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Rape Prevention Through Empowerment of Adolescent Girls

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Rape Prevention Through Empowerment of Adolescent Girls



WHAT'S KNOWN ON THIS SUBJECT: In parts of sub-Saharan Africa, sexual assault incidence among adolescents is as high as 24%, resulting in serious physical and mental health problems. In the United States, empowerment and self-defense training have been shown to decrease incidence of sexual assault.



WHAT THIS STUDY ADDS: This study evaluated an empowerment and self-defense training intervention for adolescent girls in the African context. This intervention proved highly effective at preventing sexual assault and should be replicable in other countries in sub-Saharan Africa and around the world.

abstract

BACKGROUND AND OBJECTIVE: Sexual assault is a major cause of injury, unplanned pregnancy, HIV infection, and mental health problems worldwide. In parts of sub-Saharan Africa, sexual assault has reached epidemic proportions. This study evaluated the efficacy of an empowerment and self-defense intervention for adolescent girls to decrease the incidence of sexual assault and harassment in Nairobi's large informal settlements.

METHODS: A prospective cohort of 1978 adolescents from 4 neighborhoods near Nairobi were taught empowerment, deescalation, and self-defense skills in six 2-hour sessions. The standard-of-care (SOC) group ($n = 428$) received a life skills class. Self-reported, anonymous survey data were collected at baseline and 10.5 months after intervention.

RESULTS: Annual sexual assault rates decreased from 17.9/100 person-years at baseline to 11.1 at follow-up (rate ratio = 1.61; 95% confidence interval [CI], 1.26–1.86; $P < .001$); there was no significant change in the SOC group (14.3 to 14.0, rate ratio = 1.02; 95% CI, 0.67–1.57, $P = .92$). Sexual assault disclosure in the intervention group increased from 56% to 75% ($P = .006$), compared with a constant incidence of disclosure (53%) in the SOC group. The majority (52.3%) of adolescents in the intervention group reported using skills learned to stop an assault.

CONCLUSIONS: This intervention decreased sexual assault rates among adolescent girls in Kenya. The intervention was also associated with an increase in the disclosure of assaults, thereby enabling survivors to seek care and support and possibly leading to the identification and prosecution of perpetrators. This model should be adaptable to other settings both in Africa and globally. *Pediatrics* 2014;133:e1226–e1232

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KEY WORDS

sexual violence, adolescent health, prevention, intervention, empowerment, Africa

ABBREVIATIONS

CI—confidence interval
GBV—gender-based violence
SOC—standard of care

Drs Sarnquist and Maldonado performed all data analysis and drafted the initial manuscript; Mr Omondi and Ms Gitau designed data collection instruments, oversaw intervention implementation and data collection at all sites, and critically reviewed the manuscript; Dr Sinclair and Ms Paiva conceptualized and designed the study, created the intervention, and critically reviewed the manuscript; Dr Mulinge consulted on study design and implementation and critically reviewed the manuscript; Dr Cornfield provided input into the data analysis and critically reviewed the manuscript; and all authors approved the final manuscript as submitted.

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Gender-based violence (GBV), including sexual assault, remains a substantial public health issue worldwide. Sexual assault consequences are often severe and include physical and psychological injury, sexually transmitted infections including HIV, social isolation, and unwanted pregnancy.¹⁻⁴ In Africa the burden of GBV is profound: 16% to 59% of women report having been sexually assaulted during their lifetime, and many of these assaults occur during childhood.⁵ In Kenya, 11.3% to 46% of women report childhood sexual assault, with numbers varying greatly by source.^{6,7}

The social-ecological model of violence prevention provides a framework for sexual assault prevention.⁸ In Kenya, individual- and relationship-level behavioral change strategies designed to increase awareness of sexual assault among school children, as well as community-level social marketing campaigns, have had minimal demonstrable impact on sexual assault incidence. At the societal level, there are policies in place to prosecute sexual assault perpetrators, yet the crime remains underreported and underprosecuted, largely because of the blame and stigma assigned to victims. The ongoing high incidence of sexual assault suggests that novel prevention strategies are needed.

