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Original Article

School Support as Structural HIV Prevention for Adolescent Orphans in Western Kenya

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A B S T R A C T

Purpose: Using a clustered randomized controlled trial design, we evaluated whether support to keep Kenyan orphaned adolescents in school reduces the risk of HIV infection.
Methods: Participants included 835 orphaned boys and girls in grades 7 and 8 (mean age at the baseline = 15 years) in western Kenya. Primary schools (N = 26) were randomized to the study condition. Intervention participants received school uniforms, payment of tuition when they transitioned into high school, and nurse visits to monitor school absenteeism and provide assistance to stay in school. Annual surveys were conducted from 2011 through 2014, and HIV and herpes simplex virus 2 (HSV-2) biomarker data were collected at the baseline and the end line. Data were analyzed using survey logistic regression or generalized estimating equations controlling for age, gender, and socioeconomic status.
Results: Intervention and control groups were equivalent at the baseline and did not differ on new HIV or HSV-2 incidence at the end line. The school support intervention increased school retention but had few HIV-related effects, except increased circumcision among male participants and reduced likelihood of transactional sex.
Conclusions: Despite a strong study design, we found no relative reduction in HIV or HSV-2 infection after 3 years of intervention implementation. New incidence of HIV was lower than expected in this region among youth whose average age at end line was 18 years (range = 14–23). Although support for secondary school promises many benefits for vulnerable youth, our study adds to the growing body of research showing weak evidence for its effectiveness as an HIV prevention.
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IMPLICATIONS AND CONTRIBUTION

Three years of experimentally testing support to stay in school as an intervention showed few effects on HIV-related outcomes and no impact on HIV or herpes simplex virus 2 biomarkers. Given similar findings from most other rigorously implemented trials, the evidence for school support as an HIV prevention appears to be weak.

Worldwide, there are 17.8 million orphans who have lost one or both parents to AIDS. About 11.6 million of these orphans are living in Sub-Saharan Africa (SSA), including 2.6 million in Kenya alone [1]. Compared with their nonorphan counterparts, orphans are at an increased risk of psychological distress, exploitation, early marriage and pregnancy, sexual trafficking, poverty, and school dropout, which leaves adolescent orphans particularly vulnerable to HIV infection [2,3].

Over the past few decades, HIV/AIDS prevention efforts, including those targeting vulnerable adolescent populations such as orphans, have shifted toward considering whether structural social and economic factors may help drive the HIV epidemic [4,5].

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Social protection or social safety net programs in the form of conditional cash transfer (CCT) to improve educational and health outcomes have garnered tremendous attention [6]. CCT programs generally provide small amounts of cash, uniforms, and/or school tuition to the poorest households, conditional on certain behaviors, with the most common one being child school enrollment. The conceptual framework for these programs posits that cash transfers and/or direct school support will increase the likelihood of adolescents staying enrolled in school and that this, in turn, will lower social risk factors and behaviors leading to HIV and other sexually transmitted infections [7]. Such incentives are also assumed to alleviate economic burdens to households, and beneficiaries of the transfers are expected to be less likely to depend on older sex partners or transactional sex for school fees [8].

Several studies evaluating this structural approach to HIV prevention have been conducted in recent years [1,7]. We limit our review here to the four rigorous randomized controlled trials (RCTs) testing the relationship between cash transfers and/or direct school support and HIV risk among adolescents in SSA. These studies included three major domains of study outcomes: (1) educational outcomes; (2) proxy indicators of risk for HIV such as early sexual debut, marriage, and transactional sex; and (3) biomarker data of HIV and herpes simplex virus 2 (HSV-2) infections. The first domain is important, since it would be hard to support the conceptual theory that school provides a protective environment for orphans against HIV risk in the absence of effects on school retention. A Kenya study provided two school uniforms to students in the upper primary school and found reduced school dropout among Kenyan boys and girls after both a 3- and a 7-year follow-up [9,10]. A Zimbabwe orphaned girl study provided a comprehensive school support program of school tuition, fees, and uniforms from grade 6 through high school and found reduced dropout and increases in the highest grade achieved among the intervention compared with the control group [11–13]. In South Africa, a large CCT study of girls in grades 8–11 found no impact on school enrollment [14], while a Malawi CCT study that also included secondary school fees found improved school enrollment for girls in the treatment group compared with controls [8,15].

