

Impulsiveness, Depression, Sexual Behavior, and Sexually Transmitted Infections and HIV-related Outcomes among Out-of-school Adolescent Girls and Young Women in Rural Southern Malawi

Malawi has a generalized HIV epidemic with a prevalence of 10.6 percent among those aged 15 to 64 years.¹ In the southern region of Malawi, HIV prevalence rates are higher than in other regions, ranging from 15 to 18 percent by district.¹ According to the most recent Malawi Population-Based HIV Impact Assessment (MPHIA), Malawi falls short of the first 90 of the UNAIDS 90-90-90 targets but has surpassed the second and third: 77 percent of people living with HIV (PLHIV) aged 15 to 64 years know their status; of those, 91 percent are on antiretroviral treatment (ART); and of those on ART, 91 percent are virally suppressed.¹ USAID/Malawi is supporting the five-year One Community (One-C) program (2015–2020), implemented by the Johns Hopkins University Center for Communications Program (JHU-CCP), with Plan International and Project HOPE. One-C, being implemented in eight districts in the southern region of Malawi, is a community-based program that seeks to increase utilization of HIV prevention, care, and treatment services among high-risk populations; improve linkages to services at the community level; and encourage the adoption of HIV risk reduction behaviors.² The purpose of this Project SOAR activity—conducted by the Population Council in collaboration with the University of Malawi College of Medicine—was to monitor key HIV prevention, care, and treatment outcomes among populations who are targeted by the One-C program, including:

- Orphans and other vulnerable children (OVC) (aged 0 to 17 years) and their caregivers (18 and older)
- Out-of-school adolescent girls and young women (AGYW) (aged 15 to 24 years)
- Other vulnerable populations (OVP) ages 18 and older, including fishermen, estate workers, and market vendors

KEY FINDINGS

- Impulsiveness was associated with age, education, and depression among out-of-school adolescent girls and young women.
- Impulsiveness was associated with higher lifetime number of sexual partners and risky sexual behavior in the past six months.
- Impulsiveness was associated with having an STI or having STI symptoms in the past 12 months, but not with HIV testing or having HIV.
- Incorporating awareness of personality traits in programs seeking to improve sexual health among adolescents could prove beneficial.

Under this study, the Population Council investigated associations between impulsiveness, depression, sexual behavior, sexually transmitted infections (STIs), and HIV among out-of-school adolescent girls and young women (AGYW). Impulsivity is a personality trait that has been associated with risky sexual behavior among young people in different settings in the developed world.^{3–7} Young people, who have not fully developed their capacity for self-control, are more likely to make decisions with little thought or planning. More impulsive adolescents may be at higher risk of initiating sex at younger ages and more likely to engage in unprotected sex, which in turn increases exposure to and the risk of acquiring HIV or other STIs.

The data we used for this analysis come from a survey conducted from May to July 2019 among



out-of-school AGYW living in five (Blantyre, Chikwawa, Mangochi, Mulanje, Phalombe) of the eight program districts.

METHODS

We conducted interviews with a total of 739 out-of-school AGYW aged 15–24 years living in 24 health facility catchment areas in the five program districts where One Community is being scaled up. Households were identified through a household census and selected for the study if an out-of-school AGYW lived in the household.

We collected data on sociodemographic characteristics, depression, sexual behavior, STI symptoms, HIV testing and self-reported serostatus, and impulsiveness. Multivariate regression analyses were used to determine the sociodemographic correlates of impulsiveness, and to assess associations between impulsiveness and self-reported indicators of sexual behavior, STIs, and HIV.

Measures

Impulsivity

We used the Barratt Impulsiveness Scale (BIS) adapted to the local context (see box for more information). To measure impulsiveness, responses to the BIS individual items were scored 1–4, with higher scores representing more frequent impulsiveness. The individual items' scores were summed and the total score was standardized to have a mean of 0 and standard deviation of 1, to facilitate interpretation.

Depression

Depression, as measured using the nine-item Patient Health Questionnaire (PHQ-9), assessed feelings of depression in the previous two weeks. Item responses were scored 0–3 and summed. The standardized cutoff of 4 was applied to the total score to descriptively estimate depression regardless of level, and regression models used binary variables to compare mild depression (score of 5–9) and moderate to severe depression (10–27) to no depression (score less than or equal to 4).

