ปัจจัยที่มีอิทธิพลต่อความรอบรู้ด้านสุขภาพในการป้องกันการตั้งครรภ์ซ้ำของมารดาวัยรุ่นหลังคลอด
Factors Influencing Health Literacy of Repeat Pregnancy Prevention among Postpartum Adolescent Mothers

นิพนธ์ต้นฉบับ **Original Article**

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาปัจจัยที่มีอิทธิพลต่อความรอบรู้ด้านสุขภาพในการป้องกันการตั้งครรภ์ซ้ำของมารดาวัยรุ่นหลังคลอด **วิธีการศึกษา:** การวิจัยเชิงทำนายในมารดาวัยรุ่นหลังคลอดที่พักฟื้นแผนกหลังคลอด และมารับบริการแผนกวางแผนครอบครัวหลังคลอด โรงพยาบาลรัฐแห่งหนึ่ง ใน จ.ชลบุรี จำนวน 122 ราย รวบรวมข้อมูลโดยใช้แบบบันทึกข้อมูลส่วนบุคคล แบบสอบถามทัศนคติในการป้องกันการตั้งครรภ์ซ้ำ การรับรู้ความสามารถของตนเองในการป้องกันการตั้งครรภ์ อิทธิพลของครอบครัวและคู่รักในการป้องกันการตั้งครรภ์ อิทธิพลของเพื่อนในการป้องกันการตั้งครรภ์ และความรอบรู้ด้านสุขภาพเพื่อป้องกันการตั้งครรภ์ซ้ำ วิเคราะห์ความสัมพันธ์ด้วยการถดถอยพหุคูณ **ผลการศึกษา:** ปัจจัยที่มีอิทธิพลต่อความรอบรู้ด้านสุขภาพในการป้องกันการตั้งครรภ์ซ้ำของมารดาวัยรุ่นหลังคลอด ได้แก่ ทัศนคติในการป้องกันการตั้งครรภ์ซ้ำ (β = 0.243, P-value = 0.002) การรับรู้ความสามารถของตนเองในการป้องกันการตั้งครรภ์ (β = 0.271 P-value = 0.001) และอิทธิพลของเพื่อนในการป้องกันการตั้งครรภ์ (β = 0.326 P-value < 0.001) และสามารถร่วมทำนายความรอบรู้ด้านสุขภาพในการป้องกันการตั้งครรภ์ซ้ำอย่างมีนัยสำคัญทางสถิติ ร้อยละ 36.6 (R^2 = 0.366, $F_{(3,118)}$ = 22.721, P-value < 0.001) **สรุป:** ผลการศึกษาสนับสนุนการส่งเสริมทัศนคติที่ดีในการป้องกันการตั้งครรภ์ซ้ำ โดยส่งเสริมให้บุคคลที่มีความสำคัญต่อมารดาวัยรุ่น เช่น เพื่อน มีส่วนร่วมในการให้คำแนะนำปรึกษา เพื่อให้มารดาวัยรุ่นมีการรับรู้ความสามารถของตนเองในการป้องกันการตั้งครรภ์ ส่งผลให้มีความรอบรู้ด้านสุขภาพในการป้องกันการตั้งครรภ์ซ้ำและสามารถป้องกันการตั้งครรภ์ซ้ำที่อาจเกิดขึ้นได้

คำสำคัญ: ทัศนคติ, การรับรู้ความสามารถของตนเอง, อิทธิพลของเพื่อน, ความรอบรู้ด้านสุขภาพ, การป้องกันการตั้งครรภ์ซ้ำ, มารดาวัยรุ่นหลังคลอด

