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Clinical and Sociodemographic Profile of Patients Receiving Buprenorphine at an OST Center in Kashmir: A Cross-Sectional Study

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Abstract

Background: Opioid dependence is a major public health concern in Kashmir, with increasing use of buprenorphine-based opioid substitution therapy (OST). Understanding the sociodemographic and clinical characteristics of patients in treatment is crucial for optimizing outcomes. This study was conducted to assess the clinical and sociodemographic profile of patients receiving buprenorphine at an OST centre with exploratory assessment of sexual dysfunction among participants reporting sexual complaints.

Methods: This hospital-based cross-sectional study included 102 patients on buprenorphine maintenance. Data were collected using a semi-structured proforma covering demographic details, opioid use characteristics, and treatment variables. Severity of dependence was assessed using the Severity of Dependence Scale. The Arizona Sexual Experience Scale was applied to 24 patients reporting sexual complaints.

Results: The mean age was 26.7 years, and 95.1% were male. Intravenous or combined routes were predominant (78.4%), and 44.1% were HCV positive. The mean SDS score was 10.08 ± 3.42, with 66.7% showing severe dependence. The mean buprenorphine dose was 3.89 mg/day. Among 24 patients assessed, 83.3% met ASEX criteria for sexual dysfunction. ASEX scores correlated positively with SDS ($r = 0.422$, $p < 0.01$) and duration of opioid use ($r = 0.374$, $p < 0.05$), but not with buprenorphine dose or duration on treatment.

Conclusion: Patients attending OST centers in Kashmir are predominantly young, male, and severely opioid-dependent, with high rates of injecting drug use and HCV infection. Exploratory assessment among participants reporting sexual complaints suggested a substantial burden of sexual dysfunction, which appeared to correlate with the severity and chronicity of opioid dependence. These findings should be interpreted cautiously and warrant confirmation through larger studies with universal sexual health screening.

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Introduction

Substance use disorders (SUDs) represent a major global public health concern, with significant medical, psychological, and social consequences. Among various substances, opioids account for a substantial share of morbidity and mortality due to overdose, infections such as HIV and hepatitis C, and co-occurring psychiatric disorders.[1,2] Globally, around 61 million people use opioids, marking a sharp rise over the past decade.[3]

In India, the problem of opioid dependence has grown steadily. The National Survey on Extent and Pattern of Substance Use (2019) reported that about 2.1% of the population, nearly 22 million individuals, use opioids, with heroin being the most common, followed by pharmaceutical opioids and opium.[4] The northern states, including Jammu and Kashmir, Punjab, and Haryana, report some of the highest prevalence rates. In Kashmir, a combination of factors such as prolonged conflict, unemployment, psychosocial stress, and easy access to illicit substances has led to an alarming rise in opioid dependence, especially among young males. Recent years have also seen a transition from traditional opioid use (like opium) to more potent and hazardous forms such as heroin and injectable buprenorphine, leading to increased risks of blood-borne infections and overdose. Studies from the valley have documented a growing trend toward injecting drug use, a shift that poses significant challenges for public health and addiction management.[5]

Opioid Substitution Therapy (OST) is internationally recognized as an effective, evidence-based intervention for opioid dependence. It involves the supervised administration of a long-acting opioid agonist or partial agonist to reduce withdrawal symptoms, cravings, and relapse risk. In India, OST introduced by the National AIDS Control Organization (NACO) also serves as a harm-reduction measure to prevent HIV transmission among people who inject drugs. Buprenorphine, a partial μ-opioid receptor agonist with a ceiling effect on respiratory depression, is the widely used OST medication in India. It has proven effective in reducing illicit opioid use, improving treatment retention, and enhancing quality of life. Its pharmacological properties make it safer and less prone to misuse compared to full agonists such as methadone.[6]

Despite the established effectiveness of buprenorphine-based opioid substitution therapy (OST), there is limited regional data regarding the sociodemographic and clinical profile of patients receiving treatment in Kashmir. Previous Indian studies have reported significant rates of sexual dysfunction among patients receiving opioid agonist therapy, including buprenorphine maintenance treatment. Ramdurg S *et al.*[7] demonstrated substantial sexual dysfunction among men receiving buprenorphine and naltrexone maintenance therapy in India. However, data from Kashmir remain scarce, despite the region's distinct sociocultural environment and evolving patterns of opioid use. Understanding the clinical characteristics, treatment profile, and associated adverse effects among patients receiving OST is essential for optimizing treatment outcomes and strengthening harm-reduction strategies. Therefore, the present study was undertaken to assess the sociodemographic and clinical profile of patients receiving buprenorphine at an OST center in Kashmir, with an exploratory assessment of sexual dysfunction among participants reporting sexual complaints.

