

ORIGINAL RESEARCH ARTICLE

Prevalence and correlates of condom use at last sexual intercourse pre- and post-COVID-19 lockdown among adolescent girls and young women in central and western Kenya

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Abstract

We investigated condom use at last sexual intercourse among adolescent girls and young women (AGYW) to determine the prevalence and correlates of condom use pre- and post-COVID-19 lockdown. Condom use was compared pre- and post-COVID-19 lockdown using a single group interrupted time series analysis. Multivariable Poisson regression was used to determine the correlates of condom use at last sexual intercourse. We found a statistically significant decrease in prevalence of condom use at last sexual intercourse post-COVID-19 lockdown. Condom use at last sexual intercourse was associated with younger age, current contraceptive use, and higher education. AGYW in concurrent relationships were less likely to use condoms, as were owners of mobile phones. These findings suggest a disconnect between youth knowledge of HIV prevention and their actual condom use, particularly in concurrent sexual partnerships. Future research should explore how dynamic fertility intentions, mobile phone access, concurrent sexual partnerships and empowerment influence condom use among sub-Saharan AGYW. (*Afr J Reprod Health* 2023; 27 [6]: 70-76).

Keywords: Adolescent girls and young women, condom use, COVID-19

Résumé

Nous avons enquêté sur l'utilisation du préservatif lors du dernier rapport sexuel chez les adolescentes et les jeunes femmes (AGYW) afin de déterminer la prévalence et les corrélats de l'utilisation du préservatif avant et après le confinement lié à la COVID-19. L'utilisation du préservatif a été comparée avant et après le verrouillage de la COVID-19 à l'aide d'une analyse de série chronologique interrompue d'un seul groupe. Une régression de Poisson multivariée a été utilisée pour déterminer les corrélats de l'utilisation du préservatif lors du dernier rapport sexuel. Nous avons constaté une diminution statistiquement significative de la prévalence de l'utilisation du préservatif lors du dernier rapport sexuel après le confinement lié au COVID-19. L'utilisation du préservatif lors du dernier rapport sexuel était associée à un âge plus jeune, à l'utilisation actuelle de contraceptifs et à une éducation supérieure. Les AGYW dans des relations simultanées étaient moins susceptibles d'utiliser des préservatifs, tout comme les propriétaires de téléphones portables. Ces résultats suggèrent une déconnexion entre les connaissances des jeunes sur la prévention du VIH et leur utilisation réelle du préservatif, en particulier dans les partenariats sexuels simultanés. Les recherches futures devraient explorer comment les intentions de fécondité dynamiques, l'accès au téléphone mobile, les partenariats sexuels simultanés et l'autonomisation influencent l'utilisation du préservatif chez les AGYW subsahariennes. (*Afr J Reprod Health* 2023; 27 [6]: 70-76).

Mots-clés: Adolescentes et jeunes femmes, utilisation du préservatif, COVID-19

Introduction

Correct and consistent condom use is a highly effective prevention strategy for unintended pregnancy and STI transmission, including HIV¹⁻³. In sub-Saharan Africa, adolescent girls and

young women (AGYW; age 15-24) experience disproportionate rates of HIV acquisition and the consequences of unintended pregnancy. In 2017, AGYW accounted for 20% of all new HIV infections in sub-Saharan Africa, despite comprising 10% of the population⁴. In Kenya,

63% of adolescent pregnancies are unintended, with significant social and health consequences, including unsafe abortion⁵. The majority of African AGYW have limited agency to negotiate condom use with male partners⁶⁻⁸, and risk-reducing behavior among youth is dynamic and complex. Efforts to better meet the sexual and reproductive health (SRH) needs of adolescents depend, in part, on understanding condom use patterns.

The COVID-19 pandemic, with its multi-sectorial impact on healthcare access and health behaviors, provided a unique opportunity to explore factors affecting condom use among AGYW in Kenya. The Kenyan government announced a nationwide curfew, restrictions on gatherings and public transportation, and restriction of movement into and out of counties with a high number of COVID-19 positive cases, such as Nairobi, Mombasa, and Kilifi⁹⁻¹⁰. Emerging evidence has demonstrated the negative impacts of COVID-19 lockdown measures on SRH access and delivery specifically for AGYW¹¹⁻¹². Few studies have specifically investigated AGYW condom use behavior in the context of COVID-19 healthcare disruptions.

We hypothesized that condom use would decrease after the COVID-19 lockdown in Kenya among a large cohort of AGYW participating in a randomized clinical trial in central and western Kenya.

