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Depression and Sexual Trauma among Adolescent Girls and Young Women in HIV-Prevention Research in Tanzania

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Abstract

Purpose: Clinical trials are necessary to test HIV-prevention strategies among adolescent girls and young women in sub-Saharan Africa. Psychosocial risk factors that increase girls' and young women's vulnerability for HIV may also impact their experiences in clinical trials. A better understanding of psychosocial risks among girls and young women enrolled in HIV-prevention research is needed. This analysis explores depression and sexual trauma among adolescent girls and young women enrolled in a mock microbicide trial in Tanzania.

Methods: We collected cross-sectional data from 135 HIV-negative adolescent girls and young women between 15–21 in Dar es Salaam, Tanzania enrolled in a mock microbicide trial. Depression, sexual behavior, and sexual trauma were measured. Sexual trauma and demographic variables were entered into a multivariate binomial logistic regression model predicting depression.

Findings: Overall, 27% of participants had moderate-to-severe depression. The most commonly endorsed items were anhedonia (lack of interest/pleasure) and low mood, which were reported by 78% of participants. Thoughts of suicide or self-harm were endorsed by 17% of participants. Coerced/forced first sex was reported by 42% of participants. Participants reporting coerced/forced first sex had 3.16 times the likelihood of moderate-to-severe depression.

Conclusions: Depression and coerced/forced sex were common among participants in an HIV-prevention mock clinical trial in Tanzania. When enrolling adolescent girls and young women in HIV-prevention trials in sub-Saharan Africa, our research suggests the need for a trauma-informed approach, referrals for trauma and depression, and interventions that address the impact of depression and trauma on HIV prevention, clinical trial adherence, and clinical outcomes.

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Keywords

mental health; depression; HIV; sexual trauma; clinical trials; Tanzania

Clinical trials to test biomedical HIV-prevention methods among adolescent girls and young women in sub-Saharan Africa are urgently needed (Hosek & Pettifor, 2019; Phillips & Mbizvo, 2016). Approximately 3.6% of 14- to-24-year-old girls across East and Southern Africa are infected with HIV (Brown et al., 2018). Rates of HIV are disproportionately high among adolescent girls and young women. HIV disparities are driven by multiple interacting psychosocial risks experienced by women and girls, such as high rates of sexual trauma and poor mental health, which are associated with HIV-infection and sexual risk behavior (Page & Hall, 2009; Pence et al., 2012; Spies, Konkiewitz, & Seedat, 2018; UNAID, 2014). Conducting clinical trials with young women and girls, a vulnerable population that encounters frequent psychosocial challenges, may present logistical and ethical barriers. For example, in addition to issues of parental consent and confidentiality, researchers must ensure adolescents understand experimental assignment and the benefits and harms of an intervention (Hosek & Zimet, 2010; Pack et al., 2019; Singh et al., 2006). Despite potential difficulties conducting research with adolescents, studies with adolescents are necessary to combat HIV among those most affected by the virus (Nelson, Lewis, Struble, & Wood, 2010; Pomfret, Karim, & Benatar, 2010).

To implement feasible, acceptable, and ethical clinical trials, researchers must investigate mental health and factors such as sexual trauma that could impact recruitment, retention, consent, adherence to intervention procedures, and clinical outcomes. However, little is known about depression or correlates between depression and sexual trauma among girls and young women in HIV-prevention trials in sub-Saharan Africa. For this reason, the present analysis focuses on depression and sexual trauma among girls and young women enrolled in a mock vaginal and oral microbicide trial in Tanzania.