Materials and Methods

This hospital-based cross-sectional descriptive study was conducted at the Opioid Substitution Therapy (OST) Center attached to the Department of Psychiatry, Govt. Medical College, Srinagar. Ethical clearance for the study was obtained from the Institutional Ethics Committee and written informed consent was obtained from enrolled participants. The study was conducted over a period of 12 months and aimed to assess the sociodemographic and clinical profile of patients receiving buprenorphine maintenance therapy, with an exploratory assessment of sexual dysfunction among participants reporting sexual complaints. All patients aged 18 years and above who were registered at the OST Center and currently receiving buprenorphine maintenance treatment were eligible for inclusion. Patients who were medically unstable, refused consent, or had severe cognitive impairment or intoxication at the time of interview were excluded.

A consecutive sampling technique was used, and all eligible patients attending the OST Center during the study period were approached for participation. All eligible patients approached during the study period consented to participate; therefore, no participant was excluded due to non-response. The final study sample comprised 102 participants. Sample size estimation was based on prior literature suggesting that about 2.1% of the Indian population uses opioids.[4] Assuming a prevalence of 2.1%, with a

Table 1: Sociodemographic and clinical profile of participants (N=102)

Parameters	*Variables*	*No. of patients*	*Percentage*
Age (Years)	<20	5	4.9
	20-30	77	75.5
	<30	20	19.6
	Mean age	26.71 ± 4.65 (19–40) years	
Gender	Male	97	95.1
	Female	5	4.9
HCV status	Negative	57	55.9
	Positive	45	44.1
Duration of opioid use (Years)	<5 Years	84	82.3
	5.1–10 years	17	16.7
	> 10 years	1	1.0
	Mean duration	3.1 ± 1.97 (0.16–12) years	
Route of opioid use	Chasing	22	21.6
	IV	50	49.0
	Chasing + IV	30	29.4
Severity of sependence (SDS Score)	0–4	4	3.9
	5–9	30	29.4
	≥ 10	68	66.7
	Mean SDS	10.08 ± 2.81 (2–15)	

95% confidence level and a aloowable error of ±3%, the sample size was calculated using the formula $n = Z^2 \times p \times (1–p) / d^2$. Substituting values (Z=1.96, $p = 0.02$, d=0.03), the minimum required sample size was estimated to be approximately 87.8 patients, which was increased by 15% to account for non-response, resulting in an adjusted sample size of approximately 101. The final study included 102 participants, which met and slightly exceeded the required sample size.

A structured proforma was designed to record sociodemographic and clinical details, including age, gender, duration of opioid use, hepatitis C virus (HCV) status, route of opioid use, severity of dependence assessed using the Severity of Dependence Scale (SDS)[8], duration on buprenorphine maintenance therapy, period of abstinence achieved, number of relapses (if any), and the maintenance dose of buprenorphine. Adverse effects of buprenorphine were also noted based on patient self-report and clinical evaluation. Participants reporting sexual complaints during clinical interview and spontaneous self-report during routine assessment were further evaluated using the Arizona Sexual Experience Scale (ASEX). Universal ASEX screening was not feasible due to time constraints and sociocultural sensitivity surrounding discussions of sexual health in all participants. The ASEX is a validated, brief, five-item scale that evaluates sexual drive, arousal, penile erection/vaginal lubrication, ability to reach orgasm, and satisfaction from orgasm. Each item is rated on a six-point Likert scale, with higher scores indicating greater sexual dysfunction. Sexual dysfunction was defined according to the standard ASEX cut-off criteria. All data were collected through direct interviews conducted by trained psychiatrists in a confidential setting.

