

Original article:

Level of Knowledge on Sexual and Reproductive Health Among Youths in Southern Region of Peninsular Malaysia

Siti Mariam Ja'afar¹, Hafizuddin Awang², Azriani Ab Rahman¹

Abstract:

Background: Premarital sexual activity is associated with low level of knowledge of sexual and reproductive health which gives less control over decision making pertaining to sexuality. Low understanding of sexual and reproductive health knowledge made adolescents unaware of the consequences of premarital sexual activity. This study aimed to describe the knowledge of sexual and reproductive health among youths in the state of Johor, in southern region of peninsular Malaysia. **Materials and Methods:** A cross-sectional study was conducted in eleven health facilities in Johor state, Malaysia. The study samples were all youths who fulfilled study inclusion and exclusion criteria. The youths were assessed through a validated self-administered, anonymous questionnaire on socio-demographic background and 21 items of knowledge on sexual and reproductive health. Descriptive statistics were employed to present the findings. **Results:** There were 204 respondents involved in the study. The mean (\pm standard deviation) age of respondents was 21 years old (± 1.9). Majority of them were female (60.7%) and Malay (89.1%). Most of the respondents had high level of education (secondary and tertiary levels) (98.5%). A small percentage of the respondents were smokers (18.6%), alcohol drinkers (7.5%), drug users (3.5%), and a smaller portion reported of having history of sexually molested (4%). This study found sexual exposure among subjects ranged from reading (35.3%) and watching pornographic materials (44%), imagining sex (18.2%), as well as masturbating (21.1%). As for level of knowledge on sexual and reproductive health, majority of our respondents had low level of knowledge on the domain of sexual activity and pregnancy, complication of premarital sexual activity, and contraception. **Conclusion:** As the involvement of youths in sexual activity is getting more prevalent, youth sexual and reproductive health should be prioritized in Malaysia. Public health campaigns need to focus on the positive aspects of healthy sexual relationships. The importance of ensuring easy access to sexual and reproductive health services for all youths needs to be acknowledged and addressed.

Keywords: knowledge, sexual and reproductive health, youths, Malaysia.

*International Journal of Human and Health Sciences Vol. 05 No. 02 April'21 Page : 315-323
DOI: <http://dx.doi.org/10.31344/ijhhs.v5i3.281>*

Introduction:

Adolescence is a transitional phase that involves dramatic physical, mental, sexual and social changes between childhood and adulthood¹. There are notable physical and sexual changes in teenagers during this transition from childhood to adulthood. Psychosocial development during adolescence is important in determining the

adolescents' identity, autonomy, sexuality and achievement². If adolescents are not adequately educated and introduced to sex education and knowledge of sexual and reproductive health, they may engage in high-risk behaviour and sexual practices, including premarital sexual activity^{2,3}.

Premarital sexual activity is linked with lower level of sexual and reproductive health knowledge,

1. Department of Community Medicine, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan.
2. Setiu District Health Office, Bandar Permaisuri 22100 Setiu, Terengganu.

Correspondence to: Dr Hafizuddin Awang, Public Health Medicine Specialist, Setiu District Health Office, Bandar Permaisuri, 22100 Setiu, Terengganu. **E-mail:** drhafizuddin@moh.gov.my

which gives less autonomy over sexuality decisions^{4,5}. Low understanding of sexual and reproductive health knowledge made adolescents unaware of the consequences of premarital sexual activity. Therefore, they might be easily persuaded into sexual intercourse that is usually unprotected. A research in Taiwan found that active participation in school prevents a child from sexual premarital activity, which could coincide with the inclusion of a formal sex education curriculum taught in school⁶.

A few studies in Malaysia revealed that young people's knowledge of sexual and reproductive health was significantly poor^{4,7,8}. They were not acquainted with the functions of reproductive organs⁹, virginity-related questions⁴, complications of premarital sexual activity (pregnancy, abortion)⁴, contraception^{4,9,10}, and sexually transmitted diseases⁴.

