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Depressive symptoms and HIV among a cohort of adolescent young men and transgender women who have sex with men, Bangkok and Nakhon Sawan, Thailand, 2017–2019

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Abstract

Screening for depression may identify persons for HIV prevention services and to ensure linkage to care for ART and mental health. We assessed factors associated with depressive symptoms using multiple logistic regression among 15- to 29-year-old gay, bisexual or other men who have sex with men (MSM) and transgender women who have sex with men (TGW) attending HIV prevention clinics at Silom Community Clinic or Bangrak Hospital in Bangkok or Rainbow Clinic in Nakhon Sawan, Thailand. We defined depressive symptoms as a self-report of feelings of sadness that impacted daily life in the past one month. Among 192 MSM, 51 TGW, and 11 gender-questioning persons screened: 12.6% met the criteria for depression; 5.9% had new HIV diagnosis. Independently associated factors which increase the risk of depressive symptoms included: studying in a private school (AOR 7.17); experiencing any type of bullying (AOR 2.8); having a partner with HIV (AOR 4.1); and learning about the study from sources other than a friend (AOR 4.2). Given many youths had depressive symptoms, screening for depression and connection to mental health services would be beneficial in sexual health settings to meet the needs of HIV-vulnerable youth.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

Disclaimer

The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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Keywords

HIV; adolescent; depressive symptoms; men who have sex with men; transgender women; Thailand

SUSTAINABLE DEVELOPMENT GOALS

SDG 3: Good health and well-being

Introduction

Psychosocial factors, such as depression, are associated with an increased risk of HIV acquisition in Thailand and other settings (Guadamuz et al., 2014; Sun et al., 2020), particularly among youth (Coker et al., 2010; van Griensven et al., 2004). Homophobia, stigma, and discrimination negatively impact psychosocial health among gay and bisexual men (Centers for Disease Control and Prevention [CDC], 2016). The burden of depression is considerably higher in men who have sex with men (MSM).

One study in Thailand and Brazil reported that depressive symptoms were common in both MSM (40%) and transgender women (TGW) who have sex with men (51%) (Poteat et al., 2020). Another study reported that higher numbers of psychosocial health conditions were associated with a history of forced sex, social isolation, suicidal thoughts or actions, “club” drug (i.e., ecstasy, ketamine, methamphetamine, and Gamma-hydroxybutyrate) use, alcohol intoxication, and selling sex among MSM and TGW in Bangkok, Thailand (Guadamuz et al., 2014). A study of adolescents in northern Thailand reported that a significantly higher proportion of males identifying as homosexual or bisexual had signs of depression compared to heterosexual males, (MSM: 30.8%; heterosexual: 13.6%; $p < 0.001$) (van Griensven et al., 2004). Additionally, TGW experience depression at higher rates than the general population (Hoffman, 2014). Among sexual minority adolescent males, depression and other psychosocial issues are associated with engaging in risk-taking behaviours, such as having sex without a condom, which increases the likelihood of acquiring HIV (Liu et al., 2020; Perry et al., 2019). A study among persons with diagnosed HIV infection in South Africa found that depression is a significant barrier to ART initiation (Truong et al., 2021) and another study found mental health screening around the time of HIV testing may improve linkage to care (Truong et al., 2021).

Characterizing the psychosocial health of youth at risk for HIV is important for providing tailored support for optimal HIV prevention to this population (Miltz et al., 2019). However, only a limited number of studies have been conducted in Southeast Asia. To assess the importance of integrating mental health screening and services with HIV prevention, we evaluated behavioural and psychosocial factors, including depressive symptoms, among young MSM and TGW screened for a cohort study in Thailand.

Methods

Adolescents and young men aged 15–29 years who were male sex at birth and identified as male, female, or questioning their sexual identity, were a resident of Bangkok or neighbouring provinces (Pathum Thani, Nonthaburi, Samut Prakarn, and Nakhon Pathom) or Nakhon Sawan province, and reported sexual interest in or having had oral or anal sex with another man during the past six months were invited to the study at three sites in Thailand: Silom Community Clinic (SCC, a non-governmental setting with a provider-client service delivery model) and Bangrak Hospital (BH) in Bangkok (a governmental setting with a provider-client service delivery model); and Rainbow Clinic (RC, a governmental setting with peer-driven community outreach) in Nakhon Sawan which is, approximately 243 km north of Bangkok.