Table 2: Treatment characteristics and adverse effects (N = 102)

Parameters	*Variables*	*No. of patients*	*Percentage*
Duration on buprenorphine (years)	< 2 Years	73	71.6
	≥ 2 Years	29	28.4
	Mean duration	1.22 ± 0.76 (0.08–5) Years	
Period of abstinence on buprenorphine (Years)	< 1 Year	50	49.0
	≥ 1 Year	52	51.0
	Mean period	1.22 ± 0.76 (0.08–5) Years	
No. of relapse on buprenorphine	None	67	65.7
	< 3	27	26.5
	≥ 3	8	7.8
	Mean relapse	0.74 ± 1.48 (0–10)	
Dose of buprenorphine (mg)	< 3 mg	28	27.5
	3–6 mg	71	69.6
	>6 mg	3	2.9
	Mean dose	3.89 ± 1.21 (1–8) mg	
Side effects of buprenorphine	Nil	31	30.4
	Sexual side effects	24	23.5
	Tiredness or drowsiness	23	22.5
	Dental issues	20	19.6
	Excess sweating	16	15.7
	Nausea/Lack of appetite	8	7.8
	Constipation	3	2.9

Table 3: Arizona sexual experience scale (ASEX) results (N = 24)

ASEX score	*Sexual dysfunction*	*No. of patients*	*Percentage*
< 17	Absent	4	16.7
≥ 17	Present	20	83.3
Mean ASEX score		19.5 ± 3.51 (10-24)	

Statistical Analysis

Data were entered in Microsoft Excel and analyzed using IBM SPSS version 25.0. Descriptive statistics were used to summarize the data, with continuous variables expressed as mean ± standard deviation (SD) and categorical variables as frequencies and percentages. Correlation was evaluated using Pearson's coefficients. A *p-value* of <0.05 was considered statistically significant.

Results

The mean age of participants was 26.71 ± 4.65 years (range: 19–40 years), with the majority of patients (75.5%) between 20 and 30 years of age. Males constituted the predominant proportion (95.1%). Regarding hepatitis C virus (HCV) status, 44.1% of patients tested positive. The mean duration of opioid use was 3.1 ± 1.97 years (range: 0.16–12 years), with most patients (82.3%) reporting a duration of less

Table 4: Correlation of sexual dysfunction (ASEX Scores) with clinical variables

Variables	*Correlation coefficient (r)*	*p-value*
Age	-0.069	0.774
SDS score	0.422	<0.01
Duration of opioid use	0.374	<0.05
Buprenorphine dose	0.074	0.730
Duration on buprenorphine	-0.251	0.236

than 5 years. In terms of the route of opioid administration, 49% reported intravenous (IV) use. Assessment of dependence severity using the Severity of Dependence Scale (SDS) revealed a mean score of 10.08 ± 2.81, with 66.7% of patients having an SDS score ≥10, indicating severe dependence (Table 1).

The mean duration on buprenorphine maintenance therapy was 1.22 ± 0.76 years (range: 0.08–5 years). The mean period of abstinence achieved was also 1.22 ± 0.76 years. The mean number of relapses was 0.74 ± 1.48 (range: 0–10). The mean buprenorphine maintenance dose was 3.89 ± 1.21 mg (range: 1–8 mg). The most common adverse effects (23.5%) were sexual side effects (Table 2).

Out of the total sample, 24 patients with sexual disorders were evaluated using the Arizona Sexual Experience Scale (ASEX). Sexual dysfunction (ASEX ≥17) was observed in 83.3% of these patients, with a mean ASEX score of 19.5 ± 3.51, with a range of 10–24 (Table 3).

Pearson's correlation analysis was performed to evaluate associations between ASEX scores (sexual dysfunction) and key clinical variables. The ASEX score showed a significant positive correlation with Severity of Dependence (SDS) ($r = 0.422$, $p < 0.01$) and Duration of Opioid Use ($r = 0.374$, $p < 0.05$). However, correlations with age ($r = -0.069$, $p = 0.774$), Buprenorphine Dose ($r = 0.074$, $p = 0.730$), and Duration on Buprenorphine ($r = -0.251$, $p = 0.236$) were not statistically significant (Table 4).

