ORIGINAL ARTICLE

Factors affecting preventive behaviors for unplanned pregnancy in female high school students

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ABSTRACT

This cross-sectional study aimed to study the factors affecting preventive behavior for unplanned pregnancy in female high school students. The participants were 498 high school students selected through multi-stage sampling and the sampling of random students from the specified educational levels of Grades 10, 11, and 12 was conducted by using the following inclusion criteria: be a student aged 15-18 years; be a student attending Grade 10, 11, or 12. The data were analyzed by using mean, standard deviation, and binary logistic regression.

The results showed that seven factors affected behavior concerning unplanned pregnancy in female high school students including: the educational levels in Grade 12 (OR = 10.65, 95% CI = 1.35 - 83.50), the latest GPA ≥ 3.51 (OR = 9.00, 95% CI = 1.45 - 55.99), the knowledge of birth control (OR = 22.12, 95% CI = 2.43 - 201.81), the attitude toward birth control and pregnancy prevention (OR = 4.15, 95% CI = 1.38 - 12.43), perception of the risk of pregnancy from sexual relationships (OR = 3.79, 95% CI = 1.56 - 9.21), the perception of self-efficacy to prevent pregnancy (OR = 5.31, 95% CI = 2.89 - 9.73), and the self-esteem (OR = 4.24, 95% CI = 1.87 - 9.61). These factors had a 79.10% chance of predicting unplanned pregnancy preventing behaviors in high school students. This study suggests that schools or related organizations should develop health education programs for preventing unplanned pregnancies including knowledge, attitudes, self-efficacy, and self-esteem.

Key words:
prevention behavior; unplanned pregnancy; female students; high school

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INTRODUCTION

According to the 2014 report of the World Health Organization on the problem of adolescent unplanned pregnancy, the live birth rate in female teenagers (15-19 years) around the world was 11%, of which 95% of births were in low-income countries.[1] In 2019, adolescents aged 15-19 years in low- and middle-income countries had an estimated 21 million pregnancies each year, of which approximately 50% were unintended and resulted in an estimated 55% of abortions.[2] The USA reported that more than 50% of pregnancies in adolescents were unplanned.[3] Consistently, another study found that abortion of adolescent unplanned pregnancies was about 30-40 cases around the world.[4] Moreover, ASEAN countries reported a high adolescent pregnancy and birth rate including Laos, the Philippines, Indonesia, and Cambodia, with the birth rates in teenagers at 110, 53, 52, and 48 per 1,000 population respectively.[5] In Thailand, it is considered the 2nd most problem in ASEAN in 2016, and from the analysis of the situation of the birth rate for women aged 15-19 years in 2019, Thailand is ranked 7th in ASEAN and 5th in the WHO Region.[6] The Ministry of Public Health reports that in the 2018-2021 period, the live birth rates for women aged 15-19 years with unintended pregnancy in Thailand per 1,000 population were 35.0, 31.3, 28.7, and 24.4 percent, and repeated births were 9.3, 8.5, 8.1, and 7.7 percent, respectively. In Loei province, it was found that live births among teenage girls aged 15-19 years in the 2018-2021 period were 33.97, 32.8, 30.5, and 28.3 percent, respectively. Teenage pregnancy in Loei province is revealed as a significant problem because, teenagers (aged 15-19 years) are studying in high school, and unwanted pregnancies result in teenagers dropping out of school because of stress and anxiety. It was also found that repeat pregnancies among mothers in this age group had increased from 14.76 percent in 2015 to 16.79 percent in 2017 which was the 1st ranked in health region 8. This was higher than the criteria of the Ministry of Public Health which specified that the rate should not be more than 10 percent.[7]

From the overall situation of teenage pregnancy in Thailand, the birth rate has decreased because the true birth rate is unknown. According to abortion surveillance in Thailand in 2015, 2016, and 2019, abortions were found among those under 20 years old accounting for 26.3%, 37.0%, and 29.8%, respectively. The main reasons for abortion were economic, social, and family reasons.[8]

An unplanned pregnancy significantly affects the physical and mental health of female students. Therefore, this study aimed to explore the factors affecting preventive behavior for unplanned pregnancy in female high school students in order to use these factors as guidelines for preventing unplanned pregnancy, which will benefit students in the future.