A two-step enrollment process was performed during August 2017–July 2018. In the first step, interested persons who provided informed consent answered demographic, and behavioural questions about the preceding 3 months including questions about having experienced depression using computer-assisted self-interview (CASI). They underwent rapid HIV antibody testing (Alere Determine™, Abbott, Inc., Japan). HIV-reactive test results were confirmed by two alternative rapid HIV antibody tests (SD-Bioline™, Standard Diagnostics, Inc., Korea, and One Step Anti-HIV (1&2) ™, InTec Product Inc., P.R. China), in accordance with Thai national HIV testing algorithm. If all three rapid tests were reactive, the person was provided with these results and given post-test counselling, and if HIV-positive, the person was actively linked to HIV care and treatment according to Thai national guidelines. If the rapid tests were inconclusive, an HIV nucleic acid amplification test (NAAT) was performed on a second sample taken after the initial blood draw on the same day to test for acute HIV.

In the second step, HIV-negative persons were invited to participate in a 12-month longitudinal Young MSM cohort study (YMSM study) (Figure 1), which included regular clinical visits at three-month intervals. SCC offered daily oral HIV pre-exposure prophylaxis (PrEP) with tenofovir disoproxil fumarate/emtricitabine to all cohort participants at its site; BH and RC (supported by the Ministry of Public Health) did not offer PrEP since this was not standard of care at these clinical sites during the study period. Cohort participants underwent a physical examination at baseline. Every 3 months, they completed a CASI to collect psychosocial and behavioural data, and were tested for HIV. In addition, participants initiating PrEP completed a CASI to collect data on PrEP use during the prior seven days and one month.

We defined adolescents as persons aged <18 years. The presence of depressive symptoms was defined as responding “Yes” to both of the following questions: “Have you ever felt very sad, very depressed, excessively tired, or excessively stressed in the past one month?”; and “Does this affect your daily life?” Bullying was defined as reporting feeling one or more of the following: neglected; ignored; or bullied, disrespected, or looked down on in any school, healthcare, family, or community setting.

Acceptance of gender identity and sexual orientation was defined as responding “Yes” to the following questions: “Do you have at least one member in your family who knows and accepts who you are as [your gender identity (male/TGW/Not sure)] and [sexually attractive to (man/woman/TGW/Not sure)]?” All questions were reviewed and approved by representatives of the young Thai MSM and TGW community. PrEP adherence among participants in the longitudinal cohort who took PrEP was defined as a self-report of taking at least four doses of daily oral PrEP during the preceding seven days and skipping <5 days of daily oral PrEP during the preceding one month.

Statistical analyses

Categorical variables were described using frequencies and percentages. Continuous variables were described using median and range. We calculated the prevalence and exact binomial 95% confidence intervals (CIs) for prevalent HIV and depressive symptoms at the first step (screening). The difference between proportions was calculated using Z-test or Chi-square Fisher Exact test where appropriate. We used bivariate analysis to evaluate factors associated with self-report of depressive symptoms. Variables with $p \leq 0.10$ in the bivariate analysis were included in the multivariable logistic regression analysis. We used a manual backward likelihood ratio test with $p < 0.05$ to determine the factors in the final multivariable model. We tested for interactions among the factors included in the final model. Where appropriate, subgroup analysis by demographic characteristics of associated factors was described. The baseline HIV prevalence analysis included all persons who had completed the first step.

The HIV incidence analysis included all participants enrolled in the longitudinal cohort and had had at least one follow-up visit (second step). Exact Poisson 95% CIs were calculated for HIV incidence per 100 person-years (PY) based on Poisson distribution. We used Cox regression to assess the relationship between depressive symptoms and incident HIV infection. We performed all analyses using SAS 9.4 (SAS Institute Inc., Cary, NC, USA).

Results

Characteristics at baseline

Baseline characteristics—Demographic characteristics of the 254 persons who participated in the first step from August 2017 to July 2018 are presented in Table 1. Of the 254 persons screened from August 2017 to July 2018, the majority (76.8%) were aged ≥18 years, and 59 (23.2%) were aged 15 to <18 years. Self-identified gender identity among the persons screened was as follows: 192 (75.6%) as MSM; 51 (20.1%) as TGW; and 11 (4.3%) as unsure about their gender identity. Among these 254 persons, 106 (41.7%) answered “None,” 39 (15.3%) answered “Not sure”, and 109 (42.9%) answered “Some/High” to the question “What level of risk do you think you have for STI infection?”