Depression is a global problem that may impact girls and young women in HIV research. Globally, unipolar depressive disorders are the leading cause of disability among girls and women 10-to-24 years old (Gore et al., 2011). Prevalence estimates of clinical depression among adolescents in sub-Saharan Africa range from 36% to 37% (Closson et al., 2016; Neese, Pittman, & Hunemorder, 2013; Kuringe et al., 2019). Symptoms such as suicidal ideation and self-harm may require immediate referrals in clinical trials and are sometimes used as exclusion criteria in psychotherapy research (Fisher, Pearson, Kim, & Reynolds, 2002; Ronconi, Shiner, & Watts, 2014; Stirman, DeRubeis, Crits-Christoph, & Brody, 2003). However, evidence from research on antidepressants suggests excluding individuals with suicidal ideation or severe depression leads to a discrepancy between clinical trial samples and what is actually seen in clinical practice (Zimmerman, Chelminski, & Posternak, 2005). The potential impact of using mental health symptoms as exclusion criteria for HIV research warrants further investigation. Across populations, depression has been linked to poor HIV care engagement, poor healthcare utilization, and poor HIV medication adherence (Byakika-Tusiime et al., 2009; Ramirez-Avila et al., 2012). Treating depression leads to improvements in antiretroviral medication adherence (Sin & DiMatteo, 2014). This research highlights the

possibility that depression may impact clinical trial participation and may be important to address. Lastly, depression is associated with increased sexual risk behaviors and poor clinical outcomes, which makes it an essential factor to consider when examining outcomes of HIV-prevention clinical trials (Ickovics JR, Hamburger ME, Vlahov D, & et al, 2001; Khan et al., 2009).

Forced and coerced sex are common among adolescent girls in sub-Saharan Africa, and trauma may impact HIV-related clinical trials (Closson et al., 2016; Lalor, 2004). Trauma has been linked to depression, poor adherence to HIV care, poor healthcare utilization, poor clinical health outcomes, increased sexual risk behavior, and worse health-related functioning (Closson et al., 2016; Kalichman & Simbayi, 2004; Mugavero et al., 2009; Pence et al., 2012; Raja et al., 2015; Siyahhan Julnes et al., 2016; Suliman et al., 2009). Although growing research shows the importance of gender issues and intimate partner violence on the implementation of pre-exposure prophylaxis and microbicides among women (Doggett et al., 2015), less is known about how past sexual trauma can impact participants when woman-controlled biomedical strategies, such as vaginal microbicides, are used in clinical trials. For these reasons, trauma may be relevant to clinical trial participation.

Objectives

Despite the potential for depression and sexual trauma to impact clinical trials, less is known about the prevalence of these issues or the interrelationship between these factors among HIV-negative adolescent girls and young women in sub-Saharan Africa who would agree to take part in a biomedical HIV-prevention trial. The present analysis of cross-sectional data fills this gap by exploring depression symptoms and the relationship between depression and sexual trauma among girls and young women enrolled in a mock microbicide trial in Tanzania.

Method

Participants

We collected self-report, cross-sectional baseline data from adolescent girls (15–17 years old) and young women (18–21 years old) in Dar es Salaam, Tanzania who were enrolled in a mock microbicide trial. Methods for the mock trial have been previously described (Baumgartner et al., 2015; Tolley et al., 2014). Enrollment criteria included reporting sexual activity in the last three months, not being currently pregnant, and being HIV-negative. Convenience sampling was used with the aim of recruiting participants who would be likely to take part in a real microbicide trial. Recruitment occurred in a range of settings, including youth-focused clinics, schools, other organizations, and public areas where adolescents are known to frequent. Word of mouth and written study brochures were used.

Protection of Human Subjects

Ethical approval was granted by the National Institute for Medical Research (NIMR) and Muhimbili University of Health and Allied Sciences (MUHAS) in Tanzania and FHI 360's Protection of Human Subjects Committee. Participants who were 15 years old provided

written assent with parental consent, and participants older than 15 years old provided written informed consent to take part in the study.

Mental health professionals were available to address suicidality and depression and follow-up with participants as needed.

Procedure

From 2011–2013, we collected quantitative data via interview in Swahili at the Infectious Disease Clinic (IDC) in Dar es Salaam, Tanzania, which provided adolescent-friendly health services. All data collection was completed by Swahili-speaking female research assistants with at least a bachelor's degree. Because the parent study was focused on ethical and legal issues working with adolescents, all staff were trained in the special conduct of research with adolescents (Baumgartner et al., 2015; Tolley et al., 2014). Research was conducted in a private location either at the clinic or in the participant's home, if requested. Interviews took approximately one hour.