METHODS

This cross-sectional survey on factors affecting preventive behavior for unplanned pregnancy in female high school students was approved by the Human Research Ethics Committee of Naresuan University with the research IRB certificate No. 0842/62, COA No. 118/2020 through the full board review.

Population and samples

The population consist of female high school students in Grades 10-12 in government high schools affiliated with the Ministry of Education in Loei province. The sample size was calculated with the estimation of population proportion to obtain values of reliability, proportion, and errors[9] at the resulting sample size of 498 people. Multi-stage sampling was used to

randomly select 5 districts from 14 districts, and finally, the simple random sampling was performed at 8 schools. Then, the random sampling of students in the specified educational levels of Grades 10, 11, and 12 was carried out by using the following inclusion criteria: 1) be a student aged 15-18 years; 2) be a student in Grade 10, 11, or 12.

Research instrument and qualification

The research instrument is a questionnaire developed by the researchers from the literature review on the relevant concepts, theories, and research by determining the scope and content structure of the questionnaire in accordance with the conceptual research frameworks. The questions were developed by considering the study's definitions of terms and objectives which were divided into 3 parts as follows:

Part 1 Personal information: This part includes age, educational level, latest GPA, parents' marital status, accommodation while studying, people living with students, daily allowance and sufficiency of allowance, sexual experience, and people in the first sexual relationship.

Part 2 Factors affecting behavior to prevent unplanned pregnancy: This part consisted of 12 sub-parts validated on content validity by 5 experts. The questionnaire was tried out with another group of 30 high school students in similar contexts and with similar qualifications to the sample group.

Part 2.1 Knowledge of birth control: This part included 11 items in a multiple-choice format with 4 options in each item for the respondents to choose only one correct answer. In each item, a correct answer was given 1 point whereas a wrong answer was given 0 points. The index of content validity was in the range of 0.6-1.00 and the Cronbach's alpha coefficient was 1.00. The score interpretation on knowledge of birth control was in 3 levels: high knowledge level at 80%, moderate knowledge level at 60-79%, and low knowledge level at lower than 60%.[10-12]

Part 2.2 Attitude toward birth control and pregnancy prevention, perception of the risk of becoming pregnant from sexual relationships, perception of effects from unplanned pregnancy, perception of self-efficacy for pregnancy prevention and perception of self-esteem: This part included 19, 8, 6, 8, and 13 items in a rating scale format with 5 levels: strongly agree, agree, unsure, disagree, and strongly disagree, with the scoring criteria assigned to give 5, 4, 3, 2, and 1 point(s) respectively to positive questions, but to give 1, 2, 3, 4, and 5 point(s) respectively to the negative questions. The index of content validity[9] was in the range of 0.5-1.00 and the Cronbach's alpha coefficients were 0.86, 0.80, 0.77, 0.91, and 0.80. The score interpretation on attitude toward birth control and pregnancy prevention was in 3 levels: high attitude level at 80%, moderate attitude level at 60-79%, and low attitude level at lower than 60%.[10-12]

Part 2.3 Perception of support from family, boyfriend/lover, friends, and school/teachers in birth control and pregnancy prevention, and perception of support from health personnel during the past 12 months: This part included 5, 7, 10, 9, and 10 items, respectively, and used a rating scale format in 4 levels: always support, mostly support, seldom support, and never support, with the scoring criteria assigned to give 4, 3, 2, and 1 point(s) respectively to the response of always support or mostly support, but to give 1, 2, 3, and 4 point(s) respectively to the response of seldom support or never support. The index of content validity was in the range of 0.5 – 1.00 and the Cronbach's alpha coefficients were 0.84, 0.95, 0.75, 0.92, and 0.90. The score

interpretation on the perception of support from boyfriend/lover in birth control and pregnancy prevention was in 3 levels: high perception level at 80%, moderate perception level at 60-79%, and low perception level at lower than 60%.[10-12]

