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Factors Associated with Sexual Intercourse, Condom-Use, and Perceived Peer Behaviors Among Adolescents in Malaysia: A School-Based Cross-Sectional Study

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Abstract

High-risk sexual behavior among young adults is concerning to clinicians, public health practitioners and policy makers because it is associated with unintended health outcomes including transmission of sexually transmitted infections (STIs) and unintended pregnancy. This paper analyzes how knowledge of HIV, experience with dating behavior, and perception of peer behavior factors are associated with having sexual intercourse and use of condoms among adolescent students in Malaysia. National data from school-age adolescents who completed the Malaysian HIV/AIDS Knowledge, Attitude and Practice survey were used. Chi-square analysis and multivariate logistic regression analyses were performed. Having sexual intercourse was associated with urbaneness ($p<0.001$); correctly answered all UNGASS indicator ($p=0.011$); and perception of peer behavior having had sex ($p=0.001$). Condom use among those who had sexual experience was associated with males ($p=0.013$), believing condoms prevent HIV and STIs ($p<0.002$), and having friends who report having had sex ($p=0.034$). Equitable and effective sexual education program must be developed to promote the health of adolescents. Practical education about how condoms may prevent the transmission of STIs and HIV should be promoted.

Keywords: adolescent, condom-utilization, premarital sex

Introduction

In Malaysia, marriage is traditionally considered the entry into sexual activity for both genders (Region, 2007). Since 1970, the age of marriage has increased steadily, from below 20 years in 1970 to 28 years in 2014 (Region, 2007). While marriage is typically when sexual intercourse is first experienced, recent literature illustrates that sex among adolescents is not uncommon. Regionally focused studies have demonstrated that as many as 12% of adolescents have engaged in sexual activity by the age of 19 years (Anwar, Sulaiman, Ahmadi, & Khan, 2010).

Early engagement in sexual activity outside of marriage is associated with adverse health consequences including teenage pregnancy, sexually transmitted infections (STI), and Human Immunodeficiency Virus (HIV) infection (S. Zulkifli, Low, & Yusof, 1995). According to the World Health Organization (WHO), more than two million adolescents are at risk of contracting HIV and 11% of all births are to girls ages 15 to 19 worldwide (Ahmadian, Hamsan, Abdullah, Samah, & Noor, 2014; Lee, Chen, Lee,

& Kaur, 2006). According to the Ministry of Health Malaysia, the cumulative of HIV cases accounted 2.6% of those aged 19 years and younger and the trend of infection is increasing particularly through homosexual or bisexual contact (Malaysia, 2016). Barriers to health services impede access for health screening, testing, counseling for adolescent's sexual health (Ghafari, Shamsuddin, & Amiri, 2014).

One study published in 2014 found that among adolescents aged 12 to 19 years old across Peninsular Malaysia, 50% reported having engaged in sexual behavior in the past (Farid, Rus, Dahlui, Al-Sadat, & Aziz, 2014). Because of the potential for negative health consequences associated with unprotected sexual activity in adolescence, it is important to understand factors associated with sexual activity among adolescents in Malaysia. A 2012 survey in Malaysia found that adolescents who reported ever having sex were more likely to not have a close friend, have no supportive peers, and not feel connected to parents (Ahmad, Awaluddin, Ismail, Samad, & NikAbdRashid, 2014). A 2006 study focusing on adolescents in Negeri Sembilan, Malaysia showed that being a boy, alcohol use, marijuana use, cigarette smoking, and living with parents were associated with having sex in adolescence (Lee et al., 2006).

Lack of knowledge about sexual and reproductive health is also associated with engagement in risky sexual behavior among adolescents in Malaysia (Ohene & Akoto, 2008). Cultural and religious norms are considered to be strong determinants of knowledge related to sexual health (Mustapa, Ismail, Mohamad, & Ibrahim, 2015). Adolescents are frequently not aware of the opportunity for transmission of STIs when engaging in risky sexual activity, a result, many are not aware when they have been infected with a STI (Chandra-Mouli, McCarraher, Phillips, Williamson, & Hainsworth, 2014; Mohd, Adibah, & Haliza, 2015). A 2017 national survey found that Malaysian adolescents' knowledge of sexual health, including reproductive health related to pregnancy, was limited across the country (Mustapa et al., 2015).

