

# An Assessment of Comprehensive Knowledge of HIV/AIDS among Slum and Non-Slum Populations in Delhi, India

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## Abstract

In order to design appropriate HIV prevention programs, it is important to examine the perception and knowledge of HIV/AIDS and methods of prevention. This article explores comprehensive knowledge of HIV/AIDS prevention methods among women and men in slum and non-slum areas in the National Capital Territory of Delhi, India. Data were drawn from the National Family Health Survey, 2005-06 (NFHS-3). The sample included 3096 women aged 15 - 49 years and 1321 men aged 15 - 54 years. Pearson Chi-square test and logistic regression analyses were conducted to examine the association between the study variables and the background characteristics of the slum and non-slum populations. Comprehensive knowledge of HIV/AIDS prevention methods was significantly lower among women and men in slum areas as compared with non-slum areas. Compared to men, women had less comprehensive knowledge of HIV/AIDS prevention methods in slum and non-slum areas, even after controlling for various demographic and socio-economic and exposure variables. Interventions are needed to build knowledge of HIV/AIDS transmission and prevention methods through mass media campaigns, and information, education and communication programs (IEC) on HIV/AIDS in slum areas.

## Keywords

Slum, Knowledge, HIV/AIDS

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## 1. Introduction

India, with a population of over 1.21 billion, [1] is the second most populous country in the world [2]. Around 31.2 per cent of India's population resides in urban areas, which was 27.8 per cent in 2001, witnessing 3.4 per cent increase in the share of urban population during 2001-11 [1] [3]. In absolute numbers, India has the second largest slum population after China [4] with 17.4 per cent of the urban population living in slum areas in 2011, which was about 15 per cent in 2001 [1]. Of these, around 38 per cent of the population lives in 46 million-plus cities [5]. Such unprecedented urban population growth is attributed to greater job opportunities in metro cities pulling unemployed poor people from different regions of country for employment and livelihood [5]. These migrants are often from tribal and rural communities, with a low level of education and skills. They are not able to afford the higher cost of housing in metro cities, and thereby forced to settle in slums, resulting in a high growth of the slum population [5] [6]. People living in slums are deprived of access to health and other services, making them vulnerable to opportunistic infections; moreover, many are not aware of available services, especially for diseases like HIV/AIDS [4]. The National Capital Territory (NCT) of Delhi is one state of India where about 98 per cent of the population lives in urban areas, and 15 per cent of urban households live in slums, which is about 3 per cent in India's slum population [1] [5]. While India has witnessed a decline in adult HIV prevalence during the past decade, HIV prevalence rates in Delhi have been increasing [7]. Adult HIV prevalence in Delhi was estimated at 0.18 per cent in 2007, and 0.22 per cent in 2011, against the national estimate of 0.41 per cent in 2001 and 0.27 per cent in 2011 [7]. However, there are no separate HIV prevalence estimates for the slum and non-slum population of India. A number of studies have been conducted to examine the behavioral risk factors [8]-[10] associated with HIV/AIDS, but few studies have compared the risk behaviors of slum and non-slum populations in the country. A population based study conducted in Kenya has indicated that slum population as compared to non-slum urban population was at a greater risk of HIV infection [11]. A study of migrant tribals living in urban slums in India shows that they engage in risky sexual behavior and initiate sex at an early age [8] [10]. Hence, to address the transmission of HIV in slum populations, the level of comprehensive knowledge of HIV/AIDS prevention methods and access to HIV/AIDS information and services are important issues, especially in HIV epidemic countries. UNAIDS (2008) had emphasized improving awareness and knowledge of prevention methods of HIV/AIDS as the first strategy in the battle against HIV/AIDS [12]. Globally, improving awareness and knowledge of HIV/AIDS through targeted HIV interventions for high-risk groups have succeeded in reducing new HIV infections [12].