Measures

The measures in the present analysis were part of a larger battery of items exploring psychosocial factors among adolescent girls and young women enrolled in a mock microbicide HIV-prevention trial. Per the World Health Organization's recommended translation and adaptation process, the local study team conducted forward and back translations of the psychosocial scales to finalize the survey in Swahili, and scales were pre-tested with adolescent girls (World Health Organization, n.d.).

Depression.—Depression was measured using the Patient Health Questionnaire – 9, a brief, self-administered measure of depression severity (Kroenke, Spitzer, & Williams, 2001). The PHQ-9 has been previously used in East Africa and among adolescents in Tanzania and high-income settings and has shown good reliability and validity (Dow et al., 2016; Gelaye et al., 2013; Monahan et al., 2009; Richardson et al., 2010). In the PHQ-9, participants were asked how often they had been bothered by a series of problems over the last two weeks. Responses could range from 0 = not at all to 3 = nearly every day. Symptoms included (1) little interest or pleasure in doing things; (2) feeling down, depressed or hopeless; (3) trouble falling asleep or staying asleep, or sleeping too much; (4) feeling tired or having little energy; (5) poor appetite or overeating; (6) feeling bad about yourself - or that you are a failure or have let yourself or your family down; (7) trouble concentrating on things, such as reading the newspaper or watching television; (8) moving or speaking so slowly that other people could have noticed, or the opposite - being so fidgety or restless that you have been moving around a lot more than usual; and (9) thoughts that you would be better off dead, or of hurting yourself in some way. A final question asked about the difficulty of functioning due to these problems, with responses ranging from "not difficult at all" to "extremely difficult." A summary score was computed for the nine symptoms of depression, with a score of 1–4 indicating minimal depression, 5–9 indicating mild depression, 10–14 indicating moderate depression, 15–19 indicating moderately severe depression, and 20–27 indicating severe depression (Kroenke et al., 2001). A dichotomous variable was computed for whether a participant had none-to-mild depression (0–9) or

moderate-to-severe depression (10–27). The cut-off of 10 or more has been shown to be the most optimal for accurately diagnosing clinical depression among adults in East Africa and Nigeria, although research with adolescents in high-income settings has provided conflicting findings on whether a cut-off of 8 or 11 provides a better balance of sensitivity and specificity (Adewuya, Ola, & Afolabi, 2006; Gelaye et al., 2013; Richardson et al., 2010).

Demographics.—Participants were asked about their religion, age, highest level of schooling completed, education and employment status, and whether one or both biological parents are still alive.

Sexual behaviors and sexual trauma.—Participants were asked to report on their marriage status, whether they have ever been pregnant, whether they have ever been diagnosed or had the self-reported symptoms of a reproductive tract infection, whether they have ever used contraceptives, the age of their first and current sexual partner(s), and age of sexual debut. Variables were computed to examine if their current or first partners were five or more years older than the participant. Participants were asked how willing they were to have sex for the first time, with the options of willing/wanted, persuaded/coerced, or physically forced/raped. They were also asked this question for the last time they had sex. For analysis, the category of persuaded/coerced was collapsed with physically forced/raped, to create a dichotomous variable of either 1) willing/wanted or 2) coerced/forced.