Data from the United States indicate that women and children who are trained in empowerment and self-defense are more likely to report having confidence and control over their lives and less likely to experience sexual assault.⁹⁻¹¹ Therefore, we hypothesized that an individual-level empowerment intervention for adolescents could reduce the incidence of sexual assault in Nairobi's large informal settlements. A pilot study ($n = 381$) of this intervention, completed in 2011, demonstrated a decrease in incidence of sexual assault from 24.6% the year

before to 9.2% 10 months after the intervention.¹² The current study seeks to determine whether this intervention might be more broadly applicable.

METHODS

In this cross-sectional study, participants were adolescent girls 13 to 20 years old, attending one of 31 secondary schools selected by convenience sampling in the Huruma/Mathare, Dandora, Kibera, and Mukuru Kwa Reuben ("Kwa Reuben") informal settlements of Nairobi. Settlements were selected because of their high crime rates and nonparticipation in the pilot study. A standard-of-care (SOC) group of adolescents was recruited from 4 socio-demographically similar schools in the Mukuru Kwa Njenga/Kawangware settlements. The SOC neighborhoods were geographically distinct from the intervention neighborhoods to limit cross-contamination. Neighborhoods were purposively assigned to the SOC or intervention group; individual randomization was not possible because the participants were often friends and neighbors. Participation was voluntary, and participants reviewed and signed an informed consent. Nobody refused to participate. This study was reviewed and approved by the Kenya Medical Research Institute National Ethics Review Committee. The Stanford University Institutional Review Board exempted the study because Stanford researchers only accessed deidentified data sets.

Empowerment and Self-Defense Training

The curriculum was modified from one piloted in Kenya in 2011 by the non-government organization No Means No Worldwide (<http://nomeansnoworldwide.org/>).¹² The primary outcome measure was a reduction in the incidence of sexual assault among the trainees. For this study, sexual assault or rape was defined as "forced or coerced penetra-

tion of the mouth, vagina, or anus using a penis, other body part, or an object," and sexual harassment was defined as "unwanted comments, whistles, or gestures with a sexual intent" or "unwanted sexual touching."

The intervention was grounded in social learning theory and the health belief model and was adapted from existing empowerment and self-defense modules. Educational sessions included role-plays, facilitated discussions, and extensive verbal and physical technique practice. In Session I, rapport, definitions, and objectives were established. Session II focused on personal awareness, self-efficacy, boundaries, and assertive communication skills. Session III was an introduction to physical defense. Session IV reviewed verbal and physical skills and focused on specific strikes using bags and mitts. Session V focused on deescalation and negotiation to avoid fighting and covered more advanced defense techniques, such as multiple or armed attackers. Session VI reviewed all previous sessions, and facilitators also encouraged women to share assault experiences. Survivors were linking to the Sexual Assault Survivors Anonymous program, which holds free weekly meetings in all the informal settlements where No Means No Worldwide operates (www.sasaworldwide.org).

Six 2-hour intervention sessions were held weekly for 6 weeks. Sessions were conducted from 16:00 to 18:00, directly after school, on school property. Two-hour refreshers were offered at 3, 6, and 10 months. Twenty-seven trainers and 4 supervisors were hired in the 2 years before the intervention. All the instructors and supervisors were local women, ranging in age from 20 to 34 years of age, and all had at least 2 years of experience advocating to reduce GBV in their neighborhoods. Trainers underwent 276 hours of training and hands-on practice. The training

emphasized teaching empowerment and self-defense, facilitation and presentation skills, data collection, rapport building, and handling of unforeseen situations. Trainees participated in mock interviews and pilot field training exercises conducted outside the study area. Intervention sessions took place January 9, 2012 to February 10, 2012. The instructor training sessions were monitored by supervisors to ensure quality and adherence to protocol. The SOC group received a standard 1.5-hour life skills class that is accredited by the Kenyan Ministry of Education and includes a wide range of topics, including sexual assault but also sanitation, food safety, and personal rights.

Data Collection

Surveys were closed-ended, structured, in English or Kiswahili, anonymous, and collected via the ballot box method. In Africa this approach was demonstrated to elicit more reliable self-reported sexual behavior information than traditional interviews.¹³ In the ballot box method, the interviewer reads the survey, and respondents secretly mark their responses and put completed surveys into a portable wooden box, guaranteeing anonymity.

Baseline surveys were administered before the first class, then again after the third and sixth classes. Multiple measurements were used to assess whether answers changed as rapport was established. The reported sexual assault incidence over the previous 12 months did not change significantly (from 17.9% at baseline to 17.7% at 3 weeks to 17.1% at 6 weeks, $P = .45$), so responses to the first survey were used in analysis.