Sex education in Malaysia has long been integrated in the school curricular. It was introduced in secondary school in 1989 and then was expanded into primary school in 1994. There is no specific topic devoted to sex education, but the modules are blended into various school subjects. The sex education module, for example, is integrated into Islamic and moral, science, and physical health subjects⁴. Sex education is not provided by the Malaysian Ministry of Education alone, but also by other government agencies and non-governmental organizations (NGOs), such as the National Board for Population and Family Development and the Malaysian Adolescent Health Association³.

Despite the initiative taken by the Ministry of Education Malaysia, the trend of premarital sexual activity is on the rise. A previous local study had found that the module of sex education should be taught to adolescents in accordance to their developmental stages¹¹. The module itself should have information on all aspect of sexuality, from physical changes to sexual behaviour and contraception¹¹. To the best of our knowledge, there is no well-published study on the knowledge level of sexual and reproductive health among youths in the southern region of peninsular Malaysia. Hence, this study aimed to describe the knowledge of sexual and reproductive health among youths in the state of Johor, in southern region of peninsular Malaysia.

Materials and Methods:

From 1st February 2017 until 28th February 2017, we conducted a cross-sectional study in eleven primary healthcare facilities in the district of Muar, Johor, a southern state of Peninsular Malaysia. The reference populations were all youths in Muar district, and the source populations were youths who attended the eleven recruited health facilities for any kind of health services. The study samples were all adolescents who fulfilled study inclusion and exclusion criteria. The inclusion criteria were Malaysian citizen aged between 18 until 24 years old. Adolescents who were illiterate and unable to understand Malay language were excluded from the study.

The sample size was determined using a single proportion formula¹². Using the proportion of low knowledge on sexual and reproductive health of 70%⁴, precision of 7%, 5% type 1 error, 80% power and additional of 10% non-response rate, the total sample size required is 190 youths. We employed proportionate sampling for subject recruitment based on the number of youth daily attendance in each of the eleven health clinics.

Written consent was obtained from the youths and their parents (for adolescents aged below 18 years old) prior to data collection. The students were assessed through an anonymous validated self-administered questionnaire, but they were guided to answer the questions. The questionnaire consists of socio-demographic information, including personal and family background, and knowledge on sexual and reproductive health (21 items). Questions on human reproductive organs, pregnancy, contraceptives, human immunodeficiency virus (HIV), sexually transmitted diseases and abortions are included in SRH knowledge sections. There were 21 items; 'Vagina is a place for sexual act', 'Hymen could be injured by sexual intercourse', 'Perineal area can be touch by parents/siblings', 'Seminal fluids contain sperms', 'You must sleep separately with other family members of different gender', 'Girl who has reached menarche could become pregnant if involved with sexual activity', 'Girl could become pregnant if penis is inserted into the vagina', 'Pregnancy could happen if there is fertilization of sperm and ovum', 'Girl could not become pregnant if had sexual intercourse only

once', 'Girl could not become pregnant if had sexual intercourse with only one man', 'Premarital sex could cause a girl to become pregnant', 'Sexually transmitted disease is caused by sexual intercourse', 'HIV is transmitted through sexual intercourse', 'Baby dumping is related to premarital pregnancy', 'Abortion could cause massive bleeding', 'Abortion could cause maternal sepsis', 'Illegal abortion could lead to maternal death', 'Pregnancy could be prevented by wearing condom', 'Washing vagina after sexual intercourse could prevent pregnancy effectively', 'Abstinence is the best way to prevent pregnancy', and 'Girls could not get pregnant if taken hot water bath after sexual intercourse'. The items were categorized into "true", "false" or "do not know" response. Correct response was given a score of '2', "do not know" as '1', and incorrect response as '0'. Item analysis in the previous pilot study for the knowledge domain was good: Cronbach's α was more than 0.7¹³.

Every youth participated in the study voluntarily, after signing an informed consent form in accordance with the Declaration of Helsinki. The aims of the study were explained to the youths in the presence of their parents (for minor adolescents), and all participants were assured that their anonymity would be protected. Ethics approval was obtained from the Medical Review and Ethical Committee from National Institute of Health, Ministry of Health Malaysia [NMRR-16-2719-31657]. No monetary incentives were offered.