Abstract

Objective: To determine factors influencing health literacy of repeat pregnancy prevention among postpartum adolescent mothers. **Methods:** This predictive research study recruited 122 primiparous adolescent mothers who were admitted at postpartum ward and who visited family planning department at a public hospital in Chonburi province. Participants completed the questionnaires for personal information, attitude toward repeat pregnancy prevention, self- efficacy toward repeat pregnancy prevention, influence of family and partner toward repeat pregnancy prevention, influence of friends toward repeat pregnancy prevention, and health literacy of repeat pregnancy prevention. Associations were analyzed using multiple regression analysis. **Results:** The results revealed that factor that significantly influenced health literacy of repeat pregnancy prevention was attitude (β = 0.243 P-value < 0.01) self-efficacy (β = 0.271 P-value = 0.002) and influence of friends (β = 0.326, P-value = 0.001). These variables significantly predicted 36.6% of the variance in health literacy of repeat pregnancy prevention (R^2 = 0.366, $F_{(3,118)}$ = 22.721, P-value < 0.001). **Conclusion:** Study findings suggest promoting repeat pregnancy prevention in adolescent mothers and include people who are important to adolescent mothers such as friends to participate in pregnancy prevention counselling to allow postpartum adolescent mothers have self- efficacy in preventing pregnancy to increase health literacy of repeat pregnancy prevention and prevent repeated rapid pregnancies.

Keywords: attitude, self-efficacy, influences of friends, health literacy, repeat pregnancy prevention, postpartum adolescent mothers

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Introduction

Repeat pregnancy in adolescents has been a rising problem worldwide including Thailand. In Thailand, in 2019, 14. 78% of women younger than 20 years had repeat pregnancy, while in Chonburi province, 12. 56% did so which was higher than the indicator of 10% SET BY THE Department of Reproductive Health, Ministry of Public Health.[1] Repeat pregnancy among adolescents negatively affects the mother and fetus physically and psychologically. The World Health organization (WHO) recommends waiting at least 2 – 5 years before a rapid repeat pregnancy to maintain health of the mother and baby and reduce the risk of infant death.[2]

Repeat pregnancy causes health problems in adolescents more than regular pregnancy in these adolescents.[3] It has been found that 2 in 3 repeat pregnancies within 2 years have complications including gestational hypertension, preterm delivery, and postpartum complications such as bleeding,

infections of the uterus and sutured tissues, baby small for gestational age (SGA), pre-term delivery, and low-birth weight.[4] Repeat pregnancy n adolescents could cause a ack of warmth for the child, insecure job, and inadequate income which could lead to poor quality child rearing.[5]

Risk factors of repeat pregnancy in adolescents are lack of contraception post-partum of adolescent mothers, no plan for the former pregnancy, and no concern about repeat pregnancy[6], a lack of support from partner/spouse, friends, and disrupted education or no education of the adolescent mother.[7] Adolescent mother with no education are more likely to have repeat pregnancy than those with education. This is because they lack knowledge about sex education and life skill to protect adolescent pregnancy. They also lack self-esteem, perceived risk of pregnancy, lack of seeing through someone trick, and lack of contraception knowledge and skill. If they learn to overcome these drawbacks after delivery, they would be well equipped to prevent repeat pregnancy.[8] Thus knowledge and health literacy to prevent repeat pregnancy is crucial for adolescents to prevent repat pregnancy.

Health literacy is one of the national strategic plan of 20 years in public health.[9] It aims to have individuals be able to manage their own health including social skill, cognitive skill, and critical thinking to determine motivation or individuals' ability to access, understand and use the information to promote and maintain a good health.[10] For health knowledge, 6 components include capability and skill to access health service information, knowledge, understanding, communication skill, decision-making skill, media literacy, and self-management.[10,11] It is also expected that health system should enhance health literacy and health behavior with health education process and health communication.[9] Health literacy is a determining factor of good communication and health behavior appropriate for self-care especially in adolescents.[12] Health literacy could be used in caring adolescent mother post-partum. Healthcare providers have to promote health literacy in adolescent mother post-partum in caring for the mother and baby. Planning to prevent repeat pregnancy should be in place. Adolescent mothers need all 6 components of health literacy to prevent repeat pregnancy.[13]

Previous studies suggest that factors influencing health literacy are personal and social factors.[14] For personal factors, age is associated with health literacy among adolescent mothers where health literacy increases with age.[15] Younger adolescent mothers usually lack knowledge and motivation to access health service. Older adolescent mothers have more self-efficacy and confidence to seek healthcare service which make them have more health literacy.[12,16] Income also influences health literacy in adolescents.[17] Higher income and socioeconomic status affects health literacy positively. Adolescents with low income or with family of limited income are more likely to have poorer health and well-being, as well as health literacy. They also have poorer development potential and self-management.[18] Self-efficacy is also associated with health literacy.[19,20] Adolescent with self-efficacy could refuse behaviors that lead to sexual interaction, have health literacy and appropriate sexual interaction.[21] Social factors include influence of family and partner, and indirect influence on quality of life mediating through health literacy.[22] Support from sexual partner about contraception is associated with the actual contraception practice of female adolescents in vocational schools.[13,23] Peers also influence health literacy of adolescents.[17] Peers of adolescent mothers share health information. They feel comfortable communicating and sharing health information and their experience. They help each other analyze and interpret their health for decision-making.

