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Multi-media teacher training and HIV-related stigma among primary and secondary school teachers in Western Kenya

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ABSTRACT

HIV stigma is associated with delayed HIV disclosure and worse clinical outcomes for adolescents living with HIV (ALWH). Teachers critically influence school environments, but are understudied in terms of HIV stigma. We implemented a school-level, cluster-randomized trial to assess the impact of a one-day multi-media training on the knowledge, attitudes and beliefs (K/A/B) of school teachers in western Kenya. Teachers' K/A/B were evaluated at baseline and six months. Additionally, we assessed stigma with ALWH enrolled in the included schools to explore the impact of the training. Teachers (N = 311) and ALWH (N = 19) were enrolled from 10 primary and 10 secondary schools. The intervention and control groups did not significantly differ in overall stigma score (mean 1.83 vs. 1.84; adjusted difference, 0.18 [95% CI, −0.082 to 0.045]) at six months; however, we found a trend towards improvement in overall stigma score and a significant difference in the community discrimination sub-scale among secondary school teachers (mean 3.02 vs. 3.19; adjusted difference, −0.166 [95% CI, −0.310 to −0.022]). ALWH reported few experiences of discrimination, but emphasized keeping their HIV status secret (84%). The teacher-training reduced secondary school teacher perceptions of community-level stigma, but did not impact individual attitudes or beliefs..

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Introduction

HIV-related stigma shapes daily life and care management for adolescents living with HIV (ALWH) and is associated with worse adherence and mental health outcomes and delayed HIV disclosure – which hinder retention in care and viral suppression (National Aids and STI Control Programme (NASCOP), 2014; Slogrove et al., 2017; Viner et al., 2012; Vreeman et al., 2010, 2015, 2017). Adolescents spend much of their time in schools, making it an important and understudied sphere for HIV stigma. ALWH describe experiencing taunting, gossiping or bullying related to their own or a family member's HIV status, and stigmatizing content shared by teachers (Baggaley et al., 1999; Chase, 2001; Munyati, 2006; NASCOP, 2014). Developmentally, peer influence, acceptance and in-group identity are critical to the development of self-worth and mental health; stigma poses a significant threat to forming peer groups, perpetuating cycles of isolation and poor health outcomes (Callen et al., 2021).

Teachers are role models in the classroom, school and community, and their attitudes and behavior toward people living with HIV (PLWH) may have psychosocial and treatment ramifications. ALWH report experiencing HIV stigma from teachers directly and indirectly from components of the HIV curriculum that are stigmatizing or contain false information (Eisenberg et al., 1997; Vreeman et al., 2015). This stigmatizing content and negative teacher attitudes shape the beliefs of peers as well (Mahajan et al., 2008; Nyarondia et al., 2014).

Despite reported HIV stigma experiences in the classroom, there are few data on teacher-targeted interventions (Stangl et al., 2013). A systematic review of

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stigma reduction interventions targeting teachers described a gap in the literature (Martin et al., 2022), identifying only two relevant studies (Chao et al., 2010; Norr et al., 2007). The impact of HIV stigma reduction interventions on HIV-related health outcomes has also been overlooked. In a systematic review of 48 interventions to reduce HIV-stigma and discrimination, none measured the impact on health outcomes (Stangl et al., 2013).

Altering teachers' knowledge, attitudes and beliefs (K/A/B) about HIV could reduce stigmatizing content within their teaching, classrooms and schools, improving the environment for ALWH. We used a cluster-randomized trial to assess whether a locally developed, multi-media teacher-training intervention altered negative HIV-related K/A/B and HIV stigma among primary and secondary school teachers in western Kenya.

Materials and methods

Study setting

This work was done through the AMPATH program, a partnership between a consortium of North American academic medical centers, Moi University, Moi Teaching and Referral Hospital, and the Kenyan Ministry of Health. AMPATH's clinical program provides free, comprehensive care for over 160,000 PLWH across western Kenya (AMPATH, 2020). This study took place within the Turbo sub-county of Uasin Gishu county in western Kenya, that includes 140 primary and 22 secondary schools between October 2019 and November 2020.