Statistical analysis

Socio-demographic information of the respondents was tabulated for descriptive statistics. All of the items on knowledge were tabulated according to theme for descriptive analysis. They were described in frequency (n) and percentage (%) for each of answer's category (correct, not sure, and wrong). Data entry and statistical analysis were carried out using SPSS Statistics (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp).

Results:

Socio-demographic characteristics of the respondents

This study employed a total of 204 respondents. The mean (\pm standard deviation) age of respondents was 21 years old (\pm 1.9). Majority of them were

female (60.7%) and Malay (89.1%). Most of the respondents had high level of education (secondary and tertiary levels) (98.5%). The highest percentage of respondents came from households with a monthly income of less than RM2000 (65%), and living with both parents (82.6%). Majority of the respondents reported their parents showed good concern (95%) towards them. Many of them reported never feel lack of parental attention (81.6%). 97.5% of respondents reported they had good relationship with family, where most of their parents know their friends (96%), and always reminded about prayer (90%). A small percentage of the respondents were smokers (18.6%), alcohol drinkers (7.5%), drug users (3.5%), and a smaller portion reported of having history of sexually molested (4%). This study found sexual exposure among subjects ranged from reading (35.3%) and watching pornographic materials (44%), imagining sex (18.2%), as well as masturbating (21.1%). Details regarding socio-demographic characteristics were shown in Table 1.

Table 1. Socio-demographic characteristics of respondents (n=204)

Variables	n (%)
Age (years)*	21.0 (\pm 1.9)*
Gender	
Female	122 (60.7)
Male	79 (39.3)
Race	
Malay	179 (89.2)
Chinese	10 (4.9)
Indian	11 (5.4)
Others	1 (0.5)
Religion	
Muslim	180 (89.7)
Buddha	9 (4.4)
Hindu	11 (5.4)
Christian	1 (0.5)
Prayer practice (Muslim) (n=181)	
Always	88 (48.6)
Seldom	91 (50.3)
Never	2 (1.1)
Education level	
Primary	3 (1.5)
Secondary	111 (55.8)
Tertiary	85 (42.7)
Academic achievement	
Top 20	78 (41.1)
Average	106 (55.8)
Bottom 20	78 (3.1)
Family construct (living arrangement)	
Both parents	156 (77.5)
Mother and stepfather	4 (2.0)
Grandparents	4 (2.0)
Mother only	10 (5.0)

Father and stepmother	2 (1.0)
Alone	8 (4.0)
Father only	2 (1.0)
Relatives	4 (2.0)
Adopted parents	1 (0.5)
Others	10 (5.0)
Household income (Malaysian Ringgit)	
<500	11 (5.5)
501 – 1000	46 (23.0)
1001 – 2000	73 (36.5)
>2000	70 (35.0)
Parents' marital status	
Living together	160(80.0)
Separated	6 (3.0)
Divorced	9 (4.5)
Mother passed away	20 (10.0)
Father passed away	3 (1.5)
Both passed away	2 (1.0)
Parental concern	
Good	190 (95.0)
Lack	10 (5.0)
Lack of parental attention	
Always	9 (4.5)
Seldom	27 (13.5)
Never	164 (82.0)
Good family relationship	
Yes	196 (97.5)
No	5 (2.5)
Parent knows friend	
Yes	193 (96.0)
No	8 (4.0)
Parent reminded about prayer	
Always	181 (90.0)
Seldom	17 (8.5)
Never	3 (1.5)
Smoking	
No	162 (81.4)
Yes	37 (18.6)
Alcohol drinking	
No	186 (92.5)
Yes	15 (7.5)
Substance abuse	
No	193 (96.5)
Yes	7 (3.5)
Reading pornographic material	
No	130 (64.7)
Yes	71 (35.3)
Watching pornographic material	
No	112 (56.0)
Yes	88 (44.0)
Masturbation	
No	146 (78.9)
Yes	39 (21.1)
History of sexually molested	
No	193 (96.0)
Yes	8 (4.0)

* Mean (\pm SD)

For assessing the knowledge on sexual and reproductive health, the results were divided into knowledge on reproductive organ; sexual activity

and pregnancy; complications of premarital sexual activity; and contraception.

