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Determinants of self-reported sexually transmitted infections among reproductive age women in Senegal: evidenced by Senegal demographic and health survey

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Abstract

Background Globally, access to sexual and reproductive health is a significant public health issue for women of the reproductive age group. Senegal is a low-income country with limited access to reproductive health services, such as in the prevention and treatment of STIs. The prevention and treatment of STIs is one of the goals set by the government to decrease reproductive health-related morbidity and mortality among women. So, the main objective of this research was to evaluate the prevalence's and determinant of self-reported sexually transmitted infections among reproductive-age women.

Methods Data from the 2023 Senegal Demographic and Health Survey datasets were used for secondary data analysis. A total of 16,583 women of reproductive age participated in the study. Bivariate analysis was employed in order to select the factors for multivariate analysis. In the multivariate analysis, variables with $p < 0.05$ significance levels were considered to be significant predictors of sexually transmitted infections among reproductive-age women. Finally, the percentage and odd ratio, together with their 95% confidence intervals, were reported.

Results The prevalence of sexually transmitted infection among women was 3.21% with a 95 CI. [2.95–3.49] in the last 12 months. Being between the age range of 20 and 44 years old; attending higher education [AOR: 2.70, 95% CI (1.74, 4.19); $P=0.0001$]; women who were never in union [AOR: 0.09, 95% CI (0.046, 0.17); $P=0.001$] were positively associated with sexually transmitted infections among women. In contrast to this, living in Louga [AOR: 0.41, 95% CI (0.23,0.69); $P=0.001$]; Fatick [AOR: 0.33, 95% CI (0.18,0.61); $P=0.0001$]; Kolda [AOR: 0.23, 95% CI (0.11,0.49); $P=0.0001$]; Kedougou [AOR: 0.34, 95% CI (0.17,0.68); $P=0.002$]; and Sedhiou [AOR: 0.43, 95% CI (0.23,0.79); $P=0.007$] and women who had history terminated pregnancy [AOR: 1.27, 95% CI (1.03,1.58); $P=0.023$] were negatively associated with sexually transmitted infections among women.

Conclusions and recommendations Women's sexually transmitted infection has been associated with sociodemographic and geographic determinants such as the age of the woman, region, educational status, marital

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status, and history of terminated pregnancy. Therefore, to prevent the spread of sexually transmitted infections among women, the governments of Senegal and other concerned stakeholders should give special attention to women by addressing sociodemographic and geographic determinants.

Keywords Sexually transmitted infection, Senegal, Women, Demographic health survey

Introduction

Background

Globally, access to sexual and reproductive health (SRH) is a significant public health issue for women of the reproductive age group [1]. Sexually transmitted infections (STIs) are an important public health challenge worldwide, with an estimated 357 million new cases of four curable STIs (chlamydia, gonorrhea, trichomoniasis, and syphilis) among 15–49 year old's, 417 million cases of herpes simplex type 2 (HSV2), and 291 million cases of human papillomavirus (HPV) among women each year [2]. In sub-Saharan Africa (SSA), the incidence of STI was estimated at 63 million per year, making it one of the most affected areas in the world, sharing an estimated 40% of the global STI burden [2, 3]. Women often have more serious health problems from STIs than men; including pelvic inflammatory disease, ectopic pregnancy, postpartum endometriosis, infertility, and chronic abdominal pain in women; adverse pregnancy outcomes, including abortion, intrauterine death, and premature delivery; neonatal and infant infections and blindness [4]. In 2018, new infections totaled nearly $16 billion in direct lifetime medical costs. While medical costs alone are significant, the overall cost of STIs is higher when factoring in costs associated with maternal transmission, STI prevention, lost productivity, or other non-medical costs [5]. Several studies in Senegal demonstrated that sexually transmitted infections among women were associated with sociodemographic factors such as age groups, marital status, place of residence, education status, religion, and media exposures [6–11].

Although, there are several studies that were done in Senegal related to STI among reproductive age women in different settings [12–16]. Up to our knowledge, there is no studies that were done in this particular topic at national Level. So, the major objective of this research was to evaluate the prevalence's and determinant of self-reported sexually transmitted infections among reproductive-age women in Senegal at national level. Furthermore, policymakers and other stakeholders can use this finding as a foundation to create and implement appropriate intervention programs aimed at reducing the incidences of sexually transmitted infections among women.