In India, the National AIDS Control Program (NACP) focuses on enhancing HIV/AIDS awareness and knowledge through behaviour change preventive practices [13]. A study of 8 metropolitan cities including Delhi indicates that AIDS knowledge is almost 100 per cent among adult men aged 15 - 59 and 89 - 99 per cent among women aged 15 - 49, and lower among women from slum areas than non-slum areas [14]. In India studies on awareness and knowledge of HIV/AIDS and its transmission among the slum population [15]-[20], indicate that slum population have limited knowledge, myths and misconceptions [15] [19] [20] about the mode of HIV transmission [8] [14]. Evidence from India [8] [9] [14], China [21] and Ghana [22] and some West African countries [23] show that women are less knowledgeable about HIV/AIDS than men. A large cross-sectional survey shows that the percentage of women and men in Indian slums with comprehensive knowledge of HIV/AIDS prevention methods varies respectively between 22 - 61 per cent and 33 - 71 per cent [14]. The objective of this study is to examine awareness of HIV/AIDS, comprehensive knowledge of HIV prevention methods, and the factors associated with comprehensive awareness of HIV/AIDS among adult women and men in slum and non-slum areas of Delhi, India.

## 2. Materials and Methods

This study uses data from women aged 15 - 49 years and men aged 15 - 54 years in slum and non-slum areas of Delhi, India, who participated in the National Family Health Survey (NFHS-3), conducted in 2005-06 [8] [24]. NFHS-3 provides information on HIV prevalence, attitudes toward HIV/AIDS patients, high-risk sexual behavior, and HIV knowledge among the slum and non-slum population in Delhi, and other cities of India [14] [24]. In NFHS-3, people in slum and non-slum areas were asked specific questions related to awareness and knowledge of HIV/AIDS and its prevention methods, e.g. it is possible to reduce the chances of getting HIV/AIDS by abstaining from sex, having just one uninfected and faithful sex partner who has no other sex partners, and using a condom during every act of sexual intercourse [24]. A two-stage sampling procedure was used to select

households from slum and non-slum areas in Delhi. In the first stage, slum and non-slum Census Enumeration Blocks (CEBs) were independently selected, which subsequently served as two separate sampling frames. In the second stage, households were selected from each sampling frame using probability proportional to size sampling (PPS). In Delhi, 2000 households were selected from the enumeration areas designated as slum and non-slum areas within the Municipal Corporation city limits, separately [24].

### 3. Measures

#### 3.1. Outcome Variable

The outcome variable in this study was comprehensive knowledge of HIV/AIDS of prevention methods, measured by correct answers to HIV transmission modes and HIV prevention methods. This variable was constructed based on the ability to correctly identify three major ways of preventing HIV (Questions 1 - 3 below), awareness that a healthy looking person can have HIV (Question 4 below), and to reject the two most common misconceptions about HIV transmission (Question 5 below) [14].

- 1) Using a condom for every act of sexual intercourse
- 2) Limiting sexual intercourse to just one uninfected faithful partner
- 3) Abstaining from sexual intercourse
- 4) Aware that a healthy looking person can have HIV/AIDS, and
- 5) HIV/AIDS can be transmitted through mosquito bites and by sharing food with a person who has HIV/AIDS.

A respondent was considered to have comprehensive knowledge of HIV/AIDS prevention methods if s/he responded positively (yes) to Questions 1 - 4 and responded negatively (No) to question number 5. The indicator was dichotomized as did not have comprehensive knowledge of HIV/AIDS prevention methods (coded as 0) and have comprehensive knowledge of HIV/AIDS prevention methods (coded as 1).

#### 3.2. Independent Variables

Socio-demographic and economic characteristics included age, education, marital status, occupation, age at first intercourse, alcohol consumption, media exposure, prior HIV testing and wealth index. The wealth index constructed in NFHS-3 has been used in the study. In NFHS-3, the wealth index was constructed on the basis of 33 assets and housing characteristics using principal components analysis [8].

Age was measured as a continuous variable and grouped into three categories: 15 - 24, 25 - 34, and 35 years or older. Education was divided into three categories: no education, completed less than 10 years of education, completed 10 or more years of education. Marital status was categorized as never married (including return marriage not performed), and ever married (including currently married and widow/divorced/separated/deserted). Occupation was categorized as not working, and working. Media exposure was grouped into three categories: no exposure (did not read newspapers or magazines, watch TV, listen to the radio and visit the cinema/theatre at least once a week); partial exposure (read newspapers or magazines, or watched TV, or listened to the radio, or visit the cinema/theatre at least once a week); and regular exposure (read newspapers or magazines, watched TV, listened to the radio and visited the cinema/theater at least once a week). Wealth index was subdivided into the following five categories: poorest, poorer, middle, richer, and richest.