In terms of HIV risk indicators, school support trials have shown variable results. The Kenya uniform subsidy intervention found a lower likelihood of marriage and pregnancy for treatment females after both a 3- and a 7-year follow-up [9,10]. The Zimbabwe orphan girls' school support study found a reduced likelihood of marriage and an increase in socioeconomic status (SES) with the intervention [11,12]. The South African CCT study found an increased likelihood of 12-month sexual abstinence and a reduced likelihood of intimate partner violence and unprotected sex [14]. The Malawi girls study found program effects on frequent sexual intercourse and having an older sexual partner [15].

Likewise, the effects of CCT interventions on HIV and HSV-2 biomarker outcomes have been mixed. The Kenya uniform subsidy intervention found no effects on girls' or boys' biomarker outcomes after 7 years, although uniforms combined with an HIV education program reduced HSV-2 prevalence among girls only [9,10]. The Zimbabwean orphan girls' school support study found no treatment effects on HIV or HSV-2 biomarkers after 5 years; neither did the South African CCT girls' study after 3 years of follow-up [12,14]. Only the Malawi CCT study reported a reduction in HIV infection, although not HSV-2 infection, after 18 months of follow-up [15]. For all studies, HIV prevalence among the control group was low: less than 1% in Kenya, 4% in South Africa, 4.1% in Zimbabwe, and 3% in Malawi.

Differences in impacts on sexual risk behaviors and biomarkers may be due to differences in study setting, target population, type or size of intervention, or study design. Although conducted in different countries and with different ethnic groups, participants in all studies were similar in age. Regarding important design issues, three studies (in Kenya, Zimbabwe, and Malawi) all conducted biological testing at the end line but not the baseline [10,12,15], thus failing to establish HIV infection by condition prior to the intervention. This design factor may be particularly problematic for orphan youth, since they are at greater risk of being HIV infected through maternal-to-child transmission compared with nonorphans [16], but it begs caution across all three studies, given the relatively low HIV and HSV-2 prevalence found among participants.

The current RCT was developed following a pilot RCT of 100 orphan boys and girls in western Kenya that found that a 1-year intervention of school fee, uniform, and community visitor support delayed sexual debut, reduced school dropout and attitudes supporting early sex, and increased prosocial bonding and gender equity attitudes [17]. These program impacts, however, disappeared at the 2-year follow-up [18], leading to design and intervention adjustments (i.e., randomization of schools rather than households and selecting students by grade level rather than by age; lengthening the duration of the follow-up to 3 years to follow students from upper primary into high school; using a no-treatment control group design with biomarkers at the baseline and the end line; and using nurses with bachelor's degrees to monitor students rather than lay community visitors) [19]. The purpose of this paper was to report program effects on HIV risk from the subsequent RCT. We hypothesized that intervention orphans would be more likely to stay in school, have lower self-reported sexual risk behaviors, and have a lower likelihood of HIV and HSV-2 infection compared with controls.

Methods

Study design and setting

The RCT was conducted in Siaya County, Nyanza region, in Kenya. Nyanza has the highest prevalence of both HIV and orphanhood in Kenya [20]. The study was longitudinal with annual repeated measures collected over 4 years. We selected 26 primary schools with at least 20 orphans in grades 7 and 8 per school in 2011 and that were at least 10 km apart to avoid control group perceptions of relative depravation. Orphans were defined as individuals who had lost one or both parents to death from any cause. We invited all orphans in grades 7 or 8 in the 26 schools to participate in the study (n = 923); of these, 837 students completed both the student survey and the biomarker testing at the baseline. Stratified randomization procedures were conducted assigning 13 schools to be intervention (E) schools (n = 411 students) and 13 to be control (C) schools (n = 426 students).

Intervention

The study tested a structural intervention, as opposed to a health education program, providing participating students in intervention schools with a school uniform in grades 7 and 9, and payment of secondary school fees. In addition, nurse research staff

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