



Review Article

## Substance use and sexual functioning in women: An intricate interplay

Ajeet Sidana<sup>1</sup>, Smriti Mahajan<sup>2</sup>

<sup>1</sup>Professor, <sup>2</sup>Senior Resident, Department of Psychiatry, Government Medical College & Hospital, Sector-32, Chandigarh, India

**Date of Submission :**

19 March 2021

**Date of Acceptance :**

16 June 2021

### Abstract

Substance use disorders (SUDs) are a significant public health problem, and women, contrary to popular belief, are no exception to this phenomenon. Surveys suggest that women using substances are a small but significant group and can be difficult to access and target. Sexual health in these women is of particular importance because most drugs of abuse have a bearing on sexual functioning. The exact mechanisms through which they cause sexual dysfunction is still under scrutiny. Treatment of substance use disorders in women requires a gender-sensitive approach. Drug use and sexual functioning have a complex and multidimensional relationship. In this article, the authors examine this relationship; and review relevant literature on drug use in women, drug-induced female sexual dysfunction, and management strategies for the same. It can be concluded that there is a conspicuous lack of sufficient literature in this area, especially in the Indian context, which needs to be remedied at the earliest.

**Keywords:** Addiction, Alcohol, Substance use disorder, Drug use, Female sexual dysfunction, Anorgasmia

### Introduction

The threads of history about sex and drugs have been intimately intertwined over centuries. These threads, spanning right from

the concept of aphrodisiacs to the use of common substances to enhance performance to chronic use leading to impairment, and sexually transmitted diseases (STDs) in the context of drug use, have been almost inextricably linked, weaving a fascinating albeit puzzling yarn (Palhaand Esteves, 2008). For years, workers have been diligently studying the effects of drug use on human sexuality, with significant findings. Disappointingly, these studies have been exceedingly partial to males while mainly excluding the fairer sex.

**Corresponding author:** Ajeet Sidana

Email: [ajeetsidana@hotmail.com](mailto:ajeetsidana@hotmail.com)

**How to cite article:** Sidana, A., Mahajan, S. (2021).

Substance use and sexual functioning in women: An intricate interplay. *Indian Journal of Health, Sexuality & Culture*, 7(1), 41-49.

**DOI:** 10.5281/zenodo.5109539

This article is distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Female sexuality was considered taboo for the longest time. It is only recently that the topic has garnered the attention of researchers and clinicians. Akin to this, women as substance users are finally being recognized as an important group, with service needs just like their male counterparts. Women who use drugs are not easy to access, owing to the stigma associated with their situation. Our cultural beliefs and conditioning do not allow us to view women as much other than wives, mothers, and care givers of the family. There are significant gender-related differences in various aspects such as types of drugs, the pattern of use, and lived experiences and needs, owing to a multitude of factors like female physiology, family functioning, occupation, financial status, gender roles, and stigma (Sharma et al., 2017). There is a substantial under representation of women in the discourse on people who use drugs. Hence, combining the two, drug use and female sexuality, we get a talking point that has tremendous significance but has long been disregarded. Studies on this topic are few and far between. If we are to further research and discuss this issue, it would be pertinent to evaluate the current information. In this article, we review the literature pertaining to drug use and women's sexual health.

### **The pattern of drug use in women**

Drug use has been primarily considered a male forte, and it is only recently that we are waking up to the ground reality of this phenomenon in women. A handful of studies have been carried out in this regard in the past few decades. The initial studies demonstrated a considerable gap between substance use by men and women, which has been steadily narrowing with time, pointing towards increased substance use by women. In the Epidemiological Catchment Area Study in the US, the male-to-female ratio of alcohol use disorders was 5:1. (Helzer et al.,

1991) The National Epidemiologic Survey on Alcohol and Related Conditions found that males had a 2.2 times higher likelihood than females of abusing drugs and 1.9 times higher likelihood of being dependent users, with a 3:1 male-to-female ratio of alcohol use disorders (Compton et al., 2007; Hasin et al., 2007). Later surveys suggested a 1.4:1 ratio, and it is clear that globally, the gap is narrowing (McHugh et al., 2014). This has been attributed to changes in traditional gender roles, with more women stepping out to work and lesser women choosing to have children, changes in societal norms, and decreased stigma pertaining to drug use in women (Greenfield and Room, 1997; Thronton and Freedman, 1983). However, the same statistics can definitely not be applied to the Indian scenario, as we are a country with immensely diverse outlooks and social structures.