#### 3.3. Statistical Analysis

State weights were used to correct oversampling and to maintain the representativeness of the data as well as the statistical soundness of indicators calculated based on these data at the city level and also for slum and non-slum areas within the city [24]. Pearson Chi-square test and logistic regression were used to examine statistical significance of association between comprehensive knowledge of HIV/AIDS prevention methods and the background characteristics of women and men in slum and non-slum areas. In logistic regression, no comprehensive knowledge of HIV/AIDS prevention methods (coded as 0) was assigned as the reference category. In the case of media exposure and the wealth index variables, partial media exposure and the middle wealth category were respectively used as the reference category for calculating adjusted odds ratios, due to the small number of observations in the no media exposure group (in the media exposure variable) and the poorest and poorer groups (in the wealth index). In this study, SPSS-20 was used to analyze the data.

## 4. Results

### 4.1. Awareness of HIV/AIDS

Of the 4417 respondents included in the analysis, 3096 were women and 1321 were men; of these, 90 per cent of women and 98 per cent of men had heard of HIV/AIDS (**Table 1**). Overall, more women and men in non-slum than slum areas were aware of HIV/AIDS. In slum areas, a higher percentage of younger than older women were aware of HIV/AIDS; however a reverse pattern was observed in non-slum areas (**Table 1**). In slum and non-slum areas, HIV/AIDS awareness among women increased with education level. Among men, HIV/AIDS awareness was higher among those aged 25 - 34 years in slum areas, and less than 25 years in non-slum areas. The percentage of uneducated men aware of HIV/AIDS was higher in slum than non-slum areas. In both slum and non-slum areas, a larger percentage of never married than ever married women were aware of HIV/AIDS. Similarly, HIV/AIDS awareness was higher among never married than ever married men in slum and non-slum areas.

Awareness of HIV/AIDS in slum areas was highest among women who never had sex, while in non-slum areas, awareness was highest among women who had experienced first sex after age 20 years. While awareness was high among men who never experienced sex in slum as well as non-slum areas, awareness was higher in non-slum than slum areas. In slum and non-slum areas, HIV/AIDS awareness was higher among men who did not drink alcohol than others. Among women and men with regular media exposure, awareness of HIV/AIDS was high in both locations. The highest proportion of women and men from the richest wealth group in both slum and non-slum areas were aware of HIV. However, awareness was highest among women and men from the middle wealth category in slum as compared to non-slum areas.

### 4.2. Comprehensive Knowledge of HIV/AIDS Prevention Methods

Comprehensive knowledge of HIV/AIDS prevention methods was significantly lower among women and men in slum areas than non-slum areas respectively (women:  $\chi^2 = 43.32$ ,  $df = 2$ ,  $p < 0.05$  and men:  $\chi^2 = 4.74$ ,  $df = 2$ ,  $p < 0.05$ ). Comprehensive knowledge of HIV/AIDS prevention methods was lower among women than men in both slum and non-slum areas (**Table 2**). For most indicators, comprehensive knowledge of prevention methods was lower among women in slum areas than non-slum areas, except for uneducated women and those in the middle wealth category. In both slum and non-slum areas, comprehensive knowledge of HIV/AIDS prevention methods was high among women who were educated (more than 10 years education), never married, working, had first sex after age 20, had regular media exposure, and were from the richest wealth category. Among men, comprehensive knowledge of prevention methods was high in the younger group (less than 25 years) in slum areas, and in the older group (aged 35 years or more) in non-slum areas. Further, comprehensive knowledge of prevention methods was lower in non-slum areas as compared to slum areas among men with high educational levels (10 years or more education), those not working, who never had sex, with partial media exposure, and from the richest, richer, and poorer wealth groups.

### 4.3. Predictors of Comprehensive Knowledge of HIV/AIDS Prevention Methods

Logistic regression analysis show that comprehensive knowledge of prevention methods was significantly higher among women in non-slum areas than slum areas (OR: 1.98, 95%CI (1.61 - 2.44),  $p < 0.05$ ) and similarly higher among men in non-slum areas compared to men in slum areas (OR: 1.29, 95%CI (0.10 - 1.69),  $p = 0.06$ ).