Methods and materials

Study setting and period

The Republic of Senegal, is the westernmost country in West Africa, situated on the Atlantic Ocean coastline. Senegal is located 14 degrees north of the equator and 14 degrees west of the Prime Meridian. Senegal is bordered by Mauritania to the north, Mali to the east, Guinea to the southeast and Guinea-Bissau to the southwest [17]. The National Agency for Statistics and Demography (ANSD), in collaboration with other relevant stakeholders and with technical support from ICF, conducted the 2023 Senegal demographic and health survey on behalf of the Government of Senegal. Data collection was carried out from January to August 2023 with a break of approximately two months, i.e., five-month collection period [18].

Data source / data extraction and study population

After permission was secured through an online request by explaining the aim of the study, the data for this analysis were obtained from the 2023 Senegal Demographic and Health Survey that were accessible at DHS portal of (https://dhsprogram.com/data/dataset_admin/index.cfm). The study population for this study was extracted from the IR (individual record) of the 2023 Senegal demographic and health survey. All reproductive age women (15–49) extracted from the IR file was included in this analysis.

Study design

The data for this analysis were obtained from the 2023 Senegal Demographic and Health Survey that employed a community-based cross-sectional study design. The 2023 Senegal DHS sample was designed to ensure adequate representation at the national level but also at the level of urban and rural areas, as well as for the 14 regions of the country. This is an area survey, stratified and drawn in two stages. The primary sampling unit is also called a cluster. Each region was separated, partly urban and partly rural, to form the sampling strata, and the sample was drawn independently in each sampling stratum. In total, 28 sampling strata were created. In the first stage, 400 clusters were drawn with a probability proportional to their size, the size being the number of households residing in the cluster. At the second level, in each of the clusters selected at first stage, a fixed number of 22 households was selected with a systematic probability drawing

equal, from the newly established lists at the time of enumeration. Among the 400-clusters selected, 186 are located in urban areas and 214 in rural areas. A total of 8,423 households have been selected to be included in the 2023 Senegal Demographic health survey. In the selected household; 17,459 reproductive age women were eligible for individual interviews; 16,583 women were interviewed, resulting in a 95% response rate (Figure 1) [18].

Study variables

The outcome variable for this study was self-reported sexually transmitted infections among women. It is a variable with a dichotomous outcome (no or yes). Women were asked whether they had a disease that had acquired through sexual contact in the past 12 months. If the women hadn't sexually transmitted infections in the last twelve months, which was labeled as "no" and coded as "0," and if the women had sexually transmitted infections in the last twelve months, which was labeled as "yes" and coded as "1,".

Independent Variables age of the women, region, place of residence, educational status, marital status, religion, sex of household head, combined wealth index, community wealth quantile, frequency of reading magazine, frequency of listening to radio, frequency of watching television, community media exposure, history of ter-