Methods

Data for this analysis were drawn from the KEN SHE Study (NCT03675256), a phase 4 randomized clinical trial testing the efficacy of single-dose human papilloma virus (HPV) vaccination as a catch-up strategy among adolescent girls and young women (AGYW) in Kenya. The KEN SHE study enrolled 2275 sexually-active 15- 20 year-old AGYW in Thika, Kisumu, and Nairobi, Kenya, with methods described elsewhere¹³. Participants answered structured questionnaires on sexual practices and condom use at last vaginal intercourse at enrollment (baseline), and every 6 months. We analyzed data from 2048 AGYW through 18 months of the trial.

Prevalence of condom use was compared pre- and post-COVID-19 lockdown using interrupted time series analysis (ITSA), a regression technique that can be used to assess the impact of an external influence, policy implementation, or intervention over time¹⁴. We defined the start of the lockdown as March 2020, when the Government of Kenya initiated a curfew, closed schools and other facilities, and enacted policies to restrict gatherings and movement. The pre-COVID-19 lockdown period was defined as 1st April 2019 to 12th March 2020 (11 months) and post-COVID-19 lockdown period was defined as 14th March 2020 to 30th June 2021 (16 months). Prevalence of condom use last sexual intercourse was aggregated and computed quarterly. Interrupted time-series analysis with ordinary least square regression with Newy-West standard errors was used to examine trends in prevalence of condom use last sexual intercourse pre-and post-COVID-19 lockdown.

Results

Of the 2048 participants included in the analysis, 908 (44%) were minors, 1879 (92%) were single, and the majority 1476 (72%) reported secondary school as their highest level of education. A minority (14%) of participants reported earning income at the time of enrolment. At the baseline visit, overall prevalence of condom use at last sexual intercourse was 53%, highest in Kisumu at 69% and lowest in Thika at 33%, while at 18 months, it was 50%, highest in Kisumu at (65%) and lowest in Thika at 25%.

Interrupted time-series analysis demonstrated a decrease in prevalence of condom use last sexual intercourse post-COVID-19 lockdown (coef=-0.09, 95% CI: -0.12, -0.05, $p < 0.001$) (Figure 1). Prevalence of condom use was 0.07 at the beginning of 2019 and appeared to increase significantly every quarter prior to COVID-19 lockdown (13 March 2020) by 0.17 ($p = 0.001$, 95% CI= [0.11 – 0.24]). Immediately after the lockdown (first quarter of 2020), there appeared to be a decrease in the prevalence of condom use by -0.12 but not statistically significant ($p = 0.107$, 95% CI= [-0.28, 0.03]), followed by a significant quarterly trend decrease

Aggregated prevalence of condom use= $\beta_0 + \beta_1 \text{*(time since start of the trial)} + \beta_2 \text{*(COVID-19 lockdown periods)} + \beta_3 \text{*(time since start of trial)} \times \text{(COVID-19 lockdown periods)}$

Where

- β_0 - “intercept” representing the baseline level of the condom use
- β_1 - “slope” indicating the trend in the outcome variable before the COVID-19 lockdown
- β_2 - “step-change” or the change in the outcome variable that occurs immediately following the COVID-19 lockdown
- β_3 - “slope” indicating the trend post COVID-19 lockdown relative to that before the lockdown

Box: Interrupted time series regression model and coefficients

Table 1: Baseline demographic characteristics of the study population (n= 2048)

Characteristic	n (%)
Age group in years	
<18yrs	908(44.4)
>=18yrs	1137(55.6)
Marital status	
Single	1878(92.3)
Married	138(6.8)
Divorced/Separated	19(0.9)
Highest educational level	
Primary	151(7.4)
Secondary	1476(72.1)
Post-Secondary	421(20.6)
Own source of income	
No	1771(86.5)
Yes	277(13.5)
Own a mobile phone	
No phone	369(18.0)
Own phone	1207(58.9)
Share	472(23.0)
Smoking	
No	2038(99.5)
Yes	10(0.5)
Intercourse with new partner in the last 6 months	
No	1423(89.8)
Yes	161(10.2)
Number of male sexual partners last 6 months	
One	1497(94.6)
2 or more	86(5.4)
Believes partner has other sexual partners	
No	781(49.3)
Yes	168(10.6)
Not sure	635(40.1)
Do you drink alcohol	
No	1930(94.2)
Yes	118(5.8)
Currently trying to conceive	
No	1896(93.0)
Yes	143(7.0)
Non-condom contraceptive use in the last month	
No	1036(50.8)
Yes	1004(49.2)

