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Research Article

Effect of Comprehensive HIV Prevention Information Package on Number of Concurrent Sexual Partners Among Youth in Kenya

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Abstract

HIV remains the most significant public health and development challenge in the world. In sub-Saharan African countries, young people aged 15-24 years are bearing the biggest brunt. The United Nations framework for addressing the epidemic among young people who bear the high burden of HIV globally calls for comprehensive sexual and reproductive health education. Despite the availability of widening array of HIV prevention tools and methods, new infections among youth in Kenya only reduced by 59% between 2015 and 2019. The percentage of young men aged 15-24 years who had two or more sexual partners who reported using condoms during the last sexual intercourse was higher at 63.5% compared to young women of the same age group at 35.5%. Various HIV prevention interventions have been implemented among the Young People with little assessment of their effectiveness in reducing new HIV infections. The objective of this research was to investigate the effect of comprehensive HIV prevention information package on number of concurrent sexual partners among young people aged 15-24 years in Kakamega and Kericho counties, Kenya. To achieve this, a non-randomised control trial was conducted using a structured questionnaire. It involved purposively selecting Kakamega as intervention and Kericho as Comparison County. Consenting young people residing in these counties were the study subjects. The pretest questionnaire was administered in both intervention and control counties in November - December, 2021. The posttest questionnaire was administered in both counties after nine months of providing HIV prevention information package in the intervention county. The quantitative data was analyzed using descriptive and inferential statistics (Chi square, t-test). The number of youths who had two or more sexual partners reduced at endline to 17.6% from 23.7% in intervention county. Similar reduction was also noted in comparison County, where the number reduced to 36.6% at endline from 61.1% but was not significant ($t = 2.197$, $df = 2$, $P = 0.159$). There was significant number of male youth in intervention county who had two or more concurrent sexual partners at 13.7% compared to female at 6.4%($P=0.003$). Concurrent partnership by gender among youth in comparison county was higher among men at 32.4% compared to female at 11.4% but was not significant (0.091). The findings from the study will inform national rollout of the HIV prevention information package to contribute to safer sexual behaviors among young people.

Keywords

Comprehensive HIV Information, Non-randomized, Sexual Behavior, Concurrent Partnerships

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1. Introduction

Human immunodeficiency virus (HIV) is the most significant public health and development challenge in the world [1]. Efforts to reduce new HIV infections to fewer than 500000 worldwide by 2020 have been off-track. Globally, over 1.5 million people became newly infected with HIV in 2021 compared with 1.6 million in 2019 representing 7% decline. Approximately 400 000 young people aged 15 -24 years in the world were newly infected with HIV in 2021 down from 450 000 in 2019 [1].

The Sub Saharan African region had approximately 990 000 new HIV infections in 2019 compared to 1.29 million in 2015 representing a 23% decline. An estimated 332 100 young people aged 15-24 years got newly infected in 2019 in the Sub Saharan region down from 426 000 in 2015. The East and South African region had the highest reduction in new HIV infections at 38% since 2010. An estimated 260 000 young people aged 15-24 years got newly infected in 2019 in the region down from 340 000 in 2015 [2]. Only 30% males and 19% females aged 15-24 in sub Saharan Africa have comprehensive knowledge on HIV. The Median condom use by men at last higher risk sex was only 58.6%, far from the global target of 90% by 2020 [3].

New HIV infections in Kenya have stabilized at an average of 41 408 people down from 51 000 in 2015 [4]. Average number of sexual partners in Kenya are 2 among women and 7 among men [5]. Young people aged 15-24 years contribute 42% of all new HIV infections in Kenya [6]. The high new HIV infections can be attributed to casual sex with multiple partners, limited comprehensive information on HIV prevention and inconsistent and incorrect condom use. Only 37.5% of females and 68.9% of males aged 15-24 years with more than one sexual partner in the past 12 months reported using a condom during their last sexual intercourse. Additionally, only 54% females and 55% males in this age group have comprehensive knowledge of HIV prevention [5].

