

## Article

# Substance Use and Its Association with Risky Sexual Behaviour among Indian Men: A Relative Risk Analysis from Socio-Demographic and Economic Groups

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**Simple Summary:** Substance use and risky sexual behaviour are commonly associated with each other. Sometimes, practicing risky sexual behaviour enhances sexually transmitted diseases. India is the second-most populous country in the world, so preventing sexually transmitted diseases in the Indian context bears significant importance. This study discusses the association between substance use and risky sexual behaviour among Indian men. The study found that respondents who consume substances are more likely to engage in risky sexual behaviour. Substance use can impair decision-making and increase sexual desire in the individual. As a result, it may lead to higher likelihood of engaging in practices of risky sexual behaviour. Increasing awareness among individuals through mass media can be an effective way to prevent risky sexual behaviour.

**Abstract:** Engagement in risky sexual behaviour after consuming different substances is more prevalent among Indian men. Sometimes, practicing risky sexual behaviour increases the risk of sexually transmitted diseases (STDs), including HIV, among individuals. Around 6 percent of the adult Indian population are diagnosed with STDs every year. Thus, the chief purpose of this study was to investigate the association between the use of substances and engagement in risky sexual behaviour. Descriptive statistics, Pearson's chi-square test of association, and multivariate binary logistic regression models were performed in this present study by using the data obtained from the NFHS-5 (2019–2021). The results showed that respondents who consumed alcohol were more likely to engage in extramarital sexual affairs (AOR: 1.94; 95% CI: 1.79–2.09;  $p < 0.001$ ) and sexual intercourse without any precautions (AOR: 1.23; 95% CI: 1.17–1.29;  $p < 0.001$ ). Poor socio-economic conditions and low levels of educational attainment were found as crucial factors for involvement in risky sexual behaviour. Increasing awareness among individuals through mass media may be considered an effective way to prevent risky sexual behaviour.

**Keywords:** risky sexual behaviour; substance use; alcohol consumption; protection



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## 1. Introduction

Substance use is one of the leading causes of human deaths all over the world. The World Health Organization defines substance use as “persistent or sporadic drug use inconsistent with or unrelated to acceptable medical practice”. In the Indian context, alcohol, tobacco, and cigarettes are the three most frequently used substances. According to a report prepared by the World Health Organization, nearly 2 billion people worldwide consume an alcoholic beverage and nearly 77 million people are diagnosed with alcohol-related disorders [1]. Most often, alcohol consumption is accompanied by smoking habits, which are popular among Indian men. In India, tobacco-related deaths are anticipated to increase from 1.4% in 1990 to 13.3% in 2020 as per the World Health Organization global health report 1997 [2]. Excessive substance use has several negative consequences for the health of individual substance users. Sexual behaviour is a practice exhibited by