The earliest Indian surveys reported that drug use in women was minuscule as compared to men (Mohan and Desai, 1993; Mohan and Sundaram, 1987). The 2001 national survey, titled "National Survey on Extent, Pattern and Trends of Drug Abuse in India" was highly male-centric. The Focussed Thematic Study that interviewed 75 women from three cities found that commonly used drugs were heroin, propoxyphene, alcohol and sedatives. Multi-drug use was common, and 40 women out of the sample were using intravenous drugs. The key informants opined that substance abuse in women was camouflaged (Ray et al., 2004). In a survey of 1865 female substance users (FSUs), about 6% were aged below 20 years, one-third were illiterate, and 64% were married. A high prevalence of alcohol, opioid, solvent, and cannabis use was noted (Murthy, 2008).

The National Family Health Survey carried out in 29 states in 2005-06, found 2% of women using alcohol and 11% using tobacco

(International Institute for Population Sciences and Macro International, 2007). The 2019 National Survey reported alcohol use in 1.6% of women, compared to 27.3% of men, with the interesting observation that alcohol use was found among women of almost all states of the country. Cannabis use was found among 0.6% females, opioid use in 0.2%, and inhalant use in 0.07% (Ambekar et al., 2019).

Sociocultural factors have a profound effect on drug use in women. They are attributed maternal and nurturing roles, which influence society's perception of their drug use. (Becker et al., 2016). Women who use drugs may be viewed as 'doubly deviant', having wavered from their accepted social codes of behaviour as well as traditional family roles (Fagan, 1994). At the same time, traditional use of certain preparations in women is also known, such as betel nuts, cannabis, tobacco, and even alcohol. Various circumstances can pull women into more severe forms of drug use. Women from lower socioeconomic strata may be driven by poverty into drug peddling, which can be a gateway to drug use. Those involved in criminal activity or commercial sex work are more likely to start using drugs. Specific vulnerability factors, such as drug use in family/spouse, sexual relationship with a drug-using partner, and peer group influences, have also been identified (Murthy, 2008).

### **Substance use and sexual activity**

Drugs and sex are a tale as old as time itself. Both these entities influence aspects of each other in extensive ways. Despite still being considered taboo, risky sexual behaviors among the young population are on the rise and need to be recognized (Choe et al., 2001). The UNODC study unveiled some hard-hitting and unpleasant facts about the sexual experiences of FSUs (Murthy, 2008). The

mean age at first sexual encounter was 17.3 years, with 2.5% of these women having their first experience with a customer of commercial sex work. Nearly 14% had been forced into their first sexual experience, and as high as 49.7% had more than one sexual partner in the previous year. About 46% had indulged in sex in exchange for drugs or money, and 40.5% had been forced to do so. These numbers are bound to rattle any reader, but it does not end there. Half of the users reported indulging in sexual activity under the influence of drugs, with barrier protection not being used in over 60% of these instances. A study in 2001 found that two-thirds of the FSUs interviewed were involved in sex work for money or drugs (Panda et al., 2001). About 30% of FSUs reported being subjected to sexual violence of various kinds. Many reported being coerced into non-conventional forms of intercourse (Murthy, 2008).

Conversely, women involved in sex work or who have sexual initiation at an early age are more likely to indulge in drug use, primarily through the injecting route (Roberts et al., 2010).

### **Effect of substance use on sexual functioning**

The deleterious effects of substance use on sexual functioning in men is an extensively studied and discussed topic. Research in women, however, leaves much to be desired.