The predictors of comprehensive HIV/AIDS prevention methods were similar for women across slum and non-slum settings. As seen in **Table 3**, in both slum and non-slum areas educated women were significantly more likely than uneducated women to have comprehensive knowledge of HIV/AIDS prevention methods. Further, the likelihood of having comprehensive knowledge of HIV/AIDS prevention methods was higher among working women as compared to non-working women in both slum and non-slum areas. Ever married women were less likely than never married women in slum and non-slum areas to have comprehensive knowledge of HIV/AIDS prevention methods. Women who never experienced sex were less likely than others to have comprehensive knowledge of HIV/AIDS prevention methods in slum and non-slum areas. Women with regular media exposure were significantly more likely to have comprehensive knowledge of HIV/AIDS prevention methods compared to women with partial media exposure in both slum and non-slum areas (slum-AOR: 1.50, 95%CI (1.05 - 2.14),  $p < 0.05$ ; non-slum-AOR: 1.58, 95%CI (1.03 - 2.43),  $p < 0.05$ ). Women who had ever

**Table 1.** Awareness of HIV/AIDS among Women and Men in Slum and Non-slum Areas, Delhi, 2005-06-

Background Characteristics	Women (15 - 49 years)						Men (15 - 54 years)					
	Slum		Non-slum		Total		Slum		Non-slum		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
<b>Total</b>	572	80.95	2524	92.10	3096	90.04	282	95.87	1040	98.01	1321	97.55
<b>Age (years)</b>												
<25	229	85.94	872	91.85	1101	90.62	121	96.51	388	99.33	509	98.66
25 - 34	178	79.60	772	91.12	950	88.96	79	97.32	312	97.93	390	97.80
≤35	165	75.47	880	93.22	1044	90.42	82	93.55	340	96.58	422	95.99
<b>Education (years)</b>												
No education	253	63.43	390	65.80	643	64.87	52	85.86	78	83.33	130	84.35
<10	185	91.14	578	90.55	762	90.69	146	97.10	287	97.75	433	97.53
≤10	134	100.00	1557	99.27	1690	99.32	84	100.00	675	99.81	758	99.83
<b>Marital status</b>												
Never married	148	92.04	694	94.88	842	94.38	116	96.80	467	98.89	583	98.48
Ever married	424	77.08	1829	91.05	2253	88.42	166	95.22	573	97.29	739	96.83
<b>Occupation</b>												
Not working	428	82.80	1961	92.49	2389	90.76	35	95.52	206	98.74	241	98.27
Working	144	75.44	560	90.93	704	87.77	246	95.91	830	97.82	1076	97.38
<b>Age at first intercourse (years)</b>												
Not had intercourse	148	92.04	693	94.87	841	94.37	92	95.98	397	98.70	489	98.19
<16	133	67.31	282	81.08	415	76.67	5	100.00	5	100.00	10	100.00
16 - 20	224	79.50	873	88.81	1098	86.90	29	96.30	69	98.11	97	97.58
>20	66	88.46	675	98.12	742	97.25	157	95.61	569	97.50	725	97.09
<b>Drinks alcohol</b>												
Yes	nc	nc	nc	nc	nc	nc	97	94.02	349	97.41	446	96.67
No	nc	nc	nc	nc	nc	nc	185	96.85	690	98.31	875	98.01
<b>Media exposure</b>												
No exposure	46	43.82	75	42.37	120	42.92	6	66.67	3	50.00	9	61.84
Partial exposure	106	69.71	174	72.26	280	71.29	56	90.48	101	89.74	156	90.00
Regular exposure	420	87.82	2275	95.26	2695	94.10	220	98.08	936	99.03	1156	98.85
<b>Prior HIV testing</b>												
Never tested	558	80.48	2337	91.47	2895	89.35	276	95.79	984	97.90	1260	97.43
Ever tested	14	100.00	187	100.00	200	100.00	6	100.00	56	100.00	61	100.00
<b>Wealth index</b>												
Poorest	3	40.00	0	0.00	3	40.00	3	80.00	0	0.00	3	80.00
Poorer	30	51.72	23	33.33	53	43.72	21	76.92	21	87.50	41	82.22
Middle	140	61.90	51	52.50	190	59.40	72	93.43	32	88.00	105	91.76
Richer	177	83.86	302	75.21	480	78.41	89	98.81	164	96.06	253	97.03
Richest	222	94.94	2148	96.04	2371	95.94	97	99.46	822	99.06	920	99.10

nc-not calculated due to small number of observations.