Study design

We implemented a school-level, cluster-randomized trial to assess the impact of a one-day multi-media training on the K/A/B of primary and secondary school teachers. Teachers from intervention schools underwent HIV stigma-focused training using the Teach HADITHI Module (Chory, Nyandiko, Biegon, et al., 2021). Teachers in the control group had "usual", Ministry of Health-supported teacher training sessions the year prior through the Primary School Action for Better Health program, a school-based intervention that trains teachers on HIV education for use in delivering countrywide HIV syllabi (Nzioka et al., 2007). The intervention group had a pre-post-test evaluation immediately before and after the training, and a follow up at 6 months; control group teachers were evaluated at baseline and 6 months. An exploratory evaluation of HIV stigma-related experiences was conducted with ALWH in the study schools. Due to COVID-19-related restrictions, 6-month evaluations and the one-time assessment with ALWH participants were conducted by phone.

The "Teach HADITHI Module" adapted existing, evidence-based content for decreasing HIV stigma. The module was developed by the study team in western Kenya; the process for developing the Module has been discussed elsewhere (Chory, Nyandiko, Biegon, et al., 2021). It included lecture presentations, narrative films featuring the stories of ALWH, an educational animation, teacher role-play scenarios, and a question-and-answer session facilitated by a trained ALWH peer educator. All teachers in the intervention schools received the same training, written and facilitated at the primary school language level, regardless of school level.

Sampling, recruitment, data collection instruments (teachers). Computerized randomization was used to randomly select 10 intervention (5 primary, 5 secondary) and 10 control schools (5 primary, 5 secondary). All teachers within the school received the same intervention assignment.

We used the Genberg HIV/AIDS Stigma Assessment, a tool validated for use in this setting (Genberg et al., 2008), to evaluate the teachers' K/A/B and perceptions of HIV-related stigma. The assessment includes statements with responses in the form of a 5-point Likert scale ranging from strongly agree (scored as 5) to strongly disagree (scored as 1) and is broken down into three scales: shame/blame/social isolation, discrimination, and equity. Higher scores on the scale mean greater endorsement of stigmatizing beliefs.

Exploratory sample (students). To explore the impact of the teacher training on students living with HIV, we recruited ALWH enrolled in the AMPATH program and in the control or intervention study schools. Disclosure screening, to determine whether the ALWH were aware of their own HIV status, was conducted with caregivers of participants under the age of 18. We only enrolled those knowing their HIV status. Eligible ALWH were recruited through their AMPATH HIV clinic, and schools were not informed about the youth enrollees. The ALWH participants completed a one-time assessment, coinciding with the teachers' 6-month follow-up.

The assessments included open-ended questions regarding their experiences in school, as well as the *Stigma in AIDS Family Inventory* (SAFI) Questionnaire (Vreeman et al., 2019). The SAFI questionnaire asks about perceived, experienced, or internalized stigma and discrimination that an individual experiences because of their own or their family member's HIV status, and was developed and validated for use with Kenyan ALWH and their caregivers (Vreeman et al., 2019).

Outcomes and covariates

Our primary endpoint was teachers' overall score on the Genberg HIV/AIDS Stigma Assessment at six months. Secondary endpoints included stigma subscales that capture three aspects of stigma: shame/blame/social isolation, discrimination and equity. Covariates were collected at baseline and included teacher sex, age, years of teaching experience, school type (primary or secondary), and school name.

Statistical analysis

We compared means of participants' characteristics and baseline outcomes by intervention assignment using two-sided *t*-tests. The primary analysis was a mixed-effects linear model with dependent variable the primary endpoint (or secondary endpoint). Independent variables included participants' treatment assignment, participants' baseline value of the dependent variable, and a random effect for participants' school to account for within-school clustering. Standard errors were clustered at the school-level. In secondary analyses, we stratified participants by primary vs. secondary school teachers. Two-sided *p*-values were calculated and hypotheses were assessed by testing whether the 95% confidence interval of the regression coefficient on the treatment indicator overlapped with zero. Descriptive analyses were conducted to summarize the stigma experiences of adolescent participants. All analyses were conducted in Stata, version 16 software (StataCorp, 2019).