Similarly, 123 (48.4%) answered “None,” 40 (15.7%) answered “Not sure”, and 91 (35.8%) answered “Some/High” to the question “What level of risk do you think you have for HIV?”.

Among the 59 adolescents screened, 50 (84.7%) were aware of the Thai Ministry of Public Health’s recommendation that adolescents be able to access HIV/STI services without

parental permission. Of the 50 adolescents who were aware of this recommendation, none tested positive for HIV. Only 12 (24.0%) had ever been tested for HIV, of whom 10 (83.3%) had been tested within the past 12 months.

Among the 254 total persons screened, 19 (7.5%) reported using any one or more of the following illicit drugs in the past 3 months: marijuana, methamphetamine, amyl nitrite, ecstasy, or ketamine. The overall rate of any illicit drug use was similar across study sites, with 7.4% overall illicit drug use in the Bangkok sites combined, and 7.6% overall illicit drug use in the Nakhon Sawan site.

Psychosocial characteristics—Of the 254 persons screened, 210 (82.7%) reported that at least one family member was aware and accepting of their gender identity and sexual orientation, and 241 (94.9%) reported having at least one friend accepting of their gender identity and sexual orientation. During the past year, 43 (16.9%) of the screened persons experienced bullying in various settings, 10 (3.9%) were forced to have unwilling sex, and 15 (5.9%) were verbally or physically abused by their sex partner in the past 3 months. Of all screened persons, 32 (12.6%) reported depressive symptoms.

Among the 19 screened persons who reported using illicit drugs in the past three months, 5 (26.3%) reported depressive symptoms, while 26 of the 228 (11.4%) persons indicating no use of illicit drugs reported depressive symptoms ($p = 0.07$).

Depressive symptoms and factors—Multivariable analysis revealed that the 32 participants attending private schools were more likely to experience depressive symptoms than the 216 participants in government or non-formal education programmes (40.6% vs. 8.3%, respectively; adjusted odds ratio [aOR] 7.1, 95% CI: 2.7, 18.7) (Table 1). The majority of those with depressive symptoms who attended a private school were from sites in Bangkok (28/32, 87.5%), most of whom (15/28, 53.6%) were not living with family.

Screened persons who experienced bullying in various settings during the year preceding the screening visit were more likely to report depressive symptoms (aOR 2.8, 95% CI: 1.1, 7.1). Additionally, screened persons who during the past three months had a sex partner with HIV, or a sex partner whose HIV status was unknown, were more likely to report depressive symptoms (aOR 4.1, 95% CI: 1.7, 9.9) (Table 1). Among the 22 (68.7%) with depressive symptoms and a sexual partner with HIV or unknown HIV status, 20 (90.9%) reported having at least one episode of anal sex without a condom in the past three months.

Those who did not learn about the study from a friend were also more likely to report depressive symptoms than those who did (aOR 4.2, 95% CI: 1.6, 10.8) (Table 1).

Among the 59 adolescents, 42 (71.2%) learned about the study from friends, compared to 107 (54.9%) of persons aged 18–29 years ($p = 0.034$).

Comparing the screened adolescents with screened young adults, age was not significantly associated with experiencing bullying (15.2% vs. 17.4%, 95% CI: 6.1, 24.4 for screened adolescents versus 12.1, 22.8 for screened young adults; $p = 0.695$). However, among the 59 adolescents screened, TGW were more likely to report having been bullied in the past

year than other gender identities (i.e., MSM and unsure) (TGW: 54.5%, 6/11, 95% CI: 23.4, 83.2, versus MSM and unsure: 6.2%, 3/48, 95% CI: 1.3, 17.2 ($p = 0.0001$)). There was no interaction between any significant factors.