Kakamega county has a projected population of 1 867 579 with a HIV prevalence of 3.9 as at 2018 [7]. The county has approximately 388 255 young people aged 15-24 years who contributed 27% of the 2198 new HIV infections in the county [8]. Only 2% women and 5.6% men reported having two or more sexual partners in the last 12 months prior to the survey. Kericho county has a projected population of 995566 with a HIV prevalence of 3.4 as at 2018. The county has approximately 192 767 young people aged 15-24 years who contributed 32% of the 419 new HIV infections in the county. Only 7% women and 2.2% men reported having two or more sexual partners in the last 12 months prior to the survey (MOH. 2022). HIV preventions in these counties are not being provided on an adequate scale and with sufficient intensity to reach young people who need them most.

The aim of the study was to investigate effect of comprehensive HIV prevention information package on number of concurrent sexual partners among youth in Kenya.

2. Materials and Methods

2.1. Study Design

A Nonrandomized control trial was conducted for 9 months from December 2021 using qualitative and quantitative methods. Nonrandomized control trials are typically much cheaper and may be more politically feasible to conduct [9].

2.2. Setting

The study was undertaken in Kakamega as intervention and Kericho as comparison county. These two were purposively selected because they are medium incidence [4]. The three sub counties in the two counties were randomly selected to represent urban, cosmopolitan and rural youth. Nandi county is geographically located between Intervention area and Comparison area to prevent effect of spillover or mixing of youth from the two study counties.

2.3. Study Population

The research population of interest were all youth in Kakamega and Kericho County. A target of 495 youth was the study subjects. The study participants were selected from youth group meetings to represent out of school youth and from tertiary instutions to represent the in-school youth. Consenting youth residing in the intervention and control counties between December 2021 and September 2022 were the study participants.

2.4. Selection Criteria

2.4.1. Inclusion Criteria

1) Confirmed young person residing in the study counties for at least one year
2) Youth aged 15 -24 years and able to give informed consent
3) Youth below 18 years who assent in addition to parental consent

2.4.2. Exclusion Criteria

1) Young people who don't consent
2) Youths who don't consent
3) Mentally disturbed youths

2.5. Sampling

2.5.1. Sampling Strategy

Stratified sampling was used to select three sub counties in the intervention and control county to represent urban, cosmopolitan and rural youth. Simple random sampling was used to select colleges or technical institutes to represent in-school youth and youth groups to represent out of school youth in the

intervention and control counties. Individual youth who consented in both counties were invited to fill a questionnaire at baseline and after 9 months of providing comprehensive HIV prevention information package in the intervention county. Consecutive sampling was used to include all accessible individual study participants to provide information on the study questions. The change in usage of condoms and HIV testing services in the intervention county was compared with the comparison county.

2.5.2. Sample Size Determination

A representative sample size for the non-randomised control trial was determined using a formula developed for intervention studies [10].

$$n = DEFF \times \frac{\left[Z_{\alpha/2}\sqrt{2\bar{p}\bar{q}} - Z_{1-\beta}\sqrt{p_1 q_1 + p_2 q_2} \right]^2}{(p_1 - p_2)^2}$$

According to the Kenya Demographic and Health Survey, only 59% of youth in Kenya have comprehensive knowledge on HIV and AIDS [11]. We estimate that the intervention will increase comprehensive knowledge among this age group by 10%. Adjusting for 10% non-response rate [12].

$$n = \frac{450 * 110}{100} = 495 subjects$$

The sample size was 495 youth for the baseline survey and 495 in the follow-up survey. We used stratified probability proportional to size (PPS) method [13] to obtain the number of young people to be sampled per county. The population of interest in each county was sampled proportional to its size as shown in Table 1.

