An Evaluation of a School-Based Savings Program and Its Effect on Sexual Risk Behaviors and Victimization Among Young Ghanaians

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Abstract
The objective of this study was to examine the effect of a financial inclusion project on youth’s sexual risk behaviors and victimization. The project occurred in Ghana, where 100 schools were assigned to either a school-based savings program (SBSP), a marketing campaign, or a control group. Pretest and posttest data were collected in 2011 and 2014, respectively. Given our study objective, we restricted our sample to sexually experienced youth (n = 957). Using doubly robust methods to estimate treatment effects, the overall financial inclusion project was not associated with positive changes in sexual risk behaviors and victimization. In contrast, SBSP was significantly associated with higher likelihood of condom use and lower probability of sexual victimization. SBSP may be another promising tool that may help young people accumulate material and nonmaterial resources to reduce sexual risk taking and victimization.

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Introduction
Globally, young people, aged 15 to 24 years (hereafter, youth), account for half of all new sexually transmitted infections (STIs; Boyer, Santiago Rivera, Chiaramonte, & Ellen, 2018; Francis et al., 2018). In sub-Saharan Africa (SSA), including Ghana, prevalence of all STIs (except herpes simplex virus type 2) is higher among young women aged 15 to 24 years than women aged 25 to 49 years (Torrone et al., 2018). Young women, who represent 11% of the global adult population, also accounted for 20% of new adult HIV infections in 2015 (Joint United Nations Programme on HIV and AIDS, 2016). Research suggests that a combination of biological, behavioral, and structural factors heightens risk of transmission among youth (Boyer et al., 2018; Santelli et al., 2013). For example, sexual risk behaviors such as unprotected sexual intercourse remain a critical driver of STIs among youth (Kilburn, Ranganathan, et al., 2018; Lemme et al., 2013). Despite high knowledge of STI prevention, condom use remains low among youth, particularly those at high risk of HIV infection (Joint United Nations Programme on HIV and AIDS, 2016; Toska et al., 2017). In Ghana, only 29% of youth reported condom use at last high-risk sex, defined as sexual intercourse with a nonmarital, noncohabitating partner (Ghana Statistical Service, Ghana Health Service, & ICF International, 2015). Recent studies also suggest that condom use among sexually active youth remains low (Nelson et al., 2015; Oppong Asante, Osafo, & Doku, 2016).

In addition to low condom use, sexual victimization or unwanted sexual contact heightens risk of acquiring STIs among youth (Durevall & Lindskog, 2015; Teitelman et al., 2016). In Ghana, one fifth of senior high school students reported unwanted sexual contact by being forced to have sex (Ohene, Johnson, Atunah-Jay, Owusu, & Borowsky, 2015). The sizable number of Ghanaian youth who experienced sexual victimization reflects global trends pertaining to violence against girls and women (Decker et al., 2014; Peitzmeier et al., 2016). However, in contrast with older women, adolescent girls and young women are more vulnerable to sexual victimization and other forms of intimate partner violence (IPV; Decker et al., 2014). For young women, their experience of unwanted first sexual contact is significantly associated with IPV (Stöckl, March, Pallitto, & García-Moreno, 2014).

The high prevalence of STIs associated with sexual risk behaviors and victimization among youth has resulted in development of various primary
prevention strategies (Peterman & Carter, 2016; Steen, Wi, Kamali, & Ndowa, 2009). Many strategies have focused on sexual health education and communication to reduce risk taking (Friedman, Kachur, Noar, & McFarlane, 2016; Picot et al., 2012). In addition, recognition that limited economic and social resources increase problem behaviors, including sexual risk taking (Kim, Pronyk, Barnett, & Watts, 2008; Stoebenau, Heise, Wamoyi, & Bobrova, 2016), has led to testing and evaluation of youth economic inclusion programs (Gupta, Parkhurst, Ogden, Aggleton, & Mahal, 2017; Kennedy, Fonner, O’Reilly, & Sweat, 2014). Collectively, these programs provide and translate economic opportunities into tangible and intangible resources to tackle barriers that inhibit behavior change. A common feature of economic inclusion is the transfer of cash or accumulation of financial resources, either through income or savings. The transfer of financial resources is combined with vocational and financial skills training, access to affordable financial products and services, and health education (Kennedy et al., 2014). The additional components are included to facilitate accumulation of more resources and skills. For example, access to a financial product provides individuals who do not use banks nor have a savings account a safe and secure way to save money.

