
GYNECOLOGY

Contraceptive Knowledge, Attitude and Behavior of Contraception in Teenage Pregnancy at Buddhachinaraj Phitsanulok Hospital

Monwanee Muangchang, M.D.*,
Pallop Pongsuthirak, M.D.*.

** Department of Obstetrics and Gynaecology, Buddhachinaraj Phitsanulok Hospital, Phitsanulok 65000, Thailand*

ABSTRACT

Objectives: To assess characteristics, knowledge, attitude and behavior in contraception among pregnant teenagers.

Materials and Methods: The cross-sectional descriptive study was conducted from September 2015 to February 2016 in pregnant teenagers (under 20-year-old) attending ANC or admitted at Buddhachinaraj Phitsanulok Hospital. The questionnaires consisted of general characteristics, contraceptive behavior, contraceptive knowledge, and contraceptive attitude. The data was analyzed using descriptive statistics, Chi square test and Spearman's rank-order correlation.

Results: Three hundred and fifty pregnant teenagers were divided into two groups by using contraceptive knowledge mean scores (14.68). The above mean group (group A) composed of 192 teenagers (54.86%) and the below mean group (group B) had 158 teenagers (45.14%). There were significant differences in educational level ($p = 0.033$), gravidity ($p = 0.006$) and contraceptive attitude ($p < 0.05$) between groups. The two most common contraceptive methods were oral contraceptive pills (OCP) (66.86%) and condoms (30.29%) but the future choices will be depot medroxyprogesterone acetate (DMPA) (51.71%) and OCP (28.57%). The main sources of contraceptive knowledge were internet and school. If they had any problems, they asked their friends (47.14%) and used the internet (45.14%).

Conclusion: About a half of pregnant teenagers had contraceptive knowledge scores above mean. There was a significant difference in level of education, gravidity, and attitude between the two groups. The most common contraceptive method previously used was OCP but future contraceptive choice will be DMPA.

Keywords: contraceptive knowledge, attitude, behavior, teenage pregnancy

Correspondence to: Monwanee Muangchang, M.D., Department of Obstetrics and Gynaecology, Buddhachinaraj Phitsanulok Hospital, Phitsanulok 65000, Thailand, E-mail: monwanee@gmail.com

การศึกษาความรู้ ทักษะ และพฤติกรรมการคุมกำเนิด ของวัยรุ่นหญิงที่ตั้งครรภ์ในโรงพยาบาลพุทธชินราชพิษณุโลก

มนวณี เมืองช้าง, พัลลภ พงษ์สุทธิรักษ์

บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาความรู้ ทักษะ และพฤติกรรมการคุมกำเนิด ของวัยรุ่นหญิงที่ตั้งครรภ์

วัสดุและวิธีการ: เป็นการศึกษาวิจัยเชิงพรรณนา ในหญิงวัยรุ่นตั้งครรภ์ที่มาตรวจที่แผนกฝากครรภ์ และห้องคลอด โรงพยาบาลพุทธชินราชพิษณุโลก ในช่วง กันยายน 2558 ถึง กุมภาพันธ์ 2559 สุ่มข้อมูล โดยใช้แบบสอบถาม ความรู้ ทักษะ และพฤติกรรมการคุมกำเนิด และวิเคราะห์โดยใช้สถิติเชิงพรรณนา, Chi square test และ Spearman's rank-order correlation

ผลการศึกษา: วัยรุ่นตั้งครรภ์ทั้งหมด 350 คน ได้คะแนนเฉลี่ยของความรู้การคุมกำเนิด 14.68 คะแนน ถูกแบ่งเป็นสองกลุ่ม คือ กลุ่ม A ได้คะแนนมากกว่าคะแนนเฉลี่ยมี 198 คน (ร้อยละ 54.86) กลุ่ม B ได้คะแนนน้อยกว่าคะแนนเฉลี่ยมี 152 คน (ร้อยละ 45.14) ทั้งสองกลุ่มมีความแตกต่างอย่างมีนัยสำคัญทางสถิติ ในเรื่องระดับการศึกษา ($p = 0.033$) จำนวนการตั้งครรภ์ ($p = 0.006$) และทัศนคติต่อการคุมกำเนิด ($p < 0.05$) โดยทั้งสองกลุ่มมีการใช้ยาเม็ดคุมกำเนิด และถุงยางอนามัย มาก่อน และวางแผนจะใช้ยาฉีดคุมกำเนิดในอนาคต แหล่งความรู้เรื่องการคุมกำเนิดได้มาจากอินเทอร์เน็ตและโรงเรียนเป็นหลัก และเมื่อมีปัญหาปรึกษาเพื่อน (ร้อยละ 47.14) และค้นหาจากอินเทอร์เน็ต (ร้อยละ 45.14)

