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Short Communication

Evaluating the effectiveness of the HIV adolescent package of care (APOC) training on viral load suppression in Kenya

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ABSTRACT

Objectives: To evaluate the effectiveness of the implementation of the adolescent package of care (APOC) training on adolescent viral suppression at Family AIDS Care & Education Services (FACES)–supported sites.

Study design: The effect of APOC training was evaluated based on viral load suppression (<1000 copies/mL) of 10–19-year-olds in 13 FACES-supported sites in six months before (January 2015–August 2016) and after (November 2015–March 2017) the APOC training for each site.

Methods: Patient-level data were abstracted from the FACES electronic medical records (OpenMRS) and the National AIDS and STI Control Programme viral load website. Information on adolescent clinic day implementation and utilization of an APOC checklist as a proxy for services provided at each site was collected. Generalized estimating equations with repeated measures clustered by patients were used for bivariate and multivariate modeling to assess factors associated with viral suppression.

Results: In the pretraining period, 60% of adolescents received services at clinics offering adolescent clinic days compared to 95% in the post-training period. Among those tested, 65% were virally suppressed during the pretraining period compared to 72% during the post-training period (odds ratio [OR] = 1.31, 95% confidence interval [CI] 1.12, 1.53, $P < 0.01$). In multivariable analysis, there was no statistically significant change in viral load suppression due to APOC training (adjusted OR [aOR] = 0.97, 95% CI: 0.72, 1.30, $P = 0.84$). However, at clinics offering adolescent-friendly clinic days, adolescents were nearly 2 times more likely to be virally suppressed than at facilities not offering these specialized clinic days (aOR = 1.86, 95% CI: 1.04, 3.32, $P = 0.04$).

Conclusions: This study suggests that adolescent clinic days greatly improve adolescent viral load suppression and should be considered for implementation across HIV programs.

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There is growing recognition that adolescents are an important population in need of attention within the worldwide HIV/AIDS response.[1] An estimated 1.8 million adolescents (10–19 years of age) are living with HIV.[2] AIDS is now the leading cause of death among adolescents in Sub-Saharan Africa (SSA).[3] This has been attributed, in part, due to a lack of prioritization of adolescents in national HIV programs. A review of the uptake and positivity rate of HIV testing services among adolescents reported that approaches evaluated to date have not been tailored to the needs of this age group, as they replicate strategies for adults and do not consider barriers specific to adolescents. Factors affecting linkage to care for adolescents living with HIV (ALHIV) found that structural and health system issues are not adequately addressed.[4] Adolescence (10–19 years of age) is a stage in life when many hormonal changes, emotional, cognitive, and behavioral changes occur. Adolescents infected with HIV often have worse adherence to antiretroviral therapy (ART) compared to older populations.[5]

To address this discrepancy, the World Health Organization has emphasized the need to develop adolescent-friendly health services to improve the care provided to young people.[6] Implementation of a comprehensive package of care with optimization of adolescent-focused components can address structural care delivery challenges, can contribute to improved health outcomes, and is an important public health initiative.[1,3] In 2013, the Kenya Ministry of Health (MOH) developed the adolescent package of care (APOC) as a model to treat adolescents at all health facilities in Kenya.[1] APOC is a framework for healthcare providers describing adolescent-tailored health services including developmental, reproductive, sexual, psychosocial, and mental health as well as HIV prevention, care, and treatment. Additionally, the APOC curriculum contains sections on transition from pediatric to adult services, techniques for communicating effectively with adolescents, and providing adolescent-friendly services.

Family AIDS Care & Education Services (FACES) is a collaboration between the Kenya Medical Research Institute and the University of California, San Francisco (UCSF) to provide technical support the MOH for HIV care, treatment, and prevention services in the former Nyanza region and Kisumu County, Kenya. This resource-limited region has the highest HIV prevalence in the country at 15.1% compared to 5.6% nationwide.[7] AIDS-related deaths among adolescents (10–19 years) in Kenya have declined from 3900 in 2010 to 2100 in 2017.[8] Healthcare workers at FACES-supported facilities were trained on specific adolescent components contained in the APOC manual with the goal of improving adolescent-friendly HIV services.