Table 1. *Population size and sample size of participants in each sample locations.*

	County	Sub county	Youth (15-24 years)	Sample
1	Kakamega	Lurambi	42322	140
2	Kakamega	Lugari	25431	85
3	Kakamega	Navakholo	32100	106
Sub total			99853	331
4	Kericho	Ainamoi	37122	68
5	Kericho	Kipkelion	25638	47
6	Kericho	Sigowe	26724	49
Sub total			89484	164
Total				495

2.5.3. Pre-testing

Pre-test study was conducted using 50 youth in Machakos County that formed 10% of the sample size. Data was collected from 25 youth in a randomly selected sample of 3 youth groups and 25 young people from two Colleges or technical institutes in Machakos County. Data was collected through use of detailed questionnaire, structured interviews and some use of direct observation. The pretest county is medium incidence and was characteristically similar to participant counties. Pre-testing of instruments was also intended to improve clarity, precision, reliability and validity of data. Following analysis of the pretest study data, ambiguous or unclear questions were either be rephrased or removed.

2.5.4. Validity

The questionnaire was comprehensive enough to collect all the information needed to address the purpose and objectives of the study. A field test was conducted before the questionnaire was used for the pilot study. To test validity, the questionnaire was also reviewed by an expert at Kenyatta University. Data from other sources was compared with results from this study. The findings from this study can be generalized for the effect comprehensive HIV prevention information package on risk sexual behavior among youth in Kenya.

2.5.5. Reliability

Pretesting the questionnaire helped enhance reliability of the instrument. The Research Assistants were trained on ad-

ministering the research instruments. Reliability was established using a pilot test by collecting data from subjects not included in the sample. The same questionnaire was used during the interviews and all its subparts were measured using the same characteristic. To increase reliability of data collected, efforts for triangulation was undertaken including performing two separate interviews per county in addition to direct observation made [14].

2.6. Intervention

The comprehensive HIV prevention information package was provided to the youth in the intervention county after the baseline assessment. The HIV prevention information package had 3 contact sessions offered termly for 9 months. Each contact session was 3 hours long consisting of presentation, experience sharing, group discussion and practical demonstration. The package consisted of frequently asked questions on HIV and AIDS, overview of HIV including transmission and prevention options, condom use dialogue, key HIV and STIs messages and documentary. Two local peer facilitators were trained on the comprehensive HIV Prevention information package to facilitate termly sessions with the youth. The out of school youth were meeting at the county Youth Empowerment center every last Saturday of the month to receive the intervention. Youthful HIV testing counselors from partner organizations were referred to the youth empowerment center to offer the service. Youth in the comparison county continued to receive routine HIV services offered at health facilities.