While no study in Malaysia has focused on perception of peers' behavior regarding sexual activity, other studies have shown that this is an important factor to consider (Chiao & Yi, 2011; Jaafar, Wibowo, & Afiatin, 2006). Early onset of sexual debut appears to be affected by perception of peer's engagement in early sexual activity (Romer et al., 1994). In Nigeria, 90% of unmarried students indicated that they believed that their peers had sexual partners, and half of unmarried students indicated they felt pressure by peers to engage in premarital sexual intercourse (Okonkwo, Fatusi, & Ilika, 2005). The use of barrier methods to prevent STIs and pregnancy also appear to be impacted by perception of peer behavior. Adolescents who believe that their peers use condoms indicate that they are likely to use condoms themselves (Diclemente, 1991). Because of the importance of peer pressure in relation to sexual activity among adolescents in low and middle-income countries, this study analyzes the relationship between knowledge of HIV and STIs, perception of the efficacy of condoms, and beliefs about peer sexual and risky behavior with self-reported sexual activity and use of condoms with among school-age adolescents in Malaysia.

Methodology

This study used data from the 2012 Malaysian HIV/AIDS Knowledge, Attitude and Practice (KAP) survey, which collected information about sexual knowledge, sexual behavior, and HIV/AIDS knowledge among adolescents aged 15 to 17 years who were attending selected government-run schools in all states of Malaysia. This national school-based KAP assessment targeted public schools in both urban and rural areas. Using a sampling frame provided by the Ministry of Education of Malaysia, systematic sampling was used to select one government secondary school from each selected district from each state, A total of 15 schools were selected from each district of the 15 states in Malaysia.

Data collection occurred during January and February 2012. All selected students were given a self-administered validated questionnaire in Bahasa Malaysia (Malaysian national language). Parents and students were informed about the purpose of this study. Parents were required to fill up informed consent form to approve their children to participate in the study while students who agreed to participate completed an assent form. For confidentiality, students were treated anonymously with a

unique identification number. The questionnaire was piloted, tested for clarity and appropriateness for the students before the study commenced in January 2012 (Bowling, 2014; Fadzilah Kamaludin, 2011). Onsite quality control was performed to ensure all students provided valid answers.

Ethical approval was obtained from the Medical Research Ethical Committee, Ministry of Health Malaysia (NMRR: 11-293-8562) and the Ministry of Education Ethics Committee, Malaysia. Adolescents with assent and approved inform consent by their parents were included in this study.

Measures and Use of Variables

The KAP survey included questions adopted from standardized and validated HIV/AIDS surveillance indicators including the United Nations General Assembly Special Session on HIV/AIDS (UNGASS) indicators, WHO indicators and the Ministry of Health, Malaysia indicators (Fadzilah Kamaludin, 2011). The survey captured information about socio-demographic characteristics, knowledge of HIV/AIDS, sexual behavior and STI prevention practices, and perception of sexual education.

Students' knowledge about HIV/AIDS was assessed through questions pertaining to general knowledge about STIs and responses to the UNGASS indicator for HIV knowledge. The UNGASS indicator was employed using five questions, which measured knowledge about HIV transmission and adequate knowledge was classified for students who answered all five questions correctly. Satisfactory knowledge about STI symptoms was indicated through students attaining or surpassing the 50th percentile (Thanavanh, Harun-Or-Rashid, Kasuya, & Sakamoto, 2013).

Sexual experience was assessed through a categorical variable asking whether the student had ever had sexual intercourse, in the forms of vaginal and anal intercourse. In addition, students were asked about the type of sexual activity they had engaged in, pregnancy status and abortion experienced. They were asked about their experience viewing pornography, masturbation and dating behavior: kissing, petting, or both. Among students who had sex, questions about condom use and perceptions of condom use were asked. Perception of peer sexual activity was assessed through questions about whether students believed that their friends ever had sex, been raped, used drugs, or had contracted STIs.

Statistical Analysis

Data were analyzed using Stata 12 (Stata Corp) for descriptive statistics including sociodemographic characteristics, students' knowledge of HIV and condom use, and experience with sexual intercourse and other sexual behaviors. Preliminary bivariate categorical analysis was performed using chi-square statistics to examine factors associated with sexual intercourse experience. All significant independent variables that associated with the sexual intercourse were selected for main effects in multivariate logistic regression. Then, multivariate logistic regression was performed to assess the effect of independent variables on participation in sexual intercourse, controlling for selected covariates. Another multiple logistic regression model was performed to assess factors associated with condom use among those who had sex. Diagnostic test for the goodness of fit was applied based on Hosmer & Lemeshow to ensure the fit of logistic regression with the final model (Bewick, Cheek, & Ball, 2005). All analyses were considered statistically significant at $p< 0.05$.