The success of the package first requires training healthcare providers who offer direct services to adolescents. We sought to evaluate the effectiveness of the implementation of APOC training on adolescent viral suppression at FACES-supported sites.

The Kenya National AIDS and STI Control Programme (NASCOP) disseminated the APOC in 2016, after which FACES conducted program-wide training events to sensitize lead program clinic staff on the adolescent-tailored services. Each 5-day training event was led by FACES technical advisors. Upon returning to their facilities, lead program clinic staff trained clinicians who provide services to ALWH through a series of continuing medical education sessions held at the facility. Some sites had implemented some elements of APOC such as the APOC checklist and adolescent clinic days, prior to the rollout of the full APOC manual and trainings. The APOC checklist is a standardized NASCOP tool containing 28 components to be assessed at every adolescent visit. Monthly adolescent clinic days only serve adolescents on the appointed clinic day.

We evaluated the effect of APOC training on viral load suppression of 10–19-year-olds in 13 FACES-supported sites utilizing electronic medical records (EMRs). Eligible patients received HIV care six months before (January 2015–August 2016) and after (November 2015–March 2017) APOC training at one of the 13 sites. The pretraining and post-training periods were individualized to each site, based on their training attendance dates, with a two-week wash-out period between the end of the training and start of the post-training period. APOC training dates and attendance were collected for each site as well as implementation of adolescent-specific clinic days and overall facility utilization of the APOC checklist. As APOC checklist data were not readily available electronically for all patients, we created a facility-level APOC checklist utilization score as a proxy for the amount of APOC client-level services provided to adolescents at each clinical visit. We audited a random selection of patient visits at each facility, assigning scores on a scale from 0 to 10 (0 indicating checklist not in use; 10 indicating consistent full completion of the checklist activities). Individual patient scores were averaged to create facility-level scores for each time period.

Patient data were abstracted from the FACES EMRs (OpenMRS) and the NASCOP viral load website.[9] Variables included facility, age, gender, ART status, visit dates, and referrals for other services (OpenMRS) and viral load test date and viral load result (Viral Load website). All data management and analysis were performed using STATA v12 (College Station, TX, USA). Patients were considered virally suppressed according to the NASCOP guideline of <1000 copies/ml. Generalized estimating equations with repeated measures clustered by patient were used for bivariate and multivariate modeling to assess factors associated with viral suppression. Covariates included in the final multivariable model were patient age and gender and clinic-level MOH tier (level of services provided), checklist utilization, and adolescent clinic days offered at clinic.

The evaluation protocol was reviewed and approved by the KEMRI Ethical Review Committee, (UCSF) Committee on Human Research, and the Associate Director for Science, Division of Global HIV/AIDS, CDC. All data collected were from routinely collected clinical data forms and electronic laboratory databases approved by the aforementioned ethical committees. De-identified data were obtained from medical records for analysis; consent was not required from individual patients to contribute data to the study.

We analyzed 2195 adolescent viral loads in the pretraining period and 1345 in the post-training period. In both pretraining and post-training periods, the majority of the adolescents tested were 10–14 years old, 1350 (61%) and 782 (58%), respectively. More than fifty percent were females, and more than eighty percent visited MOH tier 2 facilities in both periods. The mean checklist utilization score was 5.9 (standard deviation [SD] 1.9) in the pretraining and 4.4 (SD 2.0) in the

Table 1 – Change in viral load (VL) suppression from pre-adolescent to postadolescent package of care training, bivariate and multivariate modeling clustered by patient.