**Table 2.** Comprehensive Knowledge of HIV/AIDS Prevention Methods among Women and Men in Slum and Non-slum Areas, Delhi, 2005-06.

Background Characteristics	Women (15 - 49 years)						Men (15 - 54 years)					
	Slum		Non-slum		Total		Slum		Non-slum		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
<b>Total</b>	463	36.5	2325	53.25	2788	50.48	270	54.07	1018	60.41	1289	59.12
<b>Age (years)</b>												
<25	197	36.10	801	54.04	998	50.50	117	53.85	385	53.02	502	53.21
25 - 34	142	36.82	703	51.44	845	48.99	77	60.69	305	63.56	382	62.98
≤35	124	36.63	820	54.02	944	51.74	77	48.28	328	66.14	405	62.76
<b>Education (years)</b>												
No education	161	22.93	256	20.30	417	21.31	45	32.94	65	36.00	110	34.75
<10	168	34.95	523	35.92	691	35.69	142	50.37	281	48.39	422	49.05
≤10	134	54.58	1545	64.59	1679	63.79	84	72.15	674	67.75	757	68.24
<b>Marital status</b>												
Never married	136	40.98	659	55.30	795	52.85	112	56.13	462	56.58	574	56.49
Ever married	327	34.59	1666	52.44	1992	49.51	158	52.84	557	63.57	715	61.20
<b>Occupation</b>												
Not working	354	35.21	1814	51.85	2169	49.13	34	60.94	203	56.69	237	57.30
Working	108	40.57	509	58.35	618	55.23	236	53.14	812	61.31	1048	59.47
<b>Age at first intercourse (years)</b>												
Not had intercourse	136	40.98	658	55.21	794	52.77	88	55.09	392	54.46	480	54.57
<16	89	24.00	229	30.56	318	28.71	5	77.78	5	50.00	10	63.31
16 - 20	178	34.10	776	46.64	954	44.30	28	50.00	67	67.31	95	62.28
>20	59	52.17	663	66.86	722	65.66	150	53.71	555	63.87	704	61.71
<b>Drinks alcohol</b>												
Yes	nc	nc	nc	nc	nc	nc	179	55.62	679	61.33	858	60.14
No	nc	nc	nc	nc	nc	nc	91	51.45	340	58.56	432	57.05
<b>Media exposure</b>												
No Exposure	20	20.51	32	16.00	52	17.74	4	25.00	1	100.00	6	42.56
Partial exposure	74	24.83	126	31.31	200	28.91	50	43.16	91	42.86	141	42.96
Regular exposure	369	39.67	2167	55.07	2536	52.83	216	57.35	927	62.06	1143	61.17
<b>Prior HIV testing</b>												
Never tested	449	35.31	2138	51.48	2587	48.68	264	54.60	963	60.00	1228	58.84
Ever tested	14	74.07	187	73.47	200	73.51	6	36.36	56	67.44	61	64.50
<b>Wealth index</b>												
Poorest	1		0		1		2	50.00			2	50.00
Poorer	15	6.67	8	16.67	23	9.98	16	56.67	18	28.57	34	41.69
Middle	86	27.22	27	19.05	113	25.29	68	44.53	28	59.09	96	48.84
Richer	149	28.18	227	29.05	376	28.71	88	50.60	158	46.72	246	48.11
Richest	211	48.43	2063	56.49	2274	55.74	97	63.93	815	63.81	911	63.82

nc-not calculated due to small number of observations.

**Table 3.** Association between Women's and Men's Background Characteristics and Comprehensive Knowledge of HIV/AIDS Prevention Methods in Slum and Non-slum Areas, Delhi, 2005-06-