Results

A total 2,769 students responded to the survey (79% response rate). More than half lived in a rural area and were female. Just 10.3% (n=285) reported ever having had sex. Details of the participant characteristics, stratified by those who had sex and those who never had sex are included in Table 1.

Table 1: Characteristics of students who report ever having sex vs. Those who report never having had sex (n=1,709)

Variable	Overall, n=1,709 n (%)	Ever had sex, n=285 n (%)	Never had sex n=2,424 n (%)
Gender			
Male	1,201 (44.33)	174 (14.49)	1,027 (85.51)
Female	1,242 (45.85)	101 (8.13)	1,141 (91.87)
Did not disclose	266 (9.82)	10 (3.76)	256 (96.24)
Locality			
Urban	1,221 (45.07)	172 (14.09)	1,049 (85.91)
Rural	1,488 (54.93)	113 (7.59)	1,375 (92.41)
SES status (RM 1 = USD 0.251)			
Did not know	858 (31.67)	96 (11.19)	762 (88.81)
< RM 1,000	879 (32.45)	92 (10.47)	787 (89.53)
RM 1,000 - 4,999	876 (32.34)	83 (9.47)	793 (90.53)
RM >= 5,000	96 (3.54)	14 (14.58)	82 (85.42)
Parent Marital Status			
Married	2,433 (89.84)	249 (10.45)	2,133 (89.55)
Divorced	141 (5.21)	17 (12.14)	123 (87.86)
Widow/ Widower	134 (4.95)	12 (9.16)	119 (90.84)
Knowledge about STIs and HIV			
Satisfactory knowledge about STIs	608 (22.70)	68 (11.43)	527 (88.57)
Correct UNGASS responses	135 (5.05)	6 (4.55)	126 (95.45)
Sexual behavior			
Kissing	371 (15.25)	112 (30.52)	255 (69.48)
Petting	310 (12.72)	107 (34.97)	199 (65.03)
Masturbation	447 (18.63)	85 (19.50)	351 (80.50)
Watching pronography	1,175 (44.78)	185 (15.99)	972 (84.01)
Perception of peer behavior			
Has friends who also had sex	716 (27.18)	134 (19.01)	571 (80.99)
Has friends who use drugs	229 (8.90)	39 (17.26)	187 (82.74)
Has friends who were raped	164 (6.40)	43 (26.38)	120 (73.62)
Has friends who have STIs	80 (3.09)	23 (29.11)	56 (70.89)

Students who reported have had sex

Among students who had sex, the median of first onset of sexual intercourse was 15 years old (IQR=1.5). The majority reported having heterosexual intercourse (79%) and 70% did not use a condom when they had sex. Nearly 50% reported not knowing that condoms could minimize the risk of HIV and STI transmission. Among girls who had sex, 9% reported ever being pregnant, and among those reporting a history of pregnancy, almost all reported had an abortion (Table 2).

Table 2: Characteristics of students who reported ever having had sex (n=285)

Characteristics	n (%)
Age of Sexual debut,	

Median (IQR)	15 (1.50)
25 percentile	14.00
75 percentile	15.50
Sexual experience	
Heterosexual	225 (78.95)
Homosexual	36 (2.63)
Refuse to disclose	24 (8.42)
Ever use condom	
Use condom	73 (25.61)
Did not used condom	188 (65.96)
Refuse to disclose	24 (8.42)
Perceived condoms could minimize contraction of HIV and STIs	
Agree	140 (49.12)
Does not agree	55 (19.30)
Don't know	84 (29.47)
Non-response	6 (2.11)
Pregnancy and abortion experience (females only), n=101	
Ever been pregnant	9 (8.91)
Had abortion	8 (7.92)

Factors associated with having sex among adolescents

Among all students participated in this study, 1,861 students completed all variables for multivariable analysis. Table 3 describes factors associated with engagement in sexual activity. In unadjusted analysis, gender ($p<0.001$); locality of schools ($p<0.001$); knowledge of HIV transmission via UNGASS ($p=0.027$); experienced with kissing ($p<0.001$), petting ($p<0.001$), masturbating ($p<0.001$), watching pornography ($p<0.001$); and perception of peers engaging in having sex ($p<0.001$), been raped ($p<0.001$), using drugs ($p<0.001$), and having STIs ($p<0.001$) were associated with having sex. In adjusted analyses, increased odds of sexual intercourse among adolescents were observed among those who went school in urban areas ($p<0.001$), experienced kissing ($p<0.001$), petting ($p<0.001$), believing that friends have engaged in sex ($p=0.011$), and believing that friends have been raped ($p=0.004$), controlling for covariates. While the odds of sexual intercourse among adolescents decrease among adolescents who had good knowledge of HIV transmission from UNGASS questions ($p=0.011$) controlling for covariates.