The follow-up survey was administered at 10.5 months after intervention. Although the initial study design included data collection at 12 months after intervention, a teachers' strike resulted in an abbreviated school year. The

survey question reflected this change, so in the 10.5-month survey, adolescents were asked, "Since your last class with 'No Means No Worldwide' (or last 'life skills' class for the SOC group), have you ever been forced against your will to have sex?"

Data Entry and Analysis

Data were double entered into SPSS (IBM SPSS Statistics, IBM Corporation); inconsistencies were resolved by a third person. Because of the anonymity of the surveys, subjects' responses at baseline and follow-up could not be linked, so repeated-measures analyses were not possible. To correct for the time frame differences between the baseline period (12 months) and the follow-up period (10.5 months), raw sexual assault incidence was converted to incidence rates (sexual assault per 100 person-years). Statistical comparisons for sexual assault were made using incidence rate ratios and Poisson 95% Confidence Intervals (CIs). Statistical comparisons for disclosure of assault, lifetime assault prevalence, and age were made with Fisher's exact tests and χ^2 tests. Significance was set at $P \leq .05$. Data were analyzed by using SPSS 17.0 (IBM) and SAS 9.1 (SAS Institute, Inc, Cary, NC).

RESULTS

Sociodemographics

A total of 1978 adolescents entered into the intervention arm and 428 entered into the SOC arm. Participant retention rates at 10.5 months were 79% in the intervention group ($n = 1562$) and 73% in the SOC group ($n = 314$). All the adolescents lived in extreme poverty, generally in houses made of found materials and without either fresh water or a sewer, and schools were uniformly low-performing (Table 1). Participants were ethnically heterogeneous but predominantly Kikuyu, Luo,

or Luhya. Participants were 13 to 20 years old, with about 80% being 15 to 18. There was no statistical difference in age between the intervention and SOC groups ($P = .21$, data not shown). The number of students in the schools ranged from 9 to 204, with 28 schools (90.3%) having <100 students enrolled.

Effect on Sexual Assault

Upon enrollment, lifetime sexual assault prevalence was 22.9% in the intervention group and 19.5% in the SOC group ($P = .11$). Table 2 shows that the annual sexual assault rate in all the neighborhoods combined decreased from 17.9/100 person-years at baseline to 11.1 at follow-up (rate ratio = 1.61; 95% CI, 1.26–1.86; $P < .0001$); there was no significant change in the SOC group (14.3 to 14.0; rate ratio = 1.02; 95% CI, 0.67–1.57; $P = .92$). Stratified analysis by neighborhood showed that there were significant decreases in sexual assault incidence in 3 of 4 intervention neighborhoods, with the fourth (Mukuru Kwa Njenga) having a small sample size. Figure 1 shows the geographic distribution of the participating neighborhoods and the magnitude of the changes in sexual assault incidence rate from baseline to follow-up.

Because the lost-to-follow-up rates were high (21% in the intervention group and 27% in the SOC group), sensitivity analysis was performed. This analysis showed that 38% or more of the population that was lost would have had to have been assaulted to render these results nonsignificant. With a baseline sexual assault incidence of 17.9%, it is unlikely that the girls who dropped out would have had an incidence of 38% or higher.

Disclosure

Women reporting sexual assault at baseline or follow-up were asked

TABLE 1 Characteristics of Study Slums and Schools^{21–24}

	Huruma	Kibera	Dandora	Mukuru Kwa Reuben	Kawangware/Kwa Njenga
Population (2009 census)	106 913	170 070	135 000	100 000	86 824
Size (km ²)	1.4	2.4	1.5	1.5	3.0
Population density (people/km ²)	76 366	70, 862	90 000	66 666	28 941
Monthly income	KSh 7000 (USD 85)	KSh 5000 (USD 60)	KSh 6500 (USD 80)	KSh 4400 (USD 50)	KSh 6500 (USD 80)
Single room monthly rent	KSh 2000 (USD 24)	KSh 800 (USD 9)	KSh 2000 (USD 24)	KSh 1400 (USD 17)	KSh 1400 (USD 17)
Water price (per 20 L)	KSh 10	KSh 10	KSh 8	KSh 2	KSh 10
School building material	Iron sheet and stone	Iron sheet	Iron sheet	Stone and iron sheet	Iron sheet
School floor	Cement	Cement and earth	Cement	Cement and earth	Cement and earth
Trained:untrained teacher ratio	1:2	7:5	3:4	1:5	1:14
Teacher:student ratio	1:25	1:20	1:16	1:15	1:19
National examination mean score 2011 ^a	C+	D+	D	C–	D

^a Kenya Certificate for Secondary School Education: A score of B– is required to be considered for university.