Statistical Analyses

We completed all statistical analyses using SPSS 25. We examined frequencies and distributions for overall depression severity and responses to individual questions on the PHQ-9. We computed Chronbach's alpha for the PHQ-9 total score. We conducted separate univariate binomial logistic regressions for all predictor variables, with depression severity included as a dichotomous outcome, where scores of 0–9 indicated none-to-mild depression and scores of 10–27 indicated moderate-to-severe depression. Key demographic variables and those variables that were significant in the univariate models at $p < .05$ were included in a final multivariate model, with all predictors entered into the binomial logistic regression model simultaneously using the standard selection method. Because first sex coerced/forced was a significant predictor of depression severity, we conducted chi-square tests, Fisher's exact tests, and univariate ANOVAs to explore demographic characteristics of participants who reported coerced/forced first sex compared to participants whose first sex was willing/wanted. P-values were set to .05, and 95% confidence intervals are reported throughout. Missing data was minimal and was handled using listwise deletion, which excludes cases with missing data.

Results

The final sample included 135 adolescent girls and young women. Demographic information can be found in Table 1.

Frequency and distribution outcomes for depression severity and responses to individual symptoms of depression are reported in Table 2. Overall, 27% of participants met the criteria

for moderate-to-severe depression with a score of 10 or above on the PHQ-9. The mean PHQ-9 score of 7.87 falls into the “mild depression” range.

The most commonly endorsed items were “little interest or pleasure in doing things” and “feeling down, depressed, or hopeless.” For each of these items, 78% of participants responded at least “several days” or more. The least commonly endorsed item was “thoughts you might be better off dead, or of hurting yourself,” which was endorsed by 17% of participants. Of the 98 participants with no/minimal or mild depression, 8% (n = 8) endorsed suicidality or thoughts of self-harm several days, and 2% (n = 2) reported suicidality or thoughts of self-harm more than half of the days. Figure 1 shows mean scores on each of the nine PHQ-9 items.

Results from the series of univariate binomial logistic regression models can be found in Table 3. Of the predictive variables, only first sex coerced/forced was a statistically significant predictor of depression, with participants having a coerced/forced first sexual experience being 3.09 times more likely to have moderate-to-severe depression, X^2 (1, N = 135) = 8.26, p = .004). Highest year of school completed trended on significance (p = .083), with higher years of school predicting smaller likelihood of moderate-to-severe depression.

The four-predictor model including age, highest year in school, relationship status, and first sex forced significantly predicted whether an individual had moderate-to-severe depression, X^2 (4, N = 135) = 12.611, p = .013). Partial regression coefficents, standard errors, the Wald test, odds ratios, and confidence intervals are presented in Table 4. Nagelkerke pseudo R^2 suggests the model accounts for about 13% of the variance in depression. With a classification cutoff value of .500, 72.6% of cases were correctly predicted, although rates varied by outcome, with 93.9% of individuals in the none-to-mild group predicted correctly and 16.2% of individuals in the moderate-to-severe group predicted correctly. When controlling for other variables in the model, first sex coerced/forced predicted depression, with participants reporting a coerced/forced first sexual experience having 3.16 times the likelihood of moderate-to-severe depression compared to participants whose first sex was willing/wanted. All else held constant, highest year of school completed trended toward significant association with depression; for a year increase in the highest year of school completed, participants had .82 times the likelihood of moderate-to-severe depression, indicating greater number of years in school may relate to lower likelihood of depression.

Overall, 42% of participants reported a coerced/forced first sexual experience. Those participants whose first sex was coerced/forced were not significantly different in age (p = .636), highest education level completed (p = .919), age at first sex (p = .503), or employment/student status (p = .517) compared to those whose first sex was willing/wanted. Eighty-six percent (86%) of participants whose first sex was coerced/forced were married or had a regular partner, whereas 97% of participants whose first sex was willing/wanted were married or had a regular partner, which shows a statistically significantly relationship between current relationship status and whether first sex was coerced/forced (Fisher’s Exact Test, Two-Sided = .018). Fourteen percent (14%) of participants whose first sex was coerced/forced reported that their last sexual experience was coerced/forced, compared to

2.6% of participants whose first sex was willing/wanted, which was statistically significant (Fisher's Exact Test, Two-Sided = .018).

