



Original research article

Needle fixation among drug users

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Abstract

Needle fixation describes the state in which drug users derive satisfaction from using needles, regardless of the substance applied via the needle. The phenomenon is essential for therapeutic approaches for needle-addicted persons, as it significantly affects the success level of the therapeutic process.

Goals: To describe the prevalence of individual dimensions of needle fixation among drug users in the city of Plzeň, considering their factors of drug use.

Methods: The data were collected with the help of the NEFPRO questionnaire working with fixation dimensions, specifically: preference of the effect of intravenous application, sexual satisfaction, sexual experience, pain, substitution, ritual and flushing. The questionnaire was complemented with several questions related to age, gender, time of abuse and the primary drug abused. The said variables were statistically tested in the SPSS program in relation to the fixation dimensions, by *t*-test for independent averages, ANOVA and bivariate correlations. The data were collected among injection drug users (*N* = 89) in Plzeň in cooperation with Spolek Ulice Plzeň, a non-profit organization providing field programs.

Results: The dimension of needle fixation most frequently present among the users was substitution (94.4%) and sexual practice (89.9%), followed by sexual pleasure (78.6%) and pain (66.3%); the remaining dimensions were marginally represented. A statistically significant relationship (*p* < 0.05) was identified between gender and the dimensions of pain and flushing; the type of drugs used shows a relation with the dimension of rituals. None of the dimensions significantly relate to age or duration of use.

Keywords: Drug addiction; Needle fixation; Ritual

Introduction

The world has known about the phenomenon of needle fixation for a long time, and recently it has also been discussed in our country by experts and users (Pešek, 2013). A breakthrough in the information on the phenomenon of needle fixation came at the turn of the millennium when the first (and so far only) definition of the concept was published in an article called "Towards a holistic understanding of injecting drug use: An overview of needle fixation." According to the article, needle fixation is: "Repetitive puncturing of the skin with or without the injection of psychoactive drugs via intravenous, subcutaneous or intra-muscular routes, irrespective of the drug or drugs injected or the anticipated effects of the drug" (Pates et al., 2001, p. 15). Needle fixation is supposed to develop on the principle of operant conditioning, based on the phenomenon known as 'kick-in' (Pates et al., 2001). After a time, the organism links the pleasant and strong kick-in experience with the injection. It automatically saves the information and learns that the two impulses are related to each other. The conditioned response gets more and more fixed by repetitions (Pešek, 2013). Studies by Pates et al. (2001, 2009)

show that needle fixation is a comprehensive phenomenon containing the following features: repeated aspiration (drawing blood into the syringe and then returning it into the vein; stubborn search for a point for puncture in spite of a strongly devastated vascular system; potential alternative drug application; and division of the drug dose into smaller amounts and therefore more frequent injections. For a small group of injection drug users, the secondary gains from injection may cause the users to prefer that way of application and to repeat the process in the future (Pešek, 2013).

The phenomenon is not only significant as one of the factors of understanding drug addiction, but also as a factor that has an influence on the success of the therapy. As Judson et al. (2010) state, needle fixation can be found in methadone therapy as well; the substitution is applied with a syringe if the patient/client longs for an instant effect, higher euphoria, because of the taste of the substance or because of sickness after ingestion. When needle fixation is proved, the percentage of successful abstinence and of avoiding relapse is considerably reduced (Pates et al., 2001; 2009). However, determining whether a person has needle fixation does not always happen (Walmsley, 2012), which may have an impact on the success of the therapeutic process.

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Needle fixation also brings a number of social impacts along with it. For example, the rules of the substitution treatment program are clearly defined; the user should actively participate in their situation and be stabilized – housing, employment, etc. If a relapse occurs, not only will it break the rules, but the overall social situation may deteriorate. According to Martin Pešek, there is a connection between needle fixation and substitution treatment. The user does not have withdrawal symptoms as the need itself is saturated. Nevertheless, cases where Subutex or methadone has been applied have been reported (Pešek, 2013).

Needle fixation is not only connected with the abuse of illegal drugs. In the Czech Republic, Karel Hampl tackled the topic of needle fixation in the 1990s – in his study of the intravenous use of Alnagon (Pešek, 2013). Pates et al. (2005) also describe the development of fixation in patients treated with neuralgia.

The annual report on the situation in drug matters in the Czech Republic from 2017 states that the number of injection drug users reached 43.7 thousand (approx. 0.4% of the population). Opiates/opioids and pervitin are most frequently applied with a needle (Mravčík et al., 2018). The goal of this article consists in describing the representation of the individual dimensions of needle fixation among drug users in one of the administrative centres of the Czech Republic, particularly in the city of Plzeň, and in researching the connections between the dimensions and the user's characteristics such as gender, age duration of use, and the category of the substance used.