Economic inclusion programs substantiate their potential impact on behaviors based on theories such as the conservation of resources theory (CoRT; Hobfoll, 1989) and asset effects (Sherraden, 1990). Asset effects theory suggests that accumulation of assets such as savings (even small amounts) changes people’s behaviors and images of their future selves (Sherraden, 1991). CoRT posits that limited or depleted resources such as savings hinder people’s ability to meet their needs (Hobfoll & Lilly, 1993). In turn, inability to satisfy needs due to limited resources may contribute to higher levels of stress and elevated risk of problem behaviors. Evidence indicates positive effects of multimodal economic strengthening programs on sexual risk taking (Dunbar et al., 2014; Jennings, Ssewamala, & Nabunya, 2016; Pronyk et al., 2008; Rotheram-Borus, Lightfoot, Kasirye, & Desmond, 2012) and experience of IPV (Kilburn, Pettifor, et al., 2018; Lee et al., 2010). In addition, multimodal interventions appear to be more effective than educational curriculum-based programs alone (Mason-Jones et al., 2016) and beneficial to youth than adults (Kennedy et al., 2014).

Current Study

Since the mid-2000s, the number of prevention programs with economic inclusion activities has doubled, particularly in SSA. This growth has reinforced the role of economic resources, alongside biomedical and behavioral
strategies, as vital to comprehensive STI prevention. Despite the growth, gaps remain. First, most economic inclusion components have centered on microfinance, particularly provision of microloans, combined with a financial literacy training. However, recent evaluations of microfinance programs indicate a heterogeneous effect on economic and health outcomes (Agbola, Acupan, & Mahmood, 2017; Lorenzetti, Leatherman, & Flax, 2017). Furthermore, viability and sustainability of youth-owned enterprises and potential adverse consequences of loan nonrepayment raise concerns whether microfinance can sustain its promising effects (Lorenzetti et al., 2017; Wiger, Chapman, Baxter, & DeJaeghere, 2015). Second, there is limited evidence pertaining to the effect of micro savings and asset-building programs, considered an alternative to microloans, on sexual risk behaviors and victimization. Prior studies focused mostly on evaluating effects on attitudes and intentions associated with HIV risk (Ssewamala, Alicea, Bannon, & Ismayilova, 2008; Ssewamala, Han, Neiands, Ismayilova, & Sperber, 2010). Third, in contrast with education and health services such as STI screening, many economic inclusion activities are not school-based, which may restrict outreach and participation. We developed the current study to address those gaps. Our objective was to evaluate the effect of a school-based savings program (SBSP) on sexual risk behaviors and victimization among sexually experienced Ghanaian high school students.

Method

Study Design and Sample

The current study was a subset of a youth economic and financial inclusion project (hereafter project). We used the project’s original study design to examine the effect on sexual risk taking and victimization. However, the current study focused on sexually experienced youth. In contrast to the project’s experimental design, our current study used a nonequivalent groups design, comparing sexual risk behaviors and victimization between intervention and comparison groups at posttest. Although the project used a cluster-randomized design, the current study used an observational design due to potential differences between sexually experienced and nonexperienced youth. A total of 100 schools participated in the project. The 100 schools were randomly assigned to treatment or control groups. Fifty schools were randomly assigned to two treatment groups and the other 50 schools to a control group. Half ($n = 25$) of the 50 treatment schools were randomly assigned to a SBSP and the other half ($n = 25$) were assigned to a marketing outreach campaign. Eighty-three percent of recruited participants agreed to participate in the
Out of nearly 7,500 consent forms that were sent home, 6,267 forms were signed and returned. In 2014, or 3 years after enrollment, 4,289 youth (or 68% of the baseline sample) were reinterviewed.

For the current study, we analyzed pre- and posttest data gathered from a subsample of sexually experienced participants enrolled in the project. Twenty-two percent ($n = 957$) of the end line sample ($N = 4,289$) self-reported being sexually experienced at the time of posttest data collection. Missing data on study variables reduced our final sample size to 881. Cluster-adjusted bivariable test results indicated that the two sets of data (complete and missing) were statistically comparable.

Relevant institutional review boards in Ghana and the United States approved study protocol. Local research staff met with prospective participants (and a parent or an adult guardian, if participant was a minor) to explain the project. Recruitment occurred at schools. Informed consent (and assent for those below 18 years old at the time of data collection) was obtained from all study participants. A parent or an adult guardian signified in writing their permission for the minor to participate in the project. For minor participants, we first obtained consent from a parent or an adult guardian. After receiving an adult informed consent, we obtained the assent of the youth.

**Study Setting**

The project occurred in eight of 10 administrative regions in Ghana: Ashanti, Brong-Ahafo, Central, Eastern, Greater Accra, Northern, Volta, and Western. These eight regions account for more than 90% of the country’s population. In 2010, close to a quarter of all Ghanaians were between 10 and 19 years old (Ghana Statistical Service, 2014). The study setting was determined based on the service area of the financial service provider in the original project. The project’s 100 participating schools were in 54 districts across the eight regions.