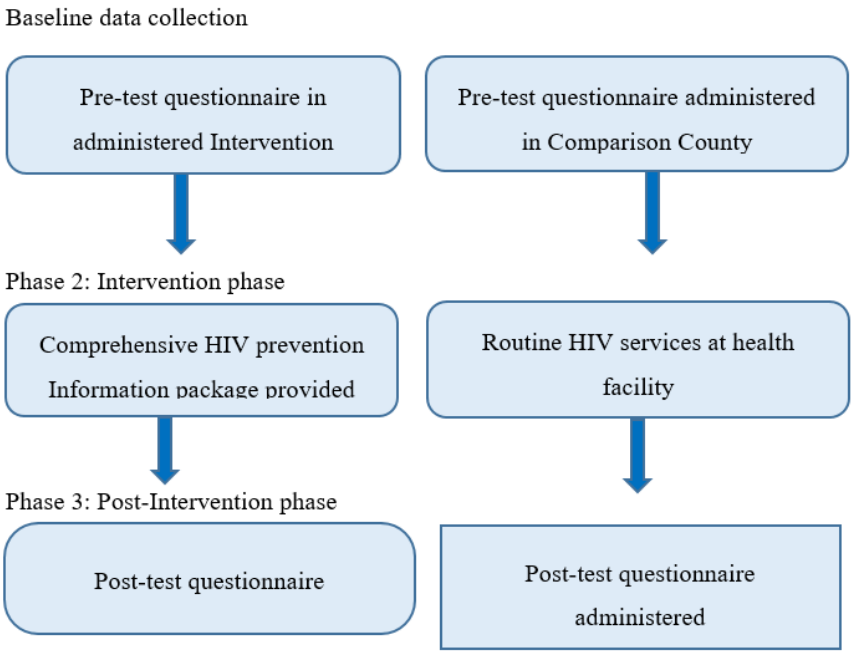

Figure 1. *Intervention Flow Chart.*

2.7. Data Collection

The quantitative data was collected from respondents at baseline and at endline after 9 months by using a self-administered questionnaire which had both structured and unstructured questions. The questionnaire was constructed through literature review and consultation with subject experts at the University. Four key informant interviews were also conducted with program implementers to establish HIV prevention strategies available for young people. Six Focus Group Discussions with 8-10 youth were conducted for the qualitative study at baseline and at endline. A similar questionnaire was administered at baseline and end line period in both intervention and comparison counties. The questionnaire also collected information on potential confounding factors such as age, gender, residence and other prevention programs that they had attended. The post test data was collected 9 months after implementing the comprehensive HIV prevention information package as shown in figure 1 below. Data was checked for completeness and internal consistency throughout the data collection period. The questionnaire together with participants' responses was then coded and entered into a computer for analysis.

2.7.1. Data Collection Process

The quantitative data collection method involved individual interviews using pretested structured questionnaire that was well designed as per the research objectives. All respondents signed consent and assent form before participating in the study. Eligible participants who declined to participate

were not coerced. The data collection process took 7 days at baseline and at endline in both intervention and comparison county. Each interview took an average of 45 minutes. The endline data was collected after 9 months of providing HIV Prevention information package to youth in the intervention county while youth in comparison county continued to receive routine health services. The researcher and research assistants analyzed the interview data and checked for inconsistencies and clarification.

The qualitative data was collected by conducting individual indepth interviews and focus group discussions. The researcher conducted 4 Key informant interview guides with key youth program implementers and 6 focus group discussions with youths per county. Participants for the qualitative study were purposefully selected based on their experience in the research study. After explaining the study objectives and obtaining consent from respondents, the researcher requested permission to record and take notes during the session. Participants were assured of confidentiality and the information provided will be strictly used for the study. Participants were asked to respect each other's opinion since there was no wrong response during the session. The researcher moderated the one hour discussion with participants while the research assistant took notes. The researcher finally thanked participants for their time.

2.7.2. Data Analysis

The qualitative data was transcribed and translated then entered into NVivo qualitative data software for coding and thematic analysis. The quantitative data was entered into SPSS and analyzed using descriptive statistics. These include mean, median, frequencies and standard deviation. The Difference-In-Difference (DID) regression model was used to compare outcomes between intervention and comparison county at baseline and after 9 months of the intervention at end line. A Chi square test was used to determine the effect of the comprehensive HIV prevention information package and testing for any significant difference. Potential confounders were measured at baseline and end line and analysis and the results adjusted for possible confounders using logistic regression to ensure unbiased estimation of the intervention effect.

2.8. Ethical Considerations

Research proposal was approved by Kenyatta University Ethical Review Committee as No. PKU/2302/11441 before start of the study**.** The research permit was obtained from NACOSTI. Kakamega and Kericho counties gave clearance to collect data from colleges and youth groups. Written informed consent was obtained from all the study participants. Parental permission for adolescents aged 15-17 years was sought first before the minor's assent was sought. No participant name appeared on the questionnaire. Participants were informed that there will be no penalties for declining to participate or for withdrawing from the study in the course of data collection and that no invasive procedures will be used. Access to database was restricted by password. Completed questionnaires were kept in lockable office.

3. Results

3.1. Demographic Information of the Sampled Population

A total of 495 respondents from Kericho and Kakamega were involved in this study with 100% response rate. Most of the respondents were from Kakamega (66.7%) based on the proportionate sample size. Both male and female young adults in the ages of 15 - 24 years were involved. Majority of the respondents 61.2% were in their tertiary education level and only 10.7% were married as summarized in Table 2.

