Perception of Pregnancy Risk and Related Obstetric Factors among Women of Advanced Maternal Age

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Abstract: The number of women of advanced maternal age becoming pregnant is more likely to increase in the future, and this is risky because of various complications in the mother and baby. Reported here are partial findings from a larger descriptive study. These findings are perceptions of pregnancy risk among women of advanced maternal age and related obstetric factors of planned pregnancy, parity, gestational age and pregnancy complications. Convenience sampling took place with 190 women, 35 years or over, who were attending antenatal care in three tertiary hospitals in eastern Thailand. Data were collected from January-June 2018. The research instruments were a demographic and obstetric information form and the Thai version of the Perception of Pregnancy Risk Questionnaire. Data were analyzed using descriptive statistics including the Pearson and Point biserial correlation coefficient.

Results revealed that participants had mean scores of perception of pregnancy risk of 32.90, which was at a low level. Obstetric factors related to risk perception were parity, gestational age and pregnancy complications. However, planned pregnancy had no significant correlation with risk perception. The findings suggest that participants' perceptions of risk could be individual, based on parity, gestational age and pregnancy complications. Nurses and midwives need to assess women's perceptions about the risk of pregnancy and instigate frequent discussions about this to promote health during prenatal visits. Further studies need to determine how perception of risk influences healthcare professionals' communication with women of advanced age and to develop effective risk communication programs to ensure better pregnancy outcomes.

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Background

Pregnancy in advanced maternal age (AMA) is usually defined as "a mother who is 35 years of age or older at delivery."[1 (p.135)] In the last three to four decades, the number of women with late childbearing in their mid-30s to 40s has risen around the world. For example, in the United States, birth rates declined for women aged 15-34 but rose in those aged 35-44 from 2018 to 2019. In 2019 the number of births for those aged 35-39 was 52.7, for those aged 40-44 there was 12, and for those ≥45 years there were 0.9 births per 1,000.[2] In 2019 in Thailand, the birth rate for women aged 35-39 was 40 per 1,000 while for 40-44 years old there were 8 births per 1,000 population.[3] The possible causes for the increasing rate of late childbearing are changes in social values, such as late marriage, acceptance of delaying having a baby, reduction

in workplace inequality and increasing educational and job opportunities for females. Additional causes are more effective contraception, modern infertility treatment, and advancements in obstetric services.[4,5]

In the medical literature, AMA is categorized as a high-risk pregnancy. Empirical research studies report that women of advanced age were significantly associated with gestational diabetes mellitus (GDM)/diabetes mellites (DM),[8-9] pregnancy-induced hypertension (PIH)/hypertension,[9,11] cesarean section,[6-7,11] premature rupture of membrane (PROM),[9] and antepartum hemorrhage.[9,11] Furthermore, they were increasingly associated with adverse birth outcomes such as preterm labor,[7,9-11] low birth weight[9,10] perinatal death,[8,10-11] fetal growth restriction,[8] low APGAR score at 5 minutes[11] and neonatal intensive care admission.[8,10] Pregnancy at an advanced age not only affects physical health but also affects the mental health of women. A recent study found that pregnant women ≥35 years had higher distress than those aged 18-34 years, because of a diagnosis of pregnancy risk and the risk of probable complications.[12] Another study also reported that a higher prevalence of worrying factors during pregnancy and postnatal depression in women of AMA.[13] Further, women of AMA had a higher perception of pregnancy risk than those aged 20-29 years and these risks included cesarean section, dying in pregnancy, preterm birth and having a baby with a birth defect.[4]

Perception of pregnancy risk has been defined as the thoughts, feelings and awareness of pregnant women about the potential harm to themselves and their babies.[14] It involves the objective medical estimations of risk and its psychological components. These include how women feel about risk, are informed by their life experience, and the coping strategies used and the context in which risk occurs.[15,16] Pregnant women must consider the many factors that will affect how they think and feel about the risks they face.[15] A qualitative approach in Canada[17] conducted with 15 nulliparous women found their understandings of risk were associated with AMA, since they were aware of an increased risk of infertility and genetic abnormalities such as down syndrome. This study also revealed that the factors that may influence the risk perception among women of AMA include medical risks, psychological aspects, the characteristics of risk, stage of pregnancy, and opinions of healthcare professionals. Another Canadian study found that pregnancy-related anxiety, maternal age, medical risks, perceived control, and gestational age predictors were significant factors in the perceived pregnancy risks among nulliparous women aged 20-44 years.[18] Recently, a study in Thailand showed the positive relationship between pregnancy-related anxiety and pregnancy risk perception among women of AMA.[19]