Attitude toward pregnancy prevention is a crucial factor to pregnancy prevention behavior of adolescents. Positive attitude would lead adolescent mothers to prevent pregnancy, which would allow the mothers to have health literacy and express the pregnancy prevention behavior appropriately.[24] Positive attitude toward pregnancy prevention and contraception influences health literacy in adolescents[15] and could predict the actual behavior of preventing undesirable pregnancy.[25]

In Thailand, studies of health literacy in adolescent mothers in association with their various factors have been scarce.[12, 24, 26] There is a need to understand more about this relationship. This study aimed to determine influence of various actors on health literacy about repeat pregnancy prevention in adolescent mothers at post-partum stage. Specifically, we aimed to examine the associations between health literacy and various factors including age, income, perceived self-efficacy in pregnancy prevention, attitude toward pregnancy prevention, influences of family, partner, and friends.

Conceptually, the relationships between health literacy about repeat pregnancy prevention and its various influencing factors were based on the health literacy of Nutbeam[10] and Manganello[17], and health literacy in adolescents of Manganello.[17] These influencing factors were personal factors (i.e., age, gender, income, education, and ethnicity) and social factors (i.e., friends and family). Based on health literacy of Nutbeam[10], health literacy consists of social skill and cognitive skill for critical thinking which could form motivation or capability of a person to access, understand, and use information for promoting good health. It consists of 6 components including capability and skill to access information, knowledge and understanding, communication skill, decision-making skill, media literacy, and self-management. Personal factors influencing health literacy in adolescent mothers also include attitude toward pregnancy prevention[24,27] and self-efficacy.[24,28] All factors affect health literacy in pregnancy prevention among adolescent mothers.

Methods

In this predictive correlational study, study population was post-partum mothers aged 10 to 19 years old at the day of their baby delivery, hospitalized in postpartum ward receiving care at the postpartum family planning clinic of Banglamung Hospital, Chonburi province. The study sample was those defined as study population who met the eligibility criteria of being to read, write and communicate in Thai language and willing to participate.

The sample size was estimated based on 6 independent variables of linear regression analysis. With a type I error of 5%, a type II error of 80%, a medium effect size with R2 of 0.13 (Polit & Beck, 2017), a sample size of 112 participants was needed. To compensate for a 10% incomplete questionnaire, a total of 123 participants were needed (Little, & Rubin, 2002). The sample size calculation was done using the G* Power software program.

Research instruments

The self-administered questionnaire consisted of 6 parts. Certain parts were tested for content validity and internal consistency reliability. For content validity, three experts in nursing were asked to evaluate content validity. Content Validity Index (CVI) was calculated. For internal consistency reliability, 30 individuals with characteristics comparable to the participants were asked to complete the questionnaire. Cronbach's alpha coefficient was calculated.

The first collected demographic characteristics of the participants including age, education level, marital status, occupation, income, history of obstetrics, history of contraception, pregnancy plan, postpartum contraception, and postpartum child plan.

The second part assessed attitude toward repeat pregnancy prevention which was modified from the attitude toward contraceptive implant questionnaire[31] by the researcher. The questionnaire contains 10 questions consisting of thought and perception about repeat pregnancy prevention. Response was a 5-point Likert-type scale ranging from 1-totally disagree, 2-disagree, 3-agree, 4-highly agree, 5-the most agree. With a possible total score of 10 – 50 points, higher scores indicate a higher positive attitude toward pregnancy prevention. This part was found to have acceptable content validity with a CVI of 0.83 and a high internal consistency reliability with a Cronbach's alpha coefficient of 0.91.