Table 2. *Respondents' demographic information.*

Demographic information	Category	At Baseline (N = 495)	End line (N = 495)
County	Kericho	164 (33.1%)	164 (33.1%)
	Kakamega	331(66.9%)	331(66.9%)
Gender	Male	233 (47.1%)	233 (47.1%)
	Female	262 (52.9%)	262 (52.9%)
Age (Years)	15 - 19	185 (373.6%)	183(37.0%)
	20 - 24	306(61.8%)	312(63.0%)
	NonRespons	3 (0.6%)	-
Education level	None	10 (2.0%)	10 (2.0%)
	Primary	58 (11.7%)	26(5.3%)

Demographic information	Category	At Baseline (N = 495)	End line (N = 495)
	Secondary	113 (22.8%)	95(19.2%)
	Tertiary	303 (61.2%)	355(71.7%)
	Non -response	11 (2.2%)	10 (2.0%)
Religion	Christians	456 (92.1%)	466(94.1%)
	Muslims	32(6.5%)	26 (5.3%)
	Others	3 (0.6%)	2 (0.4%)
	Non-respons	4 (0.8%)	1 (0.2%)
Marital status	Married	53 (10.7%)	57(11.5%)
	Single	400 (80.8%)	414 (83.6%)
	*Others	34(6.9%)	21 (4.2%)
	Nonresponse	8 (1.6%)	3 (0.6%)

3.2. Sexual Behavior Among Youths

The percentage of youths in a sexual relationship increased from 60.6% at baseline to 76.8% at endline. During the baseline, 18.8% of the youth had two or more sexual partners compared to 19.4% at endline. At the baseline, 48.0% of the youths used condoms anytime they had sex compared to 65.9% at endline as summarized in figure 2.

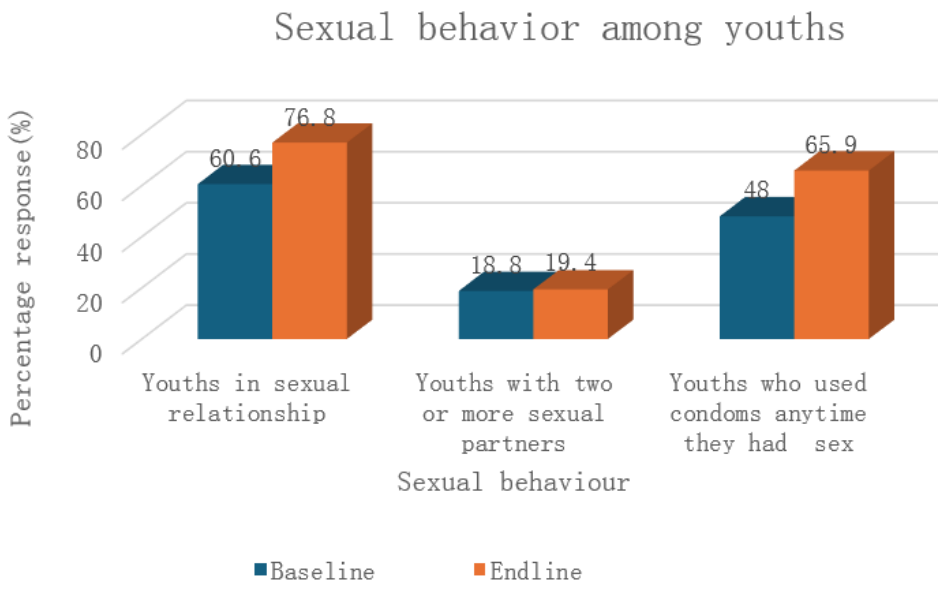

Figure 2. *Sexual behavior among youths.*

3.3. Concurrent Sexual Partners in the Two Counties

The findings revealed that 76.8% were in a sexual relationship while 23.2% were not at endline. In Kericho, the number of youth who had two or more sexual partners reduced at endline to 36.6% from the previous 61.4%. Similar reduction in the number of sexual partners was also noted in Kakamega County, where the number reduced to 17.6% at the end of the survey but was not significant (t= 2.197, p= 0.159) as summarized in Table 3.

Table 3. Number of youths in sexual relationships in Kakamega and in Kericho at baseline and endline.