TABLE 2 Sexual Assault Incidence Rates Before and After Intervention, by Neighborhood

	Baseline (rapes/total)	Rape Incidence Rate ^a Before	After Intervention (<i>n</i>)	Rape Incidence Rate ^a After	Rate Ratio ^b	95% CI	<i>P</i>
Intervention							
Huruma	127/755	16.8	67/665	11.5	1.46	1.08–2.00	.01
Dandora	103/428	24.1	44/310	16.2	1.48	1.03–2.16	.03
Kibera	95/628	15.1	32/423	8.6	1.75	1.17–2.70	.006
Mukuru Kwa Reuben	28/155	18.1	9/98	10.5	1.72	0.79–4.16	.15
Total	353/1976	17.9	152/1562	11.1	1.61	1.26–1.86	<.001
Control							
Kawangware/ Kwa Njenga	61/428	14.3	38/311	14.0	1.02	0.67–1.57	.92

^a Incidence rate = rapes/100 person-years.

^b Ratio of preintervention incidence to postintervention incidence.

whether they disclosed their assault to anyone (Table 3). Disclosure in the intervention group increased significantly, from 56.1% before to 75.0% after the intervention ($P = .006$). Disclosure in the SOC group did not change during the study period, at 53% both before and after the intervention ($P = .53$).

Among all the women (both intervention and SOC) who disclosed their sexual assault after the intervention, 26.0% told a relative and 36.2% told a friend. Only 10.2% reported the crime to the police, and only 2.3% told a doctor.

Use of Learned Skills

Women in the intervention group reported using the skills they learned to stop sexual assault and harassment. At follow-up, 52.3% reported having stopped an assailant from forcing them to have sex using skills learned in the in-

tervention, for a total of 817 assaults halted. Within that group, 45.4% of the adolescents used only verbal skills, such as yelling to attract attention, and 29.2% escalated their strategies to include both physical and verbal skills in warding off an assailant. Only 25.3% primarily used physical skills to avoid assault. Participants also reported using skills learned in the intervention to stop harassment, with 64.9% reporting using skills to stop a total of 957 harassment situations. To stop harassment, 59% reported using only verbal skills, 26% reported using verbal and physical skills, and 15% reported using only physical skills.

DISCUSSION

Adolescents who underwent training in assault prevention strategies were more able to protect themselves from

sexual assault and harassment, and more likely to disclose assaults that did take place, than those who did not receive training. Specifically, the rate of sexual assault decreased from 17.9 to 11.1 per 100 person-years in the intervention ($P < .001$), as opposed to no significant change in the SOC group. Additional proof of efficacy derives from the observation that the incidence of sexual assault decreased in all but one of the neighborhoods where the intervention took place. However, there were few participants in that neighborhood, so these results may reflect the low sample size (a type II error). Most intervention participants reported using the skills learned during training to thwart physical assault (52.3%) or sexual harassment (64.9%). Deterrence of both assault and harassment was accomplished primarily with verbal tools. Among adolescents who did experience sexual assault, those who underwent training were far more likely to report the assault, thereby providing the opportunity to access services and mitigate health risks.

Most studies demonstrate that empowerment and self-defense are simple and effective tools to decrease the incidence of sexual violence, although these studies have generally taken place in the United States.^{9–11} Thus, it is surprising that this type of intervention has rarely been implemented and