HIV prevalence—Of all 254 screened persons, 3 (1.2%) had an inconclusive HIV test result and 15 (5.9%) tested reactive for HIV (Figure 1). Among screened TGW, 11.8% (95% CI:2.9, 20.6) were identified as HIV-reactive while only 4.7% of screened MSM were HIV-reactive (95% CI: 1.7, 7.7; $p = 0.062$). Among 3 persons with inconclusive HIV test results, none had acute HIV as detected by HIV NAAT. Prevalent HIV infection was not significantly associated with depressive symptoms (HIV reactive: 20.0%, 95% CI: 4.3, 48.1 vs. HIV non-reactive 12.1%, 95% CI: 8.3, 17.0; $p = 0.413$).

Of the 15 persons testing HIV-reactive at the first step, 7 (46.7%), 6 (40.0%) and 2 (13.3%) were screened at BH, RC and SCC, respectively. Their median age was 21 years (min. 17, max. 28). One of the 15 persons was an adolescent who was not aware that adolescents may access HIV prevention, testing and treatment services in Thailand without parental permission.

Of the 15 persons with diagnosed HIV infection, 14 (93.3%) initiated ART through their health insurance, and 2 (14.3%) reported depressive symptoms. Of 1 person with diagnosed HIV infection without ART initiation, 1 (100.0%) reported depressive symptoms.

Characteristics at follow-up

HIV incidence—Among 236 persons without HIV at screening, 226 (95.8%) participated in the cohort study (Supplement). Ten (4.2%) screened persons from Nakhon Sawan did not return after the screening and were excluded from the analysis. Of the 226 persons enrolled in the 12-month longitudinal cohort study, 152 (67.3%) had at least one follow-up visit after enrollment. The median follow-up time was 7.8 months (interquartile range: 5.1, 9.8), and the 6-month study retention rates were 89% at SCC, 62% at BH, and 22% at RC (Figure 1).

During the follow-up period, four participants acquired HIV and were linked to HIV treatment. The HIV incidence at SCC, the only site able to offer PrEP to the cohort during the study period, was 0 per 100 person-years (PY), compared with an incidence of 6.7 per 100 PY across the combined two sites not offering PrEP (i.e., BH and RC).

Of the 4 participants who acquired HIV, 1 had depressive symptoms reported at the screening. Depressive symptoms at baseline were not associated with HIV acquisition ($p = 0.641$). Among the 53 participants enrolled and eligible for PrEP at SCC, 30 (56.6%) initiated oral PrEP (29 at the enrollment visit and one started at the month-6 follow-up visit). The 6-month PrEP retention was 48.3%, and PrEP adherence was 85.7%.

Discussion

More than one-tenth of youth at risk of HIV who screened for a longitudinal cohort study in Bangkok and Nakhon Sawan province had depressive symptoms and about one out of

twenty had HIV. During the follow-up period, no HIV acquisition was found at the site able to offer PrEP.

The HIV prevalence in our cohort is consistent with the HIV prevalence of 9.1% (95% CI: 5.8, 12.5) detected in sentinel surveillance of Bangkok MSM and TGW aged 15–22 years in 2018 (van Griensven et al., 2022). The study design allowed us to assess not only baseline HIV prevalence among screened youth, but also the incidence of HIV in adolescent and young adult cohort participants. HIV incidence among the cohort participants who did not have access to PrEP services was high. In a previous study that enrolled MSM and TGW who sell sex aged 18–26 years in Bangkok and Pattaya, Thailand, HIV incidence among participants not on PrEP was 3.4 per 100 person-years (95% CI: 1.6, 6.3) (Weir et al., 2023).

A substantial proportion (12.6%) of adolescent and young MSM and TGW being screened for inclusion in the cohort reported depressive symptoms. The assessment of associations between depressive symptoms and various sociodemographic, clinical, and other factors found multifactorial associations. These associated factors included attending a private school. Notably, most of the participants with depressive symptoms attended a private school, of whom the majority were not living with family. Depressive symptoms may be related to social isolation (i.e., being away from family and community) rather than the type (private vs public) of educational facility. This explanation is supported by other studies, such as a study among Brazilian adolescents that found that a distant relationship with parents and feelings of loneliness were associated with mental health challenges (Escobar et al., 2020) and depression (Stickley et al., 2016).

In our analysis, the association between depressive symptoms and having a partner with HIV may be related to the anxiety and stress associated with risk-taking behaviour. A study conducted among MSM with and without HIV in England (Miltz et al., 2021) found a high prevalence (13.3%) of depressive symptoms among MSM without HIV who reported having sex without a condom. In our results, the majority (69%) of screened persons with depressive symptoms had a sexual partner living with HIV or whose HIV status was unknown and reported at least one episode of anal sex without a condom in the past 3 months (90.9%).