Part 2.4 Perception of family relationship during the past 12 months: This part included 10 items in a rating scale format with 5 levels: always, often, sometimes, seldom, and never, with the scoring criteria assigned to give 5, 4, 3, 2, and 1 point(s) respectively to positive questions, but to give 1, 2, 3, 4, and 5 point(s) respectively to negative questions. The index of content validity was in the range of 0.5-1.00 and the Cronbach's alpha coefficient was 0.80. The score interpretation on perceptions of family relationships during the past 12 months was in 3 levels: high perception level at 80%, moderate perception level at 60-79%, and low perception level at lower than 60%.[10-12]

Part 3 Behavior to prevent unplanned pregnancy: This part included questions about behavior to prevent unplanned pregnancy among female students during the past 12 months. There were 4 questions in the multiple-choice format with 4 options in each item. The questions were: 1) During the past 12 months, did you have a boyfriend/lover? 2) During the past 12 months, in the case of having a boyfriend/lover, did you have any sexual relationship with your boyfriend/lover/friend of the opposite sex? 3) In the case of having a sexual relationship, did you use a birth control method for pregnancy prevention in the latest or last sexual relationship? 4) What method of birth control did you use to prevent pregnancy?

Data collection and analysis

This study collected data from the secondary school in Loei province during July to August 2020. During the data collection period, the researchers requested permission from the parents of the volunteers to join the study through written consent. The waiting period for considering and giving consent to join the study was 1 week. After the study is completed, the data will be destroyed within 5 years after the study completion. The data were analyzed using percentage, mean, and standard deviation for descriptive data. Furthermore, binary logistic regression was used to analyze factors affecting behavior to prevent pregnancy in female high school students. The appropriateness of the model was determined by Omnibus testing of model coefficients following Hosmer and Lemeshow, which were considered statistically significant (p-value < 0.05).

RESULTS

Socio-demographic characteristics

All participants had an average age of 16.55 ± 0.94 years, with a range of age from 15 to 18 years. Most were studying in Grade 11 (35.14%), followed by Grade 10 (33.94%), and Grade 12 (30.92%). At the time of the study, most of the students had a GPA ≥ 3.51, followed by a GPA of 3.00 – 3.50 (31.12%). The students' parents were married (72.29%) or separated/divorced (22.29%). Most students lived with their parents (62.65%) whereas the others lived alone or lived with other people (21.08%). The students received a daily allowance from their parents of more than 100 baht (47.59%), or 50-100 baht. The students' sexual experience was reported as having had a sexual relationship (44.48%), and people in a first sexual relationship with a boyfriend/lover (100%).

Behavior to prevent unplanned pregnancy

Behavior to prevent unplanned pregnancy included knowledge of birth control, attitude toward unplanned pregnancy prevention, perception of the risk of becoming pregnant from sexual relationships, perception of effects from

unplanned pregnancy, perception of self-efficacy for pregnancy prevention, perception of self-esteem, support from the family in birth control and pregnancy prevention, support from the boyfriend/lover in birth control and pregnancy prevention, support from friends in birth control and pregnancy prevention, support from school/teachers in birth control and pregnancy prevention, support from health personnel in birth control and pregnancy prevention, and family relationships.

The participants had knowledge of birth control at the low level ($\bar{x}$ = 7.04, S.D = 1.71); attitude toward unplanned pregnancy prevention at the moderate level ($\bar{x}$ = 67.60, S.D = 6.23); perception of the risk of becoming pregnant from sexual relationships at the moderate level ($\bar{x}$ = 30.32, S.D = 3.59); perception of effects from unplanned pregnancy at the high level ($\bar{x}$ = 23.80, S.D = 2.86); perception of self-efficacy for pregnancy prevention at the high level ($\bar{x}$ = 32.98, S.D = 4.90), self-esteem at the moderate level ($\bar{x}$ = 48.79, S.D = 5.87); support from family in birth control and pregnancy prevention at the high level ($\bar{x}$ = 14.64, S.D = 3.09); support from boyfriend/lovers in birth control and pregnancy prevention at the low level ($\bar{x}$ = 13.54, S.D = 6.17); support from friends in birth control and pregnancy prevention at the moderate level ($\bar{x}$ =27.92, S.D = 4.27); support from school/teachers in birth control and pregnancy prevention at the high level ($\bar{x}$ =27.15, S.D = 5.60); support from health personnel in birth control and pregnancy prevention at the moderate level ($\bar{x}$ =25.98, S.D = 6.70); and family relationships at the high level ($\bar{x}$ =38.41, S.D =7.26). The results of these factors are summarized in Table 1.