สรุป: วัยรุ่นที่ตั้งครรภ์ประมาณครึ่งหนึ่งมีความรู้มากกว่าคะแนนเฉลี่ย ระหว่างกลุ่มคะแนนความรู้มีความแตกต่างอย่างมีนัยสำคัญทางสถิติของการศึกษา จำนวนการตั้งครรภ์ และทัศนคติต่อการคุมกำเนิด วัยรุ่นส่วนใหญ่เคยใช้ยาเม็ดคุมกำเนิด แต่หลังคลอดบุตรมีการวางแผนใช้ ยาคุมแบบฉีดมากที่สุด

คำสำคัญ: ความรู้ในการคุมกำเนิด, ทักษะ, พฤติกรรม, การตั้งครรภ์ในวัยรุ่น

Introduction

In 2014, World Health Organization (WHO) ⁽¹⁾ indicated that women aged 15-19 account for about 11% of all births worldwide or a birth rate of 24.2 per 1,000 women in this age group. According to UNICEF 2013, the teenage birth rate was 43 per 1,000 women in Thailand. It was the second highest rate among countries in East Asia and the Pacific region after Lao PDR^(2, 3). There were an estimated 80,000 adolescent pregnancies (approximately 200 adolescent deliveries daily) and 14.4% of these pregnancies resulted in illegal abortions⁽⁴⁾. Recently, the teenage pregnancy rate is declining in developed countries may be due to more use of birth control while it is still increasing in developing countries⁽⁵⁾.

There is a growing interest in teenage pregnancies because they are associated with poor maternal and fetal outcomes⁽⁶⁾. There are increase risks of premature birth, low birth weight, and infant mortality. Moreover, they are likely to fail school, have low self-esteem and depression. Complications from pregnancy and childbirth are the leading causes of death in low and middle income countries (LMIC) where almost all of the estimated 3 million unsafe abortions occurred⁽⁷⁾. Prevention of teenage pregnancy is a key strategy in improving maternal and infant outcomes. At present, contraceptive prevalence and method used varies markedly in the world. With increasing availability, the percentages of contraceptive use have also increased but there is not enough satisfactory success for decreased teenage pregnancy in Thailand. Previous report denoted that sexual education was limited and misunderstanding in teenagers caused incorrect attitudes and sexual practices leading to unintended pregnancy⁽⁸⁾. In Buddhachinaraj Phitsanulok Hospital, the teenage pregnancy rate was 17% which is higher than the WHO report⁽¹⁾.

This study aimed to assess characteristics, knowledge, attitude and behavior of contraception in pregnant teenagers at Buddhachinaraj

Phitsanulok Hospital.

Materials and Methods

This cross-sectional descriptive study was conducted at the antenatal care and labor room at Buddhachinaraj Phitsanulok Hospital. The data were collected from September 2015 to February 2016. The study was approved by the ethic committee of Buddhachinaraj Phitsanulok Hospital. The sample was calculated by Cochran's formula. (population size = 1,200, SD = 1.13, error = 0.1, N = 349) and a potential dropout rate of 10% was added up. Three hundred and eighty four participants were eligible to perform the questionnaire. The inclusion criteria were teenage pregnancy (< 20 years old) at the delivery day or expected date of confinement and could complete the questionnaire by themselves. The exclusion criteria were inability to read Thai language or incomplete questionnaires. All participants were given written informed consent before the study. If they were less than 18 years old, parental informed consent was also obtained.