Discussion

This hospital-based cross-sectional study describes the clinical and sociodemographic profile of 102 patients receiving buprenorphine maintenance at an OST center in Kashmir. The sample was predominantly young (mean age 26.7 years) and male (95.1%). The demographic profile, young and predominantly male, mirrors findings from many opioid treatment cohorts in India and other low/middle-income settings where heroin and injectable opioid use are concentrated among young men.[9,10] Such age and gender distributions reflect patterns of exposure, social roles, and treatment-seeking behavior: women with opioid dependence are underrepresented in treatment services globally and in India, often because of stigma, caregiving responsibilities, and access barriers. This has implications for outreach and gender-sensitive services.

The high proportion of intravenous use and the nearly 44% HCV positivity in our sample are consistent with the well-established link between injecting drug use and blood-borne virus transmission. Regional studies from Kashmir and wider India have repeatedly documented elevated HCV prevalence among people who inject drugs (PWID), underscoring the need for integrated OST and HCV screening/treatment services at OST centers.[11,12] Co-location of HCV testing and linkage to direct-acting antiviral (DAA) therapy in OST programs can reduce morbidity and transmission and should be considered where resources allow.

The mean SDS of 10.08 and the finding that two-thirds of patients scored ≥10 indicate a high burden of psychological dependence in this cohort. The SDS is a validated, brief measure of psychological dependence widely used across substances and settings; scores in this range denote clinically important dependence and justify long-term OST interventions and psychosocial support. High SDS scores also help explain the persistence of cravings and the risk of relapse despite retention on medication, highlighting the need to combine pharmacotherapy with structured psychosocial interventions.[13]

Retention and relapse patterns in our cohort are encouraging when compared with some reports from India showing variable retention and relapse across sites and models of care. Multiple factors, including dose adequacy, accessibility, psychosocial supports, comorbidities, and programmatic factors influence retention on buprenorphine. While our data suggest many patients are achieving sustained

abstinence, the presence of relapses in a subset 34% with at least one relapse aligns with the known chronic relapsing nature of opioid dependence and indicates ongoing need for relapse prevention strategies and flexible, low-threshold services. Recent Indian data emphasize heterogeneity in relapse and retention across districts and service models.[10]

Sexual dysfunction emerged as one of the most salient adverse effects in this sample. In the 24 patients formally assessed with ASEX, 83.3% met criteria for sexual dysfunction (ASEX ≥17), with a mean ASEX score of 19.5. This is higher than some prior reports of sexual dysfunction among opioid users and OST patients, where prevalence estimates vary widely. Several studies and meta-analyses have found sexual dysfunction to be common in opioid-dependent populations and to be more pronounced among methadone-treated patients compared with buprenorphine, though buprenorphine is not free from sexual side effects.[7,14] Our observed high ASEX rates may reflect sampling, under-reporting in other studies, or differences in measurement and selection. Clinicians should proactively screen for sexual dysfunction as it impacts quality of life and may affect retention and adherence.

Among participants assessed using ASEX, difficulties related to sexual desire, arousal, erectile function, ability to achieve orgasm, and orgasmic satisfaction were commonly reported domains of dysfunction. These findings are consistent with previous studies demonstrating multidimensional sexual dysfunction among opioid-dependent individuals receiving opioid substitution therapy.[15,16] Chronic opioid exposure has been associated with neuroendocrine alterations, reduced testosterone levels, impaired libido, and disturbances in sexual performance and satisfaction. Although ASEX does not permit detailed diagnostic categorization of specific sexual disorders such as premature ejaculation, the findings suggest that sexual dysfunction in this population is broad-based and likely multifactorial in origin. Recognition of these symptoms is clinically important, as untreated sexual dysfunction may negatively impact quality of life, interpersonal relationships, treatment adherence, and long-term retention in OST programs.