Among the persons screened, those who learned about the study from friends were also less likely to have depressive symptoms, suggesting that supportive friendships are important for psychosocial health in these youth. Although most study participants reported at screening that they had at least one friend accepting of their gender identity and sexual orientation, we did not assess peer connectedness and depressive symptoms. Especially among teenagers (aged 10–19 years), adolescent friendships are important in the development of sexual behaviour and gender identity (Kornienko et al., 2016). The Youth Risk Behavior Survey, United States, 2021 demonstrated that adolescents who relied on their peers for support had positive health outcomes, including reductions in emotional distress, symptoms of poor mental health, and suicidal ideation. Lack of friends and school support were associated with self-report of poor mental health among students who identified as heterosexual, bisexual, or who questioned their gender, but not among students who identified as lesbian or gay (Wilkins et al., 2023).

Our results found that almost one-fifth (16.9%) of the screened persons had been bullied, comparable to the 10.0% (95% CI: 5.5, 14.5) reported from the Thailand national survey in 2013 (Sirirassamee & Sirirassamee, 2015) and a history of being bullied was associated with depressive symptoms. The findings are consistent with reports that bullied adolescents are about twice as likely to have depression as non-bullied adolescents (Ttofi et al., 2016). Furthermore, the survey among high school students in the U.S. found that sexual identity was significantly associated with experiencing bullying, particularly among sexual minority youth (Clayton et al., 2023). Considering the gender identity of the screened persons in the current analysis, bullying may contribute to the occurrence of depressive symptoms. Our analysis found that adolescents and young TGW were particularly vulnerable to bullying. Approximately one-third of the TGW reported experiencing some kind of bullying in the past year, almost three times higher than what screened MSM reported (29.4% and 13.5%, respectively).

We observed that depression is notably prevalent in this population and our findings are consistent with existing literature. This finding is particularly significant given that depression has been linked to an increased risk for HIV among this population. Although our analysis does not directly assess whole-person care (Van Heerden et al., 2023), and client-centred counselling for depression evaluation and management, there is potential merit in these models and integrating a simple depression screening tool such as Patient Health Questionnaire (PHQ-2), which would assist with determining whether a referral for standardized in-depth depression assessment and care with local mental health professionals would be necessary.

Fifteen per cent of the adolescents screened were not aware of the Thai Ministry of Public Health's recommendation for adolescents to access HIV/STI services without parental permission. That lack of knowledge of this opportunity may have led to a delay in the initiation of HIV testing in at least one participant. This finding emphasizes the importance of ensuring that all youth at risk of HIV are aware of, and follow guidance on, HIV testing and know their rights to access HIV testing, prevention and treatment services.

The reduced HIV incidence among participants enrolled in the longitudinal cohort at the single site offering HIV PrEP access highlights the prevention potential of PrEP, even among groups that may have lower adherence, such as adolescents and young adults. The findings of this study support the importance of HIV prevention services for young and adolescent populations, including HIV testing and PrEP (Thailand-MoPH, 2021).

Our findings are subject to several limitations. The definition of depressive symptoms was not based on standardized mental health tools such as the Thai version Patient Health Questionnaire (PHQ-9) (Lotrakul et al., 2008). However, the use of CASI to collect sensitive information (sexual behaviour, drug use and symptoms of depression) with an easy short questionnaire may increase the sensitivity and validity of the data collected (van Griensven et al., 2001). The YMSM study was not intended to assess depressive symptoms specifically and we could not evaluate any association of depressive symptoms with incident HIV due to the length of the follow-up period in the study. The study population was not representative of all young men who have sex with men and TGW receiving HIV prevention services

in Thailand, however, they were geographically diverse and were drawn from a variety of governmental and non-governmental settings with peer-driven community outreach and a provider-client service delivery model. The high rate of loss to follow-up among persons enrolled in the longitudinal cohort at the rural Nakhon Sawan site outside of Bangkok, may create bias in our calculation of HIV incidence. Accessible HIV services that include PrEP may help improve follow-up and service utilization for youth in rural areas such as Nakhon Sawan in the future.