Conclusions for Practice

Secondary analyses were conducted on baseline data from a mock vaginal and oral microbicide trial among HIV-negative, non-pregnant, and sexually active adolescent girls and young women in Tanzania to examine depression symptoms and the relationships between depression and sexual trauma. Findings suggested concerning rates of moderate-to-severe depression (27%), thoughts of suicide and self-harm (17%), and forced/coerced first sexual experiences (42%). In both a univariate model and a multivariate model controlling for demographic variables, depression severity was predicted by first sex forced/coerced, with participants whose first sexual experience was forced being over 3 times more likely to have moderate-to-severe depression. A multivariate model including first sex forced/coerced and other demographic variables accounted for approximately 13% of the variance in depression severity.

Not every participant who reported thoughts of suicide or self-harm met the criteria for moderate-to-severe depression. Suicidality and completed suicide without major depression has been found in other studies and highlights the multiple causes of suicidal ideation (Rhodes & Bethell, 2008). In prior research, PHQ item 9, which asks about suicidality and self-harm, was a strong predictor of suicide attempts (Simon et al., 2013). For this reason, particular attention should be paid to responses on item 9 of the PHQ-9 when considering risk for suicide or self-harm. This consideration may be important to researchers who are choosing between the PHQ-2 and the PHQ-9. The PHQ-2 only includes the first two questions of the PHQ-9, which pertain to anhedonia and low mood. When we examined responses on just the first two items of the PHQ-9 using a cutoff score of 3 for "further screening recommended," 28% of our sample would have met the criteria, which is only 1 point more than the 27% who had moderate-to-severe depression using all nine items of the PHQ-9 (Monahan et al., 2009). However, the risk for suicide among 10 participants would be missed when using just these two items. For this reason, researchers should carefully consider whether to add a separate question on suicidality when using the PHQ-2.

Our findings provide suggestions for researchers hoping to enroll HIV-negative adolescent girls and young women in clinical trials in sub-Saharan Africa. First, researchers should be aware of the significant rate of depression and sexual trauma in this group, be ready to provide referrals for care, and have an action plan for handling suicidality or cases where there is risk of imminent harm that follows local confidentiality laws, reporting requirements, and professional ethics codes while protecting the rights and well-being of participants. Ideally, same-day psychosocial counseling should be provided to high-risk individuals. The World Health Organization's mhGAP Intervention Guide 2.0 for mental health disorders in non-specialized health settings provides assessment and management guides for depression and suicide that could be used as screening, referral, and treatment planning tools by both mental health professionals and non-specialists in clinic settings (World Health Organization, 2016).

When including participants who have experienced sexual trauma, a trauma-informed approach should be taken, particularly when research involves the vaginal delivery of microbicides or gynecological exams (Stadler, Delany-Moretlwe, Palanee, & Rees, 2014). Prior research on this sample showed high rates of familial violence, which also should be taken into consideration (Baumgartner et al., 2015). There is evidence for the effectiveness of trauma-informed HIV-related interventions both globally and in sub-Saharan Africa (Sales, Swartzendruber, & Phillips, 2016). However, there is a need for interventions that focus specifically on trauma and the use of intravaginal medications.

Although researchers may want to exclude individuals with depression, sexual trauma, or suicidal ideation from HIV-prevention trials, researchers should think about the implications for generalizability if they exclude these individuals, as the present study indicates this criteria would exclude a considerable percentage of potential participants.

Further research is needed on the impact of depression, sexual trauma, and the intersection of these two issues on clinical trial participation, understanding of consent, and adherence to biomedical interventions. Interventions that have a dual component to treat mental health issues in tandem with biomedical HIV prevention methods may be warranted.

Limitations

The present analysis was cross-sectional, so causality cannot be inferred, and it is possible that important confounding variables were not included in the model. However, forced/coerced first sex occurred in the past, whereas scores on the PHQ-9 referred to symptoms over the past 2 weeks, so forced/coerced first sex preceded current symptomology.

Our study was designed to focus on the unique population of girls and young women who would take part in a microbicide trial. As such, our findings are not generalizable to the entire population of girls and young women in Tanzania. Although our study included more Muslim participants than would be expected according to country-level demographics, we expect that our sample was more reflective of the demographic characteristics of Dar es Saalam (Anthony, 2002; Stark, 2018).