The positive correlations between ASEX scores and both SDS (r=0.422, p <0.01) and duration of opioid use (r=0.374, p<0.05) indicate that sexual dysfunction in this cohort is more strongly linked to the chronicity and severity of the underlying opioid disorder than to the buprenorphine dose or length of buprenorphine treatment. This finding aligns with the literature suggesting that opioid-induced endocrine changes and cumulative effects of prolonged opioid exposure contribute substantially to sexual dysfunction; while OST can mitigate some harms of illicit opioid use, sexual dysfunction may persist due to prior neuroendocrine alterations or comorbid conditions.[17] The lack of a dose-response relationship between buprenorphine dose and ASEX in our sample suggests that, within the usual maintenance dose range observed here (mean 3.89 mg), buprenorphine dose is not the primary driver of sexual dysfunction. However, larger samples and prospective designs are needed to confirm this. Several studies report lesser sexual dysfunction with buprenorphine than with methadone, but not the absence of dysfunction.[7,14]

It is important to note that sexual dysfunction observed in this cohort may also be influenced by unmeasured factors such as co-occurring substance use (e.g., alcohol, cannabis) and psychiatric comorbidities, which are common among individuals with opioid dependence. These factors may act as potential confounders and should be systematically evaluated in future studies.

Clinical Implication

Clinical implications from these results are severalfold. First, OST programs in Kashmir and similar settings should integrate routine screening for sexual dysfunction, mental health comorbidity, and endocrine evaluation when feasible, with clear referral pathways for persistent problems. Second, the substantial HCV burden argues for routine, on-site HCV testing and linkage to DAA therapy integrated into OST services. Third, because sexual dysfunction correlates with dependence severity and duration, early engagement in evidence-based treatment and harm-reduction services may reduce long-term morbidity. Finally, psychosocial support and tailored counseling addressing sexual health may improve quality of life and potentially enhance retention.

Limitations

The findings of this study should be interpreted in light of certain limitations. First, the cross-sectional design precludes any causal inferences regarding the relationship between opioid use, buprenorphine treatment, and sexual dysfunction. Second, as ASEX was not administered universally to all study participants, the findings related to sexual dysfunction should be interpreted as exploratory and not representative of the entire OST cohort. Third, reliance on self-reported data for variables such as adverse effects and relapse introduces the possibility of recall and social desirability bias. Fourth, co-occurring substance use (e.g., alcohol, cannabis) and psychiatric comorbidities, which are common in opioid-dependent populations and may independently contribute to sexual dysfunction, were not systematically assessed using standardized diagnostic instruments; their absence limits the ability to control for potential confounding effects. Fifth, treatment adherence was not formally evaluated using standardized measures such as regularity of attendance or medication compliance, thereby limiting detailed assessment of adherence patterns. Sixth, relevant biological parameters, including endocrine markers such as testosterone, luteinizing hormone, and follicle-stimulating hormone, were not measured, which could have provided additional insight into the mechanisms underlying sexual dysfunction. Finally, as this was a single-center study conducted at a tertiary care OST clinic in Kashmir, the findings may not be generalizable to community settings or other regions.

Conclusion

In conclusion, this study characterizes a predominantly young male cohort with high severity of opioid dependence, substantial injecting behavior, and a significant burden of HCV infection among patients receiving buprenorphine maintenance therapy at an OST center in Kashmir. Exploratory assessment among participants reporting sexual complaints suggested a considerable burden of sexual dysfunction associated with the severity and chronicity of opioid use rather than buprenorphine dose. However, as sexual functioning was assessed only in a subset of participants, these findings should be interpreted cautiously. Larger studies incorporating universal sexual health screening and longitudinal follow-up are needed to better understand the relationship between opioid dependence, OST, and sexual dysfunction.

Ethics Approval and Consent to Participate

Ethical approval was obtained from the Institutional Ethics Committee of Government Medical College, Srinagar (ERC ref. No: IRBGMC/Psy/92 dated 15th may 2023). All participants were informed that their participation was voluntary and their identities would be kept strictly confidential. Informed written consent was taken from all participants who voluntarily participated.

Competing Interest

The authors declare that they have no competing interests

Availability of Data and Material

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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None.

Conflict of Interest

There are no conflicts of interest.

Statement

The manuscript has been read and approved by all the authors, the requirements for authorship as stated earlier in this document have been met, and each author believes that the manuscript represents honest work.

Authors Contribution

MZ: Conceptualization, Methodology, Literature Review, Data Acquisition, Formal Analysis, Writing – Original Draft, Writing – Review & Editing.
AAM: Data Curation, Investigation, Formal Analysis, Writing – Review & Editing.
FRB: Conceptualization, Supervision, Data Acquisition, Writing – Review & Editing.
YHR: Investigation, Data Analysis, Writing – Review & Editing.

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