**Description of Project**

YouthSave was an economic and financial inclusion project for youth in low- and middle-income countries. The project was implemented in four countries (Colombia, Ghana, Kenya, and Nepal). In addition, an experimental study was conducted in Ghana from 2011 to 2015. The objective of the experiment was to evaluate the effects on youth outcomes, including education, health, psychosocial, and financial. The project provided access to a youth-oriented savings product. In Ghana, the financial service provider, offered a youth savings account. Youth could make deposits by themselves, but withdrawals could be made only with an adult. The product was available to all youth,
including students in the control group. However, only youth in the two treatment arms were provided opportunities to open a savings account and conduct financial transactions at schools. In addition, bank staff visited treatment schools to give presentations about the importance of savings, account features, and account opening requirements. The two treatment arms differed on the number of bank staff visits and frequency and type of school-based banking activities.

The first treatment arm was an SBSP. SBSP included an initial visit by bank staff to introduce the product to students. Follow-up visits were made to conduct bank transactions at schools. There was no restriction on the number of visits. Alongside bank staff, students learned how to handle bank transactions. At each school, a teacher served as a product champion that coordinated times for and reminded students about the bank staff visits. The second treatment arm was a marketing campaign, which included a one-time visit from bank staff to introduce the product. This one-time school visit was the only time bank staff could conduct transactions at schools, including account opening and initial deposits. Unlike SBSP, youth in marketing campaign schools could only conduct additional transactions (i.e., after account opening and initial deposit) at a bank branch. More detail about the treatment arms and activities are available in Chowa et al. (2015).

**Data Collection and Sources**

This study used pre- and posttest survey data. Data were collected in 2011 and 2014. Data were gathered using an interviewer-administered questionnaire. The pretest questionnaire included information on youth’s demographic, educational, health, and financial characteristics. The posttest questionnaire collected data on sexual risk behaviors and victimization outcomes, in addition to the pretest items.

**Variables and Measures**

**Sexual risk behaviors and victimization.** Sexual risk behaviors, defined as behaviors that increase an individual’s risk of contracting STIs and experiencing unintended pregnancies, were measured using two variables: transactional sex and condom use at last sexual intercourse. Transactional sex was measured by asking youth whether they ever had sex for money or other resources. Sexual victimization, defined as an unwanted sexual contact, was measured by asking youth whether they ever had sex against their will. All outcome variables were dichotomous (yes/no) with no as the reference value.
Treatment variables. We used three treatment variables to examine effect on sexual risk behaviors and victimization. First, the overall treatment variable was coded as 1 for schools that were randomly assigned to either treatment arms (SBSP or marketing outreach) and 0 for schools that were randomly assigned to the control group. Second, the school-based banking variable was coded as 1 for schools that were randomly assigned to receive SBSP and 0 for schools that did not receive SBSP, which included schools in the marketing outreach arm and the control group. Third, the multivalued treatment variable referred to the original assignment of schools as either control (coded as 0), SBSP (coded as 1), and marketing outreach (coded as 2).

Covariates. We reviewed the literature to identify relevant covariates. Covariates included age (in years), gender (male or female), grade level (Grade Level 6 or Junior High School 1), parent–adolescent relationship, future orientation, school traits, school access, food insecurity, and asset ownership. We used two indicators to measure parent–adolescent relationship: parental connection and parental monitoring (Skinner, Johnson, & Snyder, 2005). Parental connection described how often parents and youth expressed love, affection, and care within a 30-day period. Parental monitoring depicted how often parents verify their children’s activities within a 30-day period. Both constructs were measured using items from the Global School-based Student Health Survey (World Health Organization & U.S. Centers for Disease Control and Prevention, n.d.). Items were measured using a 5-point Likert-type scale ranging from 1 (never) to 5 (always). Parental connection included four items, with higher scores indicating a warm and an affectionate relationship (α = .70; composite reliability [CR] = .74). Parental monitoring comprised three items, with higher scores indicating frequent parental observation (α = .73; CR = .73). In addition, we measured future orientation using two factors adapted from the School Success Profile (Bowen, Rose, & Bowen, 2005) and validated in a Ghanaian setting (Chowa & Masa, 2015). The two factors were orientation toward success and uncertainty of the future. Orientation toward success included six items, with higher scores indicating positive attitudes toward the future and successful images of future selves (α = .71; CR = .79). Uncertainty of the future comprised five items, with lower scores indicating greater confidence about the future and life aspirations and expectations (α = .67; CR = .67). Future orientation items were measured using an 11-point Likert-type scale ranging from 0 (strongly disagree) to 10 (strongly agree).

School traits included two indicators: commitment to school and academic self-efficacy. First, we measured commitment to school using items adapted from the Rochester Youth Development Study (Thornberry, Lizotte, Krohn, Farnworth, & Jang, 1991). Commitment to school was measured using a
nine-item, 11-point response scale ranging from 0 (strongly disagree) to 10 (strongly agree), with higher scores indicating youth’s greater interest and attachment with schooling and education ($\alpha = .78; \text{CR} = .80$). Second, we measured academic self-efficacy using items adapted from Muris (2001). Academic efficacy comprised eight items with an 11-point response scale, with higher scores suggesting stronger beliefs on young people’s ability to complete an academic task or to attain an academic goal ($\alpha = .79; \text{CR} = .82$).