Ethical approvals

This study was approved by the Institutional Review Board of the Icahn School of Medicine at Mount Sinai, New York, NY, U.S.A., and the Institutional Research and Ethics Committee of Moi University and Moi Teaching and Referral Hospital in Eldoret, Kenya. Additional approval was received by the Kenya National Commission for Science, Technology, and Innovation. Participants provided written informed consent at study enrollment and provided an additional, phone-based consent to complete the 6-month assessments over the phone.

Results

Participant demographics

Among 312 teacher participants at ten primary and ten secondary schools (56.09% female, mean age 36.41 years, 64.10% secondary school, mean 10.78 years teaching experience), 311 completed the trial (Table 1). Nineteen HIV-disclosed ALWH, were enrolled in the exploratory assessment (57.89% female, mean age 16.37 years, range 12–18 years, 47% orphan).

Findings were analyzed by the entire teacher cohort, then broken down by primary vs. secondary school teachers. Among all teachers, there were no statistically significant differences in gender, age, years of experience, or overall stigma score between the treatment groups. Primary school teachers in the treatment group were significantly older (42.0 vs. 32.3 years), with more teaching experience (16.0 vs. 7.9 years). There were no statistically significant differences among secondary school teachers.

Primary and secondary endpoints

Data was broken down by overall and sub-scale score (Table 2). The longitudinal stigma scores among teachers in the intervention group are reported in supplementary Table 1. The intervention and control groups did not significantly differ in overall score (mean 1.83 vs. 1.84; adjusted difference, 0.18 [95% CI, −0.082 to 0.045]) or sub-scale scores at six-months, although there was a trend toward an improvement in the discrimination sub-scale. In analyses of primary school teachers, intervention and control groups did not significantly differ in overall score or sub-scale scores at six-months (Table 2). In analyses of secondary school teachers, there was a significant difference in discrimination sub-scale score (mean 3.02 vs. 3.19; adjusted difference, −0.166 [95% CI, −0.310 to −0.022]). The intervention and control secondary school teachers did not significantly differ in overall score or sub-scale 3 score (equity); however, there was a trend towards improvement in this sub-scale and in overall scores (mean 1.86 vs. 1.9; adjusted difference, −0.053 [95% CI, −0.108 to 0.002]).

Student assessments

Participants reported few experiences of discrimination, though some participants did report their HIV status made them feel anxious (16%) or depressed (26%) (Table 3). Approximately half (53%) of participants responded that no one thinks HIV is shameful or a dirty disease. Despite reporting little enacted stigma, the majority of participants reported that they (84%) and their caregivers (74%) thought it was important to keep their HIV status a secret. Nearly half (47%) of participants reported delaying or missing medicines out of fear that someone would see them. No statistically

Table 1. Demographic characteristics of teachers, by treatment assignment.

	Control group			Treatment group				
	N	Mean	SD	*N*	Mean	SD	Unadjusted difference	95% Confidence interval[b]
All teachers								
Female sex[a]	128	0.53	0.50	184	0.58	0.49	0.05	−0.08 to 0.18
Age (yrs.)	128	35.23	9.81	184	37.24	10.29	2.01	−2.23 to 6.26
How long have you been a teacher? (yrs.)	128	9.38	9.35	184	11.75	10.16	2.38	−1.44 to 6.19
Overall Stigma Score	128	1.96	0.32	184	1.97	0.31	0.017	−0.071 to 0.105
Primary school teachers								
Female sex[a]	50	0.54	0.50	62	0.68	0.47	0.137	−0.09 to 0.36
Age (yrs.)	50	38.82	9.49	62	44.60	9.22	5.777	2.10 to 9.46
How long have you been a teacher? (yrs.)	50	12.20	9.96	62	18.98	10.29	6.784	2.61 to 10.96
Overall Stigma Score	50	1.94	0.32	62	1.94	0.33	−0.007	−0.124 to 0.111
Secondary school teachers								
Female sex[a]	78	0.53	0.50	122	0.53	0.50	0.007	−0.14 to 0.15
Age (yrs.)	78	32.92	9.37	122	33.50	8.69	0.577	−3.07 to 4.22
How long have you been a teacher? (yrs.)	78	7.56	8.52	122	8.07	7.90	0.510	−2.14 to 3.16
Overall Stigma Score	78	1.97	0.32	122	1.99	0.30	0.027	−0.104 to 0.158