### **Alcohol**

In males, high doses of alcohol have been known to decrease arousal, impair erection, and hamper ejaculation. It can also lead to hypogonadism. It can increase arousal and pleasure in low doses and reduce vaginal lubrication, pain during intercourse, and difficulty reaching orgasm with chronic intake (Dissiz et al., 2015; Ghadigaonkar and

Murthy, 2019). Interestingly, the subjective report of sexual arousal does not always correspond to physiological response in women, as it does in men. Increasing blood alcohol concentrations decreases vaginal blood flow and orgasmic intensity and increases the orgasmic latency. But women, at this time, may report being more sexually aroused (Crowe and George, 1989; Wilsnack, 1984). An Indian study of 40 women with alcohol dependence syndrome found that 55% of participants had one or more kinds of sexual dysfunction, significantly higher than the prevalence found in healthy controls. Common ones were low desire, an orgasmia, and dissatisfaction with orgasm. Low education status, longer duration of alcohol use, early initiation of alcohol use, and high severity of dependence were significant predictors (Anil Kumar et al., 2017).

### **Tobacco**

Tobacco smoking is an extensively studied cause of sexual dysfunction in men. In females, there are studies that have found it to independently be a risk factor for sexual dysfunction (Aslan et al., 2008; Oksuz and Malhan, 2006). A study conducted on 900 Korean premenopausal women found smoking a risk factor for FSD and described a dose-dependent association between smoking and sexual functioning (Choi et al., 2015). It also found nicotine dependence associated with sexual dysfunction in females, as reported by some other studies (Diehl et al., 2013; Harte and Meston, 2008). These findings have been attributed to various endocrine and vascular mechanisms. Smoking may affect oestrogen levels and inhibit ovarian functioning, which leads to sexual dysfunction. Furthermore, genital vasculature is sensitive to estrogen levels, and blood flow is decreased due to smoking (Tziomalos and Charsoulis, 2004). A study using the Colour Doppler technique to study vascular flow in women had some fascinating

findings. There was significantly higher resistance in the arteries of the uterus, clitoris, and labia minora in smoking women than in non-smoking women. The pulsatility index of the dorsal clitoral artery was inversely related to the frequency of orgasm. There was a significantly lower frequency of orgasms in female smokers. Nicotine has also been held responsible for reduced nitric oxide levels, increased beta-adrenergic receptors, and enhanced anticholinergic effects, impairing genital blood flow, leading to inadequate vaginal lubrication (Battaglia et al., 2011).

### **Marijuana**

Marijuana has been known in popular culture for its aphrodisiac properties. It is often used to enhance the sexual experience, maybe even more so than alcohol (Sumnall et al., 2007). The cannabinoid receptors have a role in modulating pathways that control sexual functioning. However, data on this is limited, and the mechanism is not entirely understood (Pfaus, 2009). There are contradictory studies available in the literature. Many studies suggest a positive association between marijuana use and parameters of sexual functioning like desire, orgasm, and sexual satisfaction (Gorzalka and Hill, 2010; Gorzalka et al., 2010). In a survey of 373 participants, 34% reported using marijuana before sexual activity. Those using marijuana were significantly more likely to report satisfactory orgasms (Lynn et al., 2019). Others indicate that marijuana use is associated with dysfunction such as impaired sexual arousal, painful sex, and inhibited orgasm (Johnson et al., 2004; Klein et al., 2012).

### **Opioids**

Data on the effects of opioid use on female sexual functioning is extremely limited. In its initial phase, opioid use can improve vaginismus in women (Ghadigaonkar and

Murthy, 2019). However, endocrine studies suggest that opioids hamper the production of hormones, lead to hypogonadism and eventually cause menstrual irregularities and sexual dysfunction (Daniell, 2008; Rhodin et al., 2010). At the core of it, there is a disturbance of the hypothalamus-pituitary-gonadal (HPG) axis (Saso, 2002). However, these studies have been carried out in women on opioid treatment for chronic pain and not for recreational use. A study of 258 Italian women stabilized on opioid maintenance therapy (methadone or buprenorphine) showed significantly higher sexual dysfunction than the regular population (Zamboni et al., 2019). Within the types of opioid maintenance too, methadone has been found to cause higher sexual dysfunction than buprenorphine (Giacomuzzi et al., 2009).