A few studies have been carried out to determine the risk perception in women of AMA, especially Thai women.[19] Risk perception in women of advanced age can affect their attitude to medical care, health behavior and well-being of mothers and their babies.[20] Previous studies revealed that medical risks (pregnancy complications), pregnancy-related anxiety, perceived control, gestational age, and opinions of healthcare professionals were factors related to risk perception in women of advanced age.[17-19] However, little is known about the association between other obstetric factors such as planned pregnancy, parity, and perception of pregnancy risk. Thus, this study aimed to explore the perception of pregnancy risk level and related obstetric factors among women of AMA. The findings may be useful in providing high-quality antenatal care and the development of effective programs for better childbirth outcomes among women of AMA.

Method

Design: This descriptive correlational study was a part of a larger research project titled "Perceptions of pregnancy risk, health behavior and holistic service needs among women of advanced maternal age."[21] This article reports on the data from this study regarding perception of pregnancy risk and related obstetric factors among women of AMA.

Sample and Setting: The sample consisted of 190 women who were aged ≥35 years and attended antenatal clinics from January–June 2018 in three tertiary hospitals in eastern Thailand. Convenience sampling was used to recruit the sample according to the following inclusion criteria: Thai women of AMA at the gestational age of ≥20 weeks with a single pregnancy, and who could read and write Thai. G*Power 3.1.9.4 was conducted to determine the sample size, which was set from previous research[14] (r) of 0.21, using a significance level (α) 0.05, power (β) of 0.80 and a two-tailed alternative hypothesis. A minimum sample of 175 women was required. To compensate for possible missing data, an additional 10% was added. The final sample size was 190 women.

Instruments: There were two instruments used to obtain the data, described below:

Demographic and obstetric information form: This included age, education, marital status, occupation, family income, parity, gestational age, planned pregnancy, reasons for late childbearing, and pregnancy complications (yes or no question).

The Thai version of Perception of Pregnancy Risk Questionnaire. This was developed by Heaman and Gopton[14] and translated by Jittraphirom et al.[22] from English into Thai using a back-translation method. It is a self-report questionnaire consisting of 9 visual analogue scales designed to measure a pregnant woman's perception of her pregnancy risks. This questionnaire consists of two subscales that include four questions about the risk to self (mother), (for example "is a risk of having a cesarean section"); and five questions about risk to the baby, (for example "is a risk of baby having a birth defect"). "Respondents were asked to put a vertical mark through the line to indicate their assessment of risk for each Item,"[14 (p. 495)] yielding a score ranging from 0–100. A total PPRQ score was obtained by adding the score for each of the 9 items, and then dividing by 9, to obtain a score out of 100. A subscale score for the risk for self (4 items) was obtained by adding the score for each of the 4 items, and then dividing by 4, to obtain a mean score out of 100. A subscale score for the risk for baby (5 items) was obtained by adding the score for each of the 5 items, and then dividing by 5, to obtain a score out of 100.[14] Higher scores indicate higher levels of perceived risk. For the overall reliability, Cronbach's alpha score was found to be 0.87.[4] In this study Cronbach's alpha score was 0.94.

Ethical Considerations: This study was approved by the Research Ethical Committee of Burapha University (Sci 74/2560). All potential participants were informed about the purposes of the study, procedures to be undertaken, potential risks and benefits of participation, expected duration, confidentiality with respect to personal identification, and rights concerning withdrawal from the study at any time without repercussion. All women agreeing to take part in the study were asked to sign a consent form.