	Baseline		Endline	
	Kakamega	Kericho	Kakamega	Kericho
Youths in sexual relationship	198 (65.6%)	102 (66.7%)	279 (84.5%)	101 (56.4%)
Youth with one partner	116 (59.2%)	9 (8.9%)	193 (69.2%)	50 (49.5%)
Youths with 2+ partners	47 (23.7%)	62 (61.4%)	49 (17.6%)	37 (36.6%)
t-value	1.608		2.197	
df	2		2	
P-value	0.249		0.159	

3.4. Concurrent Sexual Partners by Gender

During the endline survey, 13.7% of the male youth in Kakamega and 32.4% of male youth in Kericho had two or more sexual partners. In Kakamega, less females (6.4%) compared to males had two or more sexual partners. Similarly, less females in Kericho (11.4%) than males had two or more sexual partners as shown in Table 4.

Table 4. Gender of the youth having one, two or more sexual partners in the counties.

County	Demography	Category	Number of sexual partners in last nine months			
			One	Two or more	χ^2 - value	P -value
Kakamega (n = 249)	Gender	Male	83 (33.3%)	34 (13.7%)		
		Female	116(46.6%)	16 (6.4%)	11.507	0.003*
Kericho (n =105)	Gender	Male	31 (29.5%)	34 (32.4%)		
		Female	28 (26.7%)	12 (11.4%)	4.791	0.091

*Represents significant difference at $P \leq 0.05$

4. Discussion

Youths who had more than one sexual partner reduced at the endline in intervention county to 17.6% from the previous 23.7%. Similar reduction in the number was noted in comparison County, where the number reduced to 36.6% at the end of the survey. During the endline survey, 13.7% of the male youths in intervention county had two or more sexual partners compared to 32.4% of males in comparison county. In intervention county, less females (6.4%) compared to males had two or more sexual partners ($\chi 2$ =11.507, P=0.003). This finding is concurs to a resilience-based HIV prevention intervention among youths in South Africa where the participants at the 3-months follow-up had a higher tendency to participate in several romantic relationships, transactional sex and intergenerational sex than baseline [15]. A similar HIV prevention program conducted among Thai Men never decreased the number of sexual partners and STI reinfection rate after 3-month follow-up [16]. The findings were contrary to a study conducted in New York, where participants in the prevention intervention arm reported significantly fewer sexual partners and fewer sexual activities compared to participants in the control group [17]. A school based quasi experimental study in Northern Malawi also reported lower likelihood of engaging in sexual activity and having a large number of sexual partners in the intervention group at endline [18]. The study did not have control over similar HIV prevention interventions that might have diluted the effect of the intervention. The findings makes me think to drop concurrent partnerships as indicator for HIV prevention or conduct a randomized

community control study to see the effect. The risk of HIV transmission is also low where sexual partners have achieved viral suppression. Few interventions have also been successful in reducing the number of concurrent sexual partners when addressing social norms and economic vulnerability.

5. Recommendation

The Ministry of Health to promote alternative prevention interventions for multiple partnerships that include abstinence among youth.

6. Conclusions

From data analyzed, the Comprehensive HIV prevention information package had no significant effect on concurrent sexual partners among the youths (P=0.159).

Abbreviations

AIDS	Acquired Immune Deficiency Virus
AYP	Adolescent and Young People
DID	Difference-in-difference
FGD	Focus Group Discussions
HIV	Human Immunodeficiency Virus
HTS	HIV Testing Services
KDHS	Kenya Demographic and Health Survey
KII	Key Informant Interview
NACOSTI	National Commission for Science, Echnology and Innovations
UNAIDS	Joint United Nations Programme on AIDS
SPSS	Statistical Package for Social Sciences
STI	Sexually Transmitted Infection
TVET	Technical and vocational Education and Training

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Author Contributions

Joab Khasewa: Conceptualization, methodology, formal analysis, investigation, Writing - original draft

Isaac Mwanzo: Supervision, methodology, data curation, validation, Writing - review & editing

Alloys Orago: Supervision, methodology, data curation, validation, Writing - review & editing

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Data Availability Statement

Data available upon writing to the corresponding author.

Conflicts of Interest

The authors declare no conflicts of interest.

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