### **Cocaine**

Cocaine has also been considered to have aphrodisiac properties. A study of 100 female cocaine users did not support this notion and instead found higher rates of sexual dysfunction in these women (Henderson et al., 1995). Cocaine use can cause increased prolactin levels, which is known to cause sexual dysfunctions like diminished libido and difficulty reaching orgasm (Kopetz et al., 2010).

### **Amphetamines**

Amphetamines and related drugs are popular for enhancing sexual desire. In small doses, they heighten enjoyment and delay in orgasm. MDMA or ecstasy has earned the title of 'love drug'. In a study of 20 male and 15 female MDMA users, all female subjects reported moderate to a profound increase in sexual desire. 93% of the females reported moderate to a profound increase in satisfaction, and 80% felt enhanced lubrication. The orgasm was delayed in many

subjects, though 53% of women perceived higher intensity of orgasm (Zemishlany et al., 2001). However, prolonged use is known to cause decreased desire and anorgasmia (Buffum, 1982).

### **Management strategies**

Management of any condition begins with an extensive assessment. The same principle applies to drug-induced sexual dysfunction. Assessment must begin with an exploration of the client's concept and understanding of the problem. There may be various physical or emotional factors exerting an influence over sexual functioning, which must not be ignored (Ghadigaonkar and Murthy, 2019). Other causes of sexual dysfunction, including organic ones, must be considered. This would need a thorough history, general examination, and systemic examination. Blood investigations, including hormonal profiles, may be ordered as required. Specialist referrals should be sought as and when required. Start with introductory educational sessions about sexual functioning, and clarify any misconceptions (Avasthi et al., 2017). The cornerstone of treatment would be to treat the substance use disorder. The management of SUDs in females poses some unique challenges. Such clients do not readily come forward for treatment. A study carried out at our center found that among the 4642 new patients who registered themselves for treatment of SUDs over eight years, only 40 were females- a measly 0.9%. This minuscule group represents only the tip of the iceberg, and is indicative of the dismal treatment gap that needs urgent attention (Sidana et al., 2020).

The treatment of SUDs in females would carry the same basic outline like any other case, but with some significant nuances. It would be pertinent, through motivational interviewing, to explain to the client the benefits of cessation of drug use, even if it is

not the primary cause for sexual dysfunction (Dissiz et al., 2015). Many gender-specific factors can affect the treatment progression. These would include relationship factors (family/partner role), parenting issues (pregnancy/children), and co-morbid psychiatric illnesses (mood and anxiety disorders- more common in females) (Oliveros and Kaufman, 2009). Involving the partner or undertaking family therapy can be a good strategy, associated with favorable outcomes (Fals-Stewart et al., 2005; Zlotnick et al., 1996). Women in treatment for substance use disorders may derive greater benefit from supportive therapies rather than other therapeutic approaches (Oliveros and Kaufman, 2009). They do not respond very well to traditional, confrontational approaches; and have better treatment outcomes when they experience safety, respect, warmth, nurturing, and empathy from their therapist and the therapeutic experience (Cohen, 2000; Grosenick and Hatmaker, 2000). It is essential to be sensitive to these differences in order to improve treatment retention and positive outcomes.

### **Challenges and future directions**

While reviewing the literature, it was disappointing to see the deficiency of data about women in the context of this topic. The relative insufficiency of research leads to a skewed perception of the issue on service providers. Substance use in women has far more complicated biological, psychological, and social underpinnings than men. Similarly, female sexual functioning has complex neurobiological and endocrine mechanisms heavily influenced by mental makeup, societal expectations, and relationship factors. Lack of data and poor information leads health professionals to view women through a lens of either unfounded stereotypes or ill-suited masculine paradigms. This leads to poor understanding of their

issues, lack of sensitivity, and under serving of their needs.