The questionnaires were developed and divided into four parts. The first part was general characteristics. The second part asked about contraceptive practices before pregnancy and contraceptive plan in the future (five questions). The third part was contraceptive knowledge, consisted of 20 true-false questions. The right answer was scored 1 point and a wrong answer was scored zero. The validity of content was evaluated by five experts in obstetrics and gynecology (Index of Congruence = 0.6-1). From the pilot study (N = 30), the reliability, discrimination and difficulty were calculated (Kuder-Richardson Formula 20 = 0.7225, point biserial correlation ≥ 0.3 , $p = 0.5-0.7667$). The last part was contraceptive attitude and validated with a Cronbach's alpha index of 0.71. There were ten questions regarding attitude. Each question was scored after the questionnaires were completed.

The format of the positive attitude questions was a five-level Likert scale: strongly agree = 5, agree = 4, no comment = 3, disagree = 2, strongly disagree = 1. Negatively worded questions were reverse scored. All participants were adequately briefed on the content of the questionnaires before self-administration to assure privacy and confidentiality. This was performed in order to ensure reliable data. Incomplete questionnaires were eliminated from the study.

Descriptive statistics were used for the characteristics, contraceptive behavior, knowledge scores, and attitude scores. Chi square test and Spearman's rank-order correlation were generated to analyze the associations among the variables and to compare the means. The p-value < 0.05 was considered statistically significant.

Results

Three hundred and fifty complete questionnaires were divided into two groups by using knowledge mean score. The mean score was 14.68 ± 2.70 out of 20 (min, max = 8, 17). The above mean group (group A) composed of 192 pregnant teenagers (54.86%) and the below mean group (group B) had 158 teenagers (45.14%). The characteristics of the study participants are shown in Table 1. There were no significant differences in age, body mass index, occupation, marital status and source of income between the two groups. The mean age of the population was 17.99 ± 1.06 years. Two thirds of participants actively worked. They were employees (33.25%) and had their own business or trade (30.29%). Most of them lived with their partners without marriage (43.14%). There were statistically significant differences in educational level ($p = 0.033$) and gravidity ($p = 0.006$). The group A had graduated from primary school (28.13% vs 17.09%) or had bachelor degrees (11.98% vs 8.86%) more than the group B but there were no significant correlation between level of education and knowledge score in subgroup analysis. The

majority of samples were unintended pregnancy (62.9%) but group B had significant more unwanted pregnancies than group A ($p = 0.001$). Primigravida in group A and group B were 49.48% and 67.09%, respectively ($p = 0.006$). Group A had repeated pregnancies more than group B ($p = 0.006$).

Most of the pregnant teenage participants used contraception (88.29%) but there was not a significant difference between groups (Table 2). The two most common contraceptive methods were oral contraceptive pills (OCP) (62.86%) and condoms (30.29%), but the future choices will be depot medroxyprogesterone acetate (DMPA) (51.71%) and OCP (28.57%). The sources of contraceptive information were the internet (55.71%) and school (49.14%) respectively. Whenever, they had any problems, they decided to consult their friends (47.14%) and internet (45.14%). Analysis between groups, group A decided to consult a doctor while group B preferred to ask their friends.

The results on the attitude of the pregnant teenagers are shown in Table 3. The majority of participants (83.42%) had a positive attitude toward teenage pregnancy. They agreed that teenage sexual intercourse and pregnancy were unacceptable in Thailand. In addition, they believed that pregnancy would change their future life and would be the cause of abandoning their education. This attitude was significantly different in both groups ($p = 0.014$). According to the supporting health services, most participants (60.14%) thought that contraception was important and it was adequately promoted. However, there was a significant difference in these attitudes between both groups ($p = 0.005$). Most of the responders not only had a negative attitude toward induced abortion, but this also correlated significantly with their knowledge of them ($p = 0.002$). Furthermore there were correlations between knowledge scores with positive attitude to teenage pregnancy and supporting health service.

Table 1. Demographic and characteristics of the participants.

