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Gender, Sexual Self-Efficacy and Consistent Condom Use Among Adolescents Living in the HIV Hyper-Endemic Setting of Soweto, South Africa

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Abstract (150/150)

Within HIV-endemic settings, few studies have examined gendered associations between sexual self-efficacy (SSE), one's confidence or perceived control over sexual behavior, and uptake of HIV prevention behaviors. Using cross-sectional survey data from 417 sexually-experienced adolescents (aged 14-19, median age=18, 60% female) in Soweto, South Africa, we measured SSE using a 6-item scale (range:0-6) with 'high-SSE'=score>3 (study alpha=0.75). Gender-stratified logistic regression models assessed associations between high-SSE and lifetime consistent condom use. A higher proportion of women reported high-SSE (68.7%) than men (49.5%, $p<0.001$). We observed no difference in reported consistent condom use by gender (45.5% among women, 45.8% among men; $p=0.943$). In confounder models, high-SSE was associated with consistent condom use among men (aOR=3.51, 95%CI=1.86-6.64), but not women (aOR=1.43, 95%CI=0.74-2.77). Findings highlight that individual-level psychosocial factors are insufficient for understanding condom use and must be considered alongside the relational, social, and structural environments within which young women navigate their sexual lives.

Introduction

New HIV infections within South Africa- the country with the highest absolute number of people living with HIV globally- continue to disproportionately affect adolescent and young women aged 15 to 24.¹ In 2012, HIV incidence rates among women aged 15 to 24 were 4 times higher than men of the same age (2.54% versus 0.55%).² High sustained HIV incidence among adolescent women combined with observed reductions in condom use in South Africa call for a critical examination of the gendered determinants of HIV acquisition.²⁻⁴

The construct of sexual self-efficacy (SSE) assesses the confidence or perceived control that an individual has in performing HIV preventative behaviors such as condom use, partner communication, and refusal of unwanted sex. SSE constructs have been commonly used within the HIV prevention literature to examine individual-level relationships between one's confidence and perceived control over sexual behaviors and reported sexual behavior outcomes.⁵

The evidence regarding an association between higher SSE and sexual behaviors among adolescents in HIV-endemic settings has been inconsistent, with some cross-sectional studies observing a positive association between high-SSE and consistent condom use,^{4,6} while others have not.^{7,8} While behavioural HIV prevention intervention studies focused on adolescents in Kenya, Uganda, and South Africa have shown that fostering SSE moderately translates into sexual behavior change,⁹⁻¹¹ no studies have demonstrated an effect of higher SSE on reduced HIV incidence.¹² Of note, few observational or intervention studies have considered gendered differences in the pathway between high-SSE and sexual behavior, despite clear evidence that sexual behaviors, including condom negotiation, are systematically dyadic and gendered experiences.¹³⁻¹⁶ Available data indicate that gender modifies the relationship between SSE and sexual behavior, with one study showing that higher SSE was associated with increased consistent condom use among adolescent men but not among adolescent women.¹⁰

Due to the lack of gender-sensitive research and inconclusive evidence regarding the construct of SSE as a determinant of consistent condom use among

adolescents within HIV hyper-endemic settings such as South Africa, we examined the association between high-SSE and consistent condom use, stratified by gender.

Methods

Study Design

The Botsha Bophelo Adolescent Health Study (BBAHS) is a cross-sectional study, which used an interviewer-administered questionnaire to assess socio-behavioral characteristics and sexual and reproductive health among 830 adolescents between 2010 and 2012 within Soweto, South Africa. The BBAHS study methods have been previously described.¹⁷

Participants

Participants for BBAHS were recruited from 41 townships within Soweto and were eligible to participate if they were between the age of 14 and 19 at the time of enrolment. Participants were recruited through word-of-mouth and community outreach at different locations frequented by adolescents (e.g. community centres, neighbourhood parks, recreation centres and areas around schools). Given the focus on consistent condom use, we restricted the analysis to participants who reported a history of sexual activity (ever having had any penetrative [vaginal and/or anal] sexual intercourse).

Ethical Considerations

The study team collected informed consent from participants over the age of 18 and adolescents under 18 signed an informed assent consent form and provided signed parental consent. The study was approved by the University of the Witwatersrand in Johannesburg, South Africa (M090449) and Simon Fraser University in Burnaby Canada (2009s0196).