Knowledge on reproductive organ

Table 2 shows results on knowledge on reproductive organs. Most of the respondents gave correct answers to questions pertaining to reproductive organs and functions. Among three of the items on reproductive organs, questions that have the most “not sure” answer was the question on “Hymen could be injured by sexual intercourse” with 61 (30.3%) respondents.

Table 2. Knowledge on reproductive organs and its function among youths in Johor (n=204)

Variables	Correct	Not sure	Wrong
	n (%)	n (%)	n (%)
Vagina is a place for sexual act	173 (86.1)	24 (11.9)	4 (2.0)
Hymen could be injured by sexual intercourse	125 (62.2)	61 (30.3)	15 (7.5)
Seminal fluids contain sperms	17 (88.6)	15 (7.4)	8 (4.0)

Knowledge on sexual activity and pregnancy

Table 3 shows out of 204 respondents, 82.6% of them knew that they must sleep separately with other family members of different gender. Majority of the respondents were aware that the perineal area cannot be touched by parents or siblings.

On questions related to pregnancy, majority of them (68.7%) know that girls who has reached menarche could become pregnant if involved with sexual activity, and premarital sex could lead to pregnancy (76.6% of respondents). Half of them answered correctly on question of “Girl could become pregnant if penis is inserted into the vagina”.

88.6% of them knew that pregnancy could happen if there's fertilization of sperm and ovum. But for questions of “Girl could not become pregnant if had sexual intercourse only once”, almost half of the respondents were unsure (49.3%). 33.8% of the respondents were unsure on question pertaining to “Girl could not become pregnant if had sexual intercourse with only one man”, while 63.2% answered correctly.

Table 3. Knowledge on sexual activity and pregnancy among youths in Johor (n=204)

Variables	Correct		Not sure		Wrong	
	n	(%)	n	(%)	n	(%)
Perineal area can be touched by parents/siblings	8	(4.0)	34	(16.9)	159	(79.1)
You must sleep separately with other family members with different gender	166	(82.6)	14	(7.0)	21	(10.4)
Girl who has obtain menarche could become pregnant if involved with sexual act	138	(68.7)	37	(18.4)	26	(12.9)
Girl could become pregnant if penis is inserted into the vagina	111	(55.2)	67	(33.3)	23	(11.5)
Pregnancy could happen if there's fertilization of sperm and ovum	178	(88.5)	20	(10.0)	3	(1.5)
Girl could not become pregnant if had sexual intercourse only once	9	(4.4)	99	(49.3)	93	(46.3)
Girl could not become pregnant if had sexual intercourse with only one man	6	(3.0)	68	(33.8)	127	(63.2)
Premarital sex could cause a girl to become pregnant	154	(76.6)	34	(16.9)	13	(6.5)

Knowledge on complication of premarital sexual activity

Table 4 shows knowledge on complication of premarital sexual activity. In regards to sexually transmitted diseases, 70.6% answered correctly which they can be caused by sexual intercourse. For HIV, vast majority (90.0%) know that it can be transmitted through sexual intercourse.

Pertaining to baby dumping phenomenon that is

related to premarital pregnancy, 90.5% answered correctly. For the question on abortion, majority -150- respondents answered correctly which is abortion could cause massive bleeding. Half of the respondents (50.2%) answered correctly on questions relating to abortion and maternal sepsis. For the question on maternal death related to illegal abortion, 121 respondents answered correctly.