	Above mean group (N = 192)	Below mean group (N = 158)	All (N = 350)	p value
	Mean \pm SD	Mean \pm SD	Mean \pm SD	
Age (year)	18.02 \pm 0.99	17.95 \pm 1.15	17.99 \pm 1.06	0.571
Height (cm.)	158.54 \pm 4.65	158.56 \pm 4.54	158.25 \pm 7.23	0.955
Weight (kg.)	57.72 \pm 8.92	57.75 \pm 10.54	58.03 \pm 11.11	0.975
BMI (kg./m ²)	22.95 \pm 3.32	22.97 \pm 4.19	23.23 \pm 1.02	0.944
Level of education				0.033
Primary school	54 (28.13%)	27 (17.09%)	81 (23.14%)	
Secondary school	74 (38.54%)	69 (43.67%)	143 (40.86%)	
Vocational	41 (21.35%)	48 (30.37%)	89 (25.43%)	
Bachelor degree	23 (11.98%)	14 (8.86%)	37 (10.57%)	
Occupation				0.054
Employee	69 (35.94%)	37 (23.41%)	116 (33.25%)	
Own business/trade	59 (30.73%)	56 (35.44%)	106 (30.29%)	
Housewife/unemployed	28 (14.58%)	34 (21.51%)	66 (18.86%)	
Student	36 (18.75%)	30 (18.99%)	62 (17.71%)	
Source of income				0.292
Self-earning/husband	136 (70.83%)	104 (65.82%)	240 (68.57%)	
Parents	56 (29.17%)	52 (32.91%)	108 (30.86%)	
Sister/brother	0	1 (0.63%)	1 (0.29%)	
Aunt/uncle	0	1 (0.63%)	1 (0.29%)	
Status				0.197
De facto	74 (38.54%)	77 (48.73%)	151 (43.14%)	
Married	79 (41.15%)	49 (31.02%)	128 (36.51%)	
Single	33 (17.19%)	28 (17.72%)	61 (17.43%)	
Separate/divorce	6 (3.12%)	4 (2.53%)	10 (2.86%)	
Gravidity				0.006
1	95 (49.48%)	106 (67.09%)	201 (57.43%)	
2	73 (38.02%)	37 (23.42%)	110 (31.43%)	
3	21 (10.94%)	14 (8.86%)	35 (10.0%)	
≥ 4	3 (1.56%)	1 (0.63%)	4 (1.14%)	
Planned pregnancy	71 (36.98%)	59 (37.34%)	130 (37.14%)	1.00
Unplanned pregnancy	121 (63.02%)	99 (62.66%)	220 (62.86%)	
Wanted pregnancy	91 (75.21%)	51 (51.52%)	142 (64.55%)	< 0.001
Unwanted pregnancy	30 (24.79%)	48 (48.48%)	78 (35.45%)	

* Chi square test

Table 2. Contraceptive behavior of the participants.

	Above mean group (N = 192)	Below mean group (N = 158)	All (N = 350)	p value
	Mean ± SD	Mean ± SD	Mean ± SD	
Contraceptive use	173 (90.10)	136 (86.08)	309 (88.29)	0.244
Non-contraceptive use	19 (9.90)	22 (13.92)	41 (11.71)	
Contraception used before pregnancy				
OCP	124 (64.58)	96 (60.75)	220 (62.86)	
Condom	63 (32.81)	43 (27.21)	106 (30.29)	
DMPA	51 (26.56)	38 (24.05)	89 (25.43)	
Emergency pill	31 (16.14)	20 (12.65)	51 (14.57)	
Coitus interruptus	25 (13.02)	8 (5.06)	33 (9.43)	
Calendar method	5 (2.60)	0	5 (1.43)	
Implant	2 (1.04)	1 (0.63)	3 (0.86)	
IUD	1 (0.28)	0	1 (0.29)	
Future contraceptive method				
DMPA	101 (52.60)	80 (50.63)	181 (51.71)	
OCP	52 (27.08)	48 (30.37)	100 (28.57)	
Implant	13 (6.77)	10 (6.32)	23 (6.57)	
Condom	11 (5.72)	11 (6.96)	22 (6.29)	
TR	14 (7.29)	8 (5.06)	22 (6.29)	
IUD	2 (1.04)	0	2 (0.57)	
Sources of contraceptive information				
Internet	105 (54.68)	90 (56.96)	195 (55.71)	
School	86 (44.79)	86 (54.43)	172 (49.14)	
Hospital	82 (42.70)	50 (31.64)	132 (37.71)	
Friend	68 (35.41)	61 (38.60)	129 (36.85)	
Family	40 (20.83)	29 (18.35)	69 (19.71)	
TV/radio	45 (23.43)	30 (18.98)	75 (21.42)	
Consultation when having problems				
Internet	86 (44.79)	79 (50.0)	165 (47.14)	
School	85 (44.27)	73 (46.20)	158 (45.14)	
Hospital	97 (50.52)	56 (35.44)	153 (43.71)	
Friend	75 (39.06)	58 (36.70)	133 (38.0)	