Data Collection

Participants responded to a 45-60 minute structured survey that was administered by locally trained interviewers who spoke multiple local languages

including English and Zulu. Participants were given 50 ZAR (approximately 7 CAD at the time) as compensation for their time and transportation to the Perinatal HIV Research Unit (PHRU) or Kganya Motsha Adolescent Centre – a youth-friendly HIV service provider²⁰- where interviews took place.

Measures

Outcome Variable: Lifetime Consistent Condom Use

Participants were coded as consistent condom users if they answered “Always” to the question “*How often did you use a condom when having consensual vaginal/anal sex in your lifetime?*”.

Exposure of interest: Sexual Self-efficacy (SSE)

The primary variable of interest was sexual self-efficacy (SSE), which was assessed using a 6-item SSE scale previously adapted within sub-Saharan African adolescent HIV prevention studies,²¹⁻²³ that included questions such as “*Would you be able to avoid sex anytime you didn’t want it?*” and “*Would you be able to use a condom every time you had sex?*” Possible responses did not specify which partner to think of if participants reported more than one current partner and included “Yes”, “Probably yes”, “No”, or “Probably no”. All scales and items included within BBAHS were piloted and developed with the PHRU adolescent community advisory board and based off of a well-known HIV prevention intervention “loveLife”,²³ and an additional question surrounding sexual partner communication was added based off of pilot focus group discussions. After deliberation with the study team, and similar to an other South African adolescent HIV prevention study,²⁴ only those reporting an affirmative “Yes” to the SSE scale were assessed as having SSE (coded as 1), while those reporting “probably yes”, “probably no”, and “no” were assessed as not having SSE (coded as 0) (scale range 0-6, study alpha=0.75 for young women and 0.65 for young men). The scale was dichotomized at a SSE score of >3 reflecting an affirmative yes response to the majority of items.²⁴

A sensitivity analysis was conducted between the new (yes responses versus all other responses) and old scale scoring (likert scale scoring ranging from 6-24, with a cut point of ≥18 as ‘high-SSE’), and results found 84% sensitivity and 100% specificity, with

substantial agreement to the original score (Kappa=0.73). **Table 2** presents responses to all six items included within the SSE scale.

Potential Confounders

In examining the relationship between high-SSE and consistent condom use we assessed potential confounders stratified by gender. No participants identified as transgender. Confounding factors were selected based off the literature, available data, and *a priori* knowledge of important determinants of consistent condom use for adolescents within the context of South Africa.

Socio-demographic Characteristics including age (in years), education status (currently in school), adult caregiver in the home, and food security (low versus medium/high) was assessed using a 9-item validation of Radimer/Cornell's measure of hunger.^{25,26} ***Relationship Dynamics:*** Participants were asked if they had a boyfriend/girlfriend in the last 6 months (L6M), number of current boyfriends/girlfriends (none versus one versus ≥ 2), and if any of their boyfriend/girlfriend was ≥ 5 years younger/older than them.

Current ***sexual activity*** (defined as having had vaginal/anal sex in the last 6 months), and age at first sex (≤ 15 versus > 15) was assessed. Participants were also asked whether they ever had difficulty accessing condoms.

Depressive symptoms were assessed using the 20-point Centre for Epidemiological Studies Depression (CES-D) Scale (study alpha=0.81, range 0-60, with higher scores indicating greater depression symptomology).²⁷ Based off of previous work among adolescents, we chose a cut-off of ≥ 24 that has been previously determined to best measure probable depression for adolescents.²⁸

Experiences of violence was determined if participants who responded "yes" to either of the following questions: "*Have you ever experienced an act of violence, not by someone in your family, such as being attacked, shot at, stabbed, beaten, or robbed?*" or "*Sometimes kids are hurt by people in their own family, such as being punched, kicked, choked, or thrown down hard. Have you ever experienced being hurt by a member of your family?*"

Statistical Analysis

All analyses were conducted using SAS 9.4, stratified by gender. Differences in demographic variables and covariates of SSE scores were compared by gender using Wilcoxon rank sum test for continuous variables and Pearson Chi square or Fisher's exact test for categorical variables. Gender stratified univariable and multivariable logistic regression confounding models assessed the independent association between high-SSE and consistent condom use.

Results

Of the 830 adolescents, 741 had valid answers for all SSE items. Of these, 417 (56.3%) had ever had vaginal/anal sex, including 200 adolescent men (48.0%) and 217 adolescent women (52.0%), who were included in this analysis.