Barratt Impulsiveness Scale (BIS)

The BIS is a 30-item scale used to measure impulsivity, a multidimensional construct that includes the tendency to act without thinking, to focus on immediate gratification, and to have difficulty inhibiting desired actions.⁸ It includes questions to assess short-term and long-term planning, perseverance, attention/concentration, self-control, and cognitive complexity. A pilot test was conducted prior to data collection to translate and adapt items to the local context when appropriate. For each item of the BIS, respondents were read a statement (for example, “I plan tasks carefully;” “I do things without thinking”) and asked to answer whether the statement applied to them never/almost never, once in a while/occasionally, often, or always/almost always.

Sexual behavior and STI and HIV outcomes

- Indicators of lifetime sexual behavior (first sex before age 15, lifetime number of sexual partners)
- Indicators of sexual behavior in the past six months (had sex, had more than one sexual partner, had unprotected sex, had unprotected sex with a non-marital partner)
- STI and HIV outcomes (had an STI or STI symptoms in the past 12 months, ever tested for HIV, self-reported HIV-positive if had received an HIV test result)

RESULTS

Associations between impulsiveness and sociodemographic characteristics among AGYW

Impulsiveness is associated with younger age, less education, and depression.

Table 1 presents means of respondents' characteristics by relative impulsiveness using

standard deviations (SD) from the mean of the scale: low (if scored below -1 SD), average (if scored between -1 SD and +1 SD), and high (if scored above +1 SD).

Respondents were, on average, 20.6 years old. Many respondents (64%) were currently married. Respondents' education was low; respondents had completed only 5.8 grades of school on average, and 70 percent were able to read a simple sentence. Household wealth was also low, with respondents' households having on average 3 assets out of a list of 13. Less than one-third of respondents had worked during the past week (29%), but almost all had participated in social activities (89%).

A gradient by impulsiveness levels was observed in age, grade attainment, and depression, with respondents with higher impulsiveness (above +1 SD from the mean) having, on average, the youngest age (significant, though the differences are small) and the lowest grade attainment, and being the most likely to be depressed. This effect is very pronounced for depression, with less than one in five of the least impulsive AGYW experiencing mild to severe depression in the previous two weeks, compared to more than half of the most impulsive AGYW feeling depressed (Table 1).

Associations between impulsiveness and sexual behaviors

Table 2 presents means of sexual behavior outcomes across relative impulsiveness levels. About 13 percent of respondents had sexual intercourse for the first time before age 15. On average, respondents had had two lifetime sexual partners. In the past six months, 77 percent of respondents had sexual intercourse, 3 percent had more than one sexual partner, 75 percent had sex without a condom with a main partner or during their last sex, and 13 percent had unprotected sex with a non-marital main partner or during their last sex if their last sex was with a non-marital partner.

Impulsiveness is associated with higher lifetime number of sexual partners and risky sexual behavior in the past six months.

Trends across relative impulsiveness level appear to suggest that respondents with higher impulsiveness appear more likely to have initiated sex before age 15, to have had more lifetime sexual partners, to have had more than one sexual partner in the past six months, and to have had unprotected sex with a non-marital partner. Among these, number of lifetime sexual partners, having

Table 1 Sociodemographic characteristics: Overall means and by relative impulsiveness level

	Total (N=739) %	Lower imp < -1 SD (n=124) %	Average imp -1 SD to +1 SD (n=515) %	Higher imp > +1 SD n=100 %
Age* (mean)	20.6	20.9	20.6	20.2
Never married	23.3	21.8	23.7	23.0
Currently married	63.9	62.9	63.9	65.0
Previously married	12.9	15.3	12.4	12.0
Grade attainment* (mean)	5.8	6.7	5.7	5.2
Literate	70.2	77.4	68.5	70.0
Household assets (mean)	3.0	3.5	3.1	2.6
Worked past week	28.6	33.1	27.2	30
Social activities	89.0	92.7	87.6	92.0
Depressed*	36.5	18.5	37.5	54.0

*Indicator significantly ($p < 0.05$) associated with impulsiveness in a multivariate linear regression with continuous impulsiveness score as the outcome, controlling for ethnic group and clustering at the census enumeration areas (CEA) level.

Table 2 Sexual behavior indicators: Overall means and by relative impulsiveness level

	Total (N=739) %	Lower imp < -1 SD (n=124) %	Average imp -1 SD to +1 SD (n=515) %	Higher imp > +1 SD n=100 %
First sex < age 15	13.4	11.3	13.1	18.0
Lifetime sexual partners** (mean)	1.9	1.7	1.9	2.0
Sexual behavior in past 6 months				
Had sex	76.6	75.0	77.1	76.0
Had more than 1 sexual partner*	3.0	1.6	2.7	6.0
Had unprotected sex	75.4	79.6	74.1	77.6
Had unprotected sex with non-marital partner*	12.7	9.7	12.8	16.0

** p<0.01, * p<0.05. Impulsiveness was significantly associated with starred outcome in multivariate regression.

Regressions control for age, ethnicity, marital status, grade attainment, literacy, household assets, work and social activities, and participation in Go! Girls groups that are part of the One Community program. Models for sexual behavior in past 6 months also control for depression.