Table 1. Mean and standard deviation of behavior to prevent unplanned pregnancy (n = 498)

Variables	$\bar{x}$	S.D.	Min:Max	Levels
Knowledge of birth control	7.04	1.71	1:11	Low
Attitude toward unplanned pregnancy prevention	67.60	6.23	50:88	Moderate
Perception of the risk of becoming pregnant from sexual relationships	30.32	3.59	21:40	High
Perception of effect from unplanned pregnancy	23.80	2.86	10:30	High
Perception of self-efficacy for pregnancy prevention	32.98	4.90	12:40	High
Self-esteem	48.79	5.87	25:63	Moderate
Support from family in birth control and pregnancy prevention	14.64	3.09	5:20	High
Support from boyfriend/lover in birth control and pregnancy prevention	13.54	6.17	7:28	Low
Support from friends in birth control and pregnancy prevention	27.92	4.27	17:40	Moderate
Support from school/teachers in birth control and pregnancy prevention	27.15	5.60	9:36	High
Support from health personnel in birth control and pregnancy prevention	25.98	6.70	10:40	Moderate
Family relationship	38.41	7.26	10:50	High

Behavior of pregnancy prevention during the past 12 months

The results also found that 58.23% of the students had boyfriends/lovers in the past 12 months, while 44.48% had sex at some point and all had sex with their boyfriend/lovers. It was shown that 76.74% had been protected using highly effective birth control methods. The most common birth control method that students used was condoms (65.89%) (Table 2).

Table 2. Number and percentage of the students classified by behavior of pregnancy prevention during the past 12 months

Behavior of Pregnancy Prevention	Numbers	Percentage
Students' boyfriend/lovers (*n* = 498)		
• Did not have boyfriend/lovers.	208	41.77
• Had boyfriend/lovers	290	58.23
For students having boyfriend/lovers; (*n* = 290)		
• Never had a sexual relationship	161	55.52
• Had a sexual relationship	129	44.48
People with whom students had sexual relationships (*n* = 129)		
• Boyfriend/lovers	129	100
Birth control method used in the latest sexual relationship (*n* = 129)		
• Do not use birth control method.	4	3.10
• Use low-effective method of birth control	26	20.16
o Emergency contraceptive pills	15	11.63
o Fertility awareness/safe period	3	2.33
o Coitus interruptus/withdrawal method	8	6.20
• Use high-effective method of birth control	99	76.74
o Condom	85	65.89
o 21/28 contraceptive pills	10	7.75
o Contraceptive injection	4	3.10
Pregnancy Prevention (n = 498)		
• Prevent pregnancy (did not have boyfriend/lovers, never had a sexual relationship, use high-effective method of birth control)	468	93.98
• Does not protect against pregnancy (had a sexual relationship but do not use a birth control method, use low-effective method of birth control)	30	6.02

Factors affecting behavior to prevent unplanned pregnancy of female high school students

The result of the relationship between independent variables has shown that the multicollinearity was not more than 0.9, and from the Omnibus test of model coefficients, it was found that the step, block, and model box = 191.13 and the p-value < .01 in the Chi-square test. Moreover, the Hosmer and Lemeshow test showed that the Chi-square value = 10.22 and the p-value = 0.250. These tests showed the goodness of fit for the logistic regression.[13]

The results showed that 7 factors affected behavior to prevent unplanned pregnancy in female high school students including: 1) the educational level in Grade 12; 2) the latest GPA ≥ 3.51; 3) the