The median age of participants was 18 (Q1,Q3: 17,18) for both adolescent men and women. Men were significantly more likely to have had sex for the first time before the age of 15 (43.5% versus 6.7%, $p<0.001$), and report difficulty acquiring condoms in L6M (42.7% versus 15.3%, $p<0.001$). No statistically significant gender difference was found in lifetime consistent condom use (45.7% for men versus 46.3% for women, $p=0.943$). Among the 366 participants (87.8%) who reported having a boyfriend/girlfriend in the L6M, men were significantly more likely to have reported two or more current girlfriend/boyfriends (45.3%) than women (9.1%, $p<0.001$), and less likely to report their partner was much older (≥ 5 years) (5.4% versus 32.6%, $p<0.001$) (**Table 1**).

A higher proportion of women had high-SSE (68.7%) compared with men (49.5%; $p<0.001$). Statistical differences ($p\leq 0.05$) in SSE between men and women were driven by responses to the following four individual items: confidence in avoiding sex any time they didn't want to, talking to their partner about his/her previous sexual activities, using a condom during sex after they have been drinking or taking drugs, and refusing to have sex without a condom (**Table 2**). No gender differences were found between men and women's confidence in their ability to use a condom every time they had sex ($p=0.226$).

Among adolescent men, univariable analyses shows consistent condom use was associated with high-SSE (OR=2.84, 95%CI 1.57-5.16). Additional factors associated

with consistent condom use included older age (OR=1.41 per year, 95%CI:1.10-1.81), and ever experiencing physical violence (OR=2.00, 95%CI:1.07-3.75). Consistent condom use was negatively associated with having had sex for the first time before the age of 15 (OR=0.40, 95%CI:0.21-0.75). In the **multivariable confounding model**, consistent condom use was independently associated with high-SSE (aOR=3.51, 95%CI:1.86-6.64), adjusted for experiencing physical violence (**Table 3**). Results further found that 74% of men with low-SSE reported ever experiencing physical violence, compared to 57.9% of those with high-SSE ($p<0.001$). (Data not shown).

Among women, univariable analyses showed no statistically significant association between high-SSE and consistent condom use (aOR=1.74, 95%CI:0.94-3.20), while younger age (OR=0.71 per year, 95%CI:0.53-0.97) and probable depression (OR=0.46, 95%CI:0.25-0.83) was inversely associated with consistent condom use. In the **multivariable confounding model**, there remained no statistically significant association between high-SSE and consistent condom use (aOR=1.43, 95%CI:0.74-2.77), adjusted for age, food security, adult caregiver at home and probable depression (**Table 4**).

Discussion

Adolescent women had higher SSE compared to men in our study. High-SSE was not associated with consistent condom use among women, but was associated with consistent condom use among men. Higher SSE among young women in sub-Saharan African HIV prevention studies has been previously documented.^{15,23} Thus, the higher proportion of women with high-SSE in our sample is not altogether surprising as the epidemic in South Africa continues to disproportionately affect young women, they have been the focus of HIV programming, which commonly includes sexual negotiation skills strategies aimed at improving confidence in condom negotiation and sexual refusal.^{1,29,30} For adolescent men, findings reveal that after controlling for experiencing physical violence the relationship between high-SSE and consistent condom use was strengthened. Thus, SSE may be an important predictor of consistent condom use for men, but not women. Consistent with previous studies, other factors such as positive mental health and younger age may be more important for predicting consistent condom use among women than high-SSE. Although previous South African studies have found an association between depression and consistent condom use,^{19,31} to the best of our

knowledge the relationship between depression, high-SSE, and consistent condom use has not been previously described in this context.

Despite gender differences in relationship concurrency and condom access, where almost half of adolescent men reported having two or more current partners and difficulty accessing condoms, this study found no gender differences in reporting of condom use. For women, condom use was found to decrease with age, which aligns with previous South African data.^{2,4} Reductions in condom use with age may be due to an increase in intimacy and trust as sexual relationships develop and the perceived need for HIV prevention practices declines.³ Within the context of South Africa, accepted sexual scripts of condom negotiation may be more influenced by collective gender roles and social norms than individuals' perceived agency in decision-making.³² With age, these scripts may become more engrained, likely influencing condom negotiation and use.