Table 3: Factors Associated with Having Sex (n= 1,861)

Risk Behavior/ Factor	Crude OR			Adjusted OR		
	cOR	95% CI	*p*-value	aOR	95% CI	*p*-value
Locality						
Urban	1.933	1.494, 2.500	< 0.001	2.041	1.455, 2.862	< 0.001
Rural	1			1		
Gender						
Male	1.786	1.369, 2.329	< 0.001	1.417	0.998, 2.012	0.052
Female	1			1		
SES status						
Low	1					
Medium	0.916	0.653, 1.266	0.595			
High	1.600	0.871, 2.940	0.130			
Parent Marital Status						
Married	1.320	0.683, 2.549	0.409			
Divorced	1.700	0.749, 3.859	0.205			

Widow/ Widower	1					
Knowledge about STIs and HIV						
Adequate knowledge about STIs	0.815	0.606, 1.096	0.176	1.089	0.729, 1.627	0.667
Correctly answered all UNGASS indicator questions correctly	0.360	0.146, 0.889	0.027	0.205	0.061, 0.694	0.011
Dating and sexual Behavior						
Kissing	5.450	4.125, 7.201	< 0.001	2.289	1.471, 3.561	< 0.001
Petting	6.751	5.068, 8.995	< 0.001	3.634	2.313, 5.711	< 0.001
Experienced masturbating	2.187	1.642, 2.914	< 0.001			
Experienced watching pornography*	3.249	2.451, 4.308	< 0.001			
Perception of peer Behavior						
Has friends who had sex	3.790	2.888, 4.974	< 0.001	2.159	1.467, 3.177	0.001
Has friends who have been raped	3.933	2.689, 5.753	< 0.001	2.443	1.341, 4.451	0.004
Has friends who use drugs	2.157	1.479, 3.146	< 0.001	0.600	0.322, 1.119	0.109
Has friends who have STIs	4.305	2.601, 7.126	< 0.001	1.479	0.666, 3.287	0.336

Note: *Omitted in final model to obtain fit model based on Hosmer & Lemeshow, p-value = 0.1449
Excluded in final model: SES status, Parental status, Experienced Masturbating, Experienced watching pornography

Factors associated with condom use among those who report having sex

Among those who ever had sex (n=285), 210 students answered all questions. Responses from these students were included in the multivariable analysis that examined condom use and its associated factors. Table 4 describes factors associated with condom use among those who have reported having sex. In unadjusted analysis, no significant differences were identified by locality, socioeconomic status, parent status, knowledge about STIs and HIV, reporting having a friend who uses drugs, or reporting having a friend who has STIs. Significant differences were identified by gender (p=0.011), believing condoms prevent HIV and STIs (p<0.001), reporting having friends who have sex (p=0.027), and reporting having friends who have been raped (p=0.03).

In adjusted analyses, the odds of not using condom decrease by a factor of 0.4 by males, perception that condoms prevent HIV and STI transmission (aOR=0.4), and reporting having friends who have sex were factors associated with using condoms (aOR=0.5), controlling for covariates.

Table 4: Factors associated with refusal of using condom among those who reported having sex (n= 210)

Factor	**Crude OR**			**Adjusted OR**		
	cOR	95% CI	*p*-value	aOR	95% CI	*p*-value
Locality						
Urban	0.684	0.386, 1.211	0.193			
Rural	1					
Gender						
Male	0.447	0.241, 0.830	0.011	0.405	0.198, 0.826	0.013
Female	1			1		
SES status						
Low	1					

Medium	1.083	0.532, 2.204	0.826			
High	0.473	0.148. 1.517	0.208			
Parent Marital Status						
Married	0.899	0.236, 3.429	0.877			
Divorced	0.917	0.161, 5.207	0.922			
Widow/ Widower	1					
Knowledge about STIs and HIV						
Adequate knowledge about STIs	1.605	0.875, 2.943	0.126			
Correctly answered all UNGASS indicator questions correctly	1.477	0.162, 13.462	0.729			
Agree condoms prevent HIV/STI transmission	0.329	0.183, 0.590	< 0.001	0.355	0.185, 0.681	0.002
Perception of Peer Behavior						
Has friends who had sex	0.521	0.292, 0.930	0.027	0.477	0.240, 0.947	0.034
Has friends who have been raped	0.461	0.229, 0.930	0.031	0.769	0.349, 1.694	0.515
Has friends who use drugs	0.591	0.285, 1.226	0.158			
Has friends who have STIs	0.5444	0.223, 1.327	0.181			