individuals to satisfy one of their basic desires, which is their sexual needs. However, the way in which sexual behaviour is practiced may sometimes lead to adverse health consequences. As per the National Health Profile 2019, published by the ministry of health and family welfare, the total number of STDs reported in India is 126,315, with syphilis, gonorrhoea, and HIV being the top three. India currently has the world's second-largest HIV-infected population [3]. Unprotected sexual intercourse is recognized as one of the leading causes of HIV. Excessive substance use, poor socio-economic conditions, and a lack of proper education are the factors that instigate men to engage in unprotected sexual intercourse practices. Although existing studies have shown that men are more cautious about the risk of HIV infection from unprotected sexual intercourse, only a few have actually changed their sexual behaviour to prevent HIV infection [4]. The HIV prevention theme of UNAIDS in 2000–2001 was “Men make a difference”, which placed much-needed emphasis on motivating males to avoid engaging in unprotected sexual intercourse to prevent the spread of HIV [4]. Generally, HIV is more likely to be transmitted through extramarital and unprotected sexual intercourse with an infected person [5]. Researchers have started to investigate the relationship between substance use and risky sexual behaviour. Risky sexual behaviour encompasses extramarital sexual intercourse, having multiple sexual partners, and unprotected sexual intercourse. However, the definition of sexual behaviour varies in the context of culture, gender, age, and threshold. Nowadays, a greater emphasis has been given to extramarital sexual affairs in the context of HIV and other sexually transmitted diseases [6]. Risky sexual behaviour of men in the inebriated states sometimes causes unintended pregnancy among young mothers, which ultimately puts them at risk for social rejection in the form of limited access to social security, poverty, interrupted education, abortion, and subsequent pregnancies [7,8]. Several factors influence an individual's decision to engage in risky sexual practices and health-compromising behaviour such as substance use, which can result in behavioural anomalies and constitute a different form of conventional action in day-to-day life [9]. Two theoretical perspectives can be used to explain the relationship between substance use and risky sexual behaviour. At first, substance use and involvement in risky sexual practices have similar root causes, although substance use may come before risky sexual behaviour because it impairs an individual's ability to make rational judgments. Previous research has elaborated on the connection between substance use and risky sexual behaviour across a range of contexts, various age groups, and nations [10,11]. Previous research has shown the relationship between substance use and risky sexual behaviour [12–15]. India is the second-most populous country in the world after China, so preventing sexually transmitted diseases in the Indian context bears significant importance. Prevention of sexually transmitted diseases is essential in India to reduce the burden of STDs, their economic impact, social stigma, and health consequences. According to the national AIDS control organization, the estimated number of HIV-infected people in India was 2.14 million in 2017. The majority of studies on risky sexual behaviour and substance use have been conducted only in the context of developed countries [16–19] with only a few studies conducted in the Indian context, which largely emphasized minorities, adolescents, youth, and school students. Because most studies were conducted with the importance of women and child cohorts in mind, they largely ignored the men's community in this regard. This present study bears the collective novelty that, until now in the Indian context, hardly any research has been able to find out the relationship between substance use and risky sexual behaviour. The major objective of this study is to examine the association between substance use and risky sexual behaviour among Indian men. Therefore, the research hypothesis that has been formulated for the present study to support the aims and objectives is the following: “There is a significant association between substance use and risky sexual behaviour among Indian men”.

## 2. Data and Methods

### 2.1. Data Source

Data were extracted from the 5th round (2019–2021) of the National Family Health Survey (NFHS-5), which is the latest Demographic and Health Survey (DHS) data in India. The NFHS-5 is a large-scale country-wide sample survey conducted under the guidance of the Ministry of Health and Family Welfare (MoHFW), Government of India. The International Institute for Population Science (IIPS) Mumbai served as the nodal agency for the NFHS. This population-based, large-scale, nationally representative sample survey usually collected data from all 707 districts in 29 states and 7 Union Territories and gathered the information from 636,699 households, 724,115 women aged 15–49, and 101,839 men aged 15–54 years. A stratified two-stage sampling method was applied to acquire samples from the entire population. The primary goal of this survey was to collect specific information about health through a door-to-door survey. Specific attention was given to the health conditions of each cohort, including reproductive and child health status, substance use among the adolescents, utilization of maternal health care services, child vaccination services, breastfeeding practices, nutritional status of men, women, and children, family planning practices, childhood mortality and morbidity, domestic violence and women's empowerment. In the first stage, 28,586 clusters of areas were chosen in accordance with the 2011 Indian Census enumeration. Out of these, 20,059 were selected from rural areas, 8379 from urban areas and 130 from slum areas. To choose these clusters, the probability proportional to the size method was considered. In the second stage, 22 households were randomly selected with systematic sampling techniques from every urban and rural cluster. A detailed explanation of the sampling techniques and survey procedure is given in the national report of NFHS-5. NFHS-5 data are publicly available, and anyone can access the data upon request from Demographic Health Survey. The ethics committee also approved the survey in the corresponding state.