Decrease in Rape Incidence: Intervention vs. SOC

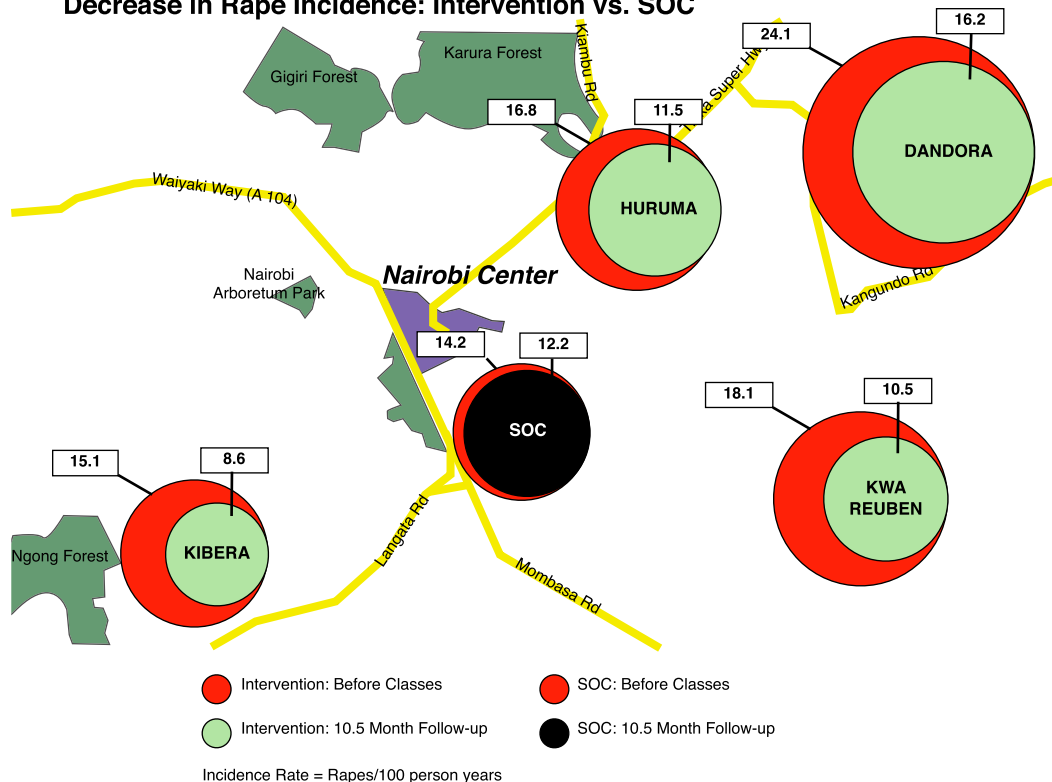


FIGURE 1 Sexual assault incidence before and after intervention in informal settlements in Nairobi.

evaluated in developing settings. This study shows that among young, high-risk people in urban informal settlements, sexual violence can be significantly reduced through training. The current study builds on an earlier pilot study¹² and demonstrates that this intervention remained effective across multiple neighborhoods and with almost 2000 adolescents. These findings support the case that the intervention can be applied more broadly in Kenya and beyond.

In this group of impoverished Kenyan adolescent girls, the annual and lifetime

incidence of sexual assault were 17.9% and 22.5%, respectively. The rates we report are significantly higher than those reported for the Nairobi region by the Kenyan police, at an annual incidence of 5.5% in 2011, or the African Population and Health Research Center, at a lifetime incidence of 12.1%, or the Kenya Demographic and Health Survey, at 14.5% lifetime risk.^{7,14,15} The significantly higher rates may result from the population studied, young residents of high-risk areas, or from the confidential and anonymous method used to collect data. Nonetheless, the present

results are consistent with reports from other parts of Africa, where 23% of schoolgirls between 13 and 15 years of age experienced sexual violence.¹⁶

The stratified analysis further supports the efficacy of the intervention across multiple neighborhoods with baseline variability in the incidence of sexual assault. Specifically, baseline assault rates ranged from 15.1 to 24.1 per 100 person-years, with the highest in Dandora (Table 2). Dandora is adjacent to the garbage dump for Nairobi and has high rates of all types of crime. Irrespective of the rates of assault at baseline, the intervention was associated with consistent declines in sexual assault incidence, and that decline was significant in 3 of the 4 neighborhoods.