* Chi square test

Table 3. Attitude of the participants.

	Above mean group (N = 192) Mean \pm SD	Below mean group (N = 158) Mean \pm SD	All (N = 350) Mean \pm SD	p value
Attitude toward adolescent pregnancy				
Positive	169 (88.02)	123 (77.85)	292 (83.42)	0.014
Attitude toward induce abortion				
Negative	61 (75.52)	97 (61.3)	242 (69.14)	0.005
Attitude toward supporting health services				
Positive	190 (98.96)	146 (92.41)	336 (96.0)	0.002

* Chi square test

Discussion

In this study, the mean knowledge score was 14.68 ± 2.70 (total score = 20). About half of teenage pregnancies were above the mean score and the other half was below. The previous study in secondary school in Tanzania⁽⁸⁾ shows that about 73% of respondents had good knowledge about contraception. Moreover, Hemachandra A⁽⁹⁾ study of pregnant teenagers during antenatal care at Chulalongkorn Memorial Hospital found that 72% of their population had average knowledge.

A previous study in South Africa demonstrated a discrepancy between respondents' knowledge of contraception and their sexual behavior, only 36.4% of them used contraception⁽¹⁰⁾. Contradictorily to our finding, the majority of participants (88.29%) had been using contraception before pregnancy but most of them (62.8%) had unintended pregnancy. That means the high knowledge does not relate to the effective use of contraception. The failure may be due to inconsistent use or reliance on ineffective method. The teenagers and their partners may be imprudent in sexual relations which lead to unintended pregnancy. In low and middle income countries, contraceptive methods are not available to adolescents due to the lack of approved of premarital sexual activity^(11, 12). In addition, some teenagers may not understand or recognize about unprotected sexual intercourse that

could possibly lead to pregnancy.

Fifty seven percent of all participants were experiencing their first pregnancy. There was 42.5 % of participants had repeated pregnancy. This finding was similar to Conde-Agudelo's study in which teen mothers were more likely to have a subsequent pregnancy still in adolescence⁽¹³⁾. Regarding unplanned pregnancies, there were significantly more unwanted pregnancy in group B ($p = 0.001$) so they tended to induce abortions more than group A. That could directly affect their attitude toward induced abortion ($p = 0.005$). However, induced abortion is still illegal and immoral in Thailand thus both groups had negative attitude for induced abortion. Hemachandra A⁽⁹⁾ revealed a negative attitude toward induced abortion as in our study. In contrast, Fengxue Y⁽¹⁴⁾ showed their participants, who were students and were not pregnant, had a positive attitude to induced abortion. The conflicting results may be different in the pregnant and non-pregnant status of the population.

The data from the National Longitudinal Study of Adolescent Health⁽¹⁵⁾ showed only 20% of female adolescents were defined as having anti-pregnancy attitudes that is similar to our finding, in which 83.4% of participants had a positive attitude to teenage pregnancy, and the contraceptive knowledge correlated significantly to this attitude ($p = 0.014$).

Our data showed the most common contraceptive method used was OCP and the second was condoms, similar to the nationally representative samples of US sexually active 15-19 years old (16), 53% used oral contraceptive pill, 20% used condoms, and 16% used other hormonal methods (injection, contraceptive patch, ring and implant). Only 3% of this group used an IUD. That contrasted with another study. Mung'ong'o SG⁽⁸⁾ study's in Tanzania, Africa where the incidence of HIV infection is high, most of their population used condoms. The reasons why condoms were more popular may be due to dual protection against HIV/AIDS and unwanted pregnancy. Although most of participants had average knowledge about condoms, but their practices were inconsistent. Condoms are associated with typical-use failure rates as high as 17% in the first year of use. These typical-use failures are due to condom breakages, incorrect use, or nonuse⁽¹⁷⁾.