### 2.2. Study Participants

A total of 101,839 men aged between 15 to 54 years were interviewed in NFHS-5, with a response rate of 92 percent. During the process of data acquisition, individual respondents were asked to provide information through face-to-face interactions with the interviewer, and no other family members were present during the interview. The data collection schedules were prepared in 18 local languages to ensure understanding and accuracy. To ensure data quality, NFHS adopted several strategies, such as recruiting a supervisor for each interviewing team to monitor interviews and conduct back checks on the quality of data. For this study, only married men who had engaged in sexual intercourse with their spouse or anyone else before the survey was chosen as a cohort for the study. Men who were not married before the survey and had never performed any sexual intercourse were excluded from this study. After properly maintaining all the inclusion and exclusion criteria, the study participants were selected separately for two outcomes: practicing protected or unprotected sexual intercourse and engaging in extramarital sexual affairs. The study included 58,465 respondents for the outcome of practicing protected or unprotected sexual intercourse and 94,628 respondents for the outcome of engaging in extramarital sexual affairs.

### 2.3. Dependent Variables

Engaging in risky sexual practices is the main outcome of interest in the present study. Risky sexual practice can be defined in a variety of ways, such as unprotected or unsafe sexual intercourse without any female or male condom use, unprotected mouth-to-genital contact, extramarital sexual affairs or having multiple sex partners, starting sexual activity at a younger age, etc. As per study motives and data availability, the study only considered unprotected sexual intercourse and extramarital sexual affairs as the main outcome of interests which are commonly defined as risky sexual practices in the present study. Both variables are binary in which respondents were asked whether they had used any precaution (condom) during their most recent sexual encounter, and if

they answered affirmatively, they were coded as “0” and “1” if they did not. On the other hand, respondents were also asked if they had any extramarital sexual affair preceding the survey; if they answered yes, responses were coded as ‘1’ and ‘0’ for otherwise.

#### 2.4. Independent Variables

A total of six independent variables were considered as explanatory variables in the present study based on a rigorous review of earlier literature. Variables related to substance use (tobacco use, cigarette smoking, and alcohol consumption) were the main exposures for the present study, and all the exposures were dichotomized as a binary response. The role of tobacco use, cigarette smoking, and alcohol consumption in risky sexual behaviour (unprotected sex and extramarital sexual affair) was estimated while controlling for respondents’ economic background, age, and educational qualifications. The wealth quintile is a proxy indicator of a household’s socio-economic condition. The wealth quintile of the households has been measured taking into consideration the ownership of household assets including consumer items and dwelling characteristics. A score was generated for each household using principal component analysis and categorized into five quintiles, each representing 20% of the respondents, between 1 (poorest) and 5 (richest). The age of the respondent was categorized at 5-year intervals starting from 15 years and ending at 54 years. Educational attainment was categorized as (i) No education, (ii) Primary education, (iii) Secondary, and (iv) Higher education. All the explanatory factors were added to this study based on the existing literature from earlier nationally and internationally reputed published articles [3,5,18,20–24].

#### 2.5. Statistical Analysis

At first, descriptive statistics were performed to determine the background characteristics of the respondents, including each outcome variable and exposure variable. Apart from the outcome and exposure variables, various assumed causative factors were included as explanatory variables in this study, retaining the importance of household and individual-level characteristics of the respondents. To know the distribution pattern of the respondents against the dependent variable or outcome of interest, a cross-tabulation has been conducted. Next, a bivariate Pearson’s chi-square statistics test was conducted to assess the association between the exposure variables and the outcome of interests. Only those variables that were significant at a level of  $p < 0.05$  in the bivariate analysis were entered in the multivariate binary logistic regression analysis. All statistical analyses were performed through STATA version 15.0 (STATA corporation LP, College Station, TX, USA).