Note: Fit model based on Hosmer & Lemeshow, p-value = 0.3119
Excluded in final model: SES status, Locality, Parental status, Knowledge on STI symptoms, UNGASS Indicator, Perceived friends used drugs and perceived friends had STIs.
There were 210 students were included in the final model out of 276 students who claimed having had sex.

Discussion

This paper describes the association between sexual activity, HIV knowledge, and perception of peer behavior among adolescents in Malaysia. In Malaysia, the majority of HIV and sexual activity-related surveillance focuses on key populations at risk for HIV including injection drug users, men who have sex with men (MSM), female sex workers, and transgender people (Malaysia, 2016). This paper presents information about a group that may be at risk for HIV in the coming years adolescents. Furthermore, this study explores factors that may be associated with adolescent sexual activity that have not been captured in prior research. It serves as the first comprehensive presentation of national-level findings describing adolescent sexual activity in Malaysia.

Of all adolescents in the study, 10.3% reported having had sex. Prior studies have reported a sexual activity rate among adolescents between 5% to 20%, while the most recent nationwide school-based survey in 2012 reporting a rate of 8.3% (Ahmad et al., 2014). Research shows that high religiosity (Awaluddin et al., 2015) and conservative attitudes (S. N. Zulkifli & Low, 2000) are associated with lower odds of sexual intercourse among adolescents. The sexual behavior of Malaysian adolescents is highly influenced by the dominant Malay culture and Muslim religious beliefs. Dating and sexually intimate behaviors among non-married people are strictly prohibited in the Malay culture. While this study did not report ethnicity or religion, we suppose that high participation among Muslim and Malay adolescents contributed to low prevalence of sexual activity.

When compared to national adolescent sexual activity statistics from neighboring countries, we notice a difference. One national study following sexual activity among 1,000 adolescents in Indonesia, where social norms surrounding sexual activity are largely similar to those in Malaysia (Holzner & Oetomo, 2004), indicated that not one reported having participated in sexual activity (Susanto et al., 2016). Outside of Indonesia and Malaysia, rates of adolescent sexual intercourse are higher than what we found in our study, and they may be related to social norms (Thanavanh et al., 2013)(Chiao & Yi, 2011) For example in Taiwan, where 65.8% adolescents report having accepting attitudes toward premarital sex, 22.4% of adolescents report having had sex (Chiao & Yi, 2011). Outside of Asia, 19.2% of adolescents from 10 European countries report having had sex (Gambadauro et al., 2018).

Interestingly, this study suggests that while the majority of students reported having had heterosexual intercourse, 14% reporting having had homosexual intercourse. Sexual diversity is not commonly discussed and often neglected due to difficulty to identify gay, lesbian and bisexual behavior in adolescents (Society, 2008). In Malaysia, few studies explore or focus on sexual orientation among adolescents in spite of the recent shift in the pattern of HIV infections in Malaysia, mainly attributable to man having sex with man (MSM) (Malaysia, 2016). Considering that same-sex relationships are legally, culturally, and religiously prohibited in Malaysia, it is surprising that these adolescents felt comfortable self-reporting engagement in homosexual sex. This finding is important for the development of equitable and effective health care promotion. It is well-documented that homosexual adolescents are especially vulnerable to HIV because of low condom use (Saewyc et al., 2006) and that they face stigma and discrimination when seeking health care services (Beyrer et al., 2012). Considering that a proportion of adolescents are documented to participate in homosexual sex, this information should be used in the development of HIV prevention programing to promote good sexual health among both heterosexual and homosexual adolescents.

Additionally, among females who had sex, 10% reported a prior pregnancy and of those who reported a prior pregnancy, 90% students reported having an abortion. In this region, abortion is highly stigmatized, but having a child born out of marriage can be even more problematic for one's social status (Rehnström Loi, Gemzell-Danielsson, Faxelid, & Klingberg-Allvin, 2015). Unintended pregnancy is preventable, including among adolescents, but limited access to contraceptives and inadequate knowledge on the use contraceptives, especially in the low-middle income countries, has become a barrier to prevent adolescent pregnancy (Chandra-Mouli et al., 2014; Mohd et al., 2015). As is consistent with many more traditional areas of the world, among Malaysian adolescents, contraception is rarely discussed (Mohd et al., 2015; Rehnström Loi et al., 2015). A lack of knowledge about pregnancy prevention and appropriate antenatal care can result in high-risk pregnancies (Najimudeen & Sachchithanantham, 2017; Omar et al., 2010). While this study specifically focused on condom use, additional research about perceptions of other forms of birth control among adolescents are needed.