knowledge of birth control; 4) the attitude toward birth control and pregnancy prevention; 5) perception of the risk of pregnancy from sexual relationships; 6) the perception of self-efficacy to prevent pregnancy, and 7) the self-esteem. These predictors can be explained as follows: 1) in educational levels, the female students in Grade 12 had 10.65 times more chance to prevent pregnancy than the female students in Grade 10 (95% CI 1.35 - 83.50); 2) according to the latest GPA, the participants with a GPA ≥ 3.51 had 9 times more chance to prevent pregnancy than participants with a GPA of 2.50 or lower (95% CI = 1.45 - 55.99); 3) on knowledge of birth control, the participants with 1 more point in knowledge of birth control had 22.12 times more chance to prevent pregnancy (95% CI = 2.43 - 201.81); 4) on attitude toward birth control and pregnancy prevention, the participants with 1 more point in attitude toward birth control and pregnancy prevention had 4.15 times more chance to prevent pregnancy (95% CI = 1.38 - 12.43); 5) on perception of the risk of becoming pregnant from sexual relationships, the female students with 1 more point in perception of the risk of becoming pregnant from sexual relationships had 3.79 times more chance to prevent pregnancy (95% CI = 1.56 – 9.21); 6) on the perception of self-efficacy to prevent pregnancy, the participants with 1 more point in self-efficacy to prevent pregnancy had 5.31 times more chance to prevent pregnancy (95% CI = 2.89 - 9.73), and 7) on self-esteem, the participants with 1 more point in self-value had 4.24 times more chance to prevent pregnancy (95% CI = 1.87 - 9.61). These factors were considered statistically significant as the p-value < 0.05. All these variables could predict at 79.10% the chance of behavior to prevent unplanned pregnancy in female secondary school students (Table 3).

Table 3. Factors affecting behavior to prevent unplanned pregnancy in the female high school students (n = 498)

Variables	B	OR	95% CI	*p*-value
Educational Levels				
Grade 10		1		
Grade 11	-0.50	0.61	0.28 – 1.32	0.211
Grade 12	2.37	10.65	1.35 – 83.50	0.024
Latest GPA				
2.50 or lower		1		
2.51 - 3.00	-0.23	0.80	0.21 – 3.00	0.737
3.01 - 3.50	0.02	1.02	0.28 – 3.80	0.972
≥3.51	2.20	9	1.45 – 55.99	0.018
Knowledge of birth control	3.09	22.12	2.42 – 201.81	0.006
Attitude toward birth control and pregnancy prevention	1.42	4.15	1.38 – 12.43	0.010
Perception of risk of becoming pregnant from sexual relationships	1.33	3.79	1.56 – 9.21	0.003
Perception of self-efficacy for pregnancy prevention	1.67	5.31	2.89 – 9.73	0.001
Self-esteem	1.44	4.24	1.87 – 9.61	0.001
Percentage correct = 89.40%, Nagelkerke R^2 = 0.791				

*p-value<0.05

DISCUSSION

The study showed 7 factors affecting behavior to prevent unplanned pregnancy in female high school students including educational level, latest GPA, knowledge of birth control, attitude toward birth control and pregnancy prevention, perception of the risk of becoming pregnant from sexual relationships, perception of self-efficacy for pregnancy prevention, and self-esteem. These factors had a chance of 79.10% to predict the behavior to prevent unplanned pregnancy in high school students.

The female students who were studying in Grade 12 had 10.65 times more chance of behavior to prevent pregnancy than female students in Grade 10 because they had more opportunity to learn about sex, birth control, and pregnancy prevention than the students in Grades 10 and 11. Therefore, the students in Grade 12 had more awareness and intention to prevent pregnancy. This finding is consistent with a previous study which found that educational level was a factor relating to intention to prevent pregnancy among teenagers in Saraburi province.[14] The factor of educational level is related to the intention to use implant contraception in female teenagers with repeat pregnancy.[15]

The participants who had the latest GPA $\geq$ 3.51 had 9 times more chance to prevent pregnancy than female students with a GPA of 2.50 or lower, probably because GPA is an indicator of interest and attention to study. Therefore, the students with a high GPA had high learning achievement. This factor is a personal influence relating to intelligence, thoughts, and self-control. The students with a low GPA might have low consciousness and self-regulation so they paid attention to sexual matters more than to study. However, only the factor of GPA alone is not sufficient to predict sexual behaviors, and other factors are needed to co-predict.[16]