The third part assess self-efficacy in pregnancy prevention. The researcher used self-efficacy in repeat pregnancy prevention questionnaire.[32] Of the 15 questions, there were 7 questions of perceived external factors of pregnancy prevention and 8 of perceived internal factors of pregnancy prevention. Response was a 5-point rating scale ranging from 1-not at all, to 2-the least, 3-little, 4-a lot, and 5-the most. With a possible total score of 15-75 points, higher scores indicate higher perceived self-efficacy in pregnancy prevention. This part was found to have acceptable content validity with a CVI of 0.93 and a high internal consistency reliability with a Cronbach's alpha coefficient of 0.81.

The fourth part assessed the influence of family and partner in pregnancy prevention. The researcher modified the influence of significant others on contraceptive implants.[31] The 6 questions asked about support from family and partner in pregnancy prevention. Response was a 5-point rating scale ranging from 1-disagree, to 2-slightly agree, 2-agree, 4-highly agree, and 5-the most agree. With a possible total score of 6 – 30 points, higher scores indicate higher influence of family and partner in pregnancy prevention. This part was found to have acceptable content validity with a CVI of 1.00 and a high internal consistency reliability with a Cronbach's alpha coefficient of 0.85.

The fifth part assessed influence of friends in pregnancy prevention. The researcher modified the influence of significant others on contraceptive implants questionnaire.[31] the 6 questions asked about support of friends toward pregnancy prevention. Response was a 5-point rating scale ranging from 1-disagree, to 2-slightly agree, 3-agree, 4-highly agree, and 5-the most agree. With a possible total score of 6 – 30 points, higher scores indicate higher influence of friend in pregnancy prevention. This part was found to have acceptable content validity with a CVI of 0.94 and a high internal consistency reliability with a Cronbach's alpha coefficient of 0.91.

The sixth part assessed health literacy in pregnancy prevention. The researcher modified the health literacy for pregnancy prevention in Thai adolescents aged 15 – 21 old and senior high school questionnaire.[9] With a total of 32 questions, there were 6 groups of questions including knowledge and understanding in pregnancy prevention (6 questions), access to information and health service to prevent pregnancy (5 questions), communication to enhance skill in repeat pregnancy prevention (6 questions), management of health conditions to prevent repeat pregnancy (5 questions), media literacy and information to prevent repeat pregnancy (5 questions), and decision to practice to prevent repeat pregnancy (5 questions). Higher scores indicate higher health literacy in repeat pregnancy prevention. This part was found to have acceptable content validity with a CVI of 0.90 and an acceptable internal consistency reliability with a Cronbach's alpha coefficient of 0.74.

Ethical considerations

This study was approved by the Ethics Committee for Human Study of Burapha University (approval number: HS 055/2563). Participation was voluntary in nature. For those under the age of 18 years, parental consent was obtained. Participants could withdraw from the study at any time with no consequences to the care they received from the hospital. All information was secured and presented as a summary not individuals' data. For to

Data collection procedure

The data collection was done from September 2020 to February 2023. Once permission to conduct research was granted by the director of Panglamung Hospital, the researcher approached the head of the postpartum ward for providing information about the research. Once these mothers attended the pregnancy planning clinic, the researcher asked about the voluntary intention to participate and screened them for eligibility. Once the written informed consent was obtained, the researcher asked the participant to complete the questionnaire which took about 45 minutes. All indenpende variables (age, income, perceived self-efficacy in pregnancy prevention, attitude toward pregnancy prevention, influences of family, partner, and friends.) were tested but only significant variables were presented in the result section.

Data analysis

Descriptive statistics including mean with standard deviation and frequency with percentage were used to summarize demographic characteristics and all study factors. Associations between scores of health literacy and its predictive factors wee tested using the stepwise multiple regression analysis. All assumptions of dependent and independent variables for linear regression analysis were tested. It was found that normality, linearity, homoscedasticity, multicollinearity, and autocorrelation were acceptable. Statistical significance was set at a type I error of 5% or P-value < 0.05. All statistical analyses were conducted using SPSS software program version 20.0.

Results

Of the 122 participants, most were in their 15 – 19 years old (96.7%); while the rest 3.3% were in their 10 – 14 years. Most lived in couple or with their husband (82.8%), had junior high school education (459%), had no monthly income (50.0%), had contraception before pregnancy (59.0%), had no intention to have a child after delivery in the next 2 years (95.1%), and had contraception plan after delivery 96.7%) (Table 1).