School access included two variables: distance from home to school (very far/far, neither far nor near, or near/very near) and school commute (by walking or by using a mode of transport such as bicycle, school bus, public transport, or other types of vehicle).

We measured household socioeconomic status using food insecurity and asset ownership. Food insecurity, defined as access to food, was assessed using the Household Food Insecurity Access Scale (HFIAS; Coates, Swindale, & Bilinsky, 2007). HFIAS consists of nine items, with higher scores indicating greater food insecurity ($\alpha = .88; \text{CR} = .88$). Asset ownership included three types of assets: household possessions, livestock, and transportation. Each asset type was measured using an asset index (Filmer & Scott, 2012), with higher index values indicating higher level of asset ownership. Transportation assets included bicycles, motorcycles, canoe or boat, and other vehicles (e.g., cars and trucks). Livestock consisted of chicken, pigs, goats, cattle, donkeys, and sheep. Household possessions comprised radio, electric or gas stove, kerosene stove, electric iron, box iron, refrigerator, television, cellular phone, and land phone. Last, we included a variable pertaining to perceived benefits of condom use. This three-item measure asked youth whether they believe condoms are effective in protecting against STIs, including HIV, and in preventing unplanned pregnancy ($\alpha = .85; \text{CR} = .85$). This covariate was only included when we examined treatment effect on condom use.

**Analysis**

We performed bivariable and multivariable tests to evaluate effect on sexual risk behaviors and victimization. Treatment effects were examined using intention-to-treat analysis. Bivariable analyses examined whether observed baseline characteristics were comparable between intervention and control groups. After bivariable tests, we estimated multivariable logistic regression models that controlled for potential confounders. Third, given the study’s quasi-experimental design, we estimated the average treatment effect (ATE) of the project using models of treatment effects for observational data (Funk et al., 2011; Imbens & Wooldridge, 2009). These models offer a more
rigorous estimation of treatment effects by explicitly modeling treatment probability. In addition, we performed diagnostic tests to check model specification and to assess violation of assumptions. First, we examined whether our models balanced the covariates, such as whether a variable’s distribution did not vary over treatment levels (Imai & Ratkovic, 2014). Second, we checked for violations of the overlap assumption, which states that everyone has a positive probability of receiving each treatment (Imbens & Wooldridge, 2009). Results indicated no violation of assumptions.

In our analyses of treatment effects, we modeled both the outcome and treatment probability. First, we adjusted for heterogeneity of treatment probability by taking into consideration covariates hypothesized to influence propensity to “take up” the treatment, when offered. We included age, gender, class level, asset ownership, future orientation, and school access as covariates associated with propensity to participate in a financial inclusion program (Friedline & Rauktis, 2014; Steinert et al., 2018). Second, we adjusted for potential confounders hypothesized to affect the outcomes. These covariates associated with sexual risk behaviors and victimization included age, gender, parent–adolescent relationship, future orientation, school traits, food insecurity, and school access (Chop et al., 2017; Meinck, Cluver, Boyes, & Ndhllovu, 2015; Toska et al., 2017). In addition, given our two auxiliary models (outcome and treatment), we used two appropriate treatment effects estimators: augmented inverse probability weighting (AIPW) and inverse probability weighting with regression adjustment (IPWRA). AIPW and IPWRA estimators are doubly robust methods that require one of two correctly specified auxiliary models to estimate a parameter of interest (Funk et al., 2011). More technical detail about the estimators is available in Bang and Robins (2005) and Wooldridge (2007). Last, we specified a cluster-robust standard error to allow for intragroup correlation. All analyses were done using Stata 15 (Stata, 2017).