Pates et al. (2001) created his questionnaire of needle fixation, NEFPRO, based on seven dimensions: preference of the effect of intravenous use, sexual satisfaction, sexual experience, pain, substitution, ritual and flushing.

Preference for injection

The motivation to use drugs with the help of a needle is based primarily on the speed of the effect (the so called “kick-in”). There is also an “economical aspect”, as the entirety of the active ingredient is used (unlike other applications) (Giddings et al., 2003). Pates et al. (2005) found that the users considered injecting as a part of their drug use; the aim of which was efficient delivery of the drug.

Sexual pleasure

The actual injection induces sexual arousal (Pates et al., 2001). Pates et al. (2005) connected sexual associations to intravenous application: some users speak about the connection between the needle penetrating the skin (and the subsequent high from this) and compared it to an orgasm. This can be compared to sado-masochistic sex. In this situation, the injection can be compared to sexual intercourse. The phallic shape of the needle may constitute a supportive phenomenon. Pates et al. (2001) interviewed a homosexual user who applied the syringe into the penis or into the anus (without the needle on the syringe). The man got great satisfaction from this; he even had orgasms several times. This occurred before using the drug; so it could not have been caused by the substance (Pešek, 2013). Another variant consisted in fully replacing sexual intercourse with syringe application. This has been proved in a study by Howard and Borges (1971), whose interviews with syringe users in San Francisco revealed that men suffering from low self-confidence and paranoia of intercourse with another person turn their interest to the needle which serves as a substitute for sex.

Sexual experience

It is common practice that the first dose or several initial applications are injected by somebody who has been using drugs for a longer time and has more experience, which earns him the position of “shooter” (McBride et al., 2001). One of the study participants reported that mutual injection between a woman and a man was commonplace. He remembered the moment his partner played with the syringe and how she drew blood into it before injecting him. He considered this a kind of foreplay (Howard and Borges, 1971).

Pain

For most injectors, the pain of injecting is something they have to endure, but for others the pain is part of the pleasure (Pates et al., 2005). McBride et al. (2001) compare this pleasure in pain to the pleasure in self-mutilation. Some users consider the pain felt during application pleasant; it gives them a similar benefit to deliberate self-mutilation. Hampl (2001) also describes the injection of drug as a form of self-punishment; which is then followed by instant mental relief.

Substitution

Intravenous application of a substance other than a drug (e.g. sterilized water, substances used in substitution therapy, different irrigations, etc.).

Flushing

The injection is more frequently accompanied by repeated aspiration in the case of needle fixation. Flushing is a repeated drawing in of blood into the syringe, which differs from the actual application by occurring before and/or after the drug application. Pešek (2013) summarizes the evidence of the connection of repeated aspiration and fascination with needles, but also of an increase of the perceived effect of the drug. Yet some users try to use the residuals seen in the syringe for control, making sure to apply the drug correctly into the vein (Pešek, 2013; Wooldridge, 2017).

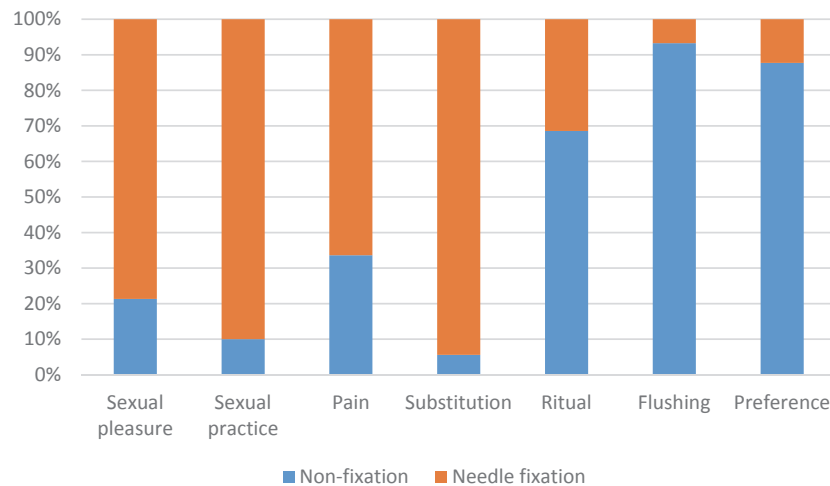
Ritual

According to Pates et al. (2005), the injection implies a number of successive actions: get the drug, prepare the aids indispensable for application (like a spoon, a pan or cut-off can, filters), add water, heat up the substance, find a suitable point for puncture, apply the drug by injection, and possibly treat the puncture points. Hampl (2001) conducted a survey among a group of heroin addicts being treated with methadone. He observed that drug craving should not have been present because pharmacologically the addicts were being adequately medicated, but that there was still a strong desire to inject. The whole process of successful injection brings a form of satisfaction (Wooldridge, 2017). Under specific circumstances, the process of injection is more important than the benefits from the effect of intravenous use of the drug (Pates and Gray, 2009).