Background Characteristics	Comprehensive Knowledge of HIV							
	Women (15 - 49 years)				Men (15 - 54 years)			
	Slum		Non-slum		Slum		Non-slum	
	AOR (95% CI)	P	AOR (95% CI)	P	AOR (95% CI)	P	AOR (95% CI)	P
<b>Age (years)</b>								
<25*	1		1		1		1	
25 - 34	0.83 (0.64 - 1.09)	0.18	0.79 (0.58 - 1.07)	0.13	1.11 (0.45 - 2.72)	0.81	1.54 (0.99 - 2.41)	0.06
≤35	1.03 (0.78 - 1.37)	0.82	1.01 (0.74 - 1.39)	0.93	0.91 (0.34 - 2.45)	0.85	1.78 (1.03 - 3.07)	0.04
<b>Education (years)</b>								
No education*	1		1		1		1	
<10	1.72 (1.26 - 2.36)	0	1.85 (1.26 - 2.71)	0	2.00 (0.89 - 4.48)	0.09	2.08 (1.09 - 3.97)	0.03
≥10	4.14 (3.01 - 5.69)	0	4.69 (3.22 - 6.82)	0	4.55 (1.82 - 11.38)	0	3.87 (2.03 - 7.40)	0
<b>Marital status</b>								
Never married*	1		1		1		1	
Ever married	0.75 (0.08 - 7.29)	0.81	0.74 (0.08 - 7.18)	0.8	1.04 (0.31 - 3.46)	0.95	0.66 (0.32 - 1.34)	0.25
<b>Occupation</b>								
Not working*	1		1		1		1	
Working	1.29 (1.05 - 1.58)	0.02	1.23 (0.98 - 1.53)	0.07	0.72 (0.30 - 1.73)	0.46	0.91 (0.60 - 1.37)	0.64
<b>Age at first intercourse (years)</b>								
Not had sexual intercourse*	1		1		1		1	
<16	1.05 (0.11 - 10.35)	0.97	1.06 (0.11 - 10.55)	0.96	3.92 (0.32 - 47.72)	0.28	2.43 (0.35 - 17.05)	0.37
16 - 20	1.36 (0.14 - 13.18)	0.79	1.40 (0.14 - 13.63)	0.77	1.23 (0.42 - 3.65)	0.7	2.70 (1.36 - 5.33)	0
>20	1.82 (0.19 - 17.77)	0.61	1.84 (0.19 - 18.07)	0.6	1.19 (0.34 - 4.15)	0.78	1.82 (0.88 - 3.76)	0.1
<b>Drinks alcohol</b>								
No*					1		1	
Yes	nc	nc	nc	nc	0.86 (0.47 - 1.57)	0.62	0.89 (0.68 - 1.16)	0.02
<b>Media exposure</b>								
Partial exposure*	1		1		1		1	
Regular exposure	1.50 (1.05 - 2.14)	0.02	1.58 (1.03 - 2.43)	0.04	1.52 (0.73 - 3.18)	0.26	1.16 (0.69 - 1.95)	0.57
<b>Prior HIV testing</b>								
Never tested*	1		1		1		1	
Ever tested	2.09 (1.47 - 2.98)	0	2.0 (1.39 - 2.88)	0	0.28 (0.04 - 1.76)	0.17	0.93 (0.51 - 1.70)	0.81
<b>Wealth index</b>								
Middle*	1		1		1		1	
Richer	0.71 (0.42 - 1.21)	0.62	0.89 (0.30 - 2.63)	0.88	0.99 (0.49 - 2.00)	0.99	0.43 (0.17 - 1.05)	0.06
Richest	1.08 (0.65 - 1.78)	0.77	1.34 (0.47 - 3.83)	0.58	1.25 (0.59 - 2.64)	0.57	0.58 (0.24 - 1.41)	0.23

AOR-adjusted odds ratios; P-p-value; \*-reference category; nc-not calculated due to small number of observations; Middle includes poorer + poorest.

tested for HIV were significantly more likely than those who had never tested for HIV in slum and non-slum areas—respectively, 2.09 ( $p < 0.05$ ) and 2.00 ( $p < 0.05$ )—to have comprehensive knowledge of HIV/AIDS prevention methods. Further women from the richest wealth category were more likely to have comprehensive knowledge of HIV/AIDS prevention measures than the reference category in both slum and non-slum areas.

Results are mixed with regard to the predictors of comprehensive knowledge of HIV/AIDS prevention methods among men. Older men (above age 34 years) in non-slum areas were significantly more likely to have comprehensive knowledge of HIV/AIDS prevention methods than the reference category ( $\leq 35$  years-AOR: 1.78, 95%CI (1.03 - 3.07),  $p < 0.05$ ). Educated men were significantly more likely to have comprehensive knowledge of HIV/AIDS prevention methods than uneducated in non-slum areas. Ever married men were more likely to have comprehensive knowledge than never married men in slum areas; however, in non-slum areas, ever married men were less likely to have comprehensive knowledge than others. Working men in slum and non-slum areas were less likely than non-working men to have comprehensive knowledge of HIV/AIDS prevention methods. Further, in non-slum areas men who had first sex between age 16 - 20 years were more likely than men who had never had sex to have comprehensive knowledge of prevention methods; however, in slum areas, men who had first sex before age 16 were more likely to have comprehensive knowledge of HIV/AIDS prevention methods than men who had never sex.