### 3. Results

Table 1 displays the background characteristics of the respondents who were included in the study and were framed against the outcome of protected or unprotected sexual intercourse and the outcome regarding extramarital sexual affairs. The frequencies presented in the table were unweighted, but the percentages were weighted. Firstly, most of the study participants selected for outcome ‘1’ belonged to the age group between 25 years to 39 years, and over half (54.86%) of the participants had completed their secondary level of education. All the rest study participants selected for both outcomes are near-equally distributed in different wealth quintile categories. Around 16 percent of the total participants chosen for extramarital sexual affairs were between the ages of 15–19 years. More than half (58.32%) of the participants had completed their secondary level of education. Among the total population who have had protected or unprotected sexual intercourse, more than 80% of men had performed unprotected sexual activity during their last sexual intercourse. Among them, only 2.33% of men use tobacco substances and almost 17% of men smoke cigarettes, while more than 30% of men consume alcohol. In the case of extramarital sexual affairs, almost 5% of Indian men had an extramarital sexual affair. Among the total number of men chosen for extramarital affairs, nearly 2% used tobacco products, nearly 15% preserved their smoking habit of cigarettes, and 1 in every 4 men (25.84%) used to consume alcohol.

**Table 1.** Background profile of the respondents.

Variables	Protected or Unprotected Sexual Intercourse	Extramarital Sexual Affairs
	(Frequency with Weighted %)	(Frequency with Weighted %)
Protected/Unprotected sex in last sexual intercourse		
Protected	47,812 (81.44%)	-
Unprotected	10,653 (18.56%)	-
Have/had an extramarital sexual affair		
No	-	90,508 (95.62%)
Yes	-	4120 (4.38%)
Use tobacco		
No	56,858 (97.67%)	99,561 (98.09%)
Yes	1607 (2.33%)	2278 (1.91%)
Smoke cigarettes		
No	49,189 (83.49%)	87,283 (85.23%)
Yes	9276 (16.51%)	14,556 (14.77%)
Drink alcohol		
No	39,518 (67.52%)	75,391 (74.16%)
Yes	18,947 (32.48%)	26,448 (25.84%)
Wealth Status		
Poorest	11,715 (17.84%)	19,796 (17.24%)
Poorer	12,794 (20.38%)	22,599 (20.63%)
Middle	12,222 (20.42%)	21,715 (20.58%)
Richer	11,475 (20.58%)	20,209 (20.79%)
Richest	10,259 (20.78%)	17,520 (20.76%)
Age		
15–19	1031 (1.69%)	16,657 (16.20%)
20–24	4373 (7.50%)	14,413 (14.41%)
25–29	8325 (14.42%)	14,360 (14.35%)
30–34	10,227 (17.62%)	13,292 (13.13%)
35–39	10,650 (18.33%)	12,874 (12.69%)
40–44	8924 (15.18%)	10,838 (10.50%)
45–49	8641 (14.74%)	10,833 (10.57%)
50–54	6294 (10.51%)	8572 (8.16%)
Education		
No education	8519 (13.67%)	12,269 (11.27%)
Primary	8343 (14.10%)	11,710 (11.32%)
Secondary	32,263 (54.86%)	60,018 (58.32%)
Higher	9340 (17.37%)	17,842 (19.09%)

Table 2 represents the distribution of respondents’ engagement in unprotected sexual activity during their last sexual intercourse with their spouse or another partner and its association with different background characteristics and substance use. The adjusted odds ratio has also been estimated to identify the probability of Indian men engaging in unprotected sexual activity during their sexual intercourse union. The results revealed that respondents’ wealth status was significantly ( $\chi^2$ : 859.62;  $p < 0.001$ ) associated with their unprotected sexual activity. The estimation recognizes that the likelihood of respondents’ unprotected or unsafe sex practices is significantly higher in all wealth quintile categories compared to the richest category. The poorest Indian men had a higher likelihood of engaging in unprotected sex (AOR: 2.19; 95% CI: 2.02–2.37;  $p < 0.001$ ) compared to the richest group. Respondents’ age ( $\chi^2$ : 2500;  $p < 0.001$ ), education ( $\chi^2$ : 1400;  $p < 0.001$ ), tobacco consumption behaviour ( $\chi^2$ : 12.43;  $p < 0.001$ ), cigarette smoking ( $\chi^2$ : 31.96;  $p < 0.001$ ), and alcohol consumption behaviour ( $\chi^2$ : 163.95;  $p < 0.001$ ) were significantly associated with their unprotected sexual activity. With increasing age, the tendency of Indian men