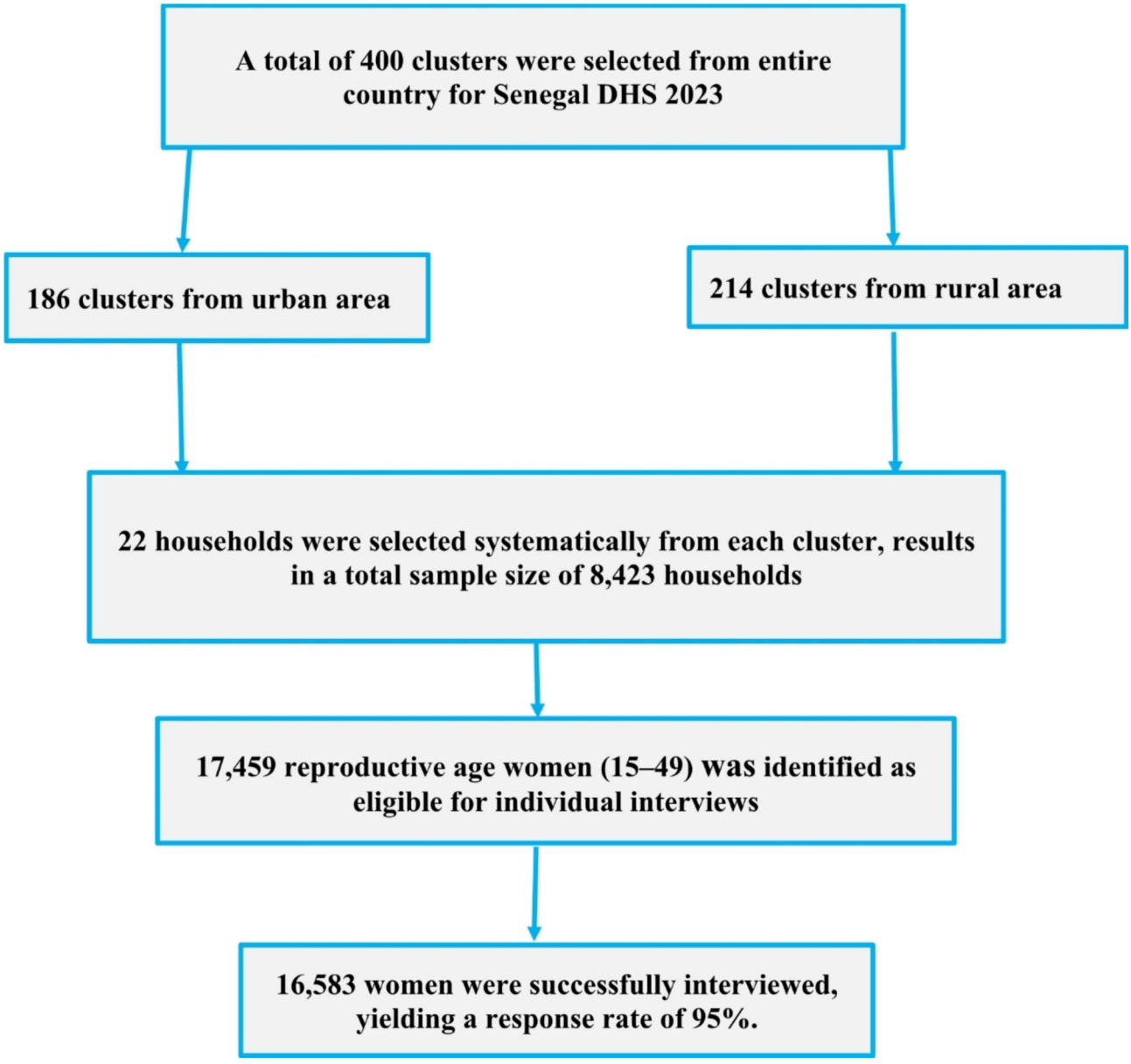

Fig. 1 demonstrated that the sampling process of Senegal women of reproductive age was presented diagrammatically [18]

minated pregnancy, number of living children, smoking cigarettes, and modern contraceptive use (Table 1).

Data management and analysis

STATA version 14 was used for data extraction, recoding, descriptive analysis, and analytical analysis. We carried out weighting by dividing the total number of women in the entire country by the appropriate survey sampling proportion and the standard weights of the women. Bivariate analysis was employed to select the factors for multivariate analysis. In the multivariate analysis, variables with $p<0.05$ significance levels were significant predictors of sexually transmitted infection among reproductive-age women. Finally, the percentage and odd ratio were provided, together with their 95% confidence intervals.

Ethical consideration

For this investigation, an ethical review and participant agreement were not required because the demographic and health survey program utilized secondary, easily accessible survey data. We requested permission from the DHS Program to use the data we obtained from their website, and they gave it to us.

Results

Socio-demographic characteristics of the participants

In all, 16,583 women of reproductive age participated in this investigation. There were about 4,024 (24.27%)