Table 4. Knowledge on complication of premarital sexual activity among youths in Johor (n=204)

Variables	Correct		Not sure		Wrong	
	n	(%)	n	(%)	n	(%)
Sexually transmitted disease is caused by sexual intercourse	143	(71.1)	55	(26.4)	5	(2.5)
HIV is transmitted through sexual intercourse	181	(90.0)	17	(8.5)	3	(1.5)
Baby dumping is related to premarital pregnancy	182	(90.5)	14	(7.0)	5	(2.5)
Abortion could cause massive bleeding	150	(74.6)	48	(23.9)	3	(1.5)
Abortion could cause maternal sepsis	101	(50.2)	93	(46.3)	7	(3.5)
Illegal abortion could lead to maternal death	121	(60.2)	77	(38.3)	3	(1.5)

Knowledge on contraception

In Table 5, which shows knowledge on contraception, majority of respondents (66.7%) answered correctly on the question of condom usage in preventing pregnancy. Majority of respondents (87.6%) concurred that abstinence is the best way to prevent pregnancy.

Surprisingly, many of the respondents (65.7%) were unsure on question of 'Washing vagina after sexual intercourse could prevent pregnancy effectively', and only 23.4% of respondents answered correctly. Most respondents (63.7%) were unsure if taking hot water bath after sexual intercourse could prevent pregnancy.

Table 5. Knowledge on contraception among youths in Johor (n=204)

Variables	Correct		Not sure		Wrong	
	n	(%)	n	(%)	n	(%)
Pregnancy could be prevented by wearing condom	134	(66.6)	60	(29.9)	7	(3.5)
Washing vagina after sexual intercourse could prevent pregnancy effectively	22	(10.9)	132	(65.7)	47	(23.4)
Abstinence is the best way to prevent pregnancy	176	(87.5)	17	(8.5)	8	(4.0)
Girls could not get pregnant if taking hot water bath after sexual intercourse	7	(3.5)	128	(63.7)	66	(32.8)

Discussion:

The mean (\pm SD) age of respondents in this study is 21 (\pm 1.9) years old, with a higher percentage of female respondents. Nearly half of our respondents earned a tertiary level of education, which included preparatory course, college or university level. A study in Kathmandu, Nepal, found that young people who obtained higher education were more accepting of premarital sexual activity because they lived by themselves and they received less parental supervision¹⁴.

Youth academic achievement was also considered in this research. It is a self-rated statement in which those who recall the results were regarded as having good academic achievement within the top 20. Those who ranked themselves as average and below 20 were considered to have poor academic performance. Slightly half of our respondents had poor academic achievement in this study. In a study conducted in Turkey, it was reported that young people with poor academic performance were more likely to be involved with sexual activity¹⁵.

Majority of our respondents were of Malay ethnicity (89.1%) but half of them were not good

practicing Moslems. A good practicing Moslem was defined as one who rated him/herself as consistently prayed while one who seldom or never prayed would be regarded otherwise. Parental supervision is crucial in shaping a child's personality. 90% of respondents stated in this study that their parents often reminded them of daily prayer. Every religion has its own code of conduct including the norm for sexual activity, especially in Islam. Studies also found that those with better insight and faith are better shielded from premarital sexual activity¹⁶⁻¹⁸.

In this current study, we found that majority of our respondents lived in an intact family structure, where both parents stayed together. Only 20% of our respondents had parents that were either divorced or passed away. A study in the United States of America showed that the quality of parenting is important in shaping the attitude of their children. Children raised in an intact family are shielded from early exposure to premarital sexual activity¹⁹. The relationship between children and family members were explored as well in this current study. 97.5% of the respondents claimed that they have good relationship with their siblings, parents or guardians. Majority of respondents reported of

having parental concern shown by their parents. Over 80% of respondents claimed they have good parental attention. Family engagement is an important determinant of the attitude of children towards sexual activity. It has been shown to be a protective factor for children from premarital sexual activity and to be particularly effective among younger youths¹⁹.