Martin Pešek (2013), in his article: ‘Needle fixation: reasons for applying drugs via injection – a theoretical review,’ speaks of needle fixation as a psychosocial problem; thus one of the treatment options is psychotherapy. He mentions the possibility of pharmacological treatment, but also points out that at present the knowledge about the effective treatment of needle dependence is not at a satisfactory level. Therefore, it is essential for the phenomenon of needle fixation to be given more consideration when working with drug users (whether therapeutically or socially). Harm Reduction employees can obtain information from users in contact centers or in field

Table 1b. Score of users in individual dimensions of needle fixation

Presence of fixation	Sexual pleasure	Sexual practice	Pain	Substitution	Ritual	Flushing	Preference
	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
Fixation absent	21.3	10.0	33.6	5.6	68.5	93.2	87.7
Fixation present	78.6	89.9	66.3	94.4	31.4	6.7	12.3

**Fig. 1.** Score of users in individual dimensions of needle fixation (N = 89)**Table 2. t-test of gender vs. needle fixation dimensions (N = 89)**

Dimension	Sex	Mean	Std. Deviation	t	Sig. (2-tailed)
Flushing	women	2.15	1.18	-2.141	0.035
	men	2.67	1.03		
Substitution	women	4.82	0.52	-0.477	0.635
	men	4.87	0.53		
Pain	women	3.95	1.26	-2.222	0.029
	men	4.46	0.87		
Sexual practice	women	4.83	0.51	0.646	0.520
	men	4.73	0.81		
Sexual pleasure	women	4.48	0.98	-0.042	0.966
	men	4.49	0.80		
Ritual	women	3.27	1.29	-1.551	0.125
	men	3.69	1.16		
Preference	women	2.22	1.27	-0.725	0.471
	men	2.43	1.35		

No relation of the needle fixation dimensions with age or with duration of use was found.

Table 3 shows the relationship between primary drugs and needle fixation. A statistically significant relationship was found only in the dimension of rituals ($F = 3.45$, $p < 0.05$). No statistically significant relation was found in the remaining dimensions of needle fixation.

Interesting interdimensional correlations were found in the dimension of rituals, which correlates with pain ($r = 0.28$, $p < 0.01$), flushing ($r = 0.25$, $p < 0.05$) and sexual practice ($r = 0.2$, $p < 0.05$). Additionally, sexual practice correlates with substitution ($r = 0.31$, $p < 0.01$), sexual pleasure ($r = 0.39$, $p < 0.01$)

and pain ($r = 0.21$, $p < 0.05$). Pain alone additionally correlates with substitution ($r = 0.28$, $p < 0.01$).

Discussion

The literature points out that the type of drug has an effect on needle fixation (see Horyniak et al., 2007; Robinson et al., 2000; Treffurth and Pal, 2010). Our results only suggested a connection in the dimension of rituals, where a significantly higher value is shown by pervitin users. Such a connection is most frequently described in relation to substitution substanc-

Table 3. ANOVA drug used vs. needle fixation dimension

Dimension		Descriptives			ANOVA test	
		Pervitin	Opiates	Combined	<i>F</i>	<i>p</i>
Flushing	Mean	2.43	2.69	2.44	0.428	0.653
	SD	1.09	1.11	1.17		
Substitution	Mean	4.85	4.95	4.74	0.805	0.45
	SD	0.57	0.15	0.66		
Pain	Mean	4.25	4.50	4.12	0.683	0.508
	SD	1.04	0.82	1.29		
Sexual practice	Mean	4.77	4.71	4.79	0.069	0.933
	SD	0.70	0.92	0.53		
Sexual pleasure	Mean	4.46	4.62	4.41	0.331	0.719
	SD	0.90	0.77	0.87		
Ritual	Mean	3.81	3.33	3.00	3.448	0.036
	SD	1.09	1.38	1.20		
Preference	Mean	2.26	2.31	2.71	0.724	0.488
	SD	1.23	1.51	1.37		

Source: Own research, *N* = 89

es, methadone and subutex, which are either injected (in spite of not being intended for injection), or whose use is accompanied by compulsive intravenous use of small doses of other substances because of fixation (Hampl, 2001). In our case, we did not focus on substitution substances; but it would be interesting to further investigate the factor of a specific drug in needle fixation.

