Original Article

The Relationship between Educational Attainment and HIV Prevalence among Pregnant Women Attending Antenatal Clinics in Six States of India: Sentinel Surveillance from 2010 to 2017

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Abstract

Background: The National AIDS Control Programme provides support for HIV prevention services to pregnant women attending antenatal care (ANC) clinics through testing, kit delivery, counseling, and treatment services. The impact of HIV prevention programs in the general population is assessed by monitoring trends and progress made against the HIV epidemic among pregnant women attending ANC clinics during HIV Sentinel Surveillance (HSS). **Objectives:** This study explores the association of HIV risk with educational attainment for Indian women across different age groups from four repeated cross-sectional surveillance of antenatal clinics in six states from the southern part of India. **Methods:** Data collected from the repeated cross-sectional HSS conducted during the year 2010–2011 (baseline) and 2016–2017 (end line) across six states were used for this analysis. The total sample size was 94,266 at baseline and 99,434 at end line. In the logistic regression analysis, we focused on identifying the association between educational attainment, and HIV prevalence adjusting for period effects across two age groups for women attending ANC clinics. **Results:** The analysis showed an inverse association between education and HIV risk across different age groups. The age-segregated and survey period adjusted analysist showed that for older women (≥25 years), the HIV risk in 2010 ranged from 41% lower among 5th Grade to 80% lower among postgraduates than illiterates. For the <25 year age group, this risk of HIV for pregnant women was 35% to 49% lower. **Conclusions:** To ensure an effective national response to control and prevent HIV infection, policymakers in India need to focus on ≥25 years' age group of women attending ANC for designing educational interventions to reduce HIV risk as well as the prevention of mother-to-child transmission of HIV.

Key words: Antenatal care, educational attainment, HIV prevalence, HIV sentinel surveillance, India

Introduction

In several countries, the impact of HIV prevention programs in the general population is assessed by monitoring trends and progress made against the HIV epidemic in antenatal care (ANC) sentinel surveillance of pregnant women.[1-5] The positive effects of specific interventions such as those for the prevention of mother-to-child transmission (PMTCT) and partner testing in ANC clinics have been seen in the general population trends through different modeling techniques.[6-9] Among the basket of interventions applied and available for the ANC population, educational interventions are known to be very effective. In a review of 83 studies[8] on educational interventions for HIV among the youth, two-thirds were found to have a positive impact on sexual behaviors. In another systematic review of

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27 articles[9] from six countries, geographical variation in the association between educational attainment and HIV prevalence was observed. Since the education and age of the pregnant woman are important cofactors of HIV prevalence, periodic assessment of the association between HIV prevalence and educational attainment is necessary to modify interventions based on changing demographics.

In India, the National AIDS Control Programme (NACP) works in collaboration with the Maternal and child health program to provide HIV prevention, treatment, and support services for pregnant women in ANC. The NACP provides support for HIV prevention services to pregnant women attending ANC clinics through testing, kit delivery, counseling, and treatment services. These include laboratory tests for CD4 count and viral load, free antiretroviral therapy (ART) treatment and early infant diagnosis (EID), and psychosocial support through community and support centers. The success of these programs lies in their utilization. The current ANC services utilization in the country has a lot of regional variation,[10-16] with full ANC checkup at 18.8%, at least one ANC checkup at 75.2%, and institutional delivery at 47%. A majority of women accessing these services falls in the >26 years age group and female literacy has been found to be a significant determinant of ANC utilization in several settings and thus can protect women from transmitting a host of sexually transmitted infections to the general population. The current HIV prevalence in ANC population is estimated at 0.28%[17] and that in the general population is 0.22% as per analysis from HIV Sentinel Surveillance (HSS) data. There is a lot of region-wise variability in the current prevalence as well as yearly trends across ANC sites. While the epidemic shows declining trends in some southern states such as Andhra Pradesh, Karnataka, and Tamil Nadu, it is rearing its head in some northern states such as Punjab, Rajasthan, and Delhi. A stable or rising trend is also observed in the northeastern states of Meghalaya, Mizoram, Manipur, and Nagaland. Very few attempts have been made[18] to study the contextual interplay of sociodemographic variables and HIV seropositivity in India.

Initiated in 1998, the HSS is an annual and biennial exercise since 2009 and is one of the primary epidemiological data inputs used in the HIV modeling exercise in addition to other demographic data and program data. The HSS plays a key role in policymaking and designing appropriate interventions for specific risk groups. In this analysis, we focused on identifying the association between educational attainment, partner occupation, and HIV prevalence trends for six states in India.