to practice unprotected sexual intercourse also increased in comparison to the age group of 15 to 19 years. In comparison with highly educated Indian men, the likelihood of unprotected sexual intercourse was 98% higher (AOR: 1.98; 95% CI: 1.81–2.17;  $p < 0.001$ ) among non-educated Indian men. The likelihood of unprotected sex was 4% higher (AOR: 1.04; 95% CI: 0.88–1.17;  $p < 0.001$ ) among those who used tobacco substances compared to those who did not use tobacco substances. The interesting fact is that the Indian men who smoked cigarettes were 22% less likely (AOR: 0.78; 95% CI: 0.74–0.83;  $p < 0.001$ ) to engage in sex without any precaution during their sexual intercourse compared to those who did not smoke. Respondents who drank alcohol were 23% more likely (AOR: 1.23; 95% CI: 1.17–1.29;  $p < 0.001$ ) to engage in unprotected sex during their sexual intercourse compared to those Indian men who did not consume alcohol.

**Table 2.** Distribution, association, and likelihood of probability estimation for the status of unprotected sexual practice among different socio-demographic and economic groups.

Variables	Unprotected Sex during Last Sexual Intercourse		Test of Association		Adjusted Odds Ratio (CI)
	Yes	No	Chi-Square	p-Value	
<b>Wealth Status</b>					
Poorest	10,246 (87.46%)	1469 (12.54%)	859.62	<0.001	2.19 (2.02–2.37) ***
Poorer	10,735 (83.91%)	2059 (16.09%)			1.74 (1.62–1.87) ***
Middle	10,193 (83.40%)	2029 (16.60%)			1.70 (1.59–1.82) ***
Richer	9129 (79.56%)	2346 (20.44%)			1.36 (1.27–1.45) ***
Richest <sup>®</sup>	7509 (73.19%)	2750 (26.81%)			
<b>Age</b>					
15–19 <sup>®</sup>	510 (49.47%)	521 (50.53%)	2500	<0.001	
20–24	2918 (66.73%)	1455 (33.27%)			2.23 (1.94–2.56) ***
25–29	6255 (72.14%)	2070 (24.86%)			3.43 (3.00–3.93) ***
30–34	8108 (79.28%)	2119 (20.72%)			4.41 (3.86–5.04) ***
35–39	8864 (83.23%)	1786 (16.77%)			5.51 (4.81–6.31) ***
40–44	7673 (85.98%)	1251 (14.02%)			6.83 (5.95–7.85) ***
45–49	7738 (89.55%)	903 (10.45%)			9.38 (8.13–10.83) ***
50–54	5746 (91.29%)	548 (8.71%)			11.49 (9.85–13.40) ***
<b>Education</b>					
No education	7632 (89.59%)	887 (10.41%)	1400	<0.001	1.98 (1.81–2.17) ***
Primary	7347 (88.06%)	996 (11.94%)			1.97 (1.90–2.14) ***
Secondary	26,250 (81.36%)	6013 (18.64%)			1.52 (1.44–1.61) ***
Higher <sup>®</sup>	6583 (70.48%)	2757 (29.52%)			
<b>Consume tobacco</b>					
No <sup>®</sup>	46,444 (81.68%)	10,414 (18.32%)	12.43	<0.001	
Yes	1368 (85.13)	239 (14.87%)			1.04 (0.88–1.17)
<b>Smoke cigarettes</b>					
No <sup>®</sup>	40,419 (82.17)	8770 (17.83%)	31.96	<0.001	
Yes	7393 (79.70%)	1883 (20.30%)			0.78 (0.74–0.83) ***
<b>Drink alcohol</b>					
No <sup>®</sup>	31,758 (80.36%)	7760 (19.64%)	163.95	<0.001	
Yes	16,054 (84.73%)	2893 (15.27%)			1.23 (1.17–1.29) ***

Note: AOR: Adjusted odds ratio; CI: Confidence Interval; \*\*\* Denotes  $p < 0.001$ . <sup>®</sup>: Reference.