[a]Male = 0; Female = 1.
[b]Standard errors clustered at the school-level.

significant differences were observed between students from the control and intervention schools.

Participants were asked open-ended questions regarding their HIV-related experiences in the school setting. All participants ($N = 19$) reported feeling comfortable in school, but 37% attributed this to having not disclosed their HIV status. Some participants reported hearing incorrect HIV information taught, including teachers saying that HIV kills, that ARVs can cure HIV, and that the only route of transmission is through sex. One participant described how false statements about sex being the only route of transmission created stigma for those who were perinatally infected. All participants reported that, during that school term, they had not witnessed HIV stigma in the classroom; however, many indicated that people do not disclose their HIV status, minimizing stigmatizing behavior. The COVID-19 pandemic resulted in long-term school closures in Kenya during the study period, so adolescents had not attended school and not interacted with teachers in several months when surveyed. The schools closed on March 15, 2020 and partially reopened on October 19, 2020 for primary school students to complete exams. Schools fully reopened to all students on January 4, 2021.

Adolescent participants reported challenges attending clinic appointments during school days, many preferred to miss all or a portion of the school day or going during holidays to avoid asking teachers for permission. Some participants either do not indicate why they are missing class, or give a different clinical reason for seeing the doctor. A minority of students had disclosed their HIV status to school staff, but those who did, reported no challenges with attending clinic appointments during school hours.

Discussion

While this pilot trial demonstrated limited evidence for impact, the results suggest potential for altering

Table 2. Six-month Stigma Scores, by treatment assignment.

Outcome	Control group			Treatment group				
All teachers	*N*	Mean	SD	*N*	Mean	SD	Treatment effect[a]	95% Confidence interval[b]
Overall Stigma Score	128	1.84	0.33	183	1.83	0.29	−0.018	−0.082 to 0.045
Subscale 1: Shame/Blame/Social Isolation	128	1.13	0.19	183	1.11	0.17	−0.031	−0.064 to 0.003
Subscale 2: Discrimination	128	3.03	0.82	183	2.94	0.77	−0.021	−0.201 to 0.158
Subscale 3: Equity	128	1.17	0.28	183	1.20	0.28	0.009	−0.065 to 0.082
Primary school teachers								
Overall Stigma Score	50	1.76	0.37	62	1.78	0.32	0.030	−0.024 to 0.085
Subscale 1: Shame/Blame/Social Isolation	50	1.14	0.20	62	1.13	0.16	−0.040	−0.097 to 0.016
Subscale 2: Discrimination	50	2.78	0.96	62	2.79	0.87	0.167	−0.049 to 0.383
Subscale 3: Equity	50	1.15	0.25	62	1.20	0.28	0.022	−0.085 to 0.128
Secondary school teachers								
Overall Stigma Score	78	1.90	0.29	121	1.86	0.28	−0.053	−0.108 to 0.002
Subscale 1: Shame/Blame/Social Isolation	78	1.12	0.18	121	1.10	0.17	−0.026	−0.068 to 0.016
Subscale 2: Discrimination	78	3.19	0.68	121	3.02	0.70	−0.166	−0.310 to −0.022*
Subscale 3: Equity	78	1.18	0.30	121	1.20	0.29	−0.002	−0.106 to 0.102

[a]Treatment effect estimated using a linear mixed model with adjustment for treatment group, baseline value of outcome, and school random effect.
[b]Standard errors clustered at the school-level.

