

Factors Associated with Knowledge and Awareness of Syphilis Among the Youths Visiting Family Planning Clinics, Bangkok, Thailand

ปัจจัยที่มีความสัมพันธ์ต่อความรู้และความตระหนักรู้ต่อโรคซิฟิลิส ในกลุ่มเยาวชนที่มารับบริการ ในคลินิกวางแผนครอบครัว กรุงเทพมหานคร ประเทศไทย

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Abstract

Objective: This was to determine factors associated with knowledge and awareness of syphilis prevention among youths who visited PPAT family planning clinics, Bangkok, Thailand.

Methods: A cross-sectional study was conducted using self-administered questionnaires among 15–24-year-old youths. Logistic regression analysis was used to determine an association between socio-demographic factors and knowledge, awareness level of syphilis prevention.

Results: Total 207 participants were recruited by purposive sampling technique. Multivariable logistic regression analysis showed that employment status, living status, frequency of condom use, reproductive health education, and history of reproductive health service use had a significant association with knowledge level of syphilis prevention. Furthermore, our study found that knowledge level of syphilis prevention and history of reproductive health service use had a significant association with awareness level.

Conclusion: The youths are generally recognized as a vulnerable population for syphilis infection. According to the change of social condition, globalization, and technology; these things influence sexual behavior among the youths. Therefore, it is important for public health workers to

understand the associated with knowledge and awareness regarding syphilis prevention in order to develop a novel strategy to control over the epidemic of syphilis among the youths in Thailand.

Keywords: syphilis, sexually transmitted infection, reproductive health, youth.

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาปัจจัยที่มีความสัมพันธ์กับความรู้และความตระหนักในการป้องกันโรคชิฟลิสในกลุ่มเยาวชนที่มารับบริการในคลินิกวางแผนครอบครัว กรุงเทพมหานคร ประเทศไทย

วิธีการศึกษา: การศึกษาแบบภาคตัดขวาง (cross-sectional study) โดยใช้แบบสอบถามในกลุ่มเยาวชน อายุ 15-24 ปี ที่มารับบริการในคลินิกวางแผนครอบครัว กรุงเทพมหานคร ประเทศไทย

ผลการศึกษา: ผู้เข้าร่วมวิจัยทั้งสิ้น 207 คน ผลการวิเคราะห์สถิติแบบทดสอบโดยโลจิสติกส์ พบร่วงสถานะการจ้างงาน สถานภาพการอยู่อาศัย ความถี่ของการใช้ถุงยางอนามัย การได้รับการศึกษาด้านอนามัยเจริญพันธุ์ และประวัติการมารับบริการอนามัยเจริญพันธุ์ มีความสัมพันธ์อย่างมีนัยยะสำคัญทางสถิติกับระดับความรู้ในการป้องกันโรคชิฟลิส และพบว่าระดับความรู้ในการป้องกันโรคชิฟลิสและประวัติการมารับบริการอนามัยเจริญพันธุ์มีความสัมพันธ์อย่างมีนัยยะสำคัญทางสถิติกับระดับของความตระหนักรู้ในการป้องกันโรคชิฟลิสของกลุ่มเยาวชนเป้าหมาย

สรุป: เยาวชนอายุ 15–24 ปี เป็นกลุ่มวัยที่มีความเสี่ยงสูงต่อการติดเชื้อชิพลิสและโรคติดต่อทางเพศสัมพันธ์ อีน เพื่อที่จะลดความเสี่ยงและอุบัติการณ์ของโรค จำเป็นต้องเข้าใจปัญหา วิเคราะห์สถานการณ์ให้สอดคล้องกับบริบท ของกลุ่มเป้าหมายและเป็นปัจจุบัน เพื่อหาแนวทางที่เหมาะสมในการสร้างความรู้และความตระหนักรถต่อการป้องกัน โรคชิพลิสซึ่งเป็นภัยร้ายสำคัญของการควบคุมและป้องกันโรคอย่างยั่งยืน

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Introduction

Sexual transmitted infections (STIs) are one of the most common communicable diseases suffering to millions of people around the world. According to World Health Organization (WHO) report, each year there are approximately 376 millions of new patients infected with 1 of 4 most common STIs that are chlamydia, gonorrhea, syphilis, and

trichomoniasis respectively.^{1,2} STIs can cause acute uro-genital problems such as cervicitis, urethritis, vaginitis, vaginal discharge, and genital ulcer. Additionally, some can cause chronic and permanent disabilities especially HIV and syphilis.