Only small group of youths were reported to indulge themselves in smoking, alcohol drinking and substance abuse. This could be due to majority of them is Malay and Muslim which are bound to cultural and religious restrictions. An Iranian study documented a significant association between consuming alcohol and premarital sexual activity as alcohol impaired the reasonable judgement of youth²⁰. In a Taiwanese study, at the age of 20, youth who smoked cigarettes and drank alcohol were more likely to be involved in premarital sexual activity. In addition, consideration of premarital sexual activity was often driven by social pressure⁶.

Internet and social media play crucial role in shaping youths' perception towards sexual activity. They serve as media for searching and sharing knowledge. The Internet and social media can, however, pollute the minds of these young people without adequate guidance and supervision. Previous study has shown that most young people use the Internet to browse for sex-related materials (pornography) because these pornographic materials are readily available and accessible²¹. Exposure to these kinds of pornographic materials can make youths addicted and then consider pornography to be acceptable. Watching pornography and masturbation are inter-related. Masturbation among young people has become a natural act that will become more common as they grow older²². Our local research has shown that masturbation is a predictor of young people's early participation in premarital sexual activity^{23,24}.

As for the extent of sexual and reproductive health knowledge, the majority of our respondents had low levels of sexual activity and pregnancy knowledge, premarital sexual activity complications, and contraception. Youths were not very educated about virginity in the realm of reproductive organs and their function. This finding is comparable

to the results of the 2014 National Population and Family Development Board survey, which indicated that our youths had low levels of sexual and reproductive organ knowledge²⁵. Similar findings about the lack of knowledge about reproductive organs among youth were also evidenced by research from another countries²⁶⁻²⁸. In view of the fact that youth are actually at higher risk of engaging in premarital sexual activity, lack of sexual and reproductive health knowledge is considered unacceptable today. Participating in premarital sexual activity without adequate knowledge of sexual and reproductive health will expose young people to numerous health and social issues, such as sexually transmitted infections and the possibility of unwanted pregnancy and postpartum complications. In addition, teenage pregnancy among unprepared youth will lead further to illegal abortion and baby dumping^{7, 29-32}.

Conclusion and recommendations:

As youth participation in sexual activity is becoming more common in Malaysia, sexual and reproductive health should be prioritized. Public health initiatives should be led by research-based evidence. The initiatives need to focus on the positive aspects of healthy sexual relationships. There is a need to recognize and address the value of ensuring easy access to sexual and reproductive health services for all youth. This should include the availability, as well as screening and testing for sexually transmitted infections and a variety of affordable contraceptive options. All of these components should be integrated into the adolescent-friendly health services currently empowered in primary healthcare facilities in Malaysia. The provision of adolescent-friendly health services has indeed increased the utilization rate and satisfaction level among adolescents in Malaysia^{33,34}.

Apart from that, sex education needs to be provided with the involvement of families, schools and the wider community, whilst at the same time being attentive to their concerns. We have to acknowledge that sexual and reproductive health is a vital part of the general health and well-being of all individuals. As shown by the findings on their level of knowledge in this present study, Malaysia youths are currently disempowered. We

have to act quickly to ensure the well-being of our youth as our future generation.

Acknowledgement: The authors would like to thank the Director General of Health Malaysia for allowing us to do data collection at the primary healthcare facilities under the governance of the Ministry of Health Malaysia.

Conflict of interest: None declared. The authors have no financial, consultative, institutional, and other relationships that might lead to bias or conflict of interest.

Funding statement: This research received Bridging Incentive Grant from Universiti Sains Malaysia (304/PPSP/6316474).

Ethical approval issue: This study was approved by the Medical Review and Ethical Committee from National Institute of Health, Ministry of Health Malaysia NMRR-16-2719-31657.

Individual authors contribution: Conception: H.A., S.M.J, A.A.R; Writer: H.A., S.M.J.; Data collection and/or processing: S.M.J.; Supervision: A.A.R.; Analysis and/or Interpretation: H.A., S.M.J., A.A.R.