Table 3 depicts the distribution pattern of Indian men based on extramarital sexual affairs before the survey, as well as a chi-square test of association taking into consideration background characteristics. An odds ratio was also estimated jointly to identify the likelihood of having extramarital sexual affairs among Indian men. The findings reveal that respondents' wealth status was significantly associated ( $\chi^2$ : 20.65;  $p < 0.001$ ) with extramarital sexual affairs. Compared to the richest Indian men, all other men from different wealth quintile categories were less likely to keep any extramarital sexual affair apart from their legal spouse. Respondents' age ( $\chi^2$ : 2300;  $p < 0.001$ ), education ( $\chi^2$ : 276.69;  $p < 0.001$ ), tobacco-taking behaviour ( $\chi^2$ : 24.93;  $p < 0.001$ ), smoking ( $\chi^2$ : 480.98;  $p < 0.001$ ), and alcohol consumption behaviour ( $\chi^2$ : 233.53;  $p < 0.001$ ) were significantly associated with

their extramarital sexual affair. Extramarital sexual affairs were found to be 84% higher (AOR: 1.84; 95% CI: 1.67–2.02;  $p < 0.001$ ) among Indian men aged 20 to 24 years compared to men aged 15 to 19 years. The likelihood is also 6% higher (AOR: 1.06; 95% CI: 0.96–1.18;  $p < 0.001$ ) among the men aged between 25 years to 29 years. The prospect of having an extramarital sexual affair was significantly higher among the men who had no formal education (AOR: 1.98; 95% CI: 1.81–2.17;  $p < 0.001$ ) or completed a primary (AOR: 1.97; 95% CI: 1.90–2.14;  $p < 0.001$ ) or secondary level of education (AOR: 1.52; 95% CI: 1.44–1.61;  $p < 0.001$ ) compared to the men who have completed their education up to the higher secondary level or more than that. The likelihood of having an extramarital sexual affair was 65% higher (AOR: 1.65; 95% CI: 1.37–1.99;  $p < 0.001$ ) among the Indian men who used to take tobacco on a daily basis compared to the men who do not have any habit of using tobacco. The likelihood of having an extramarital sexual affair was 86% higher (AOR: 1.86; 95% CI: 1.71–2.02;  $p < 0.001$ ) among the men who smoke cigarettes. The likelihood of maintaining extramarital sexual affairs was also found to be 94% higher (AOR: 1.94; 95% CI: 1.79–2.09;  $p < 0.001$ ) among the men who drink alcohol on a daily basis compared to those who do not consume alcohol.

**Table 3.** Distribution, association and likelihood estimation for the status of extramarital sexual intercourse among different socio-demographic and economic groups.