It was fond that health literacy was significantly positively associated with attitude toward pregnancy prevention, perceived self- efficacy in pregnancy prevention, and influences of friends in pregnancy prevention (β = 0.243, P-value = 0.002; β = 0.271, P-value = 0.001; β = 0.326, P-value < 0.001, respectively). These 3 factors together significantly explained 36.6% of variance of health literacy (R^2 = 0.366, $F_{(3,118)}$ = 22.721, P-value < 0.001) (Table 2).

Table 1 Demographic characteristics of the participants (N = 122).

Characteristics	N	%
Age (years), mean = 17.39, SD = 1.46, range = 13 – 19.		
10 – 14	4	3.3
15 – 19	118	96.7
Marital status		
Single/divorced/separated	21	7.2
Coupled/husband	101	82.8
Education level before pregnancy		
Primary school	1	0.8
Junior high school	27	22.1
Senior high school	56	45.9
Associate degree / vocational school diploma	38	31.2
Monthly income (Baht)		
No income	61	50.0
100 – 10,000	42	34.4
10,001 – 20,000	14	11.5
20,001 or higher	5	4.1
History of contraception		
No	50	41.0
Yes	72	59.0
Plan for next child after delivery		
No child in the next two years	116	95.1
To have a child in the next 2 years	6	4.9
Contraception plan after delivery		
No contraception	4	3.3
Use contraception	118	96.7

Table 2 Associations between health literacy in repeat pregnancy prevention and its predictive factors (N = 122).

Predictive factors	B	SE	β	t	P-value
Attitude toward pregnancy prevention	.496	.157	.243	3.151	0.002
Self-efficacy	.362	.105	.271	3.441	0.001
Influence of friends	.517	.124	.326	4.180	< 0.001
R^2 = 0.366, $F_{(3,118)}$ = 22.721, P-value < 0.001.					

Discussions and Conclusion

In this cross-sectional study, health literacy was significantly positively associated with attitude toward pregnancy prevention, perceived self-efficacy in pregnancy prevention, and influences of friends in pregnancy prevention among adolescent mothers after delivery. These 3 factors could explain 36.6% of variance of health literacy.

Attitude toward repeat pregnancy prevention is a crucial factor for the actual behavior of pregnancy prevention among adolescent mothers. Attitude toward repeat pregnancy prevention is a belief and thought on the practice of pregnancy prevention. If adolescent mothers have a positive attitude toward pregnancy prevention, their health literacy in preventing pregnancy is enhanced. Out finding is consistent with previous studies revealing that attitude could explain variance of health literacy to prevent pregnancy by 17.90% with statistical significance. With positive attitude toward pregnancy prevention, adolescent mothers would have a high health literacy and express their actual behavior to appropriately prevent pregnancy.[24,27] In addition, attitude toward pregnancy prevention and contraception influence health literacy among adolescents[15] and attitude toward undesirable pregnancy could predict preventing behavior for undesirable pregnancy.[25]

Self-efficacy is a personal factor that influences health literacy in repeat pregnancy prevention. Self-efficacy in repeat pregnancy prevention is the person's perception on his or her own capability to perform the health behavior of pregnancy prevention.[19] Adolescent mothers with self-efficacy in preventing repeat pregnancy would have health literacy in pregnancy prevention. In our study, self-efficacy had an influence on health literacy among adolescent mothers after delivery (β = 0.271, P-value = 0.001). This is consistent with previous studies showing that self-efficacy was associated with health literacy among adolescents.[24,28] Adolescents having self-efficacy in refusing inappropriate behavior leading to sexual interaction could have a health literacy and appropriate sexual behavior.[21]

Influence of friends is a supporting factor for adolescent mothers in preventing repeat pregnancy. Close friends have influence on health literacy because this stage of life involves education and friends in their school. They feel comfortable sharing health information and experience with each other. They have a chance to critically analyze and interpret health information to make an appropriate decision which could lead to repeat pregnancy prevention behavior in adolescent mothers. Based on health literacy of Manganello[17], influence of friends affects health literacy in adolescents. Social support of friends influences health literacy in adolescent mothers.[25,33,34] Adolescents with social support from friends have higher health literacy.