The need of the hour is to undertake extensive and robust research to better understand these complex phenomena and bust the therapeutic sexism, so to speak, that has been at play for decades together. It is of utmost importance to try and reach populations of vulnerable women who still have limited access to knowledge, resources, and treatment. This would need a strong liaison between specialists, primary care providers, paramedical staff, social workers, and community representatives. Lastly, sensitization of both service users and providers is of the essence. Women all across must be made aware of these health conditions, have free dialogue and provide easy access to information and interventions.

### **Conclusion**

With changing times, substance use has ceased to be a primarily male phenomenon. A substantial section of women are part of the drug-using population, and India is no exception to this transition. The relationship between drugs and sexual activity is multifaceted and complex. Drugs of abuse have a bearing on the sexual functioning of women by affecting various biological processes. Commonly used substances like alcohol and tobacco have relatively better-understood mechanisms of causing sexual dysfunction. Effects of marijuana, opioids, cocaine, and amphetamines are less clearly understood, and most literature is contradictory and inconclusive. Despite their potential to cause sexual dysfunction, these substances tend to be used to enhance sexual desire and pleasurability. Sexual well-being is an inalienable part of any individual's health and deserves more attention, especially in women. There are glaring lacunae in data, resources, and training; and it is about time we as professionals took notice and made efforts to remedy the situation.

**Acknowledgements:** None

**Declaration of interests:** None

## References

- Ambekar, A. et al. on behalf of the group of investigators for the National Survey on Extent and Pattern of Substance Use in India. (2019). Magnitude of Substance Use in India. New Delhi: Ministry of Social Justice and Empowerment, Government of India.
- Anil Kumar, BN. et al. (2017). Sexual dysfunction in women with alcohol dependence syndrome: A study from India. *Asian J Psychiatr*, 28, 9-14.
- Aslan, E. et al. (2008). Prevalence and risk factors for low sexual function in women: a study of 1,009 women in an outpatient clinic of a university hospital in Istanbul. *J Sex Med*, 5, 2044-52.
- Avasthi, A. et al. (2017). Clinical practice guidelines for management of sexual dysfunction. *Ind J Psychiatry*, 59(1), 91-115.
- Battaglia, C. et al. (2011). Cigarette smoking decreases the genital vascularization in young healthy, eumenorrheic women. *J Sex Med*, 8, 1717-25.
- Becker, JB., McClellan, M., & Reed, BG. (2016). Sociocultural context for sex differences in addiction. *Addict Biol*, 21, 1052-59.
- Buffum, J. (1982). Pharmacosexology: the effects of drugs on sexual function a review. *J Psychoactive Drugs*, 14, 5-44.
- Choe, MK. et al. (2004). Substance use and premarital sex among adolescents in Indonesia, Nepal, the Philippines and Thailand. *Asia Pac Popul J*, 19(1), 5-26.
- Choi, J. et al. (2015). Dose-response relationship between cigarette smoking and female sexual dysfunction. *Obstet Gynecol Sci*, 58(4), 302-8.
- Cohen, M. (2000). *Counseling Addicted Women*. Thousand Oaks, CA: Sage Publications.
- Compton, WM. et al. (2007). Prevalence, correlates, disability, and comorbidity of DSM-IV drug abuse and dependence in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch Gen Psychiatry*, 64, 566-76.
- Crowe, LC., & George, WH. (1989). Alcohol and human sexuality: review and integration. *Psychol Bull*, 105(3), 374-86.
- Daniell, HW. (2008). Opioid endocrinopathy in women consuming prescribed sustained-action opioids for control of nonmalignant pain. *J Pain*, 9, 28-36.
- Diehl, A., Silva, RL., & Laranjeira, R. (2013). Female sexual dysfunction in patients with substance-related disorders. *Clinics (Sao Paulo)*, 68, 205-12.
- Disiz, M., Beji, N., & Oskay, Ü. (2015). The Effects of Alcohol Dependence on the Quality of Life and Sex Life of Women. *Subst Use Misuse*, 50(II), 1373-82.
- Fagan, J. (1994). Women and Drugs Revisited: Female Participation in the Cocaine Economy. *J Drug Issues*, 24, 179-225.
- Fals-Stewart, W. et al. (2005). Behavioral couples therapy for alcoholism and drug abuse: Where we've been, where we are, and where we're going. *J Cogn Psychother*, 19(3), 229-46.
- Ghadigaonkar, DS., & Murthy, P. (2019). Sexual dysfunction in persons with substance use disorders. *J Psychosexual Health*, 1(2), 117-21.
- Giacomuzzi, S. et al. (2009). Buprenorphine and methadone maintenance treatment sexual behaviour and dysfunction prevalence. *Lett Drug Design Discov*, 6, 13.
- Gorzalka, BB, & Hill, MN. (2006). Cannabinoids, reproduction and sexual behavior. *Annu Rev Sex Res*, 17, 132-61.
- Gorzalka, BB., Hill, MN., & Chang, SC. (2010). Male-female differences in the effects of cannabinoids on sexual behavior and gonadal hormone function. *Horm Behav*, 58(1), 91-9.
- Greenfield, TK., & Room, R. (1997). Situational norms for drinking and drunkenness: trends in the US adult population, 1979-1990. *Addiction*, 92, 33-47.
- Grosenick, JK., & Hatmaker, CM. (2000). Perceptions of the importance of physical