Variables	Have Any Extramarital Sexual Affair		Test of Association		Adjusted Odds Ratio (CI)
	Yes	No	Chi-Square	p-Value	
<b>Wealth Status</b>					
Richest <sup>®</sup>	815 (4.94%)	15,696 (95.06%)	20.65	<0.001	0.75 (0.67–0.84) ***
Poorest	725 (3.97%)	17,531 (96.03%)			
Poorer	907 (4.34%)	20,010 (95.66%)			
Middle	850 (4.23%)	19,258 (95.77%)			
Richer	823 (4.37%)	18,013 (95.63%)			
<b>Age</b>					
15–19 <sup>®</sup>	790 (4.76%)	15,801 (95.24%)	2300	<0.001	1.84 (1.67–2.02) ***
20–24	1456 (10.36%)	12,622 (89.66%)			
25–29	926 (6.86%)	12,563 (93.14%)			
30–34	452 (13.68%)	11,843 (96.32%)			
35–39	227 (1.94%)	11,464 (98.06%)			
40–44	126 (1.30%)	9578 (98.70%)			
45–49	87 (0.92%)	9404 (99.08%)			
50–54	56 (0.77%)	7233 (99.23%)			
<b>Education</b>					
Higher <sup>®</sup>	1059 (6.26%)	15,862 (93.74%)	276.69	<0.001	0.73 (0.63–0.84) ***
No education	276 (2.56%)	10,525 (97.44%)			
Primary	322 (3.02%)	10,330 (96.98%)			
Secondary	2463 (4.38%)	53,791 (95.62%)			
<b>Consume tobacco</b>					
No <sup>®</sup>	3985 (4.30%)	88,591 (95.70%)	24.93	<0.001	1.65 (1.37–1.99) ***
Yes	135 (6.98%)	1917 (93.02%)			
<b>Smoke cigarettes</b>					
No <sup>®</sup>	3082 (3.77%)	78,579 (96.23%)	480.98	<0.001	1.86 (1.71–2.02) ***
Yes	1038 (8.00%)	11,929 (92.00%)			
<b>Drink alcohol</b>					
No <sup>®</sup>	2650 (3.76%)	67,822 (96.24%)	233.53	<0.001	1.94 (1.79–2.09) ***
Yes	1470 (6.09%)	22,686 (93.91%)			

Note: AOR: Adjusted odds ratio; CI: Confidence Interval; \*\*\* Denotes  $p < 0.001$ . <sup>®</sup>: Reference.

#### 4. Discussion

Only a few studies on risky sexual behaviour and substance use have been conducted in the Indian context. However, those studies have mostly been identified to focus on minorities, adolescents, youth, and school students. The main purpose of the present study was to identify the plausibility of an association between substance use and risky sexual behaviour among Indian men. Risky sexual behaviour has been characterized

by researchers as sexual behaviours that put a person at risk of getting infected with sexually transmitted infections (STIs), such as the human immunodeficiency virus (HIV), which could have negative impacts on their health [25]. The study found that respondents' socio-demographic and economic characteristics were integral causal controlling factors of substance use, which ultimately instigates risky sexual behaviour indirectly. Therefore, the research hypothesis is likely to be framed as 'a significant association between substance use and risky sexual behaviour'. The result of the study was proven through several statistical tests which established the hypothesis.

Men who are under the influence of substances generally engage in risky sexual activities and are easily exposed to sexually transmitted diseases, including HIV infection [9,26]. Alcohol consumption, tobacco use, and cigarette smoking are all identified as significant markers of high-risk sexual behaviour. The above-mentioned findings are consistent with some earlier findings [3,24,27]. Low levels of socio-economic status, lack of education or basic education, and the age of the respondents also have an integral relationship with substance use and its indirect impact on the risky sexual behaviour of Indian men. These findings are also identical to some previous national and international findings [23,28]. Interestingly, the study revealed contrasting findings for age in relation to unprotected sexual activity and extramarital sexual affairs. About 20% of Indian men have performed unprotected sexual activity, while almost 5% of Indian men had extramarital sexual affairs. Notably, the study found that middle- to older-aged Indian men were at higher risk for engaging in unprotected sexual activity, while this same age group had a lower risk for extramarital affairs. Education, understanding capability, maturity level, economic responsibility and responsibility for the family, and priority given to societal norms directly and indirectly influence these contrasting findings [29,30]. Previous studies have identified detrimental effects in the form of a higher risk of sexually transmitted diseases (STDs) among middle-aged to elderly people. Considering the association between involvement in risky sexual behaviour and the respondents' socio-economic status, unsafe and unprotected sexual intercourse without using contraceptives, i.e., condoms, was found to be higher among the Indian men belonging to the poor-to-poorest quintile groups while extramarital sexual affairs were found to be prevalent among the rich-to-richest group of Indian men. Respondents with lower standards of living were more likely to be associated with inconsistent condom use. Generally, economically disadvantaged sections of society experienced a lack of health education and sex education, both of which are relevant in the context of risky sexual behaviour.