The knowledge of birth control could be effective in preventing unplanned pregnancy among female students by 22.12 times because the students had knowledge and understanding about pregnancy prevention so they could make decisions and select positive behaviors. If a person is knowledgeable in something, they will behave positively in self-defense. This finding is consistent with a previous study which found that knowledge of birth control was related to the use of birth control. Most participants who were not using birth control methods had little or no knowledge of birth control, such as using condoms together with the withdrawal method, being unaware of becoming pregnant, being unable to use contraceptive pills, not taking contraceptive pills at the specified time, or forgetting to take contraceptive pills.[17] Therefore, knowledge of birth control was related to the use of birth control. Most participants not using birth control methods had little or no knowledge of birth control.[18]

The attitude toward birth control and pregnancy prevention could be influential upon the behavior of preventing unplanned pregnancy among female students by 4.15 times because attitude is concerned with personal thoughts, feelings, or opinions to perceive something differently from other people. Similarly, people may think or perceive something differently so they express different behaviors. Attitude has a direct effect on expressing different behaviors. Moreover, attitude is one important factor combined with knowledge to perform positive behavior in pregnancy prevention. This finding is consistent with a previous study which found that most high school students with moderate attitude levels about pregnancy prevention strongly agreed to consult a doctor or a health officer about correct and suitable methods for birth control.[19] Postpartum female teenagers had an attitude toward behavioral control and intention to use birth control at a very good

level.[20] The students with a positive attitude toward birth control accepted advice together with lovers to learn about the benefits of birth control.[21]

The perception of the risk of becoming pregnant from sexual relationships affected the preventive behavior of unplanned pregnancy among adolescents by 3.79 times, probably because the female students believed that sexual relationships without birth control could lead to unplanned pregnancy while studying, and this would cause adverse effects for study and family, leading to family embarrassment, and additional expenses for raising a baby.[22] This finding is consistent with a previous study which found that perception of the risk of becoming pregnant was related to behavior aimed at preventing undesirable pregnancy.[23]

The perception of self-efficacy for pregnancy prevention affected preventive behavior for unplanned pregnancy among adolescents by 5.31 times, because the students were informed through various channels about pregnancy prevention and the effects of unplanned pregnancy such as in classes or by seeing the negative effects of an unplanned pregnancy from people around them. They perceived that unplanned pregnancy could affect their studies and it might remove their opportunities for further studies. This finding is consistent with a previous study which found that self-efficacy had a direct effect on birth control behavior. Therefore, self-efficacy should empower individuals to manage relationships and be able to make the right decisions to choose birth control methods that are correct, safe, and effective.[24] Self-efficacy to protect oneself from pregnancy was related to behavior to prevent undesirable pregnancy.[23] The self-efficacy for birth control can explain the variance of birth control behavior at 18.2.[25]

The self-esteem on behavior to prevent unplanned pregnancy affected preventive pregnancy behavior by 4.24 times, because the students perceived their own value and gave respect to themselves, leading them to making the right decisions beneficial for themselves and daring to refuse something which would bring negative effects on themselves and their studies. This result is contrasted with a previous study, which showed that self-esteem is not associated with pregnancy risk.[26]

CONCLUSION

This study found that educational levels, latest GPA, knowledge of birth control, attitude toward birth control and pregnancy prevention, perception of the risk of becoming pregnant from sexual relationships, perception of self-efficacy for pregnancy prevention, and self-esteem were influential behaviors to prevent unplanned pregnancy among the female secondary school students. Therefore, future research should investigate other additional factors expected to influence the prevention of unplanned pregnancy in female students. Moreover, relevant organizations or schools should develop health education programs for preventing unplanned pregnancies including knowledge, attitudes, perception of self-efficacy, and self-esteem. This study had its limitation in selecting only one small study in Loei province, Thailand.

RECOMMENDATIONS

Unplanned pregnancy is the main problem to be prevented, and guidelines for preventing adolescent unplanned pregnancy rely on collaboration from various sectors including educational institutions, health service centers, families, local administration organizations, and

communities. Therefore, agency organization is necessary to drive the implementation and activities to improve knowledge, attitudes, perception of self-efficacy, and self-esteem of adolescents to promote preventive behavior on unplanned pregnancy in a serious and continuous way.

CONFLICTS OF INTEREST

The authors confirm that the content of this article involves no conflicts of interest, financial or otherwise.

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