Prediction of treatment retention. *Addictive Behaviors Reports*, *16*, 100446. https://doi.org/10.1016/j.abrep.2022.100446

Holmstedt, A., Håkansson, A., & Olsson, M. (2020). Clinical characteristics distinguishing tramadol-using adolescents from other substance-using adolescents in an out-patient treatment setting. *Addictive Behaviours Reports*, *11*(100272). https://doi.org/10.1155/2017/6716929

Hser, Y. I., Longshore, D., & Anglin, M. D. (2007). The life course perspective on drug use: A conceptual framework for understanding drug use trajectories. *Evaluation Review*, *31*(6), 515–547. https://doi.org/10.1177/0193841X07307316

Hydén, M. (2016). Att lyssna till en kör av röster: Den berättarfokuserade intervjun. [Listening to a chorus of voices: The story focused interview.]*Socialvetenskaplig Tidskrift*, *7*(1–2), 137–158. https://doi.org/10.3384/SVT.2000.7.1-2.2819

Ibrahim, A. W., Yerima, M. M., Pindar, S. K., Onyencho, V. C., Ahmed, H. K., Machina, B. K., & Wakil, M. A. (2017). Tramadol abuse among patients attending an addiction clinic in North-Eastern Nigeria: Outcome of a four year retrospective study. *Advances in Psychology and Neuroscience*, *2*(1–2), 31–37. https://doi.org/10.11648/j.apn.s.2017020201.16

Järvinen, M., & Ravn, S. (2011). From recreational to regular drug use: Qualitative interviews with young clubbers. *Sociology of Health & Illness*, *33*(4), 554–569. https://doi.org/10.1111/j.1467-9566.2010.01303.x

Kataja, K., Karjalainen, K., Savonen, J., Hakkarainen, P., & Hautala, S. (2019). How do people attribute their polydrug use? A mixed methods approach. *Deviant Behavior*, *40*(9), 1157–1170. https://doi.org/10.1080/01639625.2018.1472931

Lalander, P. (2001). (). Hela världen är din – en bok om unga heroinister. [The whole world is yours – a book about young heroin addicts] Lund: Studentlitteratur.

Mars, S. G., Bourgois, P., Karandinos, G., Montero, F., & Ciccarone, D. (2014). "Every 'never'I ever said came true": Transitions from opioid pills to heroin injecting. *The International Journal on Drug Policy*, *25*(2), 257–266. https://doi.org/10.1016/j.drugpo.2013.10.004

Mayock, P. (2005). 'Scripting'risk: Young people and the construction of drug journeys. *Drugs: Education, Prevention and Policy*, *12*(5), 349–368. https://doi.org/10.1080/09687630500183020

Moore, D. (1993). Beyond Zinberg's 'social setting': A processural view of illicit drug use. *Drug and Alcohol Review*, *12*(4), 413–421. https://doi.org/10.1080/09595239300185511

Mui, H. Z., Sales, P., & Murphy, S. (2014). Everybody's doing it: Initiation to prescription drug misuse. *Journal of Drug Issues*, *44*(3), 236–253. https://doi.org/10.1177/0022042613497935

Olsson, M. O., Öjehagen, A., Brådvik, L., Kronstrand, R., & Håkansson, A. (2017). High rates of tramadol use among treatment-seeking adolescent in Malmö, Sweden: A study of hair analysis of nonmedical prescription opioid use. *Journal of Addiction*, *2017*, 6716929–6716929. https://doi.org/10.1155/2017/6716929

Rennstam, J., & Wästerfors, D. (2011). Att analysera kvalitativt material. [To analyze qualitative material]. In Ahrne, G. & Svensson, P. (Ed.), *Handbok i kvalitativa metoder*. Liber.

Richert, T., Anderberg, M., & Dahlberg, M. (2020). Mental health problems among young people in substance abuse treatment in Sweden. *Substance Abuse Treatment, Prevention, and Policy*, *15*(1), 43. https://doi.org/10.1186/s13011-020-00282-6

Richert, T., & Johnson, B. (2013). Illicit use of methadone and buprenorphine among adolescents and young adults in Sweden. *Harm Reduction Journal*, *10*(1), 27. https://doi.org/10.1186/s13011-020-00282-6

Shadnia, S., Soltaninejad, K., Heydari, K., Sasanian, G., & Abdollahi, M. (2008). Tramadol intoxication: A review of 114 cases. *Human & Experimental Toxicology*, *27*(3), 201–205. https://doi.org/10.1177/0960327108090270

Svensson, B., & Karlsson, P. (2018). *Missbruk av heroin och andra opioider*. Studentlitteratur.

Subramaniam, G. A., & Stitzer, M. A. (2009). Clinical characteristics of treatment-seeking prescription opioid vs. heroin-using adolescents with opioid use disorder. *Drug and Alcohol Dependence*, *101*(1-2), 13–19. https://doi.org/10.1016/j.drugalcdep.2008.10.015

Syvertsen, J. L., Paquette, C. E., & Pollini, R. A. (2017). Down in the valley: Trajectories of injection initiation among young injectors in California's Central Valley. *The International Journal on Drug Policy*, *44*, 41–49. https://doi.org/10.1016/j.drugpo.2017.03.003

Terry, G., Hayfield, N., Clarke, V., & Braun, V. (2017). Thematic analysis. *The SAGE handbook of qualitative research in psychology*., *2*, 17–37, https://doi.org/10.4135/9781526405555.n2

Tjäderborn, M., Jönsson, A. K., Hägg, S., & Ahlner, J. (2007). Fatal unintentional intoxications with tramadol during 1995–2005. *Forensic Science International*, *173*(2-3), 107–111. https://doi.org/10.1016/j.forsciint.2007.02.007

Trier-Bieniek, A. (2012). Framing the telephone interview as a participant-centred tool for qualitative research: A methodological discussion. *Qualitative Research*, *12*(6), 630–644. https://doi.org/10.1177/1468794112439005

White, H. R., Xie, M., Thompson, W., Loeber, R., & Stouthamer-Loeber, M. (2001). Psychopathology as a predictor of adolescent drug use trajectories. *Psychology of Addictive Behaviors*, *15*(3), 210–218. https://doi.org/10.1037/0893-164X.15.3.210

Winstock, A. R., Borschmann, R., & Bell, J. (2014). The non-medical use of tramadol in the UK: Findings from a large community sample. *International Journal of Clinical Practice*, *68*(9), 1147–1151. https://doi.org/10.1111/ijcp.12429

Zinberg, N. E. (1984). *Drug, set and setting: The basis for controlled intoxicant use*. Yale University press.