This study aims to explore the association of HIV risk with educational attainment for Indian women across different age groups from serial cross-sectional HIV surveillance at four-time points.

Materials and Methods

We used HSS data from four rounds: 2010 to 2011 (baseline), 2012–2013, 2014–2015, and 2016–2017 (end line, the latest round of surveillance). The total sample size was 94,266 at baseline and 99,434 at the end line. Statistical analysis was conducted using R-software (R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/). The period adjusted analysis was applied to the data collected from 2010 to 2017 from six states, primarily from the southern part of India. One state, Telangana, was used only for a cross-sectional graphical analysis as it is a new state created from the existing state of Andhra Pradesh in 2014. Two different statistical models were applied to the data. First, bivariate logistic regression analyses with HIV prevalence as outcome were implemented for each cross-sectional survey year to obtain unadjusted estimates of association with all covariates such as age, education status, area of residence, state, occupation, and migration status. Then, multivariate logistic regression analyses were run separately for data collected in each year to obtain measures of association for HIV prevalence and education attainment adjusted for state, rural/urban area of residence, gravida, occupation of the respondent, and spouse and migration status of spouse (Model 1). To observe the association of age variation in the effect of educational attainment on HIV risk, the same multivariate regression was applied separately to the 15–24 and 25–49 years age groups and adjusted for period effects (Model 2). Period effects were adjusted for by including the year of surveillances a categorical explanatory variable in model 2. To account for a clustering effect due to states, a random-effects logistic model with random intercept for states was explored. These models were not useful as two states had extremely low prevalence numbers making standard error estimates unstable and intraclass correlations ranged between 0.05–0.21. Logistic regression models were used to estimate the relationship between education and HIV prevalence, along with 95% confidence intervals (CI).

Ethical issue

Exempted as this a surveillance activity where the HIV test is anonymous and is not for the purpose of determining the HIV status of a person. However, the participants were informed about the purposes of the study. Item no. 6 under Chapter-III of the India HIV act 2017 also endorse this.

Results

The basic profile of the ANC attendees is given in Table 1. Approximately 27% of attendees were from AP, 25% from Karnataka, 5% from Kerala, <1% from Pondicherry, 28% from Tamil Nadu and 13% from Odisha and in 2017, 12% from the newly created state of Telangana. A majority, 123,746 (63.89%) of the attendees across both time points were <25 years old. There is a greater difference in female literacy across 2010–2017, with a higher percentage (35%) of women having >10th standard education versus only 18% in 2010 and only 8.9% female illiteracy in 2017 among ANC attendees as compared to 18.2% in 2010. On average, 67% of the attendees were rural and 45% had one pregnancy in their lifetime. Seventy-nine percent of respondents overall

were unemployed or were housewives. It is well known that the partner's employment status has an immense bearing on factors such as intimate partner violence and PMTCT. A very small percentage (0.45%) of women had unemployed partners, approximately 65% had partners who were self-employed and only 4.3% migration of spouses was reported over time.

Figure 1 shows the yearly HIV prevalence within each of the six states from 2010 to 2017. Andhra Pradesh and Pondicherry have the highest prevalence in the 2010–2011 survey and subsequently, show the steepest decline up to the 2016–2017 survey. Pondicherry reported no HIV case in ANC in the 2017 survey. The state of Telangana was created from

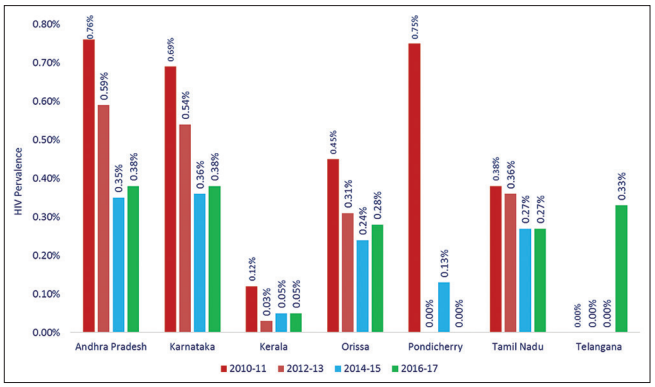

Figure 1: Time trends in HIV prevalence among the states.