Characteristics	Pre-APOC viral load tests		Post-APOC viral load tests		OR (95% CI)	P	aOR (95% CI)	P
	N = 2195	%	N = 1345	%				
VL suppression (pre vs post)	1435	65.4	958	71.2	1.31 (1.12, 1.53)	<0.01	0.97 (0.72, 1.30)	0.84
Age								
<15 years	1350	61.5	782	58.1	ref	0.54	ref	0.56
≥15 years	845	38.5	563	41.9	1.05 (0.90, 1.23)		0.92 (0.70, 1.21)	
Gender								
Female	1252	58.1	804	60.2	ref	0.70	ref	0.45
Male	904	41.9	531	39.8	0.97 (0.83, 1.14)		0.90 (0.68, 1.18)	
Clinic offers adolescent days	1315	59.9	1273	94.6	1.48 (1.25, 1.75)	<0.01	1.86 (1.04, 3.32)	0.04
Clinic checklist utilization, mean (SD)	5.9	1.9	4.4	2.0	1.05 (0.99, 1.12)	0.09	1.03 (0.96, 1.10)	0.37

SD, standard deviation; CI, confidence interval; OR, odds ratio; aOR, adjusted OR.

post-training period. In the pretraining period, 60% of adolescents received services at clinics offering adolescent clinic days compared to 95% in the post-training period. Among those tested, 65% were virally suppressed during the pre-training period compared to 72% during the post-training period (Table 1; odds ratio [OR] = 1.31, 95% confidence interval [CI] 1.12, 1.53, $P < 0.01$).

In multivariable analysis, there was no statistically significant change in viral load suppression due to APOC training (adjusted (a)OR = 0.97, 95% CI: 0.72, 1.30, $P = 0.84$). Age, gender, and checklist utilization score did not statistically significantly affect viral load suppression. However, at clinics offering adolescent-friendly clinic days, adolescents were nearly 2 times more likely to be virally suppressed than at facilities not offering these specialized clinic days (aOR = 1.86, 95% CI: 1.04, 3.32, $P = 0.04$).

The implementation of adolescent clinic days greatly increased after APOC was introduced to HIV programs in Kenya. In the multivariable analysis, adolescent-friendly clinic days were the only significant variable associated with improvement of viral load suppression, irrespective of APOC training. Adolescent clinic days are intended to create personal connections between the health providers and ALHIV in order to improve adherence to clinic appointments and ART.[10] A prior study in Kenya found that utilization of health services among adolescents was low due to unfriendliness of the healthcare providers and a lack of awareness of adolescent-friendly health services.[6] Similar problems have also been studied in Tanzania and South Africa, where few adolescents were aware that adolescent-friendly services exist and the quality of services provided by some organizations was poor.[10] This underscores the necessity of ensuring healthcare providers receive continued training and support on adolescent-friendly services, allowing opportunities for providers to practice their interactions with adolescents through role play and to partake in open discussions about possible biases that may arise when caring for adolescents. It is also important for facilities to advertise their services.

There were a number of limitations of this study. First, viral load suppression can be influenced by many factors such as improved ART regimens and viral load monitoring among asymptomatic patients, which were not measured in this study. A longer follow-up time might have better controlled for these other factors. Second, there was variability of operationalizing APOC elements at each site based on resources available and community needs. Additionally, we were unable to measure the direct effect of the APOC on augmenting facility offerings and programs as our outcome was at patient level.

Despite these limitations, this study suggests that adolescent clinic days greatly improve adolescents viral load suppression and should be considered for implementation across HIV programs. While HIV programs throughout SSA continue to grapple with lower viral load suppression rates in adolescents, there is need for continued innovation to improve outcomes for ALHIV to inform future public health interventions.

Author statements

Ethical approval

The evaluation protocol was reviewed and approved by the KEMRI Ethical Review Committee (NRP 1/2009), University of California, San Francisco (UCSF) Committee on Human Research (11–05348/217572), and the Associate Director for Science, Division of Global HIV/AIDS, CDC (2018-197).

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Competing interests

None declared.

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