Our findings indicate that the degree that the living location is urban, socioeconomic status, and parent's marital status are not significantly associated with sexual activity or condom usage. In Malaysia, while stigma surrounding the sexual behavior of people of low socioeconomic status and divorcees and children of divorced parents exists (Pong, 1996), these results suggest that these factors are not associated with using condoms among adolescents. These findings are consistent with results from other studies focusing on young people's sexual behavior around the world (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2007; Marston & King, 2006). Furthermore, in contrast to previous research (Farid et al., 2014), this study found that girls were more likely to report condom usage. Existing research about condom usage dates to 2012 and focused on adolescents aged 12 to 17 years (Farid et al., 2014). This study focused on students aged 15 to 17 years. Perhaps a difference in ages captured in the studies or the fact that more girls are educated about condom use now compared to in the past have had impacts on desire to use condoms.

Finally, studies show that peer pressure is a significant predictor of sexual behavior among adolescents (Diclemente, 1991; Jaafar et al., 2006; Okonkwo et al., 2005; Romer et al., 1994). This is consistent with findings from Malaysia's neighboring country, Indonesia, where 80% of adolescents admitted that peers had an influential role in their decision to engage in sexual activity (Jaafar et al., 2006). It is well-documented that adolescents share information about sex among friends (Jaafar et al., 2006). This study confirms that adolescent peer influence is an important factor in the decision to engage in sexual activity among adolescents. Appropriate STI and HIV prevention programs should include aspects of peer influence to maximize their impact.

In contrast to prior research (Anwar et al., 2010), this study does not confirm that with increased knowledge about STIs and HIV there is more engagement in sexual intercourse. Instead, in our study, knowledge about HIV transmission is associated with a lower frequency of engagement in sexual activity. Additionally, our results suggest that condom use is associated with the perception that condoms prevent HIV and STI infection. Interestingly, our findings suggest that having high

knowledge about STIs is not associated with use of condoms. This suggests that having knowledge about STIs and HIV is not enough to influence condom use, but that practical education about how condoms may prevent the transmission of STIs and HIV should be promoted among adolescents.

Study Limitations

While the findings from this study are important for informing policy, there are some limitations. This study did not employ a complex sampling analysis and therefore is not representational of the entire population of adolescents in Malaysia. The multistage sampling design was employed for each school's selection from each state in Malaysia and no sampling weights were adopted in the analysis to obtain estimates for adolescents in Malaysia. The cross-sectional design captured information at one point in time and cannot inform a cause–effect relationship between the tested predictors and sexual intercourse. Furthermore, this study relied on self-report to accommodate the sensitive nature of the questions.

Conclusions

Of all adolescents in the study, 10.3% reported having had sex. Of adolescents who had sex, 2.6% reported having homosexual intercourse. The development of equitable and effective HIV prevention programing is important to promote safe sexual health among both heterosexual and homosexual adolescents. Furthermore, considering that nearly 10% of sexually active girl students reported a prior pregnancy, additional research about perceptions and use of birth control among adolescents is needed. Finally, our finding that condom use is highly associated with peer influence is important for informing sexual health programs targeting adolescents in Malaysia. Practical education about how condoms may prevent the transmission of STIs and HIV should be implemented.

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References

Ahmad, N., Awaluddin, S. M., Ismail, H., Samad, R., & NikAbdRashid, N. (2014). Sexual activity among Malaysian school-going adolescents: what are the risk and protective factors? *Asia-Pacific journal of public healt, 26*(5 Suppl), 44s-52s. doi:10.1177/1010539514544700

Ahmadian, M., Hamsan, H. H., Abdullah, H., Samah, A. A., & Noor, A. M. (2014). Risky sexual behavior among rural female adolescents in Malaysia: a limited role of protective factors. *Glob J Health Sci, 6*(3), 165-174. doi:10.5539/gjhs.v6n3p165

Anwar, M., Sulaiman, S. A., Ahmadi, K., & Khan, T. M. (2010). Awareness of school students on sexually transmitted infections (STIs) and their sexual behavior: a cross-sectional study conducted in Pulau Pinang, Malaysia. *BMC Public Health, 10*(1), 47.