Table 1 The description of the independent variables

Lists of variables	Definitions/Categories
Age group (ages of mother in year)	The age of the mother was coded as 15–19, 20–24, 25–29, 30–34, 35–39, 40–44, and 45–49 in the IR file of the Senegal demographic and health survey.
Place of residence	Places of residence in the 2023 Senegal demographic and health survey were grouped as urban and rural.
Region	Region in the 2023 Senegal demographic and health survey were categorized in to 14 administrative regions. We used it as it is in our analysis.
Religion	Religion was grouped as Muslim, Christian, Animist, no religion, and other in the Senegal demographic and health survey. Depending on the number of participants from each religion, we were regrouped into Muslim and Others (Christian, Animist, no religion, and other).
Educational status	The level of education in the 2023 Senegal demographic and health survey categorized in two four groups such as attending no education, primary education, secondary, and higher education.
Sex of household heads	The sex of household heads was in categorized into male headed household and female headed household head.
Wealth index	The combined wealth index in the 2023 Senegal demographic and health survey were categorized into poorest, poorer, middle, richer and richest. So, we used in our analysis as it is.
Frequency of reading to magazine; frequency of listening to radio; and frequency of watching television	The frequency of reading to magazine; the frequency of listening to radio, and the frequency of watching television were categorized as in to four groups such as not at all, less than once a week, at least once a week and almost every day respectively in the 2023 Senegal demographic and health survey.
History of terminated pregnancy	Reproductive-age women who hadn't had a had a history of terminated pregnancy were coded as "no, "and reproductive-age women who had a history of terminated pregnancy were coded as "yes" in the IR file of the 2023 Senegal demographic and health survey.
Modern contraceptive use	In the IR file of the 2023 Senegal demographic and health survey, it is coded as no method, folkloric method, traditional method, and modern method. We recategorized it into no or yes. modern method was coded as yes and (folkloric method, traditional method and no method) was coded as No.
Community media exposure	The frequency of listening to radio, the frequency of watching television, and the frequency of using the internet were coded as not at all, less than once a week, and at least once a week, respectively. We recategorized into "no" and "yes" respectively. Then; those participants who have no exposure to media at all (reading to magazines, watching television, and using the internet) were coded "no," and those participants who have media exposure (reading to magazines, watching television, and using the internet) less than once a week, at least once a week and almost every day were coded "yes." Women who had at least one or more media exposure from the three (reading to magazine; listing to radio, watching television) labeled as "Yes" and women who hadn't at least one media exposure from the three (reading to magazine; listing to radio, watching television) was coded as "No".
Community wealth quantile	Wealth index combined and wealth index for urban/rural have five categories' such as poorest, poorer, middle, richer and richest. We recategorized it into three sub groups. i.e. "poorest and poorer" grouped as poor; middle grouped as it is and "richer and richest" grouped as rich. After that we were merging wealth index combined and wealth index for urban/rural; if participant were poor in both wealth index combined and wealth index for urban/rural the participants considered as poor; if the participant were middle in one of the two group considered as middle wealth quantile and if the participant were rich at least in one of the two the groups (wealth index combined and wealth index for urban/rural) considered as rich.
Number of living children	In the 2023 Senegal demographic and health survey; the number of children were represented by the numeric value. In this analysis we were regrouped in four group; no children; 1–2 children; 3–4 children and greater than or equal to five children.

found between the age range of 15–19 years; 1,531 (9.23%) lived in Thiès region; 9,112 (54.95%) were rural residents; 7,673 (46.27%) did not attend formal education; 11,005 (66.36%) were married; 16,051 (96.79%) were Muslims. 12,155 (73.30%) were households headed by men; 3,900 (23.52%) were poorest in wealth; 14,605 (88.07%) didn't read magazines at all; and 6,756 (40.74%) didn't listen to the radio at all. 9,050 (54.57%) were watched on television at least once a week. 14,306 (86.27%) had community media exposure; 2,347 (14.15%) had a history of terminated pregnancy; 5,952 (35.89%) haven't had children; 16,477 (99.55%) were non-smokers; and 2,722 (16.41%) used modern contraceptives (Table 2). The prevalence of sexually transmitted infection among women of reproductive age was 3.21% with a 95 CI. [2.95–3.49] in the last 12 months (Table 3).

Factors analysis associated with sexually transmitted infections

The results of the bivariable analysis showed that among women, sexually transmitted infections were statistically and significantly associated with age of the women, region, place of residence, educational status, marital status, wealth index, frequency of listening to radio, frequency of watching television, community media exposure, history of terminated pregnancy, number of living children, and modern contraceptive use. Those variables were considered for the multivariate analysis. The results of the multivariate analysis demonstrated that sexually transmitted infections were statistically and significantly associated with the age of the women, region, educational status, marital status, and history of terminated pregnancy.