Table 3. Student stigma scores.

SAFI questionnaire statement	ALWH cohort *N* (%)
Because I have HIV or because someone else in my family has HIV, I have lost friends	0
Because I have HIV or because someone else in my family has HIV, I have been called names, insulted, or bullied	0
I have experienced discrimination at home	0
I have experienced discrimination in neighborhood	1 (5%)
I have experienced discrimination in religious place	0
I have experienced discrimination at the clinic	0
I have experienced discrimination in school	0
I have experienced discrimination at another place	0
Lost financial support due to HIV	0
Lost social support due to HIV	0
Discrimination has made me feel stress or anxious	3 (16%)
Discrimination has made me feel depressed, feeling down, saddened	5 (26%)
I choose not to play with others or go certain places	3 (16%)
Feel it is important to keep HIV status secret from other people	16 (84%)
My caregiver feels it is important to keep my HIV status secret from other people	14 (74%)
How I feel about the future or my hopes about my life have changed in a negative way	4 (21%)
I have delayed or missed taking medicine because other people might see them	9 (47%)
People in my community think that HIV is a "dirty" or "shameful" disease	
No one thinks that	10 (53%)
A few people think that	7 (37%)
Most people think that	2 (11%)

individual level teacher HIV-related stigma and discrimination in an effort to minimize adverse community level experiences. We found a trend towards improvement in overall stigma score, and a significant difference in the community discrimination sub-scale among secondary school teachers. The teacher-training reduced secondary school teacher perceptions of community-level stigma, but did not impact individual attitudes or beliefs.

Previous research has found that increases in HIV knowledge (Balfour et al., 2010; Pisal et al., 2007; Wang et al., 2009), skill-building (Bell et al., 2008; Esu-Williams et al., 2004; Neema et al., 2012), and contact with PLWH reduces individual HIV stigma (Markham et al., 2000; Paxton, 2002). Implementing multiple approaches is an effective strategy in HIV-stigma reduction interventions (Stangl et al., 2013). The Teach HADITHI module employed this strategy, as well as principles designed to increase cognitive empathy and empower behavioral change based on social learning theory. While this intervention targeted individual perceptions and beliefs, teachers play a unique role in their communities, potentially shaping school-level and community-level context.

In interpreting our results, the Genberg HIV/AIDS stigma and discrimination scale requires careful consideration, as it assesses the perception of the lived experience of PLWH, in addition to participant individual opinions. *The first and third subscales focus on personal beliefs in relation to PLWH, as well as their beliefs regarding the origins of stigmatizing attitudes and discrimination practices within their communities.* A higher score on sub-scales 1 and 3 indicate more personal discriminatory beliefs (Genberg et al., 2008). *The second subscale relates to the perceptions about manifestations of stigmatizing attitudes and the amount of discriminatory practices that might occur in their community* (Genberg et al., 2008). A higher score on sub-scale 2 indicates increased perception of discriminatory behavior in the community.

We did not observe statistically significant differences in overall or sub-scale stigma scores between teacher treatment groups. Both treatment groups had low baseline scores on sub-scales 1 and 3, indicating fewer discriminatory beliefs, potentially making it difficult to observe significant changes at follow-up. Teacher participants scored higher on discrimination subscale 2 at baseline than the other sub-scales, indicating an increased perception of discriminatory behavior in the community. These findings are consistent with previous work in sub-Saharan Africa, where participants were more likely to agree with statements about discriminatory practices in their communities than their own personal beliefs (Genberg et al., 2008). We observed a significant decrease in sub-scale 2 among secondary school teachers, indicating that teachers perceived there to be less community stigma after the intervention. This change in perception may have been influenced by training components aiming to dispel common misconceptions related to HIV infection. Previous research has found the highest levels of perceived discrimination in settings with high HIV prevalence (Genberg et al., 2009), an important consideration as discrimination speaks to the manifestation of stigma (Karim et al., 2008; Nachega et al., 2004; Stangl et al., 2013), which may influence care-seeking behaviors for PLWH. The COVID-19 pandemic and associated widespread school closures during the follow-up period may have attenuated the 6-month findings, given that the teachers were no longer teaching at that time.