One limitation of the present analysis is that it was a secondary analysis, so although an a priori power analysis was conducted for the original mock trial outcomes, the sample size for the present analysis was pre-determined based on available data.

Internal reliability for the PHQ-9 was moderate, which was lower than previous studies (Monahan et al., 2009). We do not know whether the low reliability was due to cultural differences in the presentation of depression symptoms or another reason, although the measure was translated, back-translated, and pre-tested to ensure the items were understandable and relevant with adolescent girls and young women. One study from the United States did show that reliability could vary by ethnicity (Huang, Chung, Kroenke, Delucchi, & Spitzer, 2006). Future research that employs cognitive interviewing with the PHQ-9, factor analyses with larger samples, or repeated longitudinal administration of the PHQ-9 could be useful to understand the reliability of this measure among adolescent girls and young women in Tanzania (Drennan, 2003). Nevertheless, our finding that 27% of

participants had moderate-to-severe depression is in line with previous research, which provides evidence for the validity of this measure (Closson et al., 2016).

Conclusions

This study provided evidence of high rates of depression among adolescent girls and young women enrolled in HIV-prevention research, which was associated with having a coerced/forced first sexual experience. By carefully considering the impact of depression and sexual trauma on girls and young women, we can more readily develop adolescent-friendly HIV-prevention clinical trials.

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Significance

Depression symptoms were common among girls and young women ages 15–21 enrolled in HIV-prevention research in Tanzania. Participants reporting coerced/forced first sex were more likely to experience moderate-to-severe depression. Both depression and sexual trauma are important to consider when enrolling adolescent girls and young women in HIV-prevention trials.