The finding from this study shows that the odds of sexually transmitted infections between the age range of 20 and 44 years old were more likely compared to women whose ages were between 15- and 19-years old's. The odds of sexually transmitted infections among women who lived in Louga [AOR: 0.41, 95% CI (0.23,0.69); $P=0.001$]; Fatick [AOR: 0.33, 95% CI (0.18,0.61); $P=0.0001$]; in Kolda [AOR: 0.23, 95% CI (0.11,0.49); $P=0.0001$]; in Kedougou [AOR: 0.34, 95% CI (0.17,0.68); $P=0.002$]; and Sedhiou [AOR: 0.43, 95% CI (0.23,0.79); $P=0.007$] were less likely relative to women who were living in Dakar region.

Sexually transmitted infections among women who were attending higher education were 2.70 times more likely [AOR: 2.70, 95% CI (1.74, 4.19); $P=0.0001$] relative to women who weren't attending formal education. Sexually transmitted infections among the women who were never in union were 0.09 times less likely [AOR: 0.09, 95% CI (0.046, 0.17); $P=0.001$] compared to the others (living with partner, divorced, widowed, and separated). The odds of sexually transmitted infections among women who had a history terminated pregnancy were 1.27 times more likely [AOR: 1.27, 95% CI (1.03, 1.58); $P=0.023$] compared to their counterparts (Table 4).

Discussions

In the last 12 months, the prevalence of sexually transmitted infection among women was 3.21%, with a 95 CI [2.95–3.49]. This finding was higher than study which was conducted in Hong Kong (2.5%) [19]. This finding was lower than studies which were conducted in Gambia (53.6%) [20], in Morocco (38.6%) [21], in Mali (14.1%) [22], in Kenya (13%) [23], and in Brazil (36.5%) [24]. The possible reasons for this variation could be the difference in the study period, method of estimation, sample size, socioeconomic, sociocultural, and geographic location of the study area.

The finding from this study shows that the odds of sexually transmitted infections between the age range of 20 and 44 years old were more likely compared to women whose ages were between 15- and 19-years old's. This finding was opposed by the studies which were conducted in Swaziland [25], in Dubai [26], in Brazil [27] and in Malawi [28]. This could be further explained by reasons that young women's are sexually active and engaged in unprotective or unsafe sexual activity that prone them to STIs; some young people do not get the recommended STI tests; and many young people are hesitant to talk openly and honestly with a doctor or nurse about their sex lives [29].

Sexually transmitted infections among women who lived in Louga, Fatick, Kolda, Kedougou, and Sedhiou were less likely relative to women who were living in the Dakar region. This might be due to the variations in health care's facilities, health-seeking behaviors, access to media, socioeconomic, sociocultural, knowledge, attitude, and practice towards risky sexual behaviors across the regions, which contribute to the regional differences in STIs in Senegal. Furthermore, Dakar, the smallest and most populated region of Senegal, encompasses the country's capital city and may have had a higher prevalence of STIs due to the high number of migrant women, commercial sex workers, construction workers, and long-distance truck drivers that increase the risk of engagements in the risky sexual behaviors.

Sexually transmitted infections among women who were attending higher education were more likely relative to women who weren't attending formal education. This finding was in line with studies which were conducted in Ethiopia [30] and in Malawi [28]. This might be more explained by the study that has reported a positive relationship between education and the spread of STIs and HIV/AIDS [31] suggesting that an increase in

Table 2 Socio demographic characteristics of reproductive age women in Senegal 2023