Socio-economically affluent Indian men were found to be more likely to engage in extramarital sexual affairs. The study results also revealed that higher educational attainment among Indian men was associated with lower odds of risky sexual behaviour. Respondents with lower educational attainment were more likely to be associated with inconsistent condom use and extramarital sexual relations. Respondents with higher educational attainment are better able to understand biological transmission processes and have higher self-efficacy than those in lower educational attainment groups [31]. Previous studies have shown that risky sexual behaviour and substance use are correlated with each other [32,33]. Cigarette smoking was highly and positively associated with extramarital sexual affairs and unprotected sexual activity [34,35]. Existing literature has figured out that risky sexual behaviour is a result of the disinhibiting effect of cigarette smoking, as it reduces the decision-making power and judgment capacity of individuals [36]. Cigarette smoking is also related to dopamine release, which can stimulate risky sexual behaviour [21]. This study found a significant link between alcohol consumption and risky sexual behaviour. Drinking alcohol can cause chemical changes in the brain that often increase negative feelings and encourage risky behaviour. Alcohol consumption can also sometimes influence the sexual behaviour of the individual and hence leads him to proceed in risky sexual behaviour [37]. It cannot be ignored that alcohol consumption impairs an individual's decision-making ability. Excessive alcohol consumption can lead to a state of intoxication which may act as a stimulus for engaging in aggressive sexual intercourse [38]. Several

scholars have found that drinking alcohol is linked to greater arousal and heightened orgasm, which may result in adopting risky sexual behaviour [39–41]. According to a Botswana study, men who consume alcohol are three to four times more likely than non-drinkers to have multiple sexual partners and participate in unsafe sexual unions [42]. In the Indian context, risky sexual behaviour is significantly associated with tobacco users. Negative peer association among tobacco users may sometimes instigate individual users to engage in messy sexual behaviour. Practising risky sexual behaviour enhances sexually transmitted diseases. India is the second-most populous country in the world, so preventing sexually transmitted diseases in the Indian context bears significant importance. This study will help policymakers to prevent risky sexual behaviour among Indian men.

Despite accomplishing the primary goal of this study, which has significant implications for both the people and society, the study has a few limitations. Religious groups, ethnicity, region, area of residence, employment status, family size, number of children, use of other contraceptive methods, and various cultural attributes need to be incorporated as a controlling effect for a better understanding of the study. Sometimes couples usually do not adopt any precautions intentionally during intercourse for planning to procreate. In this study, this is also considered risky sexual behaviour because the NFHS dataset does not allow us to know about their motive. This is one of the notable limitations identified in this study. However, from a broad perspective; we attempted to gain a generalized understanding about the association or relationship between substance use and risky sexual behaviour. It is important to note that this study only includes persons with heterosexual relationships and does not analyse homosexual relationships. Additionally, the study did not measure the intensity or frequency of substance use, nor was the Alcohol Use Disorder Identification Test (AUDIT) conducted. When studying the causes of substance use and its impact on high-risk sexual behaviour, both the direct and indirect effects of several controlling factors should be taken into account for a more effective understanding.

## 5. Conclusions

This study finds out the relationship between substance use and risky sexual behaviour among Indian men aged between 15 and 54 years. Despite its limitations, it provides an important augmentation of earlier research conducted on convenient large-scale samples. This study found that substance use, especially alcohol consumption and cigarette smoking, was significantly associated with risky sexual behaviour among Indian men. Increasing habits of alcohol consumption, tobacco use, and cigarette smoking were likely to seem to be associated with an increased likelihood of practising unprotected sexual activity and involvement in extramarital sexual affairs which is subsequently the primary risk factor for transmission of STDs, including HIV. A state of intoxication brought on by alcohol use may serve as a catalyst for risky sexual behaviour. Moreover, drinking alcohol is connected to increased arousal and orgasm, which are connected to risky sexual conduct. According to this study, respondents with lower socio-economic status and low educational attainment were more likely to report irregular condom use. To prevent individuals from becoming victims of unsafe or unplanned sex more awareness is needed through print and virtual media.

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