Procedures: The principal investigator (PI) obtained permission from each hospital director, then informed the head nurse of each antenatal clinic about the research purposes and procedures. Data collection was undertaken by the PI and two trained research assistants from January to June 2018. The antenatal clinic staff screened for eligible participants who met the inclusion criteria and informed the PI or research assistants. The potential participants were then individually approached and informed about the purposes, procedures and their rights concerning withdrawal from the study. Written informed consent was obtained from all participants. The PI or research assistants then distributed the questionnaires to the participants. The total time required for completing the questionnaires was approximately 20–30 minutes.

Data Analysis: All statistical analyses were performed with SPSS version 26, at a 5% significance level. Descriptive statistics were used to describe the demographic and obstetric information and study variables. The Pearson correlation coefficient (r) was used to analyze the relationship between gestational age and perception of pregnancy risk. The point

biserial correlation coefficient (r_{pb}) was used to examine the relationship between planned pregnancy, parity, pregnancy complications, and perception of pregnancy risk.

Results

The sample consisted of 190 women of AMA who were aged 35-46 years, with a mean of 37.48 years (SD = 2.44). About half of the participants (50.8%) had completed at least senior high or vocational school. Most (94.2%) were married and 37.9% described their occupation as factory worker or company employee. The average family income was 19,396.93 Thai baht/month (SD = 11,989.11) (around USD 614.88). Most were multiparous with 87.9% having experienced giving birth. The average gestational age was 31.60 weeks (SD = 4.77). Over half (55.3%) were planned pregnancies. The major reason for late childbearing was they did not use contraception because they thought that they would not get pregnant (22.1%). About 31.1% experienced pregnancy complications and the most frequent were GDM/DM (21.6%) (see **Table 1**).

The results showed that participants had a mean score for the perception of pregnancy risk of 32.90 (SD = 21.13). The subscale score was more evident in the perceived risk for the self (mother) (36.56) rather than for the baby (29.98) (see **Table 2**).

Table 1 Demographic and obstetric information among women of AMA (n = 190)

Variables	N	%
Age (Mean = 37.48, SD = 2.44, Range = 35-46 years)		
35-39	154	81.1
40-45	32	16.8
> 45	4	2.1
Education		
Elementary school	39	20.5
Junior high school	55	29.0
Senior high or vocational school	59	31.1
Diploma	20	10.5
≥ Bachelor's degree	17	8.9
Marital status		
Married	179	94.2
Divorced/Separated	11	5.8
Occupation		
Housewife	62	32.6
Factory worker/Company employee	72	37.9
Small business	27	14.2
General worker	22	11.6
Government official/State enterprise	7	3.7
Family income (Mean = 19,396.93, SD = 11,989.11, Range = 0-70,000 Baht/month)		
≤ 10,000 (316 USD)	53	27.9
10,001-20,000 (< 317-634 USD)	75	39.4
20,001-30,000 (< 632-951 USD)	40	21.1
> 30,000 (< 951 USD)	22	11.6
Parity		
Nulliparous	23	12.1
Multiparous	167	87.9

Table 1 Demographic and obstetric information among women of AMA (n = 190) (Cont.)

Variables	N	%
Gestational age (Mean = 31.60, SD = 4.77, Range = 20-41 weeks)		
20-28 weeks	64	33.7
29-36 weeks	91	47.9
≥ 37 weeks	35	18.4
Planned pregnancy		
Planned	105	55.3
Unplanned	85	44.7
Reason for late childbearing		
Did not use contraception they thought that they would not get pregnant	42	22.1
Incorrect usage of the contraceptive pill	31	16.3
Becoming ready for pregnancy	31	16.3
Being infertile	20	10.5
Being ready for a new family	18	9.5
Wanting to have another baby	16	8.4
A delayed marriage	10	5.3
Having a medical condition	2	1.1
No answer	20	10.5
Pregnancy complications		
No	131	68.9
Yes	59	31.1
GDM/DM	41	21.6
Hypertension	10	5.2
Anemia/thalassemia	4	2.1
Fetal abnormally such as breech presentation, pleural effusion	2	1.1
Others such as condyloma acuminata, allergy	2	1.1

Table 2 Mean score of perception of pregnancy risk among women of AMA (n = 190)