Characteristics (*n* = 16,583)	Categories	Had any STIs		Frequency	Percentage
		No	Yes		
Age group	15–19	4,006	18	4,024	24.27
	20–24	3,142	99	3,241	19.54
	25–29	2,313	107	2,420	14.59
	30–34	2,034	109	2,143	12.92
	35–39	2,024	95	2,119	12.78
	40–44	1,464	73	1,537	9.27
	45–49	1,067	32	1,099	6.63
Region	Dakar	1,352	61	1,413	8.52
	Ziguinchor	785	22	807	4.87
	Diourbel	1,226	56	1,282	7.73
	Saint-Louis	1,107	48	1,155	6.96
	Tambacounda	1,185	26	1,211	7.30
	Kaolack	1,058	59	1,117	6.74
	Thiès	1,412	119	1,531	9.23
	Louga	1,233	19	1,252	7.55
	Fatick	1,265	15	1,280	7.72
	Kolda	1,018	9	1,027	6.19
	Matam	1,253	32	1,285	7.75
	Kaffrine	1,216	41	1,257	7.58
	Kedougou	856	11	867	5.23
	Sedhiou	1,084	15	1,099	6.63
Place of residence	Urban	7,184	287	7,471	45.05
	Rural	8,866	246	9,112	54.95
Educational status	No education	7,446	227	7,673	46.27
	Primary	3,127	124	3,251	19.60
	Secondary	4,927	147	5,074	30.60
	Higher	550	35	585	3.53
Marital status	Married	10,522	483	11,005	66.36
	Never in union	4,738	15	4,753	28.66
	Others	790	35	825	4.97
Religion	Muslim	15,528	523	16,051	96.79
	Other	522	10	532	3.21
Sex of house hold head	Male	11,767	388	12,155	73.30
	Female	4,283	145	4,428	26.70
Wealth index	Poorest	3,834	66	3,900	23.52
	Poorer	3,503	97	3,600	21.71
	Middle	3,538	132	3,670	22.13
	Richer	2,852	119	2,971	17.92
	Richest	2,323	119	2,442	14.73
Community wealth quantile	Poor	5,073	100	5,173	31.19
	Middle	3,772	119	3,891	23.46
	Rich	7,205	314	7,519	45.34
Reading newspaper	Not at all	14,153	452	14,605	88.07
	Less than once a week	1,256	58	1,314	7.92
	At least once a week	641	23	664	4.00
Listening to radio	Not at all	6,578	178	6,756	40.74
	Less than once a week	4,888	206	5,094	30.72
	At least once a week	4,584	149	4,733	28.54
Watching television	Not at all	3,976	70	4,046	24.40
	Less than once a week	3,346	141	3,487	21.03
	At least once a week	8,728	322	9,050	54.57

Table 2 (continued)

Characteristics (*n* = 16,583)	Categories	Had any STIs		Frequency	Percentage
		No	Yes		
History terminated pregnancy	No	13,836	400	14,236	85.85
	Yes	2,214	133	2,347	14.15
Number of living children	No children	5,883	69	5,952	35.89
	1–2 children	4,042	216	4,258	25.68
	3–4 children	3,105	149	3,254	19.62
	Greater than or equal to five children	3,020	99	3,119	18.81
Modern contraceptive use	No	13,479	382	13,861	83.59
	Yes	2,571	151	2,722	16.41
Smokes cigarettes	No	15,947	530	16,477	99.55
	Yes	103	3	106	0.45

Table 3 Prevalence's of sexual transmitted infection among reproductive age women in Senegal 2023

Characteristics (*n* = 16,583)	Categories	Frequency	Percentage	[95%Conf. Interval]
Had sexual transmitted infection	No	16,050	96.79	[96.50-97.04]
	Yes	533	3.21	[2.95–3.49]

the level of education increases the likelihood of STIs and HIV/AIDS infections. This view indicated that an increased education level improved the wealth index of people, and the migration of women from the rural to the urban area to live better life, which increases the risk of engagements in sex with multiple partners. Additionally, other studies have revealed that adolescents get involved in sex while still at school [32, 33]. This finding was opposed by the studies which were conducted in Dutch [34], in Indonesia [35], in Durban [36], in sub-Saharan Africa [37], in Swaziland [25] and in Tanzania [38]. This might be that education, in many respects, increases knowledge of STIs and HIV/AIDS that helps to mitigate the spread of STIs [39, 40]. It also prevents new infections because knowledgeable persons can make informed decisions about their sexual life.

Sexually transmitted infections among the women who were never in union were less compared to the others (divorced, widowed, and separated). It could be the case that being divorced, widowed, and separated is linked to feelings of loneliness and relationship dissatisfaction. So, divorced, widowed, and separated people engaged in risky sexual behavior (unsafe sex) to cope with negative feelings associated with social isolation or disconnection, which has been identified as a major risk for STIs.