We found that age, monthly income and influence of family and partner had no effect on health literacy in repeat pregnancy prevention among adolescent mothers. No associations could be because of no variability of narrow age range among adolescents and low income in most adolescent mothers. Most lived with family or partner (husband) which could contribute to low variability in these adolescent mothers. The low variability of these independent variables could lead to no associations with health literacy in repeat pregnancy prevention in adolescent mothers postpartum.

This study has certain limitations. Adolescent mothers were relative scarce, a long duration of recruitment was needed. More stdy settings should be used in the future studies.

In conclusion, health literacy about repeat pregnancy prevention was associated with attitude toward repeat pregnancy prevention, self-efficacy in pregnancy prevention, and influence of friends in pregnancy prevention among adolescent mothers after-delivery. These three factors together explained the variance of health literacy significantly. Healthcare providers could promote health literacy in pregnancy prevention through promoting attitude toward repeat pregnancy prevention and interaction and support from trusted person such as friends to take part in counseling adolescent mothers. These could enhance adolescent mothers after-delivery to have more health literacy in repeat pregnancy prevention and ultimately the actual behavior of repeat pregnancy prevention.

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References

1. Ministry of Public Health. 20-year national strategic plan (Public Health). 2016. (Accessed on Jan. 22, 2021, at https://waa.inter.nstda.or.th/stks/pub/2017/20171117-MinistryofPublicHealth.pdf) (in Thai)
2. World Health Organization. Adolescent pregnancy. 2014. (Accessed on Jan. 22, 2021, at http://www.who.int/mediacentre/factsheets/fs364/en/)
3. Marangsee S. Risk factors and guidelines for prevention of repeated teenage pregnancy. *J Fac Nurs Burapha Univ* 2019;26(2):84-89. (in Thai)
4. Norton M, Chandra-Mouli V, Lane C. Interventions for preventing unintended, rapid repeat pregnancy among adolescents: A review of the evidence and lessons from high-quality evaluations. *Glob Health Sci Pract* 2017;5(4):547-570.
5. Srivilai K. Repeated pregnancy among adolescents: A case study in a community hospital, Southern Thailand. *The Southern College Network Journal of Nursing and Public Health* 2016;3(3):142-152. (in Thai)
6. Albuquerque APDS, Pitangui ACR, Rodrigues PMG, Araújo RCD. Prevalence of rapid repeat pregnancy and associated factors in adolescents in Caruaru. *Rev Bras Saude Mater Infant* 2017;17(2):347-354.
7. Govender D, Naidoo S, Taylor M. Prevalence and risk factors of repeat pregnancy among South African adolescent females. *Afr J Reprod Health* 2019;23(1):73-87.
8. Meekaew S. Factors associated with repeated pregnancy in postpartum adolescent mothers under 20 years of age Ratchaburi province. *Hua Hin Med J* 2018;3(2):38-48. (in Thai)
9. Thailand Reproductive Health Department of Health Ministry of Public Health. Thailand reproductive health database. (Accessed on Jan. 22, 2021, at http://rhdata.anamai.moph.go.th/index.php/familyplanning/familyplanning17) (in Thai)
10. Nutbeam D. The evolving concept of health literacy. *Soc Sci Med* 2008;67(1):2072-2078.
11. Division of Health Education Department of Health Service Support Ministry of Public Health. Health literacy assessment to prevent premature pregnancy for Thai children and young women aged 15-21 years. 2018. (Accessed on Jan. 22, 2021, at http://www.hed.go.th/linkHed/362) (in Thai)
12. Vongxay V, Albers F, Thongmixay S, et al. Sexual and reproductive health literacy of school adolescents in Lao PDR. *PLOS ONE*, 2018;14(1):1-14.
13. Thongnopakun S, Pumpaibool T, Somrongthong R. The association of sociodemographic characteristics and sexual risk behaviors with health literacy toward behaviors for preventing unintended pregnancy among university students. *J Multidiscip Healthc* 2018;11(1):149-156.
14. Bautista JR. From solving a health problem to achieving quality of life: Redefining health literacy. *J Lit Res* 2015;16(2):33-54.
15. Naigaga MD, Guttersrud Ø, Pettersen KS. Measuring maternal health literacy in adolescents attending antenatal care in a developing country-the impact of selected demographic characteristics. *J Clin Nurs* 2015;24(1):2402-2409.
16. Devito J. Self-perceptions of parenting among adolescent mothers. *J Perinat Educ* 2007;16(1):16-23.
17. Manganello JA. Health literacy and adolescents: A framework and agenda for future research. *Health Educ Res* 2008;23(5):840-847.
18. Sripitak T, Chutipattana N, Thongsamsi I. Factors related to health literacy associated with consuming behavior and exercise in preventing obesity syndrome of adolescent students in Yala province. *The 10th Hatyai National and International Conference* 2019:1529-1545. (in Thai)
19. Intarakamhang U, Khumthong T. Measurement development assessment of health literacy and unwanted pregnancy prevention behavior for Thai female adolescents. *J Public Health Nurs* 2017;31(3):1-18. (in Thai)
20. Xu XY, Leung AYM, Chau PH. Health literacy, self-efficacy, and associated factors among patients with diabetes. *Health Lit Res Pract* 2018;2(2):67-77.
21. Prachanno W, Srisuriyawet R, Homsin P. Factors influencing sexual behaviors among primary school students based on the information-