setting in substance abuse treatment. *J Subst Abuse Treat*, 18(1), 29-39.

Harte, CB., & Meston, CM. (2008). The inhibitory effects of nicotine on physiological sexual arousal in nonsmoking women: results from a randomized, double-blind, placebo-controlled, cross-over trial. *J Sex Med*, 5, 1184-97.

Hasin, DS. et al. (2007). Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol abuse and dependence in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch Gen Psychiatry*, 64, 830-42.

Helzer, J. et al. (1991). Alcohol abuse and dependence. In: Robins, L., Regier, D. (Eds.), *Psychiatric Disorders in America: The Epidemiological Catchment Area Study*. (pp. 81-115). New York: The Free Press.

Henderson, DJ., Boyd, CJ., & Whitmarsh, J. (1995) Women and illicit drugs: sexuality and crack cocaine. *Health Care Women Int*, 16(2), 113-24.

International Institute for Population Sciences and Macro International. (2007). *National Family Health Survey-3, 2005-2006*. Mumbai, India: IIPS. Available from: <http://www.rchiips.org/nfhs/nfhs3.shtml>. [Last accessed on 11/03 / 2021]

Johnson, SD., Phelps, DL., & Cottler, LB. (2004). The association of sexual dysfunction and substance use among a community epidemiological sample. *Arch Sex Behav*, 33(1), 55-63.

Klein C., Hill M.N., & Chang, SC. (2012). Circulating endocannabinoid concentrations and sexual arousal in women. *J Sex Med*, 9, 1588-1601.

Kopetz, CE. et al. (2010). Social context and perceived effects of drugs on sexual behavior among individuals who use both heroin and cocaine. *Exp Clin Psychopharmacol*, 18(3), 214-20.

Lynn, BK. et al. (2019). The Relationship between Marijuana Use Prior to Sex and Sexual Function in Women. *Sex Med*, 7, 192-7.

McHugh, RK., Wigderson, S., & Greenfield, SF. (2014). Epidemiology of substance use in

reproductive-age women. *ObstetGynecol Clin North Am*, 41, 177-89.

Mohan, D., Desai, N. (1993). *A Survey on Drug Dependence in the Community, Urban Megapolis, Delhi*. New Delhi, India: Indian Council of Medical Research.

Mohan, D., Sundaram, K. (1987). *A Multi-Centred Study of Drug Abuse among Students: A Preliminary Report*. New Delhi, India: Ministry of Welfare, Government of India and All India Institute of Medical Science.