Sexually transmitted infections among women who had a history terminated pregnancy were more likely compared to their counterparts. This finding was in line with the studies that were conducted in Ethiopia [41], in China [42], in Ethiopia [43, 44], and in Shandong province of China [45]. The scientific explanation for this could be that having a history of abortions makes women very susceptible to sexually transmitted infections. When an unsafe abortion does occur, it may be performed by unskilled or traditional practitioners without adherence to aseptic techniques, further facilitating the transmission of STIs [46, 47]. Furthermore, this might be due to the fact that those women who had a history of termination of pregnancy would have better access to reproductive health care services, sexual health services, and a better understanding of the symptoms of STIs, which prevents underreporting and underscreening of STIs and contributes to high detection rates of STIs among women who had a history of terminated pregnancy.

Table 4 Factors associated with sexual transmitted infection among reproductive age women in Senegal 2023

Characteristics (*n* = 16,583)	Categories	Had any STIs		COR with 95% CI and P-value	AOR with 95% CI and P-value
		No	Yes		
Age group	15–19	4,006	18	1	1
	20–24	3,142	99	7.01(4.23,11.61);0.0001	2.67(1.57,4.52);0.0001
	25–29	2,313	107	10.29(6.23, 17.00);0.0001	2.97(1.74,5.07);0.0001
	30–34	2,034	109	11.92(7.22, 19.69);0.0001	3.28(1.92,5.63);0.0001
	35–39	2,024	95	10.44(6.29, 17.33);0.0001	2.98(1.73,5.14);0.0001
	40–44	1,464	73	11.09(6.60,18.65);0.0001	3.13(1.79, 5.49);0.0001
	45–49	1,067	32	6.67(3.73,11.93);0.0001	1.75(0.96,3.32);0.067
Region	Dakar	1,352	61	1	1
	Ziguinchor	785	22	0.62(0.37, 1.01);0.060	0.73(0.43,1.01);0.246
	Diourbel	1,226	56	1.01(0.69,1.46);0.948	1.26(0.84,1.91);0.258
	Saint-Louis	1,107	48	0.96(0.65,1.41);0.840	1.12(0.74,1.69);0.582
	Tambacounda	1,185	26	0.48(0.30,0.77);0.002	0.64(0.39,1.07);0.095
	Kaolack	1,058	59	1.24(0.85,1.78);0.258	1.41(0.95,2.11);0.087
	Thiès	1,412	119	1.86(1.35 2.56);0.0001	2.22(1.58,3.11);0.0001
	Louga	1,233	19	0.34(0.20, 0.57);0.0001	0.41(0.23,0.69);0.001
	Fatick	1,265	15	0.26(0.14,0.46);0.0001	0.33(0.18,0.61);0.0001
	Kolda	1,018	9	0.19(0.09,0.39);0.0001	0.23(0.11,0.49);0.0001
	Matam	1,253	32	0.56(0.36,0.87);0.010	0.77(0.48,1.24);0.296
	Kaffrine	1,216	41	0.74(0.49, 1.11);0.157	0.94(0.59,1.49);0.796
	Kedougou	856	11	0.69(0.14,0.54);0.0001	0.34(0.17,0.68);0.002
	Sedhiou	1,084	15	0.30(0.17,0.54);0.0001	0.43(0.23,0.79);0.007
Place of residence	Urban	7,184	287	1.43(1.21,1.71);0.0001	1.01(0.75,1.33);0.968
	Rural	8,866	246	1	1
Educational status	No education	7,446	227	1	1
	Primary	3,127	124	1.30(1.04,1.62);0.021	1.47(1.15,1.87);0.002
	Secondary	4,927	147	0.98(0.79,1.20);0.841	1.81(1.39,2.36);0.0001
	Higher	550	35	2.08(1.44,3.01);0.0001	2.70(1.74,4.19);0.0001
Marital status	Married	10,522	483	1.03(0.72,1.47); 0.843	1.27(0.88,1.83);0.186
	Never in union	4,738	15	0.07(0.03,0.13);0.0001	0.09(0.046,0.17);0.0001
	Others	790	35	1	
Religion	Muslim	15,528	523	1.75(0.93,3.30);0.080	
	Other	522	10	1	
Sex of house hold head	Male	11,767	388	1	
	Female	4,283	145	1.03(0.84,1.24);0.790	
Wealth index	Poorest	3,834	66	1	1
	Poorer	3,503	97	1.60(1.17,2.20);0.003	1.42(0.90,2.23);0.128
	Middle	3,538	132	2.16(1.60,2.92);0.0001	1.85(0.98,3.47);0.056
	Richer	2,852	119	2.42(1.78,3.28);0.0001	1.84(0.85,3.98);0.119
	Richest	2,323	119	2.97(2.19,4.03);0.0001	1.99(0.90,4.39);0.088
Reading newspaper	Not at all	14,153	452	1	1
	Less than once a week	1,256	58	1.44(1.09,1.91);0.010	1.11(0.81,1.53);0.497
	At least once a week	641	23	1.12(0.73,1.72);0.592	1.09(0.67,1.75);0.716
Listening to radio	Not at all	6,578	178	1	1
	Less than once a week	4,888	206	1.55(1.27,1.90);0.0001	1.14(0.90,1.44);0.247
	At least once a week	4,584	149	1.20(0.96,1.49); 0.104	0.84(0.65,1.08);0.195
Watching television	Not at all	3,976	70	1	1
	Less than once a week	3,346	141	2.39(1.23,1.59);0.0001	1.50(1.00,2.26);0.048
	At least once a week	8,728	322	2.09(1.61,2.72);0.0001	1.16(0.77,1.74);0.472
Community media exposure	No	2,242	35	1	1
	Yes	13,808	498	1.97(1.70, 2.27);0.0001	1.06(0.63,1.80);0.801