motivation- behavioral skills model. *J Nurs Sci Chulalongkorn Univ* 2017;29(2):39-51. (in Thai)

22. Jantacumma N, Powwattana A, Lagampan S, Chansatitporn N. Predictive model of quality of life among Thai pregnant teenagers. *Pacific Rim Int J Nurs Res* 2018;22(1):30-42.
23. Narkarat P, Thato R. Relationships between information, motivation, contraceptive behavioral skill and contraceptive use of Vocational female students in the upper south of Thailand. *Thai J Nurs Res* 2013;62(3):29-36. (in Thai)
24. Ngomsangad Y, Srisuriyawet R, Homsin P. Factors influencing health literacy related pregnancy prevention among female adolescent students in Si Sa Ket province. *Public Health J Burapha Univ* 2019;14(2):37-51. (in Thai)
25. Sribenchamas N, Samruayruen K, Kongpracha A, Poocharoen O. Factors affecting to behaviors preventing unwanted pregnancy of female senior high school student, Muang district, Phitsanulok province. *The 3th National Conference KPRU* 2016;3(2):260-272. (in Thai)
26. Suwannarat J, Panyasai K. The effectiveness of participatory health literacy model for premature pregnancy prevention of teenager. *J Health Res Develop* 2019;5(1):60-71. (in Thai)
27. Boonnow S. Knowledge, attitude and satisfaction about contraception to prevent repeat of teenage mothers at postpartum department, Chaiyaphum hospital. *Chaiyaphum Med J* 2016;36(2):35-43. (in Thai)
28. Ghanbari S, Ramezankhani A, Montazeri A, Mehrabi Y. Health literacy measure for adolescents (HELMA): Development and psychometric properties. *PLOS ONE* 2016;11(2):1-12.
29. Polit DF, Beck CT. Nursing research: Generating and assessing evidence for nursing practice, 10th ed. Philadelphia. Lippincott Williams & Wilkins, 2017.
30. Little RJA, Rubin DB. Statistical analysis with missing data, 2nd ed. New York. John Wiley & Sons, 2022.
31. Somroop A, Deoisres W, Suppaseemanont W. Factors influencing the use of postpartum contraceptive implants among primiparous adolescents. *J Fac Nurs Burapha Univ* 2019;27(3):79-87. (in Thai)
32. Wisarutkasempong A, Muangpin S. Factors related to the intention to repeat pregnancy among pregnant adolescents. *Srinagarind Med J* 2015;30(3):262-269. (in Thai)
33. França AS, Pirkle CM, Sentell T, et al. Evaluating health literacy among adolescent and young adult pregnant women from a low- income area of Northeast Brazil. *Int J Environ Res Public Health* 2020;17(8806):1-15.
34. Chaiyachat P., Saranrittichai K. The effects of health literacy and social support development program on pregnant prevention behaviors for early adolescent. *J Nurs Health Care* 2019:37(4)42-51. (in Thai)