Table 1: Year-wise characteristics of the samples from HIV sentinel surveillance data

Characteristics	2010-2011 (*n*=94,266), *n* (%)	2012-2013 (*n*=96,531), *n* (%)	2014-2015 (*n*=97,721), *n* (%)	(2016-2017) (*n*=99,434), *n* (%)
State				
Andhra Pradesh	25,211 (26.74)	25,447 (26.361)	25,090 (25.67)	27,035 (27.18)*
Karnataka	24,148 (25.62)	24,767 (25.65)	24,711 (25.28)	24,800 (24.94)
Kerala	4056 (4.30)	4000 (4.14)	5594 (5.72)	5599 (5.63)
Pondicherry	800 (0.85)	800 (0.82)	800 (0.81)	800 (0.80)
Tamil Nadu	27,283 (28.94)	28,734 (29.76)	28,773 (29.44)	28,400 (28.56)
Odisha	12,768 (13.54)	12,783 (13.24)	12,753 (13.05)	12,800 (12.87)
Telangana				11,575 (11.64)
Age (years)				
15-24	62,812 (66.63)	63,504 (65.78)	61,164 (62.59)	60,934 (61.28)
25-34	30,122 (31.95)	31,790 (32.93)	35,074 (35.89)	36,783 (36.99)
35-44	1198 (1.27)	1229 (1.27)	1479 (1.51)	1704 (1.71)
45-50	134 (0.14)	8 (0.00)	4 (0.00)	13 (0.01)
Education				
Illiterate	17,074 (18.16)	13,706 (14.21)	11,880 (12.17)	8826 (8.89)
Literate and till 5th standard	16,214 (17.24)	13,033 (13.51)	12,485 (12.79)	10,437 (10.51)
6-10th standard	43,559 (46.32)	46,066 (47.77)	44,561 (45.67)	44,708 (45.02)
11th-graduation	15,679 (16.67)	21,199 (21.98)	25,275 (25.90)	31,356 (31.58)
Postgraduation	1504 (1.60)	2419 (2.50)	3359 (3.44)	3977 (4.00)
Area of residence				
Urban	31,735 (34.16)	33,447 (34.85)	33,332 (34.26)	31,839 (32.12)
Rural	61,176 (65.84)	62,501 (65.14)	63,937 (65.73)	67,271 (67.88)
Gravida				
1	44,003 (46.77)	45,799 (47.50)	44,855 (45.98)	43,446 (43.73)
2	37,736 (40.11)	38,370 (39.80)	39,114 (40.09)	40,636 (40.90)
≥3	12,336 (13.11)	12,237 (12.69)	13,578 (13.91)	15,265 (15.37)
Occupation of respondent				
Unemployed/housewife	74,278 (78.88)	76,660 (79.46)	79,804 (81.74)	84,024 (84.56)
Employed	4403 (4.68)	4053 (4.20)	4473 (4.58)	5097 (5.13)
Self-employed	15,488 (16.45)	15,759 (16.33)	13,352 (13.67)	10,250 (10.31)
Occupation of spouse				
Unemployed	454 (0.48)	508 (0.52)	444 (0.45)	407 (0.41)
Employed	29,341 (31.23)	72,515 (75.12)	72,901 (74.60)	38,116 (38.42)
Self-employed	64,161 (68.29)	23,508 (24.35)	24,376 (24.94)	60,681 (61.17)
Spouse/partner migrated				
No	88,491 (95.08)	92,677 (96.45)	93,439 (96.00)	95,434 (96.18)
Yes	4575 (4.92)	3408 (3.54)	3884 (3.99)	3791 (3.82)

*These include ANC population from the state of Telangana which was a part of Andhra Pradesh before 2016. ANC: Antenatal care

Andhra Pradesh in 2014; hence, prevalence data (0.33%) are available in the 2016–2017 cross-sectional wave only. Andhra Pradesh, Karnataka, and Odisha showed an almost 50% decline in HIV prevalence in ANC from 2010 to 2017.

Table 2 presents the results of a set of regression models (Model 1) and reports unadjusted odds ratios for each of the risk factors: age, area of residence, education, occupation (self and partner), gravidity, and migration status. Adjusted odds ratios from logistic regression of education on HIV status for each year are also presented. Increasing age was found to have a significant association across time. Women ≥35 years were at higher risk (odds ratio [OR] = 2.16 for 35–44 years and OR = 4.51 for 45–49 years) than those in the 15–24 years age group. Across time, higher female literacy was a protective factor, with women having some education had a lower risk of HIV than those who were illiterate (2010: OR = (0.29–0.68) and 2017: OR = (0.34–0.64)). After adjusting for other risk factors such as number of pregnancies, occupation, spouse migration, and place of residence (rural/urban), the risk of HIV for higher age groups became more pronounced (2010: OR = 2.56 for 35–44-year and OR = 4.42 for 45–49 years, 2017: OR = 2.42 for 35–44 years).