Results

Sample Characteristics and Bivariable Results

Table 1 identifies sample characteristics by treatment group. Overall, 48% of youth in the study were in the control schools, whereas 23% and 29% were assigned to school-based banking and marketing campaign groups, respectively. Youth across the three groups had comparable pre- and posttest characteristics (i.e., the groups did not differ on treatment and outcome covariates). At posttest, distribution of participants who reported using condoms at last sexual intercourse significantly differed across groups. A higher proportion
Table 1. Sample Characteristics by Treatment Assignment.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Overall</th>
<th>SBSP</th>
<th>Multivalued treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overall</td>
<td>SBSP</td>
<td>Multivalued treatment</td>
</tr>
<tr>
<td></td>
<td>Treatment (n = 460)</td>
<td>Control (n = 421)</td>
<td>Treatment 1: SBSP (n = 203)</td>
</tr>
<tr>
<td></td>
<td>% or M (SD)c</td>
<td>p^d</td>
<td>% or M (SD)c</td>
</tr>
<tr>
<td>Outcomes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condom use at last sexual intercourse^a</td>
<td>.40</td>
<td>.01</td>
<td>.02</td>
</tr>
<tr>
<td>Yes</td>
<td>55%</td>
<td>45%</td>
<td>30%</td>
</tr>
<tr>
<td>No</td>
<td>51%</td>
<td>49%</td>
<td>20%</td>
</tr>
<tr>
<td>Engaged in paid sex^a</td>
<td>.38</td>
<td>.16</td>
<td>.37</td>
</tr>
<tr>
<td>Yes</td>
<td>47%</td>
<td>53%</td>
<td>16%</td>
</tr>
<tr>
<td>No</td>
<td>53%</td>
<td>47%</td>
<td>24%</td>
</tr>
<tr>
<td>Experienced unwanted sexual contact^a</td>
<td>.29</td>
<td>.15</td>
<td>.32</td>
</tr>
<tr>
<td>Yes</td>
<td>48%</td>
<td>52%</td>
<td>18%</td>
</tr>
<tr>
<td>No</td>
<td>53%</td>
<td>47%</td>
<td>24%</td>
</tr>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (in years)^b</td>
<td>17.83</td>
<td>17.93</td>
<td>18.08</td>
</tr>
<tr>
<td>Gender</td>
<td>.63</td>
<td>.53</td>
<td>.81</td>
</tr>
<tr>
<td>Male</td>
<td>53%</td>
<td>47%</td>
<td>24%</td>
</tr>
<tr>
<td>Female</td>
<td>51%</td>
<td>49%</td>
<td>22%</td>
</tr>
<tr>
<td>Class level^b</td>
<td>.36</td>
<td>.06</td>
<td>.16</td>
</tr>
<tr>
<td>Grade Level 6</td>
<td>54%</td>
<td>46%</td>
<td>26%</td>
</tr>
<tr>
<td>Junior High School 1</td>
<td>51%</td>
<td>49%</td>
<td>21%</td>
</tr>
<tr>
<td>Parental monitoring^a</td>
<td>8.40</td>
<td>8.38</td>
<td>8.22</td>
</tr>
<tr>
<td>Orientation toward success (pre)</td>
<td>51.32</td>
<td>51.99</td>
<td>51.97</td>
</tr>
<tr>
<td>Orientation toward success (post)</td>
<td>50.86</td>
<td>51.88</td>
<td>51.06</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Variables</th>
<th>Overall</th>
<th>SBSP</th>
<th>Multivalued treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment (n = 460)</td>
<td>Control (n = 421)</td>
<td>Yes (n = 203)</td>
</tr>
<tr>
<td>Uncertainty of the future (pre)</td>
<td>8.59 8.31</td>
<td>.72</td>
<td>7.35 8.79</td>
</tr>
<tr>
<td>Uncertainty of the future (post)</td>
<td>9.97 10.19</td>
<td>.82</td>
<td>8.72 10.48</td>
</tr>
<tr>
<td>Commitment to school a</td>
<td>72.02 73.14</td>
<td>.23</td>
<td>72.66 72.52</td>
</tr>
<tr>
<td>Academic self-efficacy a</td>
<td>55.77 56.45</td>
<td>.53</td>
<td>56.99 55.83</td>
</tr>
<tr>
<td>Food insecurity a</td>
<td>6.43 6.06</td>
<td>.52</td>
<td>6.26 6.25</td>
</tr>
<tr>
<td>Livestock ownership b</td>
<td>0.65 0.74</td>
<td>.10</td>
<td>0.65 0.70</td>
</tr>
<tr>
<td>Household possessions b</td>
<td>0.99 0.99</td>
<td>.65</td>
<td>0.99 0.99</td>
</tr>
<tr>
<td>Transportation asset b</td>
<td>0.47 0.49</td>
<td>.73</td>
<td>0.52 0.47</td>
</tr>
<tr>
<td>Distance to school a</td>
<td>.99</td>
<td>.46</td>
<td>.46</td>
</tr>
<tr>
<td>Very far/far</td>
<td>52% 48%</td>
<td>24% 76%</td>
<td>24% 28%</td>
</tr>
<tr>
<td>Neither far nor near</td>
<td>51% 49%</td>
<td>29% 71%</td>
<td>29% 23%</td>
</tr>
<tr>
<td>Very near/near</td>
<td>52% 48%</td>
<td>21% 79%</td>
<td>21% 31%</td>
</tr>
<tr>
<td>School commute a</td>
<td>.29</td>
<td>.60</td>
<td>.58</td>
</tr>
<tr>
<td>By walking</td>
<td>51% 49%</td>
<td>23% 77%</td>
<td>23% 28%</td>
</tr>
<tr>
<td>By using a transport mode</td>
<td>61% 38%</td>
<td>27% 73%</td>
<td>26% 35%</td>
</tr>
</tbody>
</table>

Note. SBSP = school-based savings program.

a Pretest value.
b Posttest value.
c M (SD) for continuous variables, and percentage distribution (%) for categorical variables.
d Bivariable tests were conducted using cluster-adjusted \( \chi^2 \) and cluster-adjusted \( t \) tests.
of youth (30%) in the school-based banking group reported using condoms at last sexual intercourse compared with youth in the control and marketing groups (20%). The groups did not significantly differ on the other two outcomes: transactional sex and unwanted sexual contact.

