

Associations between impulsiveness, sexual behavior and STI/HIV outcomes among out-of-school adolescent girls and young women in southern Malawi

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Extended abstract

Background

Links between personality traits such as impulsivity, risky behaviors and negative health outcomes have been studied among young people in the developed world (Kahn, Kaplowitz et al 2002; Charnigo et al 2013) and among high risk populations such as alcohol and drug abusers, sexual and other offenders, and HIV-infected people (Devieux et al 2002; Giotakos 2003). In East and Southern Africa, the region most affected by HIV, these links have rarely been investigated and particularly among young populations. As young women in this region are most affected by HIV (UNAIDS 2016), it is important to seek a deeper understanding of the factors that put adolescent girls and young women at risk of HIV.

Risk-taking behavior among young people is in part driven by their psychological profile, including their ability to regulate impulses (Stanford et al 1996; Romer 2010). Impulsiveness is a trait exhibited at an early age (Caspi and Silva 1995; Caspi, Henry et al 1995; Caspi, Moffitt et al 1996) that appears in most cases to decline steadily from age 10 (Steinberg 2010). Young females who have not fully developed their capacity for self-control will tend to make decisions with little thought or planning. For example, 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 sexually transmitted infections (STI). Further, in a context like Malawi where only 38.6% of young females aged 15–24 have completed primary school (NSO Malawi and ICF 2017), impulsiveness can also lead to early school dropout, potentially as a result of early sexual initiation and pregnancy. Existing literature suggests that out-of-school adolescents are at higher risk of HIV and other STIs (Hargreaves, Morison, et al 2008; Santelli et al 2015), although the mechanism of increased risk for out-of-school girls is not fully understood.

Data and Methods

This paper uses recently collected cross-sectional data from a sample of 766 out-of-school adolescent girls and young women (AGYW) aged 15–24 living in southern Malawi to investigate associations between a measure of impulsiveness, sexual behavior and STI/HIV outcomes. The data come from the second round of a cross-sectional survey that is taking place in five districts of southern Malawi –Blantyre, Chikwawa, Mangochi, Mulanje, and Phalombe. The data is being used to monitor and evaluate a USAID-supported program to reduce new HIV infections and alleviate the impact of HIV among at-risk populations. The survey includes a representative sample of out-of-school AGYW aged 15–24. A sampling frame of health facility catchment areas was identified using GIS and census population data across the five districts. A total of 24 catchment areas were randomly selected, proportional to population size. A catchment area

was defined as all census enumeration area clusters within five kilometers around the health facility. Within each selected catchment area, three census enumeration areas (CEAs) were randomly selected. A household screening was implemented between May-August 2018. Surveys among out-of-school adolescents were conducted in the same CEAs between July-September 2018. Households with out-of-school AGYW aged 15–24 were identified from the household screening and a sample of 957 households was randomly selected, stratified by EA, to participate in the round 2 survey. Of these households, 120 were found not to be eligible. In households with more than one eligible AGYW, one respondent was randomly selected. A total of 766 out-of-school AGYW aged 15–24 were successfully interviewed, representing 91.5% of eligible households.

The AGYW survey instrument includes an extensive set of questions, including among others: basic demographics, household wealth and economic and food insecurity, self-reported HIV testing experience and status, sexual behavior, attitudes toward violence, gender/social norms, social support and psychosocial wellbeing, perceptions around community social cohesion and collective efficacy. The round 2 instrument also included a module to measure impulsiveness based on the Barratt Impulsiveness Scale (BIS), which is one of the most widely used instruments to assess impulsiveness (Stanford et al 2009), as well as a module to measure attitudes toward risk and ambiguity on financial and health related decisions. The impulsiveness scale included the 30 items in the BIS-11 scale (Stanford et al 2009), adapted to the local context. In each item, 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 while/occasionally, often or always/almost always. Responses were scored 1-4, with higher scores representing more frequent impulsive actions/thoughts. The household screening and survey methods and procedures were reviewed by the University of Malawi, College of Medicine Research Ethics Committee and the Population Council Institutional Review Board.

Analysis methods and preliminary results

Cronbach’s alpha for internal consistency of the impulsiveness scale among the sample is 0.84, suggesting high reliability. The individual items’ scores were summed and the score standardized to have a mean of 0 and standard deviation (SD) of 1.