Since older age groups were found to have a significant risk associated with HIV prevalence, age-segregated models for the association between educational attainment and prevalence were explored [Supplement Table 1]. These models were adjusted for occupation status (respondent and partner), area of residence (rural/urban), and migration status of partner. Age was dichotomized as 15–24 years and ≥25 years. Models for baseline (2010) and end line indicated that as compared to illiterate women, those who were literate or had some level of schooling, were at significantly lower risk (all adds ratios, as well as 95% CI, were <1). This protection was especially significant for education up to graduation level in 2010 and 2017. In 2017, a postgraduate education had a protective association, but it was not significant (15–24 year: OR [95% CI] = 0.27 [0.06–1.13], ≥25 years: OR [95% CI] = 0.40 [0.15–1.08]). When adjusted for year on year effects [Table 3], the risk of HIV for those women who had education till 5th standard and were <25 years was 35% lower (OR [95% CI] = 0.65 [0.52–0.82]) than those who were illiterate. In the ≥25 years age group, this risk was 41% lower (OR [95% CI] = 0.59 [0.46–0.75]). The reduction in risk of HIV with increasing education attained is much higher in the ≥25-year-old age group with a peak of 80% lower risk in those who had a postgraduate degree when adjusted for survey period effects. When education attainment was re-categorized as illiterate and some schooling (included categories other than illiterate); it was observed that, as compared to women who were illiterate, those with some schooling had higher risk HIV reduction for the ≥25-year-old age group (OR [95% CI] = 0.41 [0.34–0.48] for ≥25 years vs. 0.54 [0.46–0.63] for 15–24 years).

Discussion

In 2018, around 160,000 (110,000–260,000) children aged 0–9 were newly infected with HIV, bringing the total number of children aged 0–9 living with HIV to 1.1 million (870,000–1.5 million). Ample documentation suggests that vertical transmission of HIV from mother to child remains the primary mode of infection in children. PMTCT programs have been identified as a primary strategy to decrease vertical transmission of HIV.[19] Studies[5-7,12-15] have shown that both social-demographic factors and health system factors have an influence on the accessibility and uptake of HIV services in PMTCT. In particular, woman's educational status or the highest education attained plays a major role[9] in the uptake of HIV testing during ANC visits and also their adherence to ART and subsequent EID in the case of seropositivity. The spatial and temporal nature of this relationship warrants periodic review and revisits on account of changing national sociodemographic profiles.

A systematic review on educational attainment and HIV infection in developing countries showed mixed evidence where studies published before 1996 tended to find either no association with education level or a higher risk of HIV infection among the most educated.[20] The analysis of studies conducted from 1996 onward identified a lower risk of infection among the most educated ([40–44]; ZDHS Report, 2014). Most of these reviews have been very Africa focused.[21] The study looks at population level temporal data from India to identify trends in the educational attainment and HIV risk relationship. We find that when adjusting for age and partner occupation and migration status, from 2010 to 2017, the risk of HIV is lower among those with some educational attainment as compared to those who are illiterate. However, the risk for women who have the education of 6th–10th grade as decreased from 42% lower than illiterates to 41% lower, 11th grade to graduation decreased from 48% lower risk to 56% lower risk than illiterates. The education attainment category that showed the most improvement was those who were educated till 5th standard with 27% lower risk of HIV than illiterates in 2010-35% lower risk than illiterates in 2017.

Age segregated temporal assessment also showed that for older women (≥25 years), the HIV risk in 2010 ranged from 29% lower among 5th Grade to 74% lower among postgraduates than illiterates. For this same age group, in 2017, the risk was 13% lower among 5th Grade to 40% lower among postgraduates than illiterates. The same relationships showed a substantial improvement in the 15–24 age group with 13% lower risk in HIV in 2010, improving to 50% lower risk HIV in 2017 among those educated till 5th grade versus those who were illiterate.

The results from our analyses are contradictory to those obtained in some other population settings.[22,23] Hence, they assume significance for policy when designing targeted education interventions to reduce HIV risk in women of child-bearing age.