Bivariable results indicated that gender, age, student traits, parent–adolescent relationship, food insecurity, and access to school were significant correlates of sexual risk behaviors and victimization. Older youth were more likely to use condoms at last sexual intercourse compared with their younger peers (odds ratio [OR] = 1.13, \( p < .001 \)). Youth who scored higher on the commitment-to-school scale were less likely to engage in transactional sex (OR = 0.98, \( p = .05 \)). In contrast with young men, young women were more likely to experience sexual victimization (OR = 2.11, \( p < .001 \)). In addition, youth who reported closer relationship with their parents (OR = 0.93, \( p = .002 \)) and frequent parental supervision of their activities (OR = 0.93, \( p = .004 \)) were less likely to experience sexual victimization. Food insecurity was associated with higher probability of sexual victimization (OR = 1.03, \( p = .02 \)). Last, walking to school was associated with lower likelihood of experiencing an unwanted sexual contact compared with using a vehicle to go to school (OR = 0.50, \( p = .01 \)).

**Effect on Sexual Risk Behaviors**

Tables 2 and 3 present ATE on sexual risk behaviors. Results indicated heterogeneity of effects. Using the AIPW estimator (see Table 2), overall treatment (i.e., SBSP and marketing outreach) had a minimal and statistically nonsignificant effect on transactional sex and condom use. When groups were categorized between schools that received and did not receive SBSP, results demonstrated a consistent and positive effect of SBSP on sexual risk behaviors. In contrast with youth in the non-SBSP, youth in the SBSP were less likely to engage in transactional sex and more likely to use condoms at last sexual intercourse. Compared with youth in non-SBSP, youth in SBSP were 14% more likely to use condoms at last sexual intercourse (\( p < .001 \)).

The project’s two treatment arms had mixed effects on sexual risk behaviors. Compared with the control group, youth in the SBSP group were less likely to engage in transactional sex. In contrast, the marketing campaign had no effect on transactional sex. However, both findings were not statistically significant. Treatment effect on condom use was also heterogeneous. Compared with youth in the control group, youth in the SBSP treatment group were 13% more likely to use condoms at last sexual intercourse (\( p < .001 \)). In contrast, youth in the marketing outreach group were 3% less likely to use condoms compared with control youth.
Table 2. Average Treatment Effect on Sexual Risk Behaviors and Victimization Using Augmented Inverse-Probability Weighted Estimator.

<table>
<thead>
<tr>
<th>Treatment variables</th>
<th>Sexual risk behaviors</th>
<th>Sexual risk behaviors</th>
<th>Sexual risk behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transactional sex</td>
<td>Condom use at last sexual intercourse</td>
<td>Sexual victimization</td>
</tr>
<tr>
<td>Overall treatment (reference = control)</td>
<td>$\beta = -.01$</td>
<td>$p = .46$</td>
<td>$\beta = .03$</td>
</tr>
<tr>
<td>SBSP (reference = non-SBSP)</td>
<td>$\beta = -.03$</td>
<td>$p = .07$</td>
<td>$\beta = .13$</td>
</tr>
<tr>
<td>Multivalued treatment (reference = control)</td>
<td>SBSP</td>
<td>$\beta = -.03$</td>
<td>$p = .10$</td>
</tr>
<tr>
<td></td>
<td>Marketing campaign</td>
<td>$\beta = -.01$</td>
<td>$p = .81$</td>
</tr>
</tbody>
</table>

Note. Results were based on two-tailed tests and cluster-robust standard errors. OR = odds ratio; SBSP = school-based savings program.

Table 3. Average Treatment Effect on Sexual Risk Behaviors and Victimization Using Inverse-Probability-Weighted Regression Adjustment.

<table>
<thead>
<tr>
<th>Treatment variables</th>
<th>Sexual risk behaviors</th>
<th>Sexual risk behaviors</th>
<th>Sexual risk behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transactional sex</td>
<td>Condom use at last sexual intercourse</td>
<td>Sexual victimization</td>
</tr>
<tr>
<td>Overall treatment (reference = control)</td>
<td>$\beta = -.01$</td>
<td>$p = .42$</td>
<td>$\beta = .03$</td>
</tr>
<tr>
<td>SBSP (reference = non-SBSP)</td>
<td>$\beta = -.03$</td>
<td>$p = .09$</td>
<td>$\beta = .14$</td>
</tr>
<tr>
<td>Multivalued treatment (reference = control)</td>
<td>SBSP</td>
<td>$\beta = -.03$</td>
<td>$p = .11$</td>
</tr>
<tr>
<td></td>
<td>Marketing campaign</td>
<td>$\beta = -.01$</td>
<td>$p = .68$</td>
</tr>
</tbody>
</table>

Note. Results were based on two-tailed tests and cluster-robust standard errors. OR = odds ratio; SBSP = school-based savings program.
As a sensitivity analysis, results using the IPWRA estimator (see Table 3) were consistent with estimates based on the AIPW estimator. Direction of treatment effect and level of statistical significance were consistent between the two estimators.