The paper first assesses adjusted associations between impulsiveness and schooling attainment and literacy; potential precursor impacts to the sexual and STI/HIV outcomes. It then investigates whether impulsiveness is associated with sexual behavior indicators (ever had sex, first sex before age 15 and total 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), and STI/HIV indicators (had an STI or STI symptoms in the past 12 months, ever tested for HIV and self-reported HIV status). Logistic and linear multivariate regression models are used as appropriate to control for respondents’ characteristics, and in the models for STI/HIV also control for sexual behavior indicators. All regression models are clustered at the CEA level. All statistical analysis is conducted with Stata 15.1.

Figure 1 shows the distribution of the impulsiveness score among the sample of out-of-school AGYW aged 15–24, and **Table 1** presents means of key respondent’s characteristics by impulsiveness levels: low (scored below -1 SD), average (scored within -1 SD and +1 SD), and high (scored above +1 SD). Results from multivariable linear regression models (not included in this abstract) show that impulsiveness is negatively associated with grade attainment (coef=-0.053, $p<0.01$), being literate (coef=-0.215, $p<0.05$) and household wealth (coef=-0.041, $p<0.05$).

Table 2 presents means of lifetime and recent sexual behavior indicators as well as STI/HIV indicators by impulsiveness levels. **Table 3** presents results from bivariate and multivariate regressions estimating associations between the impulsiveness z-score and each sexual behavior and STI/HIV indicator. The first column shows results from the bivariate models, the second column shows results from the adjusted models controlling for respondents' characteristics, and the third column shows results from adjusted models that also control for the following sexual behavior indicators: lifetime sexual partners, first sex before age 15, and recent unprotected sex with non-marital partner.

Results indicate that among out-of-school AGYW, impulsiveness is statistically significantly associated with higher odds of having initiated sex before age 15 (OR=1.31, $p<0.05$), higher number of lifetime sexual partners (coef=0.09, $p<0.05$) and higher odds of having had more than one sexual partner in the past six months (OR=1.31, $p<0.05$). Impulsiveness is also statistically significantly associated with higher odds of having had a STI/symptoms of STIs in the past 12 months (OR=1.57, $p<0.001$), lower odds of having been tested for HIV (OR=0.59, $p<0.05$), and higher odds of reporting being HIV positive (OR=1.66, $p<0.05$). No statistically significant associations are found between impulsiveness and recent unprotected sex.

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Figure 1. Distribution of impulsiveness z-scores among out-of-school AGYW aged 15-24