The finding that the intervention increased sexual assault disclosure is also important, especially because about 10% of adolescents in the intervention group still experienced sexual assault

TABLE 3 Disclosure in the 12 Months Before and 10.5 Months After the Intervention

	Intervention Group (n = 1978)			SOC (n = 428)		
	Before	After	P	Before	After	P
No. of rapes	353	152		61	38	
Disclosed	198 (56.1%)	114 (75.0%)	.006	32 (52.5%)	20 (52.6%)	.53
Not disclosed	118 (33.4%)	37 (24.3%)	Reference	22 (36.1%)	10 (26.3%)	Reference
Unknown	37 (10.5%)	1 (0.7%)	—	7 (11.5%)	8 (21.0%)	—

—, not applicable.

during the study period. Given data that victims who disclose assault to family, friends, or a trusted community member are more likely to receive medical care and have better mental and physical health outcomes than victims who do not disclose the assault,^{17–19} the public health implications are significant. In addition, disclosure has positive community effects. First, over time increasing disclosure may help decrease the stigma associated with sexual assault for survivors. Second, stories about which individuals are committing or attempting to commit assaults circulate in the community and may deter potential perpetrators. Finally, disclosure is a prerequisite for accessing services. In these neighborhoods, medical care for survivors is generally available, and groups such as Sexual Assault Survivors Anonymous (www.sasaworldwide.org) can provide support and access to additional services.

Sexual assault is expensive, both financially and in the human costs to individuals and communities. From a financial perspective, the majority of the funding targeting sexual assault goes to post-assault services. Although such services are certainly important, post-assault care is expensive because of the need for laboratory tests, anti-retroviral drugs, and medical staff.²⁰ The cost of standard post-assault hospital services in Nairobi is estimated to be about \$86 for the initial visit alone. The total expense of the intervention we studied was US\$1.75 per sexual assault averted,¹² so clearly it is highly cost-effective. The long-term effects of sexual assault, though more difficult to quantify, are even more costly. Sexual assault causes substantial human suffering, sexually transmitted infections, unwanted pregnancy, and depression

and can compromise family and community structures in Africa and worldwide.^{5,16} Prevention can save money, lives, and human potential.

This study has several important limitations. First, randomization below the community level was not possible in these communities. In this study, neighborhoods were purposively selected into either the intervention or SOC group. Purposive selection was chosen for 2 reasons: (1) It was not possible to randomize at the individual level because of the high risk of cross-contamination, because the participants were often friends and neighbors, and (2) resources for this stage of the project were not sufficient to do a cluster randomized controlled trial. Second, the main outcome measure was assessed by self-report. Funding constraints prevented the assessment of biological measures in this large group of adolescents. Third, limited sociodemographic data were collected, so the SOC group may be systematically different from the intervention group. Nonetheless, the SOC adolescents did not differ by age or baseline sexual assault incidence, and the neighborhoods from which intervention and SOC adolescents were drawn were similar in socioeconomic status. Fourth, the SOC group had 1.5 hours of training compared with the 12 hours received by the intervention group, but that 1.5-hour training is currently the standard in Kenya. Fifth, we did not collect data on risk factors for sexual assault other than age, so could not analyze whether this intervention had divergent effects on different risk groups. Sixth, the follow-up period was short. However, there are plans to follow these adolescents for an additional year, so longer-term data will be available in the future. Seventh, the surveys were anonymous, so we cannot link the responses of any 1 girl before and after the intervention, so subgroup

analyses are not possible, and we do not know anything about the group that was lost to follow-up. Finally, the lost-to-follow-up numbers were fairly high (21% and 27%). To understand the effect on our findings, sensitivity analysis was performed as described in the “Results” section. The sensitivity analysis shows that it is unlikely that the group lost would have changed the significance of the findings reported here. Despite these limitations, the paucity of studies on effective sexual assault prevention programs in under-resourced areas and the success of this program make this study important.

CONCLUSIONS

This study provides an evaluated model of a successful empowerment intervention that had a highly significant effect on decreasing sexual assault and increasing assault disclosure in Kenyan urban informal settlements. These findings suggest that this intervention may be effective in a broader population in Kenya and beyond. We are currently designing a randomized controlled trial involving 10 000 boys and girls aged 10 to 13 years, which will begin in late 2013. Given the profound negative sequelae of sexual assault, trials to demonstrate efficacy in other communities and countries should be considered.