References:

1. McIntyre P. Adolescent friendly health services: an agenda for change. Geneva, Switzerland: World Health Organization; 2002. Accessed 15 December 2020. https://apps.who.int/iris/bitstream/handle/10665/67923/WHO_FCH_CAH_02.14.pdf;jsessionid=D2B3169C4F304A117F36FD8183D03630?sequence=1.
2. Ministry of Health. Engaging The Adolescent Module Using HEADSS Framework: Family Health Development Division, Ministry of Health Malaysia; 2009. Accessed 15 December 2020. <http://fh.moh.gov.my/v3/index.php/component/jdownloads/send/21-sektor-kesihatan-remaja/252-engaging-the-adolescents-module-using-headss-framework?Itemid=0>.
3. Awang H, Ab Rahman A, Sukeri S, Hashim N, Nik Abdul Rashid NR. Making Health Services Adolescent-Friendly in Northeastern Peninsular Malaysia: A Mixed-Methods Study. *International Journal of Environmental Research and Public Health*. 2020;17(4):1341.
4. Rahman AA, Rahman R, Ibrahim MI, Salleh H, Ismail SB, Ali SH, et al. Knowledge of sexual and reproductive health among adolescents attending school in Kelantan, Malaysia. *Southeast Asian Journal of Tropical Medicine and Public Health*. 2011;42(3):717.
5. Sridawruang C, Crozier K, Pfeil M. Attitudes of adolescents and parents towards premarital sex in rural Thailand: A qualitative exploration. *Sexual & Reproductive Healthcare*. 2010;1(4):181-7.
6. Chiao C, Yi C-C. Adolescent premarital sex and health outcomes among Taiwanese youth: perception of best friends' sexual behavior and the contextual effect. *AIDS care*. 2011;23(9):1083-92.
7. Wong LP. An exploration of knowledge, attitudes and behaviours of young multiethnic Muslim-majority society in Malaysia in relation to reproductive and premarital sexual practices. *BMC public health*. 2012;12(1):865.
8. Low W. Malaysian youth sexuality: Issues and challenges. *Journal of Health and Translational Medicine*. 2009;12(1):3-14.
9. Shu C, Fu A, Lu J, Yin M, Chen Y, Qin T, et al. Association between age at first sexual intercourse and knowledge, attitudes and practices regarding reproductive health and unplanned pregnancy: a cross-sectional study. *Public Health*. 2016;135:104-13.
10. Kumar A, Tiwari V. Knowledge, Attitude and Behaviour towards Pre-marital Sex: A study among Youths from Two city-slums in India. *Health Popul Perspect Issues*. 2003;26(4):126-34.
11. Mutalip SSM, Mohamed R. Sexual education in Malaysia: Accepted or rejected? *Iranian Journal of Public Health*. 2012;41(7):34.
12. Fleiss JL, Levin B, Paik MC. *Statistical methods for rates and proportions*. 3rd ed. Canada: John Wiley & Sons; 2013.
13. Razlina AR, Azriani AR, Mohd Ismail I. Validation of questionnaire on premarital sexual activities