Table 4 (continued)

Characteristics (*n* = 16,583)	Categories	Had any STIs		COR with 95% CI and P-value	AOR with 95% CI and P-value
		No	Yes		
History terminated pregnancy	No	13,836	400	1	1
	Yes	2,214	133	1.87(1.69,2.08);0.0001	1.27(1.03,1.58);0.023
Number of living children	No children	5,883	69	1	1
	1–2 children	4,042	216	4.55(3.46,5.99);0.0001	1.27(0.91,1.74);0.153
	3–4 children	3,105	149	4.09(3.06,5.46);0.0001	1.07(0.74,1.55);0.691
	Greater than or equal to five children	3,020	99	2.79(2.04,3.81);0.0001	0.86(0.56,1.31);0.503
Modern contraceptive use	No	13,479	382	1	1
	Yes	2,571	151	2.07(1.70,2.51);0.0001	2.07(0.93,1.42);0.181
Smoking cigarettes	No	15,947	530	1	1
	Yes	103	3	0.87(0.27,2.77);0.822	0.85(0.26,2.81);0.803

COR=crudes odds ratio, AOR=adjusted odds ratio; CI-confidence interval; Others (living with partner, divorced, widowed and separated)

Conclusion and recommendations

Women's sexually transmitted infection has been associated with sociodemographic and geographic determinants such as the age of the woman, region, educational status, marital status and history terminated pregnancy. Therefore, to prevents sexually transmitted infections among women, the governments of Senegal and other concerned stakeholders should give special attention to women by addressing sociodemographic and geographic determinants.

Strengths and limitations of this study

- The DHS has a similar design, with identical variables in a different environment; the result may, therefore, be applicable to other similar locations.
- The study used a sufficiently large sample size at the national level to ensure its representativeness.
- Recall bias is one of the potential drawbacks, especially for retrospective data based on past experiences.
- The magnitude of the bias is often unknown and correcting for the bias is difficult.
- Since, this study was cross sectional study.it doesn't showed temporal relationships between independent and dependent variable.
- Finally, due to the sensitivity of the issue and the nature of the data collections method is self-report that might contribute to the low prevalence's of STIs among women Sengal.

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Author contributions
B.K., H.M.A. and G.M. Worked on this study from start to finish, including design, data extraction, and data cleaning and coding, data analysis and interpretation, and composing and revising the manuscript. G.M. then completed the final draft of the manuscript.

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Data availability
The data were obtained from the Senegal demographic and health Survey that was found at DHS portal of (https://dhsprogram.com/data/dataset_admin/index.cfm).

Declarations

Consent for publication
No applicable.

Competing interests
The authors declare no competing interests.

Ethical clearance and Consent to participate
No applicable.

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