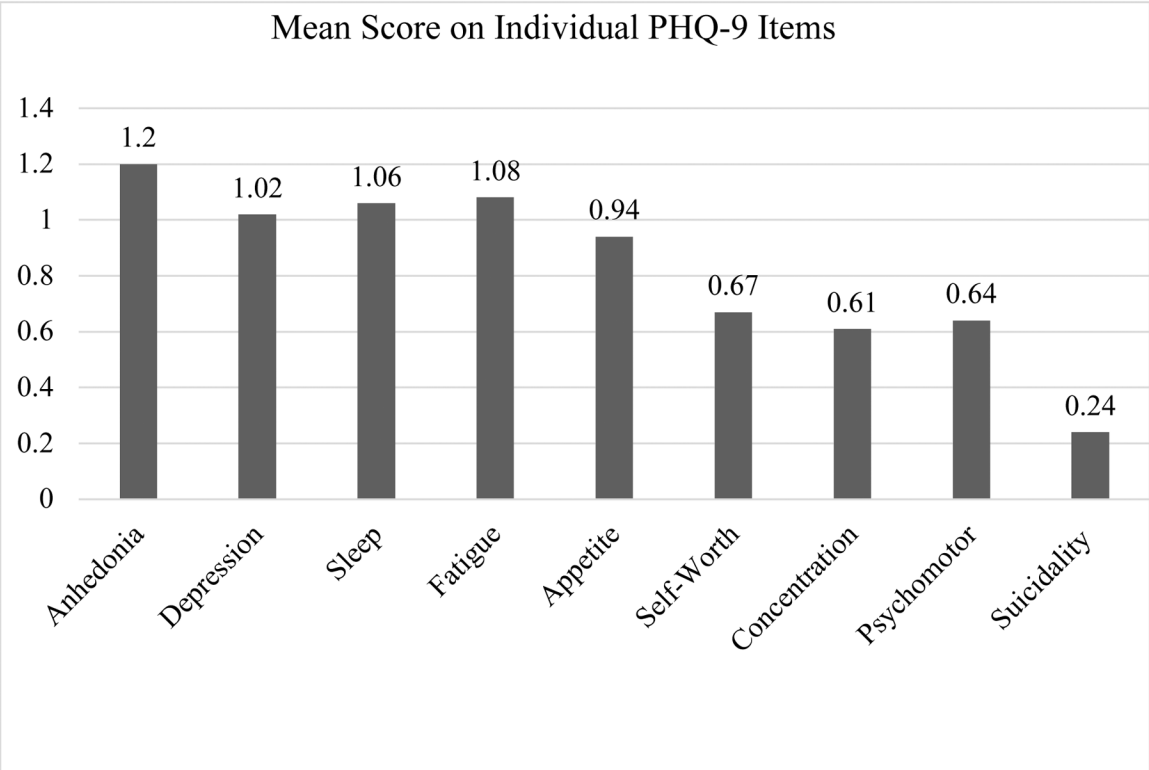

Figure 1. Mean Score on Individual PHQ-9 Items

Mean scores on items 1–9 of the Patient Health Questionnaire – 9, a measure of depression symptoms. Scores for individual items could range from 0–3.

Table 1

Demographic Characteristics

Variable	*M* (*SD*)
Age	18.38 (1.634)
Religion	% (*n*)
Muslim	53.3 (72)
Catholic	35.6 (48)
Protestant	8.9 (12)
Education	
Some Primary	5.2 (7)
Completed Primary	37 (50)
Some Secondary School	57 (77)
Secondary or Post-Secondary School	7 (1)
Employment	
Not Attending School & Unemployed	52.6 (71)
Student	19.3 (26)
Paid Employment	28.1 (38)
Had prior Pregnancy	33.3 (45)
Married	4.4 (6)
Last Sexual Encounter Coerced/Forced	7.4 (10)
First Sexual Encounter Coerced/Forced	42.2 (57)

[a] *M* = Mean, *SD* = Standard Deviation

Table 2

Endorsement of Depression Symptoms and Depression Severity among Adolescents Ages 15–21 Participating in a Mock Clinical Trial in Dar es Salaam, Tanzania

Variable	Descriptive Statistics
Depression Severity	% (*n*)
None/Minimal (0–4)	17.77 (24)
Mild (5–9)	54.81 (74)
Moderate (10–14)	22.22 (30)
Moderately Severe (15–19)	4.44 (6)
Severe (20–27)	74 (1)
Mean PHQ-9 Total Score	7.87 (*SD* = 4.06; range = 0–24, α = .64)
Little interest or pleasure	M = 1.20 (SD = .98)
Not at all (0)	22.22 (30)
Several days (1)	55.55 (75)
More than half the days (2)	4.44 (6)
Nearly every day (3)	17.77 (24)
Feeling down, depressed or hopeless	M = 1.02 (SD = .74)
Not at all (0)	21.48 (29)
Several days (1)	60.74 (82)
More than half the days (2)	11.85 (16)
Nearly every day (3)	5.18 (7)
Trouble sleeping or sleeping too much	M = 1.06 (SD = .93)
Not at all (0)	28.88 (39)
Several days (1)	49.62 (67)
More than half the days (2)	9.62 (13)
Nearly every day (3)	11.85 (16)
Feeling tired or having little energy	M = 1.08 (SD = .85)
Not at all (0)	22.96 (31)
Several days (1)	54.07 (73)
More than half the days (2)	14.07 (19)
Nearly every day (3)	8.82 (12)
Poor appetite or overeating	M = .94 (SD = .86)
Not at all (0)	30.37 (41)
Several days (1)	52.59 (71)
More than half the days (2)	6.66 (9)
Nearly every day (3)	8.88 (12)
Feeling bad about yourself	M = .67 (SD = .72)
Not at all (0)	43.70 (59)
Several days (1)	48.14 (65)
More than half the days (2)	5.18 (7)
Nearly every day (3)	2.96 (4)
Trouble concentrating	M = .61 (SD = .89)