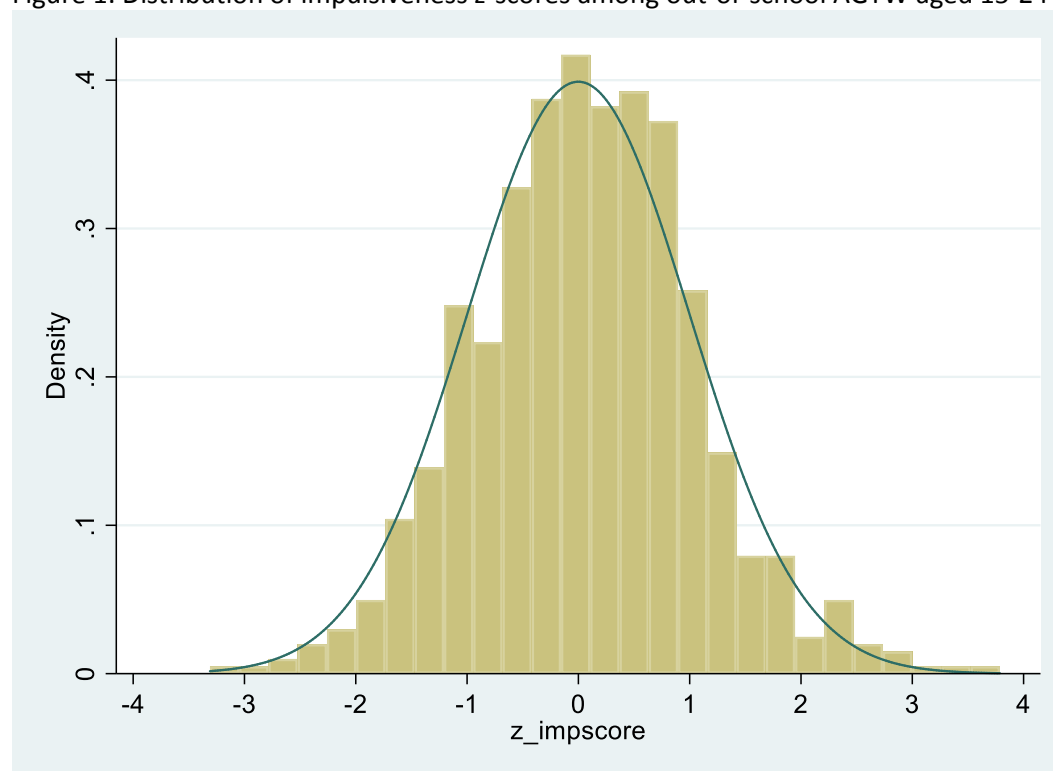


Table 1. Means of key characteristics of out-of-school AGYW aged 15-24, by impulsiveness

	Total (N=766)	By impulsiveness		
		Low (N=123)	Average (N=527)	High (N=116)
Age	20.5	21.0	20.4	20.6
Grade attainment*	5.7	6.8	5.7	4.6
Literate*	65.0%	81.3%	65.1%	47.4%
Marital status				
Never married	17.5%	15.4%	17.5%	19.8%
Currently married/in union	70.5%	74.8%	70.2%	67.2%
Separated/divorced/widowed	12.0%	9.8%	12.3%	12.9%
Ethnic group				
Lomwe	38.0%	39.8%	38.3%	34.5%
Yao	33.6%	27.6%	33.0%	42.2%
Other	28.5%	32.5%	28.7%	23.3%
Count of household assets*	2.5	3.0	2.4	2.3
Worked in the last week	30.8%	28.5%	31.7%	29.3%
Participates in sports, social groups or religious activities	76.4%	78.0%	76.9%	72.4%

* Indicator significantly associated with impulsiveness in multivariable linear regression models (results not shown)

Table 2 Means of sexual behavior and STI/HIV indicators of out-of-school AGYW aged 15-24, by impulsiveness

	Total (N=766)	By impulsiveness		
		Low (N=123)	Average (N=527)	High (N=116)
<u>Lifetime sexual behavior indicators</u>				
Ever had sex	96.6%	97.6%	96.2%	97.4%
First sex younger than age 15 ^a	15.1%	9.8%	14.9%	22.1%
Lifetime sexual partners (linear regression)	1.9	1.8	1.9	2.0
<u>Sexual behavior indicators in past 6 months</u>				
Had sex	78.2%	78.9%	78.0%	78.4%
Had more than one sexual partner	2.6%	0.8%	2.5%	5.2%
Had unprotected sex with a main partner or unprotected last sex	72.5%	71.5%	72.7%	72.4%
Had unprotected sex with a non-marital main partner or unprotected last sex with a non-marital partner	8.2%	6.5%	8.5%	8.6%
<u>STI/HIV indicators</u>				
Had an STI or STI symptoms in past 12 months	14.1%	6.5%	14.2%	21.6%
Ever tested for HIV	94.6%	99.2%	94.5%	90.5%
If received HIV result: HIV positive ^b	2.5%	0.8%	2.6%	3.8%

^aN = 753; ^bN = 724

Table 3 Impulsiveness odds ratios/coefficients from logistic/linear regressions for sexual behavior and STI/HIV indicators

	(1)	(2)	(3)
	OR/Coef	OR/Coef	OR/Coef
<u>Lifetime sexual behavior indicators</u>			
Ever had sex	0.94	1.21	
First sex younger than age 15 ^a	1.40***	1.31*	
Lifetime sexual partners (linear regression)	0.08*	0.09*	
<u>Sexual behavior indicators in past 6 months</u>			
Had sex	1.01	1.15	
Had more than one sexual partner	1.75**	1.59*	
Had unprotected sex	1.03	1.19	
Had unprotected sex with a non-marital partner	1.17	1.04	
<u>STI/HIV indicators</u>			
Had an STI or STI symptoms in past 12 months	1.53***	1.55***	1.57***
Ever tested for HIV	0.60***	0.68†	0.59*
If received HIV result: HIV positive ^b	1.64*	1.65*	1.66*

*** p<0.001, ** p<0.01, * p<0.05, † p<0.1

N = 766; ^aN = 753; ^bN = 724

(1) Bivariate regressions.

(2) Regressions control for age, grade attainment, literacy, marital status, ethnicity, household assets, work and social activities.

(3) Regressions control for all covariates in (2) and lifetime sexual partners, first sex before age 15, and recent unprotected sex with non-marital partner.