Table 2: Association of education attainment and HIV prevalence by year of HIV sentinel surveillance, from logistic regression models (Model 1)

Characteristic*	2010-2011		2012-2013		2014-2015		2016-2017	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI) (*n*=91,185)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Residence								
Urban	1.08 (0.90-1.29)	1.11 (0.92-1.35)	0.84 (0.68-1.03)	0.92 (0.75-1.13)	0.98 (0.77-1.25)	0.98 (0.76-1.28)	1.13 (0.89-1.43)	1.18 (0.92-1.51)
Rural	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
State								
Andhra Pradesh	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Karnataka	0.91 (0.74-1.12)	0.91 (0.73-1.13)	0.91 (0.71-1.15)	0.97 (0.76-1.22)	1.03 (0.77-1.38)	1.05 (0.78-1.41)	1.01 (0.73-1.40)	0.96 (0.68-1.35)
Kerala	0.16 (0.07-0.39)	0.17 (007-0.42)	0.04 (0.002-0.19)	0.16 (0.07-0.39)	0.15 (0.04-0.40)	0.21 (0.05-0.56)	0.14 (0.004-0.45)	0.15 (0.05-0.50)
Orissa	0.59 (0.44-0.79)	0.54 (0.39-0.74)	0.53 ((0.36-0.74)	0.59 (0.44-0.79)	0.68 (0.45-1.02)	0.68 (0.44-1.01)	0.75 (0.49-1.14)	0.62 (0.40-0.95)
Pondicherry	0.99 (0.44-2.24)	0.94 (0.38-2.33)	0.94 (0.38-2.33)	0.99 (0.44-2.24)	0.35 (0.02-1.58)	0.46 (0.03-2.08)	Negligible	Negligible
Tamil Nadu	0.50 (0.39-0.64)	0.50 (0.38-0.65)	0.61 (0.48-0.79)	0.50 (0.39-0.64)	0.75 (0.55-1.02)	0.91 (0.66-1.24)	0.72 (0.51-1.02)	0.77 (0.54-1.10)
Age (years)								
15-24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
25-34	1.29 (1.08-1.54)	1.48 (1.21-1.82)	1.26 (1.03-1.52)	1.22 (0.99-1.48)	1.22 (0.96-1.55)	1.19 (0.93-1.52)	0.99 (0.78-1.25)	1.21 (0.93-1.58)
35-44	2.16 (1.24-3.78)	2.56 (1.41-4.66)	1.2 (0.47-2.46)	1.08 (0.42-2.22)	3.04 (1.59-5.24)	2.70 (1.41-4.68)	1.73 (0.89-3.39)	2.42 (1.21-4.84)
45-49	4.51 (1.43-14.26)	4.42 (1.08-18.14)	0.0003 (NA)	0.0002 (NA)	0.0005 (NA)	0.0003 (NA)	0.0001 (NA)	0.0001 (NA)
Education								
Illiterate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Till 5th standard	0.68 (0.53-0.87)	0.73 (0.57-0.95)	0.49 (0.31-0.72)	0.59 (0.43-0.82)	0.48 (0.31-0.72)	0.49 (0.32-0.74)	0.64 (0.41-1.00)	0.65 (0.41-1.02)
6-10th standard	0.49 (0.40-0.61)	0.58 (0.46-0.74)	0.56 (0.42-0.75)	0.51 (0.39-0.66)	0.56 (0.42-0.75)	0.58 (0.43-0.79)	0.60 (0.43-0.84)	0.59 (0.41-0.85)
11th-graduation	0.44 (0.33-0.59)	0.52 (0.38-0.72)	0.31 (0.21-0.45)	0.36 (0.26-050)	0.31 (0.21-0.45)	0.34 (0.23-0.51)	0.46 (0.32-0.67)	0.44 (0.29-0.67)
Postgraduation	0.29 (0.11-0.77)	0.29 (0.11-0.81)	0.26 (0.09-0.59)	0.36 (0.15-0.74)	0.26 (0.09-0.59)	0.29 (0.10-0.68)	0.34 (0.15-0.75)	0.31 (0.14-0.72)
Gravida								
First	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Second	0.93 (0.77-1.12)	0.79 (0.65-0.96)	0.99 (0.81-1.22)	0.92 (0.75-1.14)	0.88 (0.68-1.12)	0.83 (0.64-1.06)	0.69 (0.54-0.89)	0.62 (0.48-0.81)
Third or more	1.10 (0.85-1.42)	0.74 (0.56-1.00)	1.04 (0.77-1.39)	0.84 (0.62-1.13)	0.80 (0.54-1.14)	0.64 (0.43-0.92)	0.75 (0.53-1.05)	0.56 (0.38-0.82)
Occupation of respondent								
Unemployed	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Employed	1.53 (1.07-2.19)	1.43 (0.99-2.09)	0.74 (0.40-1.24)	0.83 (0.45-1.40)	1.25 (0.71-2.03)	1.25 (0.90-1.69)	0.84 (0.48-1.46)	0.79 (0.44-1.43)
Self-employed	1.69 (1.38-2.07)	1.23 (0.97-1.56)	1.24 (0.97-1.56)	0.89 (0.69-1.15)	1.67 (1.24-2.21)	1.56 (0.87-2.57)	1.19 (0.84-1.67)	0.80 (0.53-1.19)
Occupation of spouse								
Unemployed	1.56 (0.58-4.20)	1.50 (0.56-4.06)	2.64 (1.04-5.43)	1.83 (0.45-4.82)	6.8 (3.22-12.57)	7.41 (3.49-13.7)	0.89 (0.46-1.56)	1.03 (0.52-1.80)
Employed	0.93 (0.7-1.12)	1.06 (0.86-1.30)	0.89 (0.71-1.12)	0.94 (0.74-1.18)	0.82 (0.62-1.09)	0.86 (0.64-1.13)	0.84 (0.67-1.07)	0.91 (0.70-1.17)
Self-employed	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Spouse/partner migrated								
No	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.63 (1.18-2.25)	2.34 (1.67-3.28)	0.86 (0.47-1.43)	1.18 (0.69-2.22)	1.16 (0.63-1.94)	1.16 (0.63-1.94)	1.51 (0.93-2.47)	2.06 (1.24-3.40)