The results of this study highlight the importance of integrating mental health screening and mental health services with HIV testing and prevention for youth at risk of HIV. To ensure good health and well-being, routine evaluations for depression in different clinical and non-clinical settings could help identify vulnerable youth, and create supportive environments with a whole-person care model for HIV prevention and ensure linkage to care.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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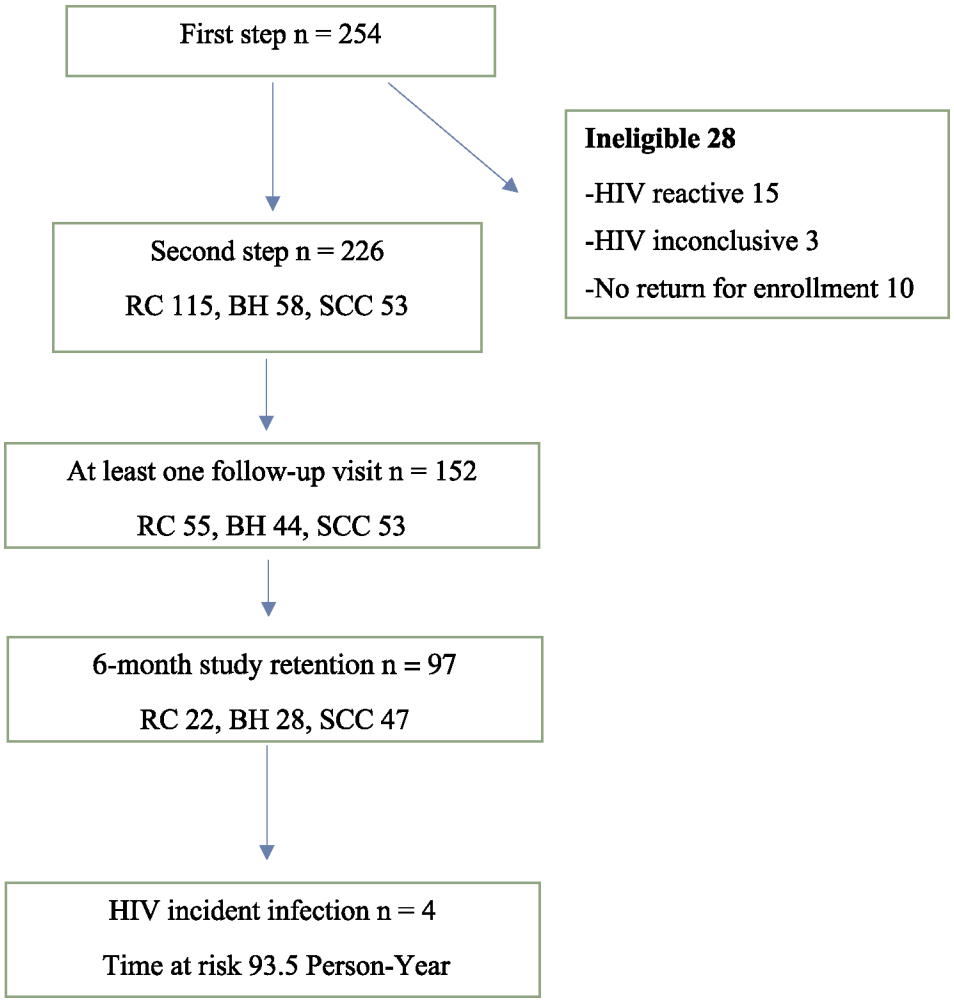

Figure 1.

Participant Flow Diagram among adolescent and young men who have sex with men and transgender women who have sex with men participated in a YMSM Study, Thailand, 2017–2019. (RC: Rainbow Clinic, BH: Bangrak Hospital, SCC: Silom Community Clinic)

Table 1.

Factors associated with depressive symptoms among adolescent and young men who have sex with men and transgender women who have sex with men, Young MSM Cohort Study, Thailand, 2017–2019.