by -0.26 (p< 0.001, 95% CI= [-1.33, -0.18]). In the multivariate model (Table 2), condom use at last sexual intercourse among AGYW was independently associated with the study site, education level, marital status, owning a mobile phone, use of a contraceptive method in the past one month and one’s partner having other sex partners (Table 2). AGYW in Nairobi and Thika were 41% and 56% less likely to use a condom at last sexual intercourse compared to those in Kisumu (RR= 0.59, 95% CI: 0.52 - 0.67, p<0.001 and RR=0.44, 95% CI 0.39 - 0.51, p<0.001, respectively. Participants who reported being married were 74% less likely to use a condom at last sexual intercourse, compared to single AGYW (RR = 0.26, 95% CI: 0.20 - 0.34, p<0.001). Attaining secondary school and above secondary school education was associated with 23% and 26% higher likelihood of condom use last sexual intercourse when compared to primary school education (RR= 1.23, 95% CI: 1.06 - 1.42, p= 0.006) and (RR= 1.26, 95% CI: 1.05 - 1.52, p= 0.013) respectively. AGYW who owned a mobile phone were 9% less likely to use a condom at last sexual intercourse when compared to those who did not own a mobile phone (RR= 0.91, 95% CI: 0.85 - 0.98, p=0.023). AGYW who reported use of a contraceptive method in the past one month were 20% less likely to use condom last sexual intercourse (RR= 0.80, 95% CI: 0.75 - 0.84, p< 0.001). Participants who reported that they thought their partners were either having sexual intercourse with others or did were not certain if they were, were 16% and 5% less likely to use condoms at last sexual intercourse as compared to those who thought their partners were faithful (RR =0.84,

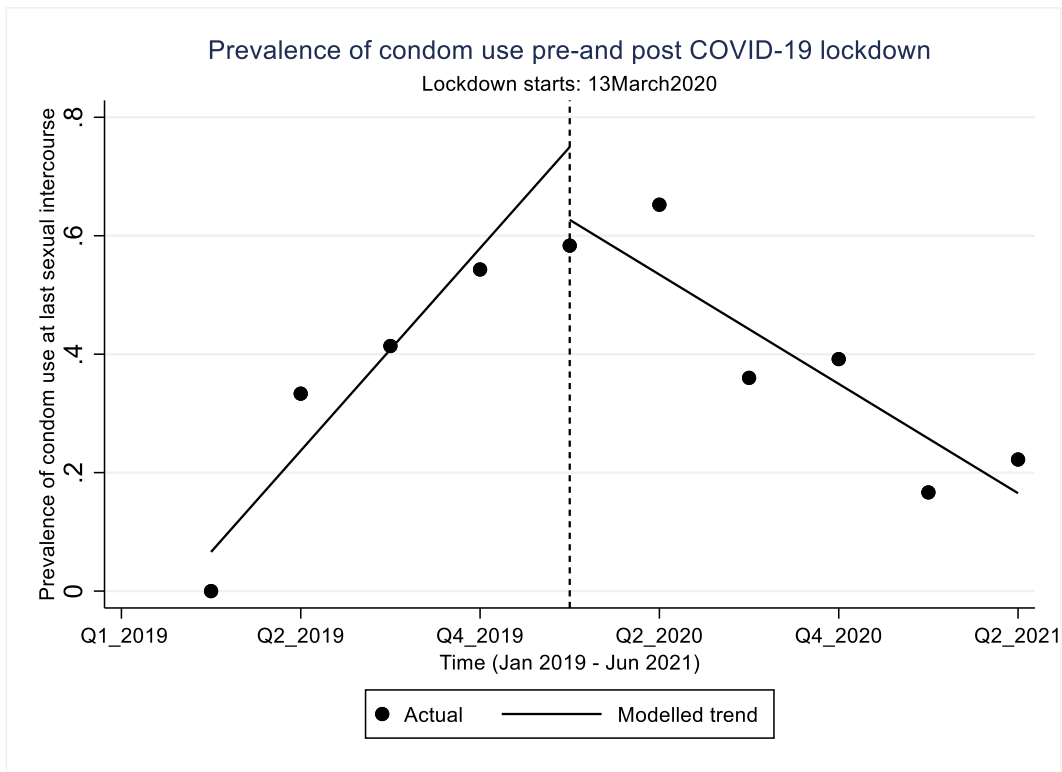


Figure 1: Prevalence of condom use pre-and post COVID-19 lockdown

Table 2: Interrupted time-series analysis coefficients with Newey-West standard errors

	Coef.	P-value	[95% Conf. Interval]
β_1	0.17	0.001	0.11 - 0.23
β_2	-0.12	0.107	-0.28 - 0.04
β_3 ($-\beta_1 * \beta_2$)	-0.26	<0.001	-0.34 - -0.19
β_0	0.07	0.287	-0.07 - 0.20
Linear Trend	-0.09	< 0.001	-0.12 - 0.05

Key

- $\beta_0 = 0.07$: Baseline prevalence level of condom use last sexual intercourse
- $\beta_1 = 0.17$ –Increase in prevalence of condom use trend by 0.17 before the COVID-19 lockdown (time since start of the study)
- $\beta_2 = -0.12$ - Decrease in prevalence of condom use by 0.12 immediately following the COVID-19 lockdown
- $\beta_3 = -0.26$ -Decrease in prevalence of condom trend by 0.26 trend post COVID-19 lockdown
- Linear Trend = Decrease in post intervention linear trend of condom use last sexual intercourse by -0.09