For women in our study, higher depressive symptomology was more strongly associated with consistent condom use than SSE. This aligns with previous studies that have found that symptoms of depression are common and associated with syndemics that mutually reinforce adolescent women's risk of acquiring HIV, through a number of pathways that reduce agency in safe sex negotiation, including increased vulnerability to relationships marked with gender-power inequity and high levels of intimate partner violence (IPV).^{31,33} Beyond increased susceptibility to abusive relationships, depressive symptoms may be heightened within these relationships.³⁴ Thus, despite high behavioral intentions to use condoms among adolescent women, our findings highlight a syndemic between depression and HIV risk that merit future research and gender-sensitive interventions that begin early.³⁵

Over half of adolescent men and women (65% for both) within our sample reported experiencing some form of physical violence in the community (e.g. shot at, stabbed) or by a family member (e.g. punched kicked, choked). Among adolescent men, we found an unexpected association between experiencing physical violence and consistent condom use, where adolescent men who have reported experiencing physical violence were more likely to use condoms. Findings also revealed that adolescent men who have experienced violence were more likely to have low-SSE, and after controlling for having ever experienced violence the relationship between high-SSE and consistent

condom use was strengthened. These results highlight the important impact that interpersonal trauma has on the sexual decision-making processes of young men growing up in peri-urban settings, such as Soweto.^{33,36} The majority of research examining the link between violence and condom use among adolescent men indicates that men who perpetuate violence are more likely to engage in risky sexual behavior including inconsistent condom use and multiple partners.^{37,38} There is much less literature about the effects of men's experience violence and sexual behaviors. For young men included within our study, previous analyses found that experiences of violence was associated with having more sexual partners, which in turn may help to explained increased probability of being consistent condom users.³⁹ However, the relationship between adolescent men experiencing high levels of violence and consistent condom use has not been widely explored, thus warranting future research.

This analysis presents a unique contribution to the literature that assesses the gendered relationship between SSE and consistent condom use. Due to the cross-sectional design of this study our findings, however cannot demonstrate causation between high-SSE and consistent condom use. As this study utilized community-based convenience sampling, these data cannot be generalized to all South African adolescents. Social desirability bias may have contributed to the over-reporting of condom use and SSE measures, particularly for adolescent women, who are often seen as responsible for condom negotiation. Readers should also note that participants who reported more than one partner were not asked to specify which partner to think of, which may have resulted in differing responses for primary and secondary partnerships. As with other studies conducted among adolescents living within sub-Saharan African settings, in which SSE scales have been utilized, we acknowledge that inconsistencies in scale validity and reliability of the measurement tool may be influencing the results found within our analysis. Inconsistent findings within sub-Saharan African adolescent HIV prevention literature may be due to SSE being a western construct of behavior change, and thus linguistic and cultural interpretations of the SSE scale may not be as applicable or predictive of sexual behavioral outcomes among sub-Saharan youth.

Moreover, the variables included within this analysis are limited in their ability to extrapolate on the important relationship dynamics (relationship length, level of intimacy, experiences and perpetuation of IPV) that are known to influence condom use.⁴⁰ Future research should examine motivations behind sexual initiation, intimacy, and experiences

of IPV and controlling behaviors, particularly among adolescent women within age-disparate partnerships who report high-SSE, yet this did not translate into consistent condom use.^{36,41,42}

Although internal validity measurements showed moderate internal consistency, limitations in the validity of the extrapolation of these data presented within this analysis may also be influenced by social desirability bias as well as contextual, cultural, lingual and gendered interpretations surrounding participants' responses to questions regarding condom use and SSE. Specifically, despite a lengthy process of translating and back-translating items within the SSE scale with multi-lingual research interviewers, translations of western-developed scale items may not have accurately reflected the interpretation of SSE scale items. As high-SSE was not associated with consistent condom use for women, despite the SSE scale included in this analysis having higher internal consistency than other South African studies,^{15,23} we suggest that future research aim to explore the specific contexts in which western conceptual constructs are understood by adolescents living in in the global South.⁴³ This may include using gender segregated statistical (e.g. exploratory factor analyses) and qualitative methods to enhance content and face validity of psychosocial scale development.

Beyond these limitations, findings from this study highlight important gendered associations between high-SSE and consistent condom use that should be considered within the implementation and development of gender-sensitive interventions. We found that despite sexually experienced adolescent women having significantly higher SSE compared to men their own age, that this was not associated with consistent condom use. High-SSE was however associated with consistent condom use for adolescent men, highlighting that gender-targeted behavioral interventions should aim to promote SSE among adolescent men. Whereas for adolescent women who face a nearly three fold risk of HIV, interventions need to move beyond individual-level self-efficacy messaging to expand to include key socio-structural and relational determinants, including addressing factors that perpetuate the syndemics of violence, depression and HIV at earlier ages.

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