Murthy, P. (2008). *Women and Drug use in India: Substance, Women and High-risk Assessment Study*. New Delhi, India: Ministry of Social Justice and Empowerment and United Nations Office on Drugs and Crime, Regional Office for South Asia.

Oksuz, E., Malhan, S. (2006). Prevalence and risk factors for female sexual dysfunction in Turkish women. *J Urol*, 175, 654-58.

Oliveros, A., Kaufman, J. (2009). *Substance abuse treatment for women. Treatment Improvement Protocol (TIP) series, No. 51*. Rockville, MD: SAMHSA (US).

Palha, AP., Esteves, M. (2008). Drugs of abuse and sexual functioning. *Adv Psychosom Med*, 29, 131-49.

Panda, S. et al. (2001). Interface between drug use and sex work in Manipur. *Nat Med J India*, 14, 209-11.

Pfaus, JG. (2009). Reviews: Pathways of sexual desire. *J Sex Med*, 6, 1506-33.

Ray, R. et al. (2004). *The Extent, Pattern and Trends of Drug Abuse in India: National Survey*. New Delhi: United Nations Office on Drugs and Crime, Regional Office for South Asia and Ministry of Social Justice and Empowerment, Government of India.

Rhodin, A., Stridsberg, M., Gordh, T. (2010). Opioid endocrinopathy: a clinical problem in patients with chronic pain and long-term oral opioid treatment. *Clin J Pain*, 26, 374-80.

Roberts, A., Mathers, B., & Degenhardt, L. on behalf of the Reference Group to the United

- Nations on HIV and Injecting Drug Use. (2010). [online] Women who inject drugs: A review of their risks, experiences and needs. Ndarcs.med.unsw.edu.au. Available at: <[https:// ndarc. med. unsw. edu. au/ sites/ default / files / ndarc/ resources/ Women%20who%20inject%20drugs.pdf](https://ndarc.med.unsw.edu.au/sites/default/files/ndarc/resources/Women%20who%20inject%20drugs.pdf)> [Accessed 12 March 2021].
- Saso, L. (2002). Effects of drug abuse on sexual response. *Ann Ist Super Sanita*, 38(3), 289-96.
- Sharma, V. et al. (2017). Women and substance use: a qualitative study on sexual and reproductive health of women who use drugs in Delhi, India. *BMJ Open*, 7:e018530.
- Sidana, A., Chavan, BS., Garg, J. (2019). Pattern of substance use disorder among first time treatment seekers: a study from North India. *Journal of Medical College Chandigarh*, 9, 25-31.
- Sumnall, HR., Beynon, CM., Conchie, SM. (2007). An investigation of the subjective experiences of sex after alcohol or drug intoxication. *J Psychopharmacol*, 21, 525-37.
- Thronton, A., Freedman, D. (1983). The changing American Family. *Popul Bull*, 39, 1-44.
- Tziomalos, K., Charsoulis, F. (2004). Endocrine effects of tobacco smoking. *Clin Endocrinol (Oxf)*, 61, 664-74.
- Wilsnack, SC. (1984). Drinking, sexuality, and sexual dysfunction in women. In: Wilsnack, SC., Beckman, LJ. (Eds). (pp. 189-229). *Alcohol Problems in Women: Antecedents, Consequences and Intervention*. New York: Guilford Press.
- Zamboni, L. et al and GICS Group. (2019). Sexual Functioning and Opioid Maintenance Treatment in Women. Results From a Large Multicentre Study. *Front Behav Neurosci*, 13, 97.
- Zemishlany, Z., Aizenberg, D., Weizman, A. (2001). Subjective effects of MDMA ('Ecstasy') on human sexual function. *Eur Psychiatry Mar*, 16(2), 127-30.
- Zlotnick, C. et al. (1996). The impact of outpatient drug services on abstinence among pregnant and parenting women. *J Subst Abuse Treat*, 13(3), 195-202.