In our study, the most frequently represented dimension of needle fixation was substitution (94.4%) and sexual practice (89.9%), followed by sexual pleasure (78.6%) and pain (66.3%).

Factors like age, gender or social status were not considered in other studies dealing with fixation – and therefore the results cannot be compared. The available literature predominantly includes qualitative studies. Hinton et al. (2013) describe the connection of needle fixation and impulsiveness, and their results show that injection drug users with needle fixation were more impulsive than users of non-injection drugs. Many studies show that repeated aspiration is a sign of needle fixation, as is an obsession with looking at blood during the process of drug application (Pates, 2004). Furthermore, injection primarily brings pain which is literally enjoyed by many injection drug users. Our results show that not all drug users who inject their drugs and believe they have needle fixation actually suffer from this condition. On the contrary, there are others who suffer from the fixation and do not recognize it (Pates et al., 2005). A section of the users classified themselves as ‘needle addicted’ when they were familiarized with the study purpose.

We can see a potential study limitation in the size of the research set. This could have an impact on the final statistical results of the differential tests, which could have been different if the number of respondents were increased. The study makes use of a relatively homogeneous sample; the data were only collected from respondents in Plzeň and from clients of the equipment type – specifically from the K-centre organization. It is not certain whether the results would differ in users

who do not use any supportive services. The users in the research are also persons with a long-term drug history (more than 75% have been using drugs for more than 10 years).

Pates and Gray (2009) state that providing therapy for needle fixation is difficult. Interrupting the use of addictive substances via syringe can be complicated due to a number of factors, such as obsessive or compulsive behavioral features, sexual association, willful self-harm, and also social factors. For that reason, the authors suggest defining the fixation from a psychological perspective, which could contribute to the provision of efficient therapy. As Hinton et al. (2013) state, needle fixation must be considered an addictive behaviour and the therapeutic interventions must be indicated accordingly. Treffurth and Pal (2010) also describe the possibilities of such therapy with the use of selective inhibitors and the back-trapping of serotonin.

Conclusions

The results show the significance of secondary benefits in the case of intravenous drug application. The low score of preference of intravenous use (due to high efficiency of the said type of application) and, on the contrary, the high score of secondary pleasure (sexual arousal or delight in pain) suggest the psychological importance of intravenous use. Primarily the dimension of substitution shows that the drug users often use syringes for substances other than drugs – to provide tranquillization or a good feeling. Persons with needle fixation undoubtedly need to be a larger focus within drug addiction diagnostics and therapy. The therapy of needle fixation may increase the success rate of drug addiction and *vice versa*.

Conflict of interests

The authors report no conflict of interests.

Fixace na jehlu u uživatelů drog

Souhrn

Fixace na jehlu popisuje stav, ve kterém uživatelé drog získávají uspokojení z používání jehel jako takových, bez ohledu na aplikovanou látku. Zabývat se tímto jevem je nezbytné pro terapeutické přístupy u závislých osob, protože významně ovlivňuje úspěšnost terapeutického procesu.

Cíle: Popsat prevalenci jednotlivých dimenzí fixace na jehlu mezi uživateli drog v Plzni s ohledem na vybrané faktory užívání drog. **Metody:** Data byla sbírána pomocí dotazníku NEFPRO, který pracuje s dimenzemi fixace na jehlu, a to konkrétně: dovednost, bolest, fascinace jehlou, rauš, náhrada za sex, sexuální vzrušení a aspirace. Dotazník byl doplněn o několik otázek týkajících se věku, pohlaví, doby zneužívání a informace o primární droze. Uvedené proměnné byly statisticky testovány v programu SPSS ve vztahu k dimenzím fixace *t*-testem pro nezávislé skupiny, testem ANOVA a biviační korelací. Data byla sbírána mezi injekčními uživateli drog ($N = 89$) v Plzni ve spolupráci se Spolkem Ulice Plzeň, neziskovou organizací poskytující terénní programy.

Výsledky: Nejčastější dimenzí fixace na jehlu byla aspirace (94,4 %) a náhrada za sex (89,9 %), následuje sexuální vzrušení (78,6 %) a bolest (66,3 %); zbylé rozměry byly okrajově zastoupeny. Statisticky významný vztah ($p < 0,05$) byl identifikován mezi pohlavím a dimenzemi bolesti a rauše. Naopak věk nebo délka užívání drog statisticky významně s dimenzemi fixace nesouviseli.

Klíčová slova: drogová závislost; fixace na jehlu; rituál

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