Robust standard errors clustered at the CEA level; N = 739.

multiple sexual partners in the past six months, and having unprotected sex with a non-marital partner were statistically significantly associated with impulsiveness, controlling for sociodemographic characteristics.

Associations between impulsiveness and STI and HIV outcomes

Occurrence of an STI or STI symptoms in the past 12 months were reported by 11 percent of respondents.

Almost all respondents (96%) had ever been tested for HIV. Among respondents who had received an HIV test result, 2 percent reported being HIV-positive.

Gradients by impulsiveness levels are also observed in the STI outcomes (Table 3). Respondents with higher impulsiveness were more likely to report having had an STI or symptoms of an STI in the past 12 months, and slightly less likely to have ever been tested for HIV. However, a gradient is not observed for self-report of HIV.

Table 3. STI/HIV outcomes: Overall means and by impulsiveness level

	Total (N=739) %	Lower imp < -1 SD (n=124) %	Average imp -1 SD to +1 SD (n=515) %	Higher imp > +1 SD n=100 %
Had STI or STI symptoms in past 12 months*	11.4	3.2	12.6	15.0
Ever tested for HIV	96.2	97.6	96.1	95.0
If received HIV test^a				
HIV positive	1.8	0.8	2.2	1.1

^a n = 709; *p<0.05. Impulsiveness was significantly associated with starred outcome in multivariate regression.

Regressions control for age, ethnicity, marital status, grade attainment, literacy, household assets, work and social activities, participation in Go! Girls groups that are part of the One Community program, depression, lifetime sexual partners, first sex before age 15, and unprotected sex with non-marital partner in past 6 months.

Robust standard errors clustered at the CEA level.

Impulsiveness is associated with having an STI or having STI symptoms in the past 12 months, but not statistically associated with HIV testing or having HIV.

Table 3 includes results from multivariate regression analyses estimating associations between the impulsiveness standardized score and STI/HIV outcomes. Results from multivariate models for STI outcomes show that higher impulsiveness is statistically significantly associated with higher odds of having had an STI or symptoms of an STI in the past 12 months ($p < 0.05$). Having ever been tested for HIV and being HIV-positive were not statistically associated with impulsiveness, though almost all AGYW reported ever testing for HIV and only very few AGYW reported testing HIV-positive. Though not significant, the direction of the effect for ever tested for HIV suggests that more impulsive AGYW are less likely to have been tested for HIV. Feeling depressed in the past two weeks was significantly associated with STI/STI symptoms in the past 12 months.

CONCLUSION AND RECOMMENDATIONS

Impulsiveness was associated with younger age among AGYW in our sample, which is aligned with previous research that has found that impulsivity peaks during pre-adolescence and decreases from adolescence into adulthood.⁸⁻⁹ More impulsive girls in our sample were also less educated. Impulsiveness may lead to early school dropout, potentially due to sexual initiation and pregnancy. Our results show impulsiveness to also be associated with depression among our sample of out-of-school AGYW. Depression is a recent mental state measured as feelings in the past two weeks, and it may be that depression is caused by negative feelings after acting impulsively, e.g., after engaging in risky sexual behaviors and contracting an STI or having STI symptoms, or that being depressed leads to impulsive behavior, but this cross-sectional study cannot determine the temporality of this association.

This study found impulsiveness to be statistically significantly associated with higher number of lifetime sexual partners, having more than one

sexual partner in the past six months, having recent unprotected sex with a non-marital partner, and STI outcomes among our AGYW respondents in a high HIV prevalence setting. While research has found these links in developed settings, our findings confirm that these associations exist among a young sample of girls and women aged 15–24 years in southern Africa. Reported HIV prevalence was too low to find significantly different levels of impulsiveness by HIV serostatus. Furthermore, risky sexual behaviors such as having multiple sexual partners and unprotected sex, both statistically associated with impulsiveness, may lead to higher risk of HIV and eventual acquisition.

Impulsiveness could be used to target girls for sexual health and HIV prevention programming. Interventions that emphasize mindfulness techniques, which have been used successfully to improve impulsiveness in other settings,¹⁰ may be considered and adapted to this context.

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