Regarding to future contraception use after delivery, most responders chose DMPA, an intermediate-acting method that allows privacy and does not require daily administration. The American College of Obstetricians and Gynecologists (ACOG) supports long acting reversible contraception (LARC) to be available to adolescents. A committee opinion shows IUD and implants are highly effective and have a significant potential to prevent unintended pregnancies, rapid repeat pregnancies and abortions in young women⁽¹⁸⁾. In our study, few participant chose LARC that may be due to inadequate counseling and promotion by health care providers, in addition to a wrong belief that long acting hormonal methods or IUD are inappropriate for nulliparous women.

Nowadays, online social media is widely used, so most of teenagers in our study got more contraceptive information from the internet more than from school. In other studies^(19, 20), the main sources of knowledge of contraception were schools and friends. Previous studies suggested that adolescents and parents agreed with school-based programs. It should be an important source of formal education for adolescent sexual health^(21, 22). While the

prospective cohort study examining teen birth rates in 24 states for 15-17 year old girls from 1997-2005⁽²³⁾ found a significant evidence that increased sexual education within school was associated with lower birth rates. However, the effect of sexual education was less important when taking into consideration with the demographic characteristics, religiosity, and abortion policies of the state. In addition, the study in India⁽²⁴⁾ showed that most teenagers received the information from their parents and friend. In Thailand, most parents are therefore also uncomfortable to talk about sexual behavior and contraception with their children. Parents should be compelled immediately to re-examine their roles in reproductive health.

Our results showed that a large number of participants asked their friends (47.14%) and used the internet (45.14%) for any problems that might be incorrect and harmful to their health. The clinicians and health care provider may have an important role in education to prevent unintended consequences to teenagers. However, the influence of family on adolescent sexual behavior and attitude with regard to contraception must also be documented⁽¹⁹⁾.

The limitation of our study was that all participants were already pregnant so they inevitably tended to have a positive attitude toward their pregnancy. The factor that affects contraception may be different from non-pregnant teenagers. In addition, the sample was limited to a hospital based population. Further study should be carried out to verify this interesting issue in the general population. The other limitation may be the cross sectional design itself that prohibited inference of causality in any way and the last one was self-administered questionnaires may lack power to detect all misunderstandings despite the presence of the researcher in the field. Questionnaire administration on sensitive subjects is likely to elicit a number of biases that could affect the reliability and validity of a yield.

Conclusion

About a half of teenage pregnancy had

contraceptive knowledge scores above mean. There was a significant difference in the level of education, gravidity, and attitude between the two groups. The most common contraceptive method previously used was OCP but the future contraceptive choice will be DMPA. The high knowledge on contraception did not relate to the effective use. The results of our study contribute to highlight the educational program for enabling and motivating to use contraception consistently and regularly.

Potential conflicts of interest

The authors declare no conflict of interest.