## 5. Discussion

Findings of this study show that comprehensive knowledge of HIV/AIDS prevention methods is not as high as HIV/AIDS awareness among both women and men in slum and non-slum areas. Further, the study shows that comprehensive knowledge of HIV/AIDS prevention methods was significantly lower among women and men in slum areas than in non-slum areas. Studies in Sub-Saharan African countries have attributed low knowledge of modes of HIV transmission and prevention methods [11] [22] [25] as one of the reason of high HIV prevalence in slum compared to non-slum areas [11]; however, knowledge of modes of HIV transmission. A large cross-sectional survey shows that comprehensive knowledge of HIV/AIDS prevention methods among women and men in Indian slums varies (22 - 61 per cent for women and 33 - 71 per cent for men) [14]. For most indicators, comprehensive knowledge of HIV/AIDS prevention methods was lower among women in slum than non-slum areas, apart from uneducated and middle wealth category women. However, among men with a high level of education (10 years or more), not working, never experienced sexual intercourse, partially exposed to media, and from the richest, richer and poorer wealth groups, the percentage of comprehensive knowledge of prevention methods was low in non-slum areas as compared to slum areas. This study suggests that education is positively associated with comprehensive knowledge of HIV prevention methods; educated women and men are more likely to have comprehensive knowledge of prevention methods in both slum and non-slum areas. The likelihood of having comprehensive knowledge of prevention methods was less among ever married women in slum and non-slum areas and among ever married men in non-slum areas; however, ever married men in slum areas had higher comprehensive knowledge of prevention methods than those never married. Women who had never experienced sexual intercourse are less likely to have comprehensive knowledge of preventive methods; women who had first sexual intercourse after age 20 had a higher likelihood of comprehensive knowledge of prevention methods in slum and non-slum areas, whereas the likelihood of comprehensive knowledge of HIV/AIDS prevention methods was higher among men who had experienced first sexual intercourse before the age of 16 years in slum areas and between the age of 16 - 20 years in non-slum areas. Women and men who were exposed to media regularly were more likely to have comprehensive knowledge of prevention methods of HIV/AIDS in slum and non-slum areas than others. Women belonging to the richest wealth category had a higher likelihood of comprehensive knowledge of prevention methods in slum and non-slum areas than others.

The low level of comprehensive knowledge of preventive methods of HIV/AIDS in slum areas is a cause for concern because heterosexual unprotected sex is still the primary mode of HIV transmission in India [26] [27] and slum people also engage in unprotected sex and multiple partner sex [10]. In addition, men sometimes migrate to cities without their spouse, and have unprotected sex with unpaid partners or paid sex workers, playing a bridging role in transmitting HIV infection their spouse [28]. People living in slum areas often have poor access to services, and lack awareness about available services, especially in the case of stigmatizing diseases like HIV [4]. The importance of education in halting and reducing the HIV epidemic in the slum areas is recognized.



## 6. Conclusion

The study findings highlight that while awareness of HIV/AIDS is near-universal, comprehensive knowledge of preventive methods of HIV/AIDS is still low among women and men in both slum and non-slum areas of Delhi. People in slum areas, especially women have lower comprehensive knowledge of HIV/AIDS prevention methods as compared to those in non-slum areas. Although HIV prevention programs in India have been making extensive use of the mass media, especially the electronic media, to build awareness of HIV/AIDS prevention methods, low levels of HIV/AIDS awareness suggests a lapse in educational campaigns in building knowledge of HIV prevention. The study findings suggest that to reduce HIV/AIDS vulnerability among women and men in slum and non-slum areas, programs must focus on appropriate behaviour change communication and build awareness to educate them on HIV/AIDS prevention methods especially among women in the reproductive age group in slum areas. It is expected that this study will help to address some of the gaps in the implementation of HIV targeted interventions in the slum and non-slum areas of India.

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