Awaluddin, S. M., Ahmad, N. A., Mohd. Saleh, N., Aris, T., Mohd Kasim, N., Muhammad Sapri, N. A., & Nik Abdul Rashid, N. R. (2015). Prevalence of sexual activity in older Malaysian adolescents and associated factors. *Journal of Public Health Aspects, 2*(1). doi:10.7243/2055-7205-2-1

Barnes, G. M., Hoffman, J. H., Welte, J. W., Farrell, M. P., & Dintcheff, B. A. (2007). Adolescents' time use: Effects on substance use, delinquency and sexual activity. *Journal of Youth and Adolescence, 36*(5), 697-710.

Bewick, V., Cheek, L., & Ball, J. (2005). Statistics review 14: Logistic regression. *Critical Care, 9*(1), 112-118. doi:10.1186/cc3045

Beyrer, C., Sullivan, P. S., Sanchez, J., Dowdy, D., Altman, D., Trapence, G., . . . Mayer, K. H. (2012). A call to action for comprehensive HIV services for men who have sex with men. *The Lancet, 380*(9839), 424-438. doi:https://doi.org/10.1016/S0140-6736(12)61022-8

Bowling, A. (2014). Questionnaire Design *Research methods in health: investigating health and health services* (4th ed., pp. 290-324). Maidenhead, GB: McGraw Hill: Open University Press.

Chandra-Mouli, V., McCarraher, D. R., Phillips, S. J., Williamson, N. E., & Hainsworth, G. (2014). Contraception for adolescents in low and middle income countries: needs, barriers, and access. *Reproductive Health, 11*(1), 1. doi:10.1186/1742-4755-11-1

Chiao, C., & Yi, C.-C. (2011). Adolescent premarital sex and health outcomes among Taiwanese youth: perception of best friends' sexual behavior and the contextual effect. *AIDS Care, 23*(9), 1083-1092. doi:10.1080/09540121.2011.555737

Diclemente, R. J. (1991). Predictors of HIV-preventive sexual behavior in a high-risk adolescent population: the influence of perceived peer norms and sexual communication on incarcerated adolescents' consistent use of condoms. *J Adolesc Health, 12*(5), 385-390.

Fadzilah Kamaludin, S. N., Tan Huey Ning, Mohd Nasir Abdul Aziz, Shaari Ngadiman, Asiah Ayob. (2011). *The Knowledge, Attitude and Practice in HIV/AIDS and Sexually Transmitted Infections Related Risk Behaviour of Secondary School Children in Malaysia.* . Research Proposal. Institute for Public Health, Ministry of Health Malaysia. Kuala Lumpur.

Farid, N. D., Rus, S. C., Dahlui, M., Al-Sadat, N., & Aziz, N. A. (2014). Predictors of sexual risk behaviour among adolescents from welfare institutions in Malaysia: a cross sectional study. *BMC Public Health, 14 Suppl 3*, S9. doi:10.1186/1471-2458-14-s3-s9

Gambadauro, P., Carli, V., Hadlaczky, G., Sarchiapone, M., Apter, A., Balazs, J., . . . Wasserman, D. (2018). Correlates of sexual initiation among European adolescents. *PLOS ONE, 13*(2), e0191451. doi:10.1371/journal.pone.0191451

Ghafari, M., Shamsuddin, K., & Amiri, M. (2014). Barriers to Utilization of Health Services: Perception of Postsecondary School Malaysian Urban Youth. *International Journal of Preventive Medicine, 5*(7), 805-806.

Holzner, B. M., & Oetomo, D. (2004). Youth, Sexuality and Sex Education Messages in Indonesia: Issues of Desire and Control. *Reproductive Health Matters, 12*(23), 40-49. doi:10.1016/S0968-8080(04)23122-6

Jaafar, J. A. S., Wibowo, I., & Afiatin, T. (2006). The Relationship Between Religiosity, Youth Culture, and Premarital Sex among Malaysian and Indonesian Adolescents. *Asia Pacific Journal of Social Work and Development, 16*(2), 5-18. doi:10.1080/21650993.2006.9755999

Lee, L. K., Chen, P. C., Lee, K. K., & Kaur, J. (2006). Premarital sexual intercourse among adolescents in Malaysia: a cross-sectional Malaysian school survey. *Singapore Med J, 47*(6), 476-481.