We found trends towards improvement in overall stigma score and in the sub-scales among secondary school teachers in this study, though they did not reach statistical significance. While a larger sample size may have been needed to reach significance for these findings, we hypothesize that secondary teachers may be primed towards considering HIV differently, perhaps with previous experience and comfort teaching about HIV, as Kenyan primary school curriculum begins HIV topics in class 4, when students are around 10 years old. Teachers who lead classrooms of younger

students therefore do not have the same experience discussing these topics (Kenya Institute for Curriculum Development, 2021). Previous work has found primary school teachers to be less comfortable and less likely to teach and discuss HIV topics (Ayo-Yusuf et al., 2001; Boscarino & DiClemente, 1996; Brook, 1994; Kachingwe et al., 2005; Lohmann et al., 2009). Primary school teachers likely have less experience engaging with disclosed ALWH, as the WHO recommends the disclosure process begin around the age of 10, when children are transitioning to secondary school (World Health Organization, 2011). Our data demonstrates that ALWH prefer not to disclose their HIV status in the school setting, which may also impact teacher comfort in navigating these scenarios. There is limited research on the differences in HIV-preparedness and stigma between primary and secondary school teachers, considerations that may significantly inform the development of stigma reduction interventions in this setting.

This study provides a rare opportunity to examine the impact of a HIV-stigma reduction intervention at the community level. Although a small study sample, we explored the potential for real life implications of this intervention through ALWH students in the classroom of intervention teachers. Despite most students not reporting experiences with stigma in the school setting, the majority indicated that it was important to keep their HIV status a secret. HIV-related secrecy poses significant threats to medication adherence, mental health and the formation of support networks (Chory, Nyandiko, Martin, et al., 2021), reiterating the need for safe and supportive school environments. Interventions that target multiple socio-ecological levels are needed; the school setting is an ideal environment to intervene at both the community and institutional level.

Limitations

There are a number of limitations in this study. First, the Genberg HIV/AIDS Stigma Assessment was chosen because it had been used and validated in Kenya; a survey with setting-specific questions may have been more likely to uncover the local nuances of HIV stigma (Genberg et al., 2008, 2009). Second, all schools in this sample had an HIV educational curriculum training prior to the intervention, which may have diluted the potential impact of our intervention. Additionally, we did not consider the differences in experience between ALWH enrolled in day school versus boarding school; boarding schools present additional difficulties, specifically around keeping HIV status secret and hiding medication (Chory, Nyandiko, Martin, et al., 2021). Third, due to concerns regarding potential stigmatization, we did not inquire about teachers' own experience with HIV, which may impact outcomes, as personal contact with PLWH may facilitate empathy, reduce stigmatizing attitudes and beliefs, and protect against HIV-related misinformation (Chan & Tsai, 2017). In addition, COVID-19 pandemic necessitated national lockdowns and school closures in Kenya during the study period, which may have interfered with the utilization of knowledge, skills and attitudes gained in the training. The shift to phone interviews during school closure may have led to greater likelihood of recall bias. Lastly, though student enrollment in this study was intended to be exploratory, the small sample and lack of baseline data limits generalizability to the broader population.

Conclusion

In this pilot, cluster-randomized trial of a one-day teacher training to influence HIV-related stigmatizing attitudes and beliefs among primary and secondary school teachers in western Kenya, we did not observe significant overall differences between the intervention and control groups. However, this training intervention did change secondary school teacher perceptions of community HIV-related stigma and discrimination, and there were trends pointing to potential impact from this kind of intervention strategy. Teachers and school settings remain a significant context for reducing HIV stigma and potentially improving the psychosocial context in which children and ALWH learn and grow.

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