Table 2: Correlates of condom use last sexual intercourse among adolescent girls and young women in central and western Kenya (n = 2045)

	*aRR	95% CI	p-value
Factors			
Study site			
Kisumu	Ref		
Nairobi	0.59	0.52 - 0.67	<0.001
Thika	0.44	0.39 - 0.51	<0.001
Age group in years			
15-17	Ref		
18-20	0.94	0.88 - 1.01	0.096
Marital status			
Single	Ref		
Married	0.26	0.20 - 0.34	<0.001

Divorced/Separated	0.68	0.42 - 1.12	0.140
Education level			
Primary	Ref		
Secondary	1.23	1.06 - 1.42	0.006
Post-Secondary	1.26	1.05 - 1.52	0.013
Non-condom contraceptive use in the last month			
No	Ref		
Yes	0.80	0.75 - 0.84	< 0.001
Partner has other sex partners			
No	Ref		
Yes	0.84	0.73 - 0.96	0.017
Not sure	0.95	0.89 - 0.99	0.031
Own a mobile phone			
No phone	Ref		
Own phone	0.91	0.85 - 0.98	0.023
Share	0.99	0.92 - 1.06	0.791

*Adjusted risk ratio

95% CI: 0.73 – 0.96, $p=0.017$) and (RR=0.95, 95% CI: 0.89 – 0.99, $p = 0.031$) respectively.

Discussion

We found a reduction in the overall prevalence of condom use at last sexual intercourse post-COVID 19 lockdown, as hypothesized. Nairobi and Thika were more affected by the COVID-19 restrictions than Kisumu and had higher reductions in condom use. This suggests impeded access to free condoms, likely secondary to disruptions in SRH care during this time that were more severe in some regions. Purchasing commercially-sold condoms may not have been feasible for most AGYW¹⁵ due to lack of income, stigma, and prior access patterns^{16, 17}. Additionally, similar to other studies, differences in condom use prevalence pre- and post-COVID-19 lockdown may be related to exacerbation of existing access barriers alongside reduced social support and resources to navigate SRH care¹⁸⁻¹⁹.

Consistent with prior studies of African AGYW, the prevalence of condom use at last sexual intercourse among Kenyan AGYW was associated with both age and educational attainment; younger AGYW and those with higher education were more likely to use condoms²⁰.

Paradoxically, AGYW were 16% less likely to use condoms with partners who they believed had other sexual partners. Most studies have shown that condom use generally declines in adult relationships where partners were thought to be faithful and is low among married

couples²¹⁻²². Adolescents in sequential and concurrent relationships have also been reported in some instances to have lower condom use than those in single relationships²³. Prior research suggests that adolescents who engage in sequential or concurrent sexual relationships differ in some important demographic, behavioral, and social characteristics and, when compared with those who engage in single relationships, have a significantly greater risk for STIs over and above the number of sexual partners^{23,24}. This finding highlights a disconnect between the high level of knowledge youth exhibit about HIV and STI prevention methods and their actual reported condom use while engaging in concurrent sexual partnerships, and may indicate that knowledge alone has a limited role in the adoption of lower risk behaviors such as condom use and reduction of concurrent sexual relationships among youth²³.

AGYW who owned a mobile phone were 9% less likely to use a condom at last sexual intercourse when compared to those who did not own a mobile phone. Online partner seeking is associated with sexual risk behavior among young adults (specifically men who have sex with men), but this association has yet to be explored among adolescents²⁵. Moreover, cell phone internet access and sexual risk taking online and offline have not been explored among AGYWs in Sub-Saharan Africa, unlike in the United States, where students with cell phone internet access have been found to be more likely to report being solicited online for sex, being sexually active, and having sex with an internet-met partner²⁵.

This analysis is strengthened by a large sample size of AGYW, and longitudinal data collection. There are also some important limitations. In the parent study, condom use was self-reported, which prior research has shown is subject to social desirability bias and may be unreliable²⁶. We collected data on the last sexual encounter, but not on the consistency of condom use, which is clearly related to the clinical outcomes of HIV acquisition and unintended pregnancy. The results from an RCT are not generalization to AGYW at population-level.

Future research should assess age disparities in condom use among AGYW, explore how mobile phones and internet access are shaping and influencing sexual risk taking behavior among sub-Saharan AGYW, and examine changing fertility desires over time, as well as sexual and reproductive empowerment. In addition, these results suggest that HIV prevention programs for youth should emphasize personal vulnerability to HIV acquisition, take into account condom use self-efficacy, and address how to overcome barriers to condom use. In the case of future disruptions to basic SRH services, strategic interventions such as community distribution of free condoms should be adopted.

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