Malaysia, M. o. H. (2016). *Global AIDS Response Progress Report 2016: Malaysia 2016 Country Responses to HIV/AIDS*. Retrieved from Putrajaya http://www.moh.gov.my/images/gallery/Report/Malaysia GARPR 2016_Final.pdf

Marston, C., & King, E. (2006). Factors that shape young people's sexual behaviour: a systematic review. *The Lancet, 368*(9547), 1581-1586. doi:https://doi.org/10.1016/S0140-6736(06)69662-1

Mohd, A. M., Adibah, H., & Haliza, G. (2015). A review of teenage pregnancy research in Malaysia. *The Medical journal of Malaysia, 70*(4), 214-219.

Mustapa, M. C., Ismail, K. H., Mohamad, M. S., & Ibrahim, F. (2015). Knowledge on Sexuality and Reproductive Health of Malaysian Adolescents – A Short Review. *Procedia - Social and Behavioral Sciences, 211*(Supplement C), 221-225. doi:https://doi.org/10.1016/j.sbspro.2015.11.088

Najimudeen, M., & Sachchithanantham, K. (2017). An insight into low contraceptive prevalence in Malaysia and its probable consequences. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 3*(3), 493-496.

Ohene, S., & Akoto, I. (2008). Factors associated with sexually transmitted infections among young ghanaian women. *Ghana Med J, 42*(3), 96-100.

Okonkwo, P. I., Fatusi, A. O., & Ilika, A. L. (2005). Perception of peers' behaviour regarding sexual health decision making among female undergraduates in Anambra State, Nigeria. *African health sciences, 5*(2), 107-113.

Omar, K., Hasim, S., Muhammad, N. A., Jaffar, A., Hashim, S. M., & Siraj, H. H. (2010). Adolescent pregnancy outcomes and risk factors in Malaysia. *International Journal of Gynecology & Obstetrics, 111*(3), 220-223. doi:10.1016/j.ijgo.2010.06.023

Pong, S.-L. (1996). School participation of children from single-mother families in Malaysia. *Comparative Education Review, 40*(3), 231-249.

Region, W. W. P. (2007). *Sexual and Reproductive Health of Adolescents and Youths in Malaysia*. Retrieved from Manila, Philippines: http://www.wpro.who.int/publications/docs/ASRHmalaysia.pdf

Rehnström Loi, U., Gemzell-Danielsson, K., Faxelid, E., & Klingberg-Allvin, M. (2015). Health care providers' perceptions of and attitudes towards induced abortions in sub-Saharan Africa and Southeast Asia: a systematic literature review of qualitative and quantitative data. *BMC Public Health, 15*(1), 139. doi:10.1186/s12889-015-1502-2

Romer, D., Black, M., Ricardo, I., Feigelman, S., Kaljee, L., Galbraith, J., . . . Stanton, B. (1994). Social influences on the sexual behavior of youth at risk for HIV exposure. *Am J Public Health, 84*(6), 977-985.

Saewyc, E., Skay, C., Richens, K., Reis, E., Poon, C., & Murphy, A. (2006). Sexual Orientation, Sexual Abuse, and HIV-Risk Behaviors Among Adolescents in the Pacific Northwest. *American Journal of Public Health, 96*(6), 1104-1110. doi:10.2105/AJPH.2005.065870

Society, C. P. (2008). Adolescent sexual orientation. *Paediatrics & Child Health, 13*(7), 619-623.

Susanto, T., Rahmawati, I., Wuryaningsih, E. W., Saito, R., Syahrul, Kimura, R., . . . Sugama, J. (2016). Prevalence of factors related to active reproductive health behavior: a cross-sectional study Indonesian adolescent. *Epidemiology and Health, 38*, e2016041. doi:10.4178/epih.e2016041

Thanavanh, B., Harun-Or-Rashid, M., Kasuya, H., & Sakamoto, J. (2013). Knowledge, attitudes and practices regarding HIV/AIDS among male high school students in Lao People's Democratic Republic. *J Int AIDS Soc, 16*, 17387. doi:10.7448/ias.16.1.17387

Zulkifli, S., Low, W., & Yusof, K. (1995). Sexual activities of Malaysian adolescents. *The Medical journal of Malaysia, 50*(1), 4-10.

Zulkifli, S. N., & Low, W.-Y. (2000). Sexual practices in Malaysia: determinants of sexual intercourse among unmarried youths. *Journal of Adolescent Health, 27*(4), 276-280. doi:https://doi.org/10.1016/S1054-139X(00)00099-9