- among secondary school students. 9th IAAH World Congress; Kuala Lumpur, Malaysia 2009.
14. Adhikari R, Tamang J. Premarital sexual behavior among male college students of Kathmandu, Nepal. *BMC Public Health*. 2009;9(1):241.
 15. Aras S, Semin S, Gunay T, Orcin E, Ozan S. Sexual attitudes and risk-taking behaviors of high school students in Turkey. *Journal of School Health*. 2007;77(7):359-66.
 16. Helm Jr HW, McBride DC, Knox D, Zusman M. The Influence of a Conservative Religion On Premarital Sexual Behavior of University Students. *North American Journal of Psychology*. 2009;11(2).
 17. Jaafar J, Wibowo I, Afiatin T. The relationship between religiosity, youth culture, and premarital sex among Malaysian and Indonesian Adolescents. *Asia Pacific Journal of Social Work and Development*. 2006;16(2):5-18.
 18. Zaleski EH, Schiaffino KM. Religiosity and sexual risk-taking behavior during the transition to college. *Journal of adolescence*. 2000;23(2):223-7.
 19. Lammers C, Ireland M, Resnick M, Blum R. Influences on adolescents' decision to postpone onset of sexual intercourse: A survival analysis of virginity among youths aged 13 to 18 years. *Journal of adolescent health*. 2000;26(1):42-8.
 20. Mohammad K, Farahani FKA, Mohammadi MR, Alikhani S, Zare M, Tehrani FR, et al. Sexual risk-taking behaviors among boys aged 15–18 years in Tehran. *Journal of Adolescent Health*. 2007;41(4):407-14.
 21. Brown JD, L'Engle KL. X-rated: Sexual attitudes and behaviors associated with US early adolescents' exposure to sexually explicit media. *Communication Research*. 2009;36(1):129-51.
 22. Robbins CL, Schick V, Reece M, Herbenick D, Sanders SA, Dodge B, et al. Prevalence, frequency, and associations of masturbation with partnered sexual behaviors among US adolescents. *Archives of Pediatrics & Adolescent Medicine*. 2011;165(12):1087-93.
 23. Awaluddin SM, Ahmad NA, Saleh NM, Aris T, Kasim NM, Sapri NAM, et al. Prevalence of sexual activity in older Malaysian adolescents and associated factors. *Journal of Public Health Aspects*. 2015;2(1):1.
 24. Manaf MRA, Tahir MM, Sidi H, Midin M, Jaafar NRN, Das S, et al. Pre-marital sex and its predicting factors among Malaysian youths. *Comprehensive Psychiatry*. 2014;55:S82-S8.
 25. Mahmud A, Wan Jaffar WH, Mohammad AH, Ishak I, Muhammad Sapri NA, Mahpul IN, et al. Laporan penemuan utama Kajian Penduduk dan Keluarga Malaysia Kelima (KPKM-5) 2014: National Population and Family Development Board, Malaysia; 2016.
 26. Eaton L, Flisher AJ, Aarø LE. Unsafe sexual behaviour in South African youth. *Social Science & Medicine*. 2003;56(1):149-65.
 27. Regmi P, Simkhada P, Van Teijlingen E. "Boys Remain Prestigious, Girls Become Prostitutes": Socio-Cultural Context of Relationships and Sex among Young People in Nepal. *Global Journal of Health Science*. 2010;2(1):60-72.
 28. Sydsjö G, Selling KE, Nyström K, Oscarsson C, Kjellberg S. Knowledge of reproduction in teenagers and young adults in Sweden. *The European Journal of Contraception & Reproductive Health Care*. 2006;11(2):117-25.
 29. Razali S, Kirkman M, Ahmad SH, Fisher J. Infanticide and illegal infant abandonment in Malaysia. *Child Abuse & Neglect*. 2014;38(10):1715-24.
 30. Glasier A, Gülmezoglu AM, Schmid GP, Moreno CG, Van Look PF. Sexual and reproductive health: a matter of life and death. *The Lancet*. 2006;368(9547):1595-607.
 31. Awang H, Husain NRN, Abdullah H. Pediatric tuberculosis in a Northeast state of Peninsular Malaysia: Diagnostic classifications and determinants. *Oman Medical Journal*. 2019;34(2):110-117.
 32. Awang H, Husain NRN, Abdullah H. Chest radiographic findings and clinical determinants for severe pulmonary tuberculosis among children and adolescents in Malaysia. *Russian Open Medical Journal*. 2019;8(2).
 33. Awang H, Ab Rahman A, Sukeri S, Hashim N, Nik Abdul Rashid NR. A Reliability Study of the Malay Version of the Malaysian Ministry of Health's Adolescent Client Satisfaction Questionnaire among Adolescents attending Health Clinics in Northeastern Malaysia. *Korean Journal of Family Medicine*. 2020;41(6):412-415.
 34. Awang H, Ab Rahman A, Sukeri S, Hashim N, Nik Abdul Rashid NR. Adolescent-friendly health services in primary healthcare facilities in Malaysia and its correlation with adolescent satisfaction level. *International Journal of Adolescence and Youth*. 2020;25(1):551-561.