Item	Possible score	Actual score	Mean	SD
Risk for self (mother)	**0-100**	**0-98.50**	**36.56**	**21.24**
Risk for myself during this pregnancy	0-100	0-100	52.33	27.10
Risk of hemorrhaging	0-100	0-100	33.15	28.38
Risk of having a cesarean section	0-100	0-100	39.68	32.65
Risk of dying during this pregnancy	0-100	0-97	21.06	24.84
Risk for baby	**0-100**	**0-95.80**	**29.98**	**23.07**
Risk for my unborn baby	0-100	0-100	47.94	28.32
Risk of baby being born prematurely	0-100	0-99	31.24	28.54
Risk of baby having a birth defect	0-100	0-95	24.91	28.00
Risk of baby needing to go to the NICU	0-100	0-100	25.10	27.60
Risk of baby dying during this pregnancy	0-100	0-100	20.72	26.78
Total score	**0-100**	**0-97**	**32.90**	**21.13**

With regard to the relationship between obstetric factors and the perception of pregnancy risk, findings showed that parity had a significant negative correlation with perception of pregnancy risk (r_{pb} = -.196, p < .01). Gestational age and pregnancy complications had significant positive correlations with perception of pregnancy risk (r_{pb} = .168, p < .05; r = .343, p < .01, respectively). However, planned pregnancy had no significant positive correlation with perception of pregnancy risk (r_{pb} = .138, p = .062) (see **Table 3**).

Table 3 Relationship between obstetric variables and perception of pregnancy risk among women of AMA (n = 190)

Variables	1	2	3	4	5
Planned pregnancy (r_{pb})	1.00				
Parity (r_{pb})	.042	1.00			
Gestational age (r)	.019	-.047	1.00		
Pregnancy complications (r_{pb})	-.101	-.135	.092	1.00	
Perception of pregnancy risk (r)	.136	-.196**	.168*	.343**	1.00

*p = < .05, **p =< .01

Discussion

The results demonstrated that women of AMA had mean scores of perception of pregnancy risk that fell below one-third of the PPRQ (32.90), which was at a low level. This finding is consistent with previous studies[4,19] using the same instrument to measure the risk which found that nulliparous Canadian women of AMA had mean scores of perception of pregnancy risk of 29.67.[4] Similarly a study in Thailand[19] found that pregnant women of advanced age recorded mean scores of perception of pregnancy risk of 22.35 (201.13/9). These suggest that women of AMA do not perceive the risk to their pregnancies as severe. A possible explanation is that "risk perception in pregnancy is multifaceted and influenced by various personal, psychological and societal factors."[23 (p. 1)] It involves objective medical estimations of risk and psychological components which include how women feel about risk, are informed by life experience, and use coping strategies in the context in which the risk occurs.[15-16] Pregnant women must consider the many factors that will affect how they think and feel about the risks they face.[15] "Most women of advanced age express fears with the birth process and the wellbeing of babies, but the risk usually is accepted as part of the psychological strategies of pregnancy that women use to cope with their apprehensions."[24(p.161)] Therefore, although women were aware that pregnancies bring about a risk to themselves and their babies, most of them may not think about themselves to be at high risk. Furthermore, in this study, 87.9% of women were multiparous. They had become familiar with the pregnancy and childbirth, and this resulted in a lower perception of pregnancy risk.[19,25] Most were also married (94.2%) and so might have received good support from the baby's father. Social support is an important factor that contributes to decreasing the risk perceptions in women of advanced age.[12]

Parity had a significant negative correlation with perceptions of pregnancy risk. This means that multiparous women tend to have a lower perception of the risks of pregnancy. On the other hand, nulliparous women tend to have a higher perception of the risks of pregnancy. The explanation might be that nulliparous or a first-time pregnancy over the age of 35 years are often categorized as "elderly primigravida" and as "at-risk" regarding both mothers and their infants.[26] A study reported that nulliparous women ≥ 35 years have higher levels of stress compared to multiparous women ≥ 35 years. Being nulliparous, together with experiencing a risky pregnancy at the same time, can

cause women ≥35 years to have a high level of stress.[12] Furthermore, multiparous women become familiar with pregnancy and childbirth and resulting in a lower perception of pregnancy risk.[19,25]