Variable	Descriptive Statistics
Not at all (0)	59.25 (80)
Several days (1)	27.40 (37)
More than half the days (2)	6.66 (9)
Nearly every day (3)	6.66 (9)
Moving too slowly or a lot	M = .64 (SD = .89)
Not at all (0)	56.29 (76)
Several days (1)	32.59 (44)
More than half the days (2)	2.96 (4)
Nearly every day (3)	8.14 (11)
Thoughts you might be better off dead, or of hurting yourself	M = .24 (SD = .63)
Not at all (0)	82.96 (112)
Several days (1)	11.85 (16)
More than half the days (2)	2.22 (3)
Nearly every day (3)	2.96 (4)
Difficulties Doing Activities Due to Problems	
Not difficult at all	60 (81)
Somewhat difficult	33.33 (45)
Very difficult	2.22 (3)
Extremely difficult	2.22 (3)

[a]M = Mean, SD = Standard Deviation

Table 3

Bivariate Logistic Regression Models Predicting Moderate-to-Severe Depression

Variable(s)	% (*n*) within variable category		OR	95% CI	*P*
	None-Mild Depression	**Moderate-Severe Depression**			
Age	*M* = 18.31	*M* = 18.57	1.10	.87, 1.40	.406
Highest year school	*M* = 8.98	*M* = 8.30	.85	.70, 1.02	.083
Student status			2.39	.76, 7.48	.135
Current Student	85 (22)	15 (4)			
Non-Student	70 (76)	30 (33)			
Age at first sex	*M* = 15.96	*M* = 15.84	.95	.76, 1.21	.695
Age of current/last partner			1.03	.45, 2.35	.951
< 5 years older	73 (51)	27 (19)			
5+ years older	72 (34)	28 (13)			
Marriage Status			2.79	.54, 14.51	.222
Never Married	74 (95)	26 (34)			
Currently? Married	50 (3)	50 (3)			
Pregnancy History			1.12	.50, 2.48	.785
Never Pregnant	73 (66)	27 (24)			
Ever//current? Pregnant	71 (32)	29 (13)			
Contraceptive Use History			.57	.24, 1.40	.224
Never Used	63 (17)	37 (10)			
Ever Used	75 (80)	25 (27)			
RTI History			2.06	.82, 5.17	.126
No RTI history	76 (74)	25 (24)			
Had RTI	60 (15)	40 (10)			
Orphan Status			1.31	.61, 2.83	.489
Both parents alive	75 (62)	25 (21)			
1 or both parents died	69 (36)	31 (16)			
Age of First Sex Partner			2.02	.59, 6.68	.260
< 5 years older	74 (82)	26 (29)			
5+ years older	58 (7)	42 (5)			
Relationship Status			1.86	.49, 7.00	.360
Has Partner	74 (92)	26 (33)			
Single	60 (6)	40 (4)			
Last Sex Forced			2.91	.79, 10.70	.109
Willing/wanted	74 (93)	26 (32)			
Coerced/forced	50 (5)	50 (5)			
First Sex Forced *			3.09	1.41, 6.77	.005 *
Willing/wanted	82 (64)	18(14)			
Coerced/forced	60 (34)	40 (23)			

[a] Percents are rounded to the nearest whole value,

* = P < .05

Table 4.

Final Multivariate Logistic Regression Model Predicting Moderate-to-Severe Depression

Variable (n)	*B*	*SE B*	Wald	*P*	Adjusted OR	95% CI
Age	.13	.13	1.02	.313	1.14	.89, 1.46
Highest Year School	−.20	.10	3.68	.055	.82	.67, 1.00
Relationship Status	.02	.71	.00	.975	1.02	.25, 4.12
First Sex Coerced/Forced	1.15	.42	7.63	.006	3.16	1.40, 7.15

[a]The dependent variable was depression categorization, with moderate-to-severe depression as the target category and none-to-mild depression as the reference category; girls without a regular partner were the focus of the Relationship Status variable; girls whose first sex was coerced/forced were the focus of the First Sex Forced variable.

[b]Nagelkerke R^2 = .13.