**Effect on Sexual Victimization**

Tables 2 and 3 also present ATE on sexual victimization. Using the AIPW estimator (see Table 2), overall treatment (i.e., financial inclusion through SBSP or marketing) had a minimal and statistically nonsignificant effect on sexual victimization. When groups were categorized between schools that received and did not receive SBSP, results indicated a positive effect of SBSP on sexual victimization. In contrast with youth in the non-SBSP groups, youth in the SBSP group were less likely to experience sexual victimization. Compared with youth in non-SBSP groups, youth in the SBSP group were 7% less likely to experience an unwanted sexual contact ($p = .05$).

In addition, when we examined effects on sexual victimization, results indicated a consistent and desirable effect of the project’s two treatment arms. Both treatment arms were associated with lower risk of sexual victimization. In contrast with the control youth, SBSP youth were 7% less likely to report having had an unwanted sexual contact. Similarly, youth in the marketing campaign group were 2% less likely to experience an unwanted sexual contact compared with the control group. The effect of SBSP was statistically significant ($p = .04$).

As a sensitivity analysis, results using the IPWRA estimator (see Table 3) were consistent with estimates based on the AIPW estimator. Direction of treatment effect and level of statistical significance were stable between AIPW and IPWRA estimators. Across all models of treatment effects, the project’s two treatment arms were associated with lower likelihood of experiencing sexual victimization. Youth in the SBSP group were significantly less likely to experience sexual victimization compared with their peers in non-SBSP groups (OR = 0.93, $p = .05$). Also, youth in the SBSP group were significantly less likely to experience sexual victimization compared with youth in the control group (OR = 0.92, $p = .04$).

**Discussion**

Prior to implementation, we considered various risks that might emerge because of owning a savings account. One concern was the possibility that youth might engage in transactional sex or other risky behaviors to earn or obtain money that they could put in their accounts. However, we did not find
evidence of a heightened exposure to sexual risk behaviors and victimization. Instead, our findings indicate three key points: (a) the overall financial inclusion intervention (SBSP and marketing campaign) did not have a significant effect; (b) SBSP had a significant and encouraging effect on condom use and sexual victimization; and (c) marketing campaign had an inconclusive effect. In other words, our findings suggest that SBSP may be a promising and additional strategy to reduce sexual risk taking and victimization among youth. The positive effect of SBSP is consistent with SBSP’s other desirable effects on financial capability and saving behaviors (Chowa et al., 2015).

Several reasons may explain the positive effect of a SBSP on sexual risk behaviors and victimization. First, consistent with research on asset effects (Sherraden, 1991), access to formal mechanisms that promote saving and planning for the future may result in a cognitive shift that shapes how young people see images of their future selves. It is plausible that the opportunity to save for the future enables young people to imagine a positive image of themselves and to avoid risky behaviors and activities that may jeopardize their future possible selves (Markus & Nurius, 1986).

Second, theoretical and empirical work related to CoRT may explain the positive effect of SBSP. CoRT emphasizes the role of resources as predictors of health behaviors. In the project, resources can be personal and material. Personal resources include self-efficacy, optimism, and future orientation. Furthermore, a key material resource is money in the form of savings. It is plausible that participation in an SBSP may facilitate or enhance accumulation of these resources. CoRT hypothesizes that individuals thrive when they gain, maintain, and conserve their resources (Hobfoll & Lilly, 1993). Personal and material resources that SBSP youth accumulated can be applied to accommodate, withstand, or overcome threats (Hobfoll, 1989) such as sexual risk taking and victimization. For example, material resources such as savings can be used to access and purchase condoms. Also, personal resources such as self-efficacy may encourage youth to communicate and to negotiate safer sexual practices with their partners. Alternatively, when these resources are limited or depleted, youth’s ability to address needs and demands becomes inadequate. Because of limited or depleted resources, youth may experience higher levels of stress that may exacerbate their risk of engaging in unsafe sexual practices or unwanted sexual contacts (Drimie & Casale, 2009).

However, it is possible that access to a savings account, which in the project was available to all youth in the study, may facilitate a similar cognitive shift and accumulation of resources that act as protective factors against sexual risk taking and victimization. In other words, SBSP’s positive effect is likely due to unique factors in the SBSP. One notable factor is the potential role of in-school banking activities in reminding and enabling youth to follow
a plan of action. It is possible that these school-based activities provide youth a self-regulatory strategy in the form of an “if-then plan” that can lead to behavior change, consistent with Gollwitzer’s (1999) work on implementation intentions. In other words, SBSP activities may provide the when, where, and how for youth to achieve their goals such as positive images of future possible selves. An example of the “if-then plan” in the project is as follows: when there is an in-school banking activity, youth will deposit the money they saved to attain a desired goal and avoid behaviors that could jeopardize the desired goal. In contrast, the control and marketing campaign groups did not provide a potential self-regulatory strategy in the form of an if-then plan.