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REFERENCES

- Breslau N, Chilcoat HD, Kessler RC, Davis GC. Previous exposure to trauma and PTSD effects of subsequent trauma: results from the Detroit Area Survey of Trauma. *Am J Psychiatry*. 1999;156(6):902–907
- Brown DS, Fang X, Florence CS. Medical costs attributable to child maltreatment: a systematic review of short- and long-term effects. *Am J Prev Med*. 2011;41(6):627–635
- Fonck K, Leye E, Kidula N, Ndinya-Achola J, Temmerman M. Increased risk of HIV in women experiencing physical partner violence in Nairobi, Kenya. *AIDS Behav*. 2005;9(3):335–339
- Lalor K. Child sexual abuse in sub-Saharan Africa: a literature review. *Child Abuse Negl*. 2004;28(4):439–460
- World Health Organization. *Multi-Country Study on Women's Health and Domestic Violence Against Women: Summary Report of Initial Results on Prevalence, Health Outcomes and Women's Responses*. Geneva, Switzerland: World Health Organization; 2005
- Federation of Women Lawyers in Kenya. Gender-based domestic violence in Kenya. 2008. Available at: <http://fidakenya.org/wp-content/uploads/2011/02/Domestic-Violence.pdf>. Accessed November 26, 2012
- Kenya National Bureau of Statistics (KNBS) and ICF Macro. Kenya demographic and health survey 2008–2009. Calverton, MD: KNBS and ICF Macro; 2010. Available at: www.measuredhs.com/pubs/pdf/FR229/FR229.pdf
- CDC. The social-ecological model: a framework for prevention. 2009. www.cdc.gov/violenceprevention/overview/social-ecologicalmodel.html. Accessed November 4, 2013
- Cummings N. Self-defense training for college women. *J Am Coll Health*. 1992;40(4):183–188
- Brecklin LR, Ullman SE. Self-defense or assertiveness training and women's responses to sexual attacks. *J Interpers Violence*. 2005;20(6):738–762
- Hollander J. Does self-defense training prevent sexual violence against women? *Violence Against Women*. 2014; (in press)
- Sinclair J, Sinclair L, Otieno E, Mulinge M, Kappahn C, Golden NH. A self-defense program reduces the incidence of sexual assault in Kenyan adolescent girls. *J Adolesc Health*. 2013;53(3):374–380
- Gregson S, Zhuwau T, Ndlovu J, Nyamukapa CA. Methods to reduce social desirability bias in sex surveys in low-development settings: experience in Zimbabwe. *Sex Transm Dis*. 2002;29(10):568–575
- Police. Kenya annual crime report for the year 2011. 2012. Available at: www.kenya-police.go.ke/resources/CRIME%20REPORT%202011.pdf. Accessed November 6, 2012
- African Population and Health Research Center. Population and health dynamics in Nairobi's informal settlements. 2002. Available at: www.aphrc.org/images/Downloads/ncss%20report.pdf. Accessed December 19, 2012
- Brown DW, Riley L, Butchart A, Meddings DR, Kann L, Harvey AP. Exposure to physical and sexual violence and adverse health behaviours in African children: results from the Global School-Based Student Health Survey. *Bull World Health Organ*. 2009;87(6):447–455
- Sarkar NN, Sarkar R. Sexual assault on woman: its impact on her life and living in society. *Sex Relationship Ther*. 2005;20(4):407–419
- Ahrens CE, Stansell J, Jennings A. To tell or not to tell: the impact of disclosure on sexual assault survivors' recovery. *Violence Vict*. 2010;25(5):631–648
- Broman-Fulks JJ, Ruggiero KJ, Hanson RF, et al. Sexual assault disclosure in relation to adolescent mental health: results from the National Survey of Adolescents. *J Clin Child Adolesc Psychol*. 2007;36(2):260–266
- Ministry of Health/Division of Reproductive Health. Care and Treatment and Health Policy Initiative. Liverpool VCT. Costing post rape care services in the public health sector in Kenya. 2007. Available at: www.svri.org/costingpost.pdf. Accessed November 4, 2013
- Amnesty International. *The Unseen Majority: Nairobi's Slum-Dwellers*. Nairobi, Kenya: Amnesty International Publications; 2009
- Bowler C, Desrocher P. *Huruma Slum Upgrading Project*. Nairobi, Kenya: 2005. www.design.upenn.edu/new/cplan/minisite/casestudies/hurumacase.pdf. Accessed May 23, 2013
- Crow B, Odaba E. Scarce, costly and uncertain: water access in Kibera, Nairobi. Nairobi, Kenya: Working Papers, Center for Global, International and Regional Studies, UC Santa Cruz; 2009:23
- Cruz Fd. *Rapid Urban Sector Profiling for Sustainability (RUSPS)*. Nairobi, Kenya: UN-Habitat; 2006

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