	Number (%)				
		Self-reported depressive symptoms			
	Overall	Yes	No	*p* [a]	aOR (95% CI)[b]
	254 (100.0)	**32 (12.6)**	**222 (87.4)**		
Type of school				<0.001	
Non-formal education programme/no school	6 (2.4)	1 (16.7)	5 (83.3)		1.7 (0.2, 17.5)
Private	32 (12.6)	13 (40.6)	19 (59.4)		**7.1 (2.7, 18.7)**
Government	216 (85.0)	18 (8.3)	198 (91.7)		1.0
Ever heard about PrEP?				.045	
Yes	113 (44.5)	20 (17.7)	93 (82.3)		1.5 (0.6, 4.3)
No, Not Sure, Don't know	141 (55.5)	12 (8.5)	129 (91.5)		1.0
Self-perceived risk of HIV				<0.001	
No risk	123 (48.4)	5 (4.1)	118 (95.9)		0.4 (0.1, 1.8)
Don't know, Refuse	40 (15.7)	6 (15.0)	34 (85.0)		0.5 (0.1, 1.9)
Some risk/high risk	91 (35.8)	21 (22.1)	70 (76.9)		1.0
Where do you get HIV/STI information: clinic staff/ Website/Facebook?				.080	
Yes	128 (50.4)	11 (8.6)	117 (91.4)		1.4 (0.4, 4.8)
No	126 (49.6)	21 (16.7)	105 (83.3)		1.0
Aware of accessing HIV/STI services without parental permission?				.420	
Yes	218 (85.8)	26 (11.9)	192 (88.1)		
No, Not sure	36 (14.2)	6 (16.7)	30 (83.3)		
Aware of accessing antiretroviral treatment for HIV at no cost?				.007	
Yes	162 (63.8)	13 (8.0)	149 (92.0)		0.8 (0.3, 2.1)
No, Not sure	92 (36.2)	19 (20.6)	73 (79.4)		1.0
Ever tested for HIV infection?				.119	
Yes	133 (52.6)	23 (17.3)	110 (82.7)		
No	114 (45.1)	9 (7.9)	105 (92.1)		
Not sure	5 (2.0)	0 (0.0)	5 (100.0)		
Refuse	1 (0.4)	0 (0.0)	1 (100.0)		
At least one family member knows and accept your gender identity				.013	
Otherwise	44 (17.3)	11 (25.0)	33 (75.0)		1.2 (0.4, 3.9)
Know & accept	210 (82.7)	21 (10.0)	189 (90.0)		1.0
At least one friend knows and accept your gender identity				.382	
Otherwise	13 (5.1)	0 (0.0)	13 (100.0)		
Know & accept	241 (94.9)	32 (13.3)	209 (86.7)		

	Number (%)				
		Self-reported depressive symptoms			
	Overall	Yes	No	*p* [a]	aOR (95% CI)[b]
Bullied in past year?				.002	
Yes	43 (16.9)	12 (27.9)	31 (72.1)		**2.8 (1.1, 7.1)**
No	211 (83.1)	20 (9.5)	191 (90.5)		1.0
Had a sex partner with HIV in past 3 months?				<0.001	
Yes, Not sure, Refuse	81 (31.9)	22 (27.2)	59 (72.8)		**4.1 (1.7, 9.9)**
No/Never have sex	173 (68.1)	10 (5.8)	163 (94.2)		1.0
Ever used injecting needle that had been used by other to inject drug/substance?				.090	
Yes/Not sure/Refuse	9 (3.5)	3 (33.3)	6 (66.7)		1.7 (0.2, 12.4)
No	245 (96.5)	29 (11.8)	216 (88.2)		1.0
How do you know this study?				<0.001	
From other source	105 (41.3)	24 (22.9)	81 (77.1)		**4.2 (1.6, 10.8)**
Friend	149 (58.7)	8 (5.4)	141 (94.6)		1.0
Age at first oral, vaginal, or anal sex				.778	
< 13 years old	89 (35.0)	9 (10.1)	80 (89.9)		
13 years and greater	143 (56.3)	21 (14.7)	122 (85.3)		
Never have sex	9 (3.5)	1 (11.1)	8 (88.9)		
Not sure	13 (5.1)	1 (7.7)	12 (92.3)		

Note: aOR, Adjusted Odd Ratio; CI, Confidence Interval; NS, Not statistically significant ($p \geq 0.05$).

[a] Fisher Exact Test, otherwise Chi-square test adjusted for continuity correction.

[b] Adjusted for baseline demographic characteristics (age group, province of residence, self-reported gender identity, education, currently attending school, type of school, currently living with, average income per month, HIV status).