Furthermore, our findings underscore the potential added effect of encouraging usage of a savings account compared with a focus on expanding access alone. Access, although important, is not enough to achieve behavior change. In contrast, inspiring young people to open and use their savings account, facilitated by the SBSP activities, may provide an extra push or reminder to attain their goals by setting up a concrete and goal-directed behavior in response to a specific event (Gollwitzer & Brandstätter, 1997). Similarly, facilitation (i.e., bringing the bank to schools) makes it easier and more convenient for youth to achieve their saving goals and accumulate resources (Beverly & Sherraden, 1999).

**Implications**

Our study adds to increasing empirical evidence that highlights the importance of tangible economic or financial strategies to facilitate and maintain behavior change. Access to financial resources such as savings may provide incentives that encourage and enable young people to change or maintain positive health behaviors. The addition of school-based activities that are relevant and attractive to youth (e.g., school-based banks) may help young people to act on their goals by providing specific and concrete situations (i.e., the when, where, and how associated with SBSP and using a savings account) that enable them to avoid behaviors (e.g., sexual risk taking) incongruous with their future possible selves. Programs that expand access to and that promote usage of tangible and intangible resources may be a promising addition to biomedical and behavioral STI prevention programs.

Our findings also emphasize the importance of environment and systems on youth sexual behaviors and their experience of sexual victimization. In addition to individual behavior change, the implementation of an SBSP highlights the role of creating an environment that makes it easier for youth to save and accumulate resources. Similarly, the use of schools and financial institutions may help fast track the adoption of a promising intervention by
effectively integrating its activities and procedure into existing systems that have a shared interest in promoting positive youth development at the community and population level. Using schools as the project setting where intervention activities occur may also facilitate student retention, particularly adolescent girls and young women. In turn, school retention or keeping young women in schools reduces sexual risk taking, gender-based violence, and STI transmission (Kilburn, Pettifor, et al., 2018; Pettifor et al., 2016). The project also worked on policy change by persuading the partner financial service provider and relevant government agency to approve the offering of a savings product to underserved youth and by allowing young people below 18 years to access and use a savings account (Chowa et al., 2015).

Last, SBSP programs on their own may not lead to health behavior changes because many SBSP programs do not include health promotion or education components. Existing infrastructures (i.e., schools) should supply the accurate and pertinent sexual health information that shapes beliefs and intentions. For example, young people must have accurate information about the benefits of condom use and consequences of unsafe sexual practices. Information on adolescent sexual health may come from the school’s curriculum, as is the case in Ghana. In other words, SBSP and similar economic inclusion programs may only be effective if young people know what change is necessary and have the desire to change. Resources accumulated from SBSP and similar programs provide the strategies and tools (tangible and intangible) to help young people act on their beliefs and intentions.

**Limitations**

We caution interpretation of findings given study limitations. First, selection bias may influence our results. Given the study objective, we analyzed data from a subsample of youth in the main study. Although the subsample of sexually experienced youth was comparable on observed covariates across treatment and control groups, the subsample may differ on unobserved variables. Selection bias may also result from the differences between sexually experienced and nonexperienced youth in the study. Second, study measures and data collection may influence reliability and validity of findings. All outcomes were self-reported by youth and may be susceptible to recall and social desirability bias. To minimize bias, we matched the interviewers and interviewees based on gender, age, and language. In addition, we did not have baseline outcome data. We collected sexual risk behaviors and victimization data at posttest, or 3 years after pretest. Thus, we did not have initial data to identify youth (a) who became sexually active during the study period, (b) who abstained from sexual activities after engaging in sex prior to the study,
and (c) with no changes in their sexual behaviors. These youth may be qualitatively different from each other. Third, our analytical procedures require assumptions that our data might not have had satisfied. Although we conducted diagnostic tests and used doubly robust methods, it is possible that our treatment and outcome models are misspecified, which in turn, can affect the validity of our results. Similarly, when there are unobserved variables that affect treatment probability and outcome, our results may be biased.

Conclusion

Increasingly, research has demonstrated that individual economic resources (vs. household income or wealth) have better impact on young people’s well-being. One promising strategy to help youth accumulate economic resources of their own is through saving. Our study findings reinforce that youth’s ability to accumulate their own economic resources through saving and involvement in school-based banking activities are associated with lower likelihood of sexual victimization and sexual risk taking. Combined with positive effect on cognition and images of future selves, SBSP and its activities may help youth act on their beliefs and intentions by creating a plan of action that specifies the when, where, and how of a goal-directed behavior. SBSP may be a promising addition to a comprehensive STI prevention toolkit for youth in low-resource settings.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Declaration of Conflicting Interests

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