Gestational age had a significant positive correlation with the perception of pregnancy risk. One explanation is that women experience an increase in their perception of pregnancy risk as their gestational age progressed. However, our results were not in accord with a previous Canadian study which found that women had a decrease in their perceived risk with the advance of gestational weeks.[17-18] Antenatal care (ANC) services may have a role in explaining the different results in our study. ANC service available in Thailand's public hospitals is provided by nurses/midwives and obstetricians and includes maternal and child health screening relating to pregnancy-related diseases. Pregnant women are generally passive recipients. They depend on public health services and have little chance to be involved in their care. Most pregnant women will receive only the standard care offered through the hospital policies and services. Because of a shortage of nurses/midwives and obstetricians, they are not offered further options for involvement in their care. Pregnant women may not receive enough information or have opportunities to make important medical decisions for themselves.[27] In this respect, in this present study some women reported that they requested fast ANC services, had adequate health personnel, that nurses/doctors provided advice and counselling, and families were allowed to participate in ANC services. This suggests that their needs for ANC service are unacknowledged by healthcare professionals. This may lead to dissatisfaction and potential conflict with healthcare professionals,[28] resulting in a higher perception of pregnancy risk as the gestational age progresses.

Pregnancy complications had a significant positive correlation with the perception of pregnancy risk. This means that when women of AMA experienced pregnancy complications their perception of pregnancy risk increased. A possible explanation might be the outcomes of women of AMA may have an adverse effect on their health because of a diagnosis of pregnancy risk and raised pregnancy complication risks.[12, 24] Such women may associate various health complications concerning themselves and their babies. They experience more distress, fearing both a diagnosis regarding pregnancy risk and the risk of probable complications[12] Moreover, parity is an important factor for the pregnancy complication risks in the AMA group.[6] These risks are differed in parity,[29-30] for example, nulliparous women show increased risks for PIH, PROM; while multiparous women have increased risks of GDM, PROM, anemia, polyhydramnios, and preterm labor.[30] In this study, most women (87.9%) were multiparous. About 31.1% experienced pregnancy complications and the most frequent were GDM/DM (21.6%), following by hypertension (5.3%). Previous studies have shown that pregnant women with complications perceived their risks significantly higher than those of uncomplications.[20,29] The results of this present study are consistent with the Canadian study,[18] which found that medical risks were a significant predictor of the perceived pregnancy risks in women aged 20-44 years. Similarly, the findings of a qualitative approach in Canada[17] reported that pregnancy complications had some influence on the perception of risk in women of advanced age, depending on the type of complication. For example, a woman with a threatened preterm birth who had to stop work described a high-risk perception. However, women with GDM who reported a well-regulated blood glucose level had a low to moderate perception of risk.

Planned pregnancy had no significant correlation with the perception of pregnancy risk. However, we then examined the subscale of the relationship between planned pregnancy and perception of pregnancy risk. An additional finding revealed that planned pregnancy had a significant positive correlation with the perception of pregnancy risk for the baby alone. The possible explanation is that after 35 years for many women,

fertility begins to decline because their eggs decrease in quantity and quality. They may take longer to conceive and are more at risk because of various pregnancy complications.[31] Thus, the women in this study experienced a high perceived pregnancy risk for their baby when they planned pregnancy so that they can improve their chance of having a healthy pregnancy. Contrarily, when women have an unplanned pregnancy, they may be unprepared for it and thus may be slower to obtain needed prenatal visits and less aware of other changes they should make (such as improving nutrition or taking vitamin supplements), compared with women with planned pregnancies.[32] A previous study[33] found that having an unplanned pregnancy was associated with higher risk of smoking and drinking alcohol during pregnancy, and attending later for the first prenatal visit as well as lower taking of folic acid supplements.

Limitations of the Study

A convenience sampling technique was used to recruit the sample. This may limit the generalization of the results to the entire population. Therefore, the results should be interpreted with caution. Since only a part of a larger study is reported here, the authors have not discussed other related factors such as pregnancy-related anxiety, perceived control and the opinions of healthcare professionals.

Conclusion and Implications for Nursing Practice

Women of AMA perceived the risks of their pregnancy at a low level. Factors relating to the perception of pregnancy risk included parity, gestational age, and pregnancy complications. The results of this study suggest that healthcare professionals should take into account that perception of risk of women of advanced age can be individual