References

1. WHO: Preventing early pregnancy and poor reproductive outcomes among adolescents in developing countries: what the evidence says. Geneva: WHO;2012. Available from http://www.who.int/maternal_child_adolescent/documents/preventing_early_pregnancy/en/
2. UNICEF Thailand. Terms of reference for situational analysis of adolescent pregnancy. Sitan: [Adolescent Pregnancy]; 2013
3. Reuters News Report citing Bureau of Reproductive Health, Ministry of Public Health. <http://news.yahoo.com/thailand-struggles-curb-high-teen-pregnancy-rate-045312739.html>. Accessed March 27, 2013.
4. Areemit R, Thinkhamrop J, Kosuwon P, Kiatchoosakun P, Sutra S, Thepsuthammarat K. Adolescent pregnancy: Thailand's National Agenda. *J Med Assoc Thai* 2012; 95:S134-42.
5. Sedgh G, Finer LB, Bankole A, Eilers MA, Singh S. Adolescent pregnancy, birth, and abortion rates across countries: levels and recent trends. *J Adolesc Health* 2014;56:223-30.
6. Kahn JG, Brindis CD, Gleit DA. Pregnancies averted among U.S. teenagers by the use of contraceptives. *Fam Plan Perspect* 1999;31:29-34.
7. Chandra-Mouli V, McCarragher DR, Phillips SJ, Williamson NE, Hainsworth G. Contraception for adolescents in low and middle income countries: needs, barriers, and access. *Reprod Health* 2014;11:1-8.
8. Mung'ong'o SG, Mugyela V, Kimaro B. Knowledge, attitude and practice on contraceptive use among secondary school students in Dar es Salaam, Tanzania. *East Central African J Pharm Sciences* 2010;13:43-9.
9. Hemachandra A, Rungruxsirivorn T, Taneepanichskul S, Pruksananonda K. KAP Study on contraception in teenage pregnancy at antenatal care clinic and delivery room in Chulalongkorn Memorial Hospital. *Thai J Obstet Gynaecol* 2006;18:154-64.
10. Onyensoh O, Govender I, Tumbo J. Knowledge of, attitudes towards, and practices of contraception in high school pupils in Tswaing subdistrict, North West province. *South Afri J Epidemiol Infect* 2013;28:227-32.
11. Magnani RJ, Gaffikin L, de Aquino EM, Seiber EE, Almeida MC, Lipovsek V. Impact of an integrated adolescent reproductive health program in Brazil. *Stud Fam Plan* 2001;32:230e-43e.
12. Pulerwitz J, Barker G. Promoting healthy relationships and HIV/STI prevention for young men: positive findings from an intervention study in Brazil. New York: Population Council 2004:1-10.
13. Conde-Agudelo A, Rosas-Bermúdez A, Kafury-Goeta AC. Birth spacing and risk of adverse perinatal outcomes:a meta-analysis. *JAMA* 2006;295:1809-23.
14. Fengxue Y, Isaranurug S, Nanthamongkolchai S, Wongsawass S. Attitudes toward adolescent pregnancy, induced abortion and supporting health services among high school students in Phuttamonthon district, Nakhon Pathom province, Thailand. *J Pub Health Dev* 2003;1:25-32.
15. Brückner H, Martin A, Bearman PS. Ambivalence and pregnancy: adolescents' attitudes, contraceptive use and pregnancy. *Perspect Sexual Reprod Health* 2004;36:248-57.
16. Jones J, Mosher W, Daniels K. Current contraceptive use in the United States, 2006-2010, and changes in the patterns of use since, 1995. National Health Statistics Report; No 60. Hyattsville, MD: National Center for Health Statistics 2012:1-26.
17. Amber Truehart, Amy Whitaker. Contraception for the Adolescent Patient. *Obstet Gynecol Surv*, Wolters Kluwer Health 2015;70:263-73.
18. Committee on Adolescent Health Care Long-Acting Reversible Contraception Working Group, The American College of Obstetricians and Gynecologists. Committee opinion no. 539: adolescents and long-acting reversible contraception: implants and intrauterine devices. *Obstet Gynecol* 2012;120:983-88.
19. Aggarwal O, Sharma AK, Chhabra P. A study in sexuality of medical college students in India. *J Adolesc Health* 2000;26:226-9.
20. Aggleton P, Campbell C. Working with young people: towards an agenda for sexual health. *Sex Relationship Therapy* 2000;15:283-96.
21. Eisenberg ME, Bernat DH, Bearinger LH, Resnick MD. Support for comprehensive sexuality education: perspectives from parents of school-age youth. *J Adolesc Health* 2008;42:352-9.
22. Lagus KA, Bernat DH, Bearinger LH, Resnick MD, Eisenberg ME. Parental perspectives on sources of sex

- information for young people. J Adolesc Health 2011;49:87-9.
23. Cavazos-Rehg PA, Krauss MJ, Spitznagel EL, Iguchi M, Schootman M, Cottler L, et al. Associations between sexuality education in schools and adolescent birthrates. Arch Pediatr Adolesc Med 2012;166:134-40.
 24. Reena S, Kumar SD, Radha J, Kumkum S, Neela S, Sushmita S. Contraceptive knowledge attitude and practice (KAP) survey. J Obstet Gynecol India 2005;55:546-50.