*The odds ratios for variables adjusted for in the model are also reported. OR: Odds ratio, CI: Confidence interval, NA: Not available

Table 3: Change in odds of HIV prevalence with educational attainment stratified by age (15-24 and ≥25) years and adjusted for period effects (Model 3)

Age group (years)	Adjusted OR (95% CI)	
	15-24	≥25
Years		
1 (2010-2011)	1.00	1.00
2 (2012-2013)	0.85 (0.72-0.99)	0.80 (0.65-0.98)
3 (2014-2015)	0.57 (0.47-0.69)	0.56 (0.45-0.70)
4 (2016-2017)	0.67 (0.56-0.81)	0.54 (0.43-0.67)
Education		
Illiterate	1.00	1.00
Till 5th standard	0.65 (0.52-0.82)	0.59 (0.46-0.75)
6-10th standard	0.62 (0.51-0.72)	0.46 (0.38-0.56)
11th-graduation	0.45 (0.36-0.56)	0.33 (0.26-0.43)
Postgraduation	0.51 (0.26-0.89)	0.20 (0.11-0.35)

OR: Odds ratio, CI: Confidence interval

Limitations

The HSS is repeated cross-sectional surveys with some degree of overlap in sample selection. The current analysis does not account for clustering effects due to geography and time.

Conclusions

Policymakers in India need to focus on the ≥25-year age group of women attending antenatal clinics for designing educational interventions to reduce HIV risk in general population as well as prevention of transmission from mother to child.

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Conflicts of interest

There are no conflicts of interest.

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Supplementary Table 1: Effect of education attainment on HIV prevalence stratified by age group 15-24 years and ≥25 years and adjust for period effects from logistic regression models (Model 2*)

Characteristics	2010		2017	
Age group	15-24 years	≥25 years	15-24 years	≥25 years
Education				
Illiterate	1.00	1.00	1.00	1.00
Literate and till 5th standard	0.67 (0.48-0.94)	0.71 (0.49-1.03)	0.50 (0.27-0.92)	0.87 (0.45-1.65)
6-10th standard	0.56 (0.43-0.74)	0.42 (0.30-0.59)	0.54 (0.35-0.83)	0.71 (0.42-1.20)
11th-graduation	0.48 (0.33-0.70)	0.40 (0.25-0.62)	0.45 (0.28-0.72)	0.46 (0.25-0.84)
Postgraduation	0.25 (0.03-1.81)	0.26 (0.08-0.82)	0.27 (0.06-1.13)	0.40 (0.15-1.08)

*Models are adjusted for occupation (self and partner), gravida and migration status of partner