Thailand has had a successful story for controlling syphilis, HIV and other STIs since 1989 which called the “100 Percent Condom

Program”³. This program was implemented by the Department of Disease Control of Thailand (DDC) focused on condom use among sex workers to ensure that clients could not purchase sexual services without using condoms. When this program was implemented, the rates of STIs dropped quickly and significantly³

However, the current situation of syphilis in Thailand has been increased dramatically over 5 times for the last 10 years. Data from DDC showed that in 2010, incidence of syphilis was 2.16 per 100,000 population and it increased to 11.52 per 100,000 population in 2020⁴. Syphilis cases were major in youths and young adults, and accountable for 41 percent of all syphilis cases in 2020.⁴ However, this report of Thailand was likely to be inferior to real situation because it received data from passive surveillance system which documented only cases that visited public hospitals.

A recent study showed that the reappearing of syphilis among youths and young adults was relative to sexual behavior change through social condition and advances in technology, especially internet and social media use⁵. As we know, internet is very useful for many purposes. However some of them use internet and social media for nudies, premature sexual intercourses, seeking sexual partners and other sexual proposes.⁶ Therefore, the 100 Percent Condom Program which emphasized on sex workers in the sex establishments might not as effective as in the past, because the program

did not cover internet and social media used.

As we know, knowledge and awareness are the important factors for preventing syphilis infection by influencing a proper sexual behavior.⁷ Recently, data from DDC found a lot of misconceptions about syphilis among the youths; some of them believed that syphilis and other STIs could be infected if only they had sexual intercourse with sex-workers⁴, and some believed that STIs could transmit only when semen was secreted, so they used a condom only at a period of ejaculation.⁸

This study aims to explore the factors that associate with level of knowledge and awareness of syphilis among youths who visited the PPAT family planning clinics to understand more and improve the syphilis prevention program.

Objective

This is to determine factors related to knowledge and awareness level of syphilis prevention among youths visiting PPAT family planning clinics, Bangkok, Thailand.

Research Methodology

Study design: A cross-sectional study

Study area

This study was conducted at 3 branches of PPAT family planning clinics, Bangkok, Thailand (Din Daeng PPAT Medical Clinic, Pin Klae PPAT Medical Clinic, Bang Khen PPAT Medical Clinic) from March to June 2021.

Study population

The youths who visited family planning clinic, Bangkok, Thailand.

Sample size

Sample size in this study was calculated by the Cochran formula (Cochran, 1963).

$$n = \frac{z^2 p(1 - p)}{d^2}$$

$Z = 1.28$: Critical value for 90% confidence level

$d = 0.05$: Absolute precision required

$p = 0.50$: Percentage picking a choice or response

$$n = \frac{(1.28)^2 0.50(1 - 0.50)}{(0.05)^2}$$

$$n = 164$$

From above formula, the minimal participants were 164 people. Twenty percent of the participants (33 people) were added to avoid persons who refused or did not complete answering the questionnaires. So, the total sample size should be at least 197 people.

Sampling technique

Purposive sampling method was done from the youths visiting 3 family planning clinics, Bangkok, Thailand. (Din Daeng PPAT Medical Clinic, Pin Klae PPAT Medical Clinic, Bang Khen PPAT Medical Clinic)

- Inclusion criteria: The youths aged between 15–24 years old both male and female who visited

PPAT family planning clinic for any reproductive health services.

- Exclusion criteria: The youths who refused to participate and the youths who could not read and write Thai language.

Research instruments

Self-administrative questionnaires composed of 2 parts as following:

- Part 1: socio-demographic data, sexual preventive behavior, sexual and reproductive health education/information, reproductive health service accessibility
- Part 2: questionnaires about knowledge and awareness of syphilis composed of 15 items of knowledge questionnaires and 15 items of awareness questionnaires. The cut-off points for both knowledge and awareness scores followed Glass's standard and criteria of assessment⁹ which uses the percentile for classification. The individual who got a score above 75th percentile is equal to "good level", and below 75th percentile equal to "fair or poor level".

Validity

Content validity of the questionnaires was provided by three experts.

Reliability

Pilot study was conducted among 30 youths before data collection. After that, internal consistency of the rating scales was done by

Cronbach's alpha coefficient to measure the reliability. Cronbach's alpha coefficient for knowledge of syphilis questionnaire was 0.896; Cronbach's alpha coefficient for awareness of syphilis questionnaire was 0.867.

Data analysis

The association between socio-demographic data and the level of knowledge/awareness of syphilis prevention was analyzed using logistic regression statistics. Additionally, bivariable logistic regression analysis was applied to all variables which a p-value less than .2 and then were considered into a multivariable logistic regression model. Finally, the multivariable logistic regression analysis was applied to determine the statistically significant

factors with p-value less than .05 and adjusted odds ratio (AOR) with 95% confidence interval. All statistics data were analyzed with "IBM SPSS Statistics" version 25.

Ethical approval

Ethical approval was obtained from "The Research Ethics Review Committee for Research Involving Human Research Participants" Chulalongkorn University (COA number 126/2021).

Results

Total number of participants was 207 people. Frequency and percentage of participants classified by socio-demographic and related factors were reported in Table 1

Table 1 Frequency and percentage of participants classified by socio-demographic and related factors

Socio-demographic and related factors	n	(%)
Age group		
15-19 years	13	(6.3)
20-24 years	194	(93.7)
Gender		
Male	84	(40.6)
Female	123	(59.4)
Marital status		
Single	97	(46.9)
Married, live together	85	(41.1)
Married, separation	11	(5.3)
Divorce	14	(6.7)
Employment status		
Fulltime job	127	(61.3)
Parttime job	36	(17.4)
Unemployment	44	(21.3)

Table 1 Frequency and percentage of participants classified by socio-demographic and related factors (Ext.)

Socio-demographic and related factors	n	(%)
Living status		
Living alone	39	(18.8)
Living with couple	76	(36.7)
Living with friend or colleague	14	(6.8)
Living with family or relative	78	(37.7)
Education level		
Junior high school	21	(10.1)
High school	43	(20.8)
Vocational school	25	(12.1)
University or higher	118	(57.0)

Table 2 Level of knowledge and awareness of syphilis prevention

Characteristic	Level of knowledge		Level of awareness	
	Fair or poor (n = 141) *	Good (n = 66) *	Fair or poor (n = 154) *	Good (n = 53) *
Age				
15-19 years	10 (76.9)	3 (23.1)	11 (84.6)	2 (15.4)
20-24 years	131 (67.5)	63 (32.5)	143 (73.7)	51 (26.3)
Gender				
Male	56 (66.7)	28 (33.3)	59 (70.2)	25 (29.8)
Female	85 (69.1)	38 (30.9)	95 (77.2)	28 (22.8)
Marital status				
Single	59 (60.8)	38 (39.2)	69 (71.1)	28 (28.9)
Married, live together	63 (74.1)	22 (25.9)	65 (76.5)	20 (23.5)
Married, separation	8 (72.7)	3 (27.3)	9 (81.8)	2 (18.2)
Divorce	11 (78.6)	3 (21.4)	11 (78.6)	3 (21.4)
Employment status				
Fulltime job	80 (63.0)	47 (37.0)	95 (74.8)	32 (25.2)
Parttime job	27 (75.0)	9 (25.0)	24 (66.7)	12 (33.3)
Unemployment	34 (77.3)	10 (22.7)	35 (79.5)	9 (20.5)

* Frequency (percentage by row)

Table 2 Level of knowledge and awareness of syphilis prevention (Ext.)

Characteristic	Level of knowledge		Level of awareness	
	Fair or poor (n = 141) *	Good (n = 66) *	Fair or poor (n = 154) *	Good (n = 53) *
Living status				
Living alone	16 (41.0)	23 (59.0)	28 (71.8)	11 (28.2)
Living with couple	53 (69.7)	23 (30.3)	52 (68.4)	24 (31.6)
Living with friend or colleague	7 (50.0)	7 (50.0)	11 (78.6)	3 (21.4)
Living with family or relative	65 (83.3)	13 (16.7)	63 (80.8)	15 (19.2)
Education level				
Junior high school	18 (85.7)	3 (14.3)	16 (76.2)	5 (23.8)
High school	31 (72.1)	12 (27.9)	33 (76.7)	10 (23.3)
University or higher	70 (59.3)	48 (40.7)	87 (73.7)	31 (26.3)
Vocational school	22 (88.0)	3 (12.0)	18 (72.0)	7 (28.0)
Reproductive health education				
Yes	105 (64.0)	59 (36.0)	122 (74.4)	42 (25.6)
No	36 (83.7)	7 (16.3)	32 (74.4)	11 (25.6)
Sexual intercourse				
Yes	139 (68.5)	64 (31.5)	151 (74.4)	52 (25.6)
No	2 (50.0)	2 (50.0)	3 (75.0)	1 (25.0)
Frequency of condom use				
Always	5 (26.3)	14 (73.7)	10 (52.6)	9 (47.4)
Usually	33 (60.0)	22 (40.0)	42 (76.4)	13 (23.6)
Sometimes	57 (75.0)	19 (25.0)	56 (73.7)	20 (26.3)
Rarely	27 (87.1)	4 (12.9)	26 (83.9)	5 (16.1)
Never use	19 (73.1)	7 (26.9)	20 (76.9)	6 (23.1)
Available of reproduction health service				
Yes	55 (75.3)	18 (24.7)	53 (72.6)	20 (27.4)
No	86 (64.2)	48 (35.8)	101 (75.4)	33 (24.6)

* Frequency (percentage by row)

Table 2 Level of knowledge and awareness of syphilis prevention (Ext.)

Characteristic	Level of knowledge		Level of awareness	
	Fair or poor	Good	Fair or poor	Good
	(n = 141) *	(n = 66) *	(n = 154) *	(n = 53) *
History of reproductive health service use				
Public hospital	39 (75.0)	13 (25.0)	41 (78.8)	11 (21.2)
Primary care hospital	19 (65.5)	10 (34.5)	17 (58.6)	12 (41.4)
Private clinic/hospital	18 (81.8)	4 (18.2)	18 (81.8)	4 (18.2)
Never use service	65 (62.5)	39 (37.5)	78 (75.0)	26 (25.0)

* Frequency (percentage by row)

Multivariable logistic regression analysis

All variables associated with level of knowledge and awareness of syphilis prevention from bivariable logistic regression analysis which had a p-value of less than .2 were considered

into a multivariable logistic regression model 1. Then, all significant variables in logistic regression model 1 which had a p-value of less than .05 were considered in a multivariable logistic regression model 2 (Table 3 and Table 4)

Table 3 Adjusted odds ratio (OR) and 95% confidence interval (CI) for knowledge level

	Factors	Adjusted OR (95% CI) **
Employment status		
Fulltime job		Ref
Parttime job		0.38 (0.13–1.11)
Unemployment		0.29 (0.11–0.75) *
Living status		
Living alone		Ref
Living with family or relative		0.19 (0.07–0.51) *
Living with friend or colleague		0.67 (0.16–2.77)
Living with couple		0.46 (0.18–1.16)
Frequency of condom use		
Never use		Ref
Always		7.95 (1.64–38.61) *
Usually		1.49 (0.46–4.83)
Sometimes		0.58 (0.18–1.86)
Rarely		0.30 (0.07–1.37)

*(P-value < .05)

** Adjusted OR for employment status, living status, frequency of condom use, reproductive health education, history of reproductive health service use

Table 3 Adjusted odds ratio (OR) and 95% confidence interval (CI) for knowledge level (Ext.)

Factors	Adjusted OR (95% CI) **
Reproductive health education	
Yes	Ref
No	0.29 (0.11–0.77) *
History of reproductive health service use	
Never use service	Ref
Public hospital	0.60 (0.25–1.43)
Primary care hospital	0.81 (0.28–2.36)
Private clinic/hospital	0.27 (0.07–0.99) *

*(P-value < .05)

** Adjusted OR for employment status, living status, frequency of condom use, reproductive health education, history of reproductive health service use

Table 4 Adjusted odds ratio (OR) and 95% confidence interval (CI) for awareness level

Factors	Model 1**	Model 2***
	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Living status		
Living alone	Ref	
Living with family or relative	1.28 (0.44–3.74)	
Living with friend or colleague	0.68 (0.14–3.38)	
Living with couple	2.40 (0.87–6.59)	
Frequency of condom use		
Never use	Ref	
Always	2.84 (0.71–11.37)	
Usually	0.85 (0.26–2.74)	
Sometimes	1.24 (0.41–3.70)	
Rarely	0.64 (0.16–2.58)	
History of reproductive health service use		
Never use service	Ref	
Public hospital	0.78 (0.33–1.86)	
Primary care hospital	2.62 (1.02–6.75) *	
Private clinic/hospital	0.98 (0.28–3.43)	

*(P-value < .05)

**Adjusted OR for living status, frequency of condom use, history of reproductive health service use, knowledge of syphilis prevention

***Adjusted OR for history of reproductive health service use, knowledge of syphilis prevention

Table 4 Adjusted odds ratio (OR) and 95% confidence interval (CI) for awareness level (Ext.)

Factors	Model 1**	Model 2***
	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Fair or poor	Ref	Ref
Good	1.21 (1.06–1.37) *	1.19 (1.06–1.33) *

*(P-value < .05)

**Adjusted OR for living status, frequency of condom use, history of reproductive health service use, knowledge of syphilis prevention

***Adjusted OR for history of reproductive health service use, knowledge of syphilis prevention

Regarding the multivariable logistic analysis of knowledge level of syphilis prevention, **employment status**; unemployment participants had 71 percent significant lower of “High knowledge level of syphilis prevention” compared to those who were fulltime job (OR 0.287 [0.111–0.746]). **Living status**; participants who lived with family or relative had 81 percent significant lower of “High knowledge level of syphilis prevention” compared to those who lived alone (OR 0.187 [0.069–0.510]). **Frequency of condom use**; participants who always used condom had almost 8 times higher of “High knowledge level of syphilis prevention” compared to those who never used condom (OR 7.952 [1.638–38.606]). **Reproductive health education**; participants who never learned reproductive health education had 71 percent significant lower of “High knowledge level of syphilis prevention” compared to those who had a reproductive health education (OR 0.287 [0.107–0.769]). **History of reproductive health service use**; participants who ever used a reproductive health service at private clinic/hospital had 73

percent significant lower of “High knowledge level of syphilis prevention” compared to those who never used any reproductive health services (OR 0.267 [0.072–0.996]).

Regarding the multivariate analysis of awareness level of syphilis prevention, **knowledge level of syphilis prevention**; participants who had “High knowledge level of syphilis prevention” had almost 1.2 times higher of awareness level compared to those who had “fair or poor” knowledge level (OR 1.191 [1.064–1.332]). **History of reproductive health service use**; participants who ever used a reproductive health service at primary care hospital had 2.62 times higher of awareness level compared to those who never used any reproductive health services (OR 2.62 [1.02–6.75]).

Discussion

In consequence of reappearing syphilis infection among youths in Thailand, our study attempted to understand a reason behind this problem by exploring knowledge and awareness of syphilis prevention among

youths which were the most high-risk group for infection. The result showed that 63 percent of participants were classified as “fair or poor knowledge level”. Along with awareness level, 74 percent of participant classified as “fair or poor awareness level”. This result reflected a school-based reproductive health education in Thailand need to be improved urgently.

Knowledge of syphilis prevention

Employment status had been reported for a risk factor of sexually transmitted infection and syphilis. Because of individuals who were employed often met a lot of people in their workplaces and everyday life, some jobs required frequent travel outside the places of residences. So, it was a chance for unprotected sex or multiple partners’ sex.¹⁰ Result from our study indicated that unemployment associated with lower knowledge of syphilis prevention compared with individuals who had fulltime jobs.

From the literature review, there were no studies directly demonstrated a relationship between living status of youths and the knowledge of syphilis prevention. But there had been some qualitative studies on sexual health literacy in Thailand that mentioned the living status of adolescents could affect the level of knowledge to prevent of sexual risk behavior (10). The study said that living with parents or relatives provided essential information to avoid sexual risk behavior as well as they would contribute a trustful counselling when the youths had some sexual issues.¹¹

Our study found an association between frequency of condom use and level of knowledge. This finding was consistent with a previous publication which studied about the relationship between level of health literacy and STIs among students, it mentioned that an adequate level of health literacy could help young people or students made better decisions about their sexual behavior.¹² Thai Health Promotion Foundation had explored this problem by conducting a survey among adolescents and youths. The top three reasons why they avoided using condom were; price of condoms was too expensive compared with meal, afraid to buy condoms especially buying from convenience stores because they were embarrassed by the cashiers, and they preferred to use a contraceptive pill instead of condom.¹³

Reproductive health education played an important role to enable the youths understood and perceived their own risk of syphilis to avoid sexual risk behavior. As we mentioned previously that the Thai youths had a lot of misconceptions about syphilis and condom use. To correct these misconceptions, we need to reform a school-based reproductive health education program in accordance with the current situation, more accessible and broader. This finding was consistent with previous studies from China,^{14,15} they found that educational level and reproductive health education associated with both level of knowledge and awareness of syphilis as well.

Reproductive health service use was associated with knowledge and awareness level of syphilis prevention in our study. However, majority of the youths in our study did not have reproductive health services available in their local areas. This problem needs to be resolved. The online reproductive health services might fill this gap of accessibility, because currently everyone can access to internet easily through mobile phone, tablet, and laptop. The youths can use internet to access online services for reproductive health education, develop skill for preventing STIs and unplanned pregnancy, online counseling for family planning, etc.

Awareness of syphilis prevention

Awareness is more complex than knowledge. it is the result of cognitive processes, that refers to the situation in which a person experiences, feels, or realizes from a particular event. Then person understands and assesses a situation based on wisdom and mental state to choose the behavior or action for dealing with problems.¹⁶ Thus, to increase the awareness level of youths we need to put more effort rather than provide only health education. It has been studied that applying a behavioral change model to increase the level of health awareness. For example; the health belief model, a well-known behavioral change model that focuses on individual beliefs about his/her health conditions.¹⁷ The model consists of the key factors that influence health behaviors: perceived susceptibility, perceived severity, perceived benefits, perceived barriers to action,

cues to action, and confidence in ability to succeed (self-efficacy). Finally, if that issue is meaningful to their core value, it will raise awareness.¹⁷

These results raise a big challenge to the current syphilis control programs of Thailand, and it is necessary to re-orientate a reproductive health program in Thailand to keep up with the changing of perception, preference, and sexual behavior of the youths.

Conclusion

The youths are generally recognized as a vulnerable population for syphilis infection. According to the change of social condition, globalization, and technology; these things influence to sexual behavior among the youth. Therefore, it is important for public health workers to understand the factors that associate with knowledge and awareness regarding syphilis prevention and keep up with the change of perception, preference, and sexual behavior of the youths. to develop a novel strategy to control over the epidemic of syphilis among the youth in Thailand.

Recommendation

For future and further study, it is suggested that the researcher should focus on syphilis knowledge implementation by looking into the participative groups' socio-demography, sexual behavior, and access to reproductive health service aspects. Additionally, novel strategy to increase knowledge and

awareness level of syphilis prevention need to be considered, for example, reproductive health education via mobile application, peer education, and social media influencer

Reference:

1. Rowley J, Vander Hoorn S, Korenromp E, et al. Chlamydia, gonorrhoea, trichomoniasis and syphilis: global prevalence and incidence estimates, 2016. *Bull World Health Organ* 2019;97(8):548–62.
2. WHO. Report on global sexually transmitted infection surveillance 2018. Geneva: World Health Organization; 2018.
3. Chamratrithirong, Aphichat, Varachai Thongthai, Wathinee Boonchalaksi, Philip Guest, Churnrurtai Kanchanachitra, and Anchalee Varangrat. The success of the 100 percent condom promotion program in Thailand: Survey results. Institute for Population and Social Research, Mahidol University. IPSR Publication 1999; 238.
4. กรมควบคุมโรค. ซิฟิลิส โรคร้ายกลับมาระบาด [อินเทอร์เน็ต]. 2562 [เข้าถึงเมื่อ 4 เมษายน 2565]; เข้าถึงได้จาก: https://ddc.moph.go.th/doe/journal_detail.php?publish=7718.
5. Division of STD Prevention. Sexually Transmitted Disease Surveillance 2014. Atlanta: Division of STD Prevention; 2015.
6. Pounglek W. Internet Pornography: Risk caution and Prevention guideline against its effects on Thai youth. *Executive Journal* 2011;31(2):223–33.
7. Lahai-Momoh JC, Ross MW. HIV/AIDS prevention-related social skills and knowledge among adolescents in Sierra Leone, West Africa. *Afr J Reprod Health* 1997;1(1):37–44.
8. Sawadcharoenying P. A study of factors affecting sexually transmitted diseases prevention and control implemented by The division of AIDS and STIS during 2010-2019. *Thai AIDS Journal* 2020;32(3):95–114.
9. Glass GV. Standards and criteria. *Journal of Educational Measurement*. 2005;15(4):237–61.
10. Shendre M, Tiwari R. Role of occupation as a risk factor for sexually transmitted disease: A case control study. *Indian Journal of Occupational and Environmental Medicine*. 2005;9(1):35-7.
11. Kantathanawat T. Sexual literacy of adolescent in Thai society. *Journal of Social Work*. 2019;23(1):1-27.
12. Mendonça V, Antunes S, Andrade I, et al. Health Literacy and Social Behaviors : What Relationship to Sexually Transmitted Diseases among Students ?. *IJBLS* 2016;1(5):9–17.
13. สำนักงานกองทุนสนับสนุนการสร้างเสริมสุขภาพ. ส่องวัยรุ่นไทย..ทำไม่ได้สักยาง?? [อินเทอร์เน็ต]. 2562 [เข้าถึงเมื่อ 4 เมษายน 2565]; เข้าถึงได้จาก: <https://www.thaihealth.or.th/sook/info-body-detail.php?id=263>.
14. Ying L, Shaokai T, Xingdong Y, et al. Awareness and knowledge of syphilis among different populations in Guangzhou, Guangdong Province, China. *Sex Health* 2013;10(3):282–3.

15. Wu X, Hong F, Lan L, et al. Poor awareness of syphilis prevention and treatment knowledge among six different populations in south China. *BMC Public Health.* 2016;16:287.
16. Marchetti G. Consciousness: a unique way of processing information. *Cogn Process* 2018;19(3):435-64.
17. Jones CL, Jensen JD, Scherr CL, et al. The Health Belief Model as an explanatory framework in communication research: exploring parallel, serial, and moderated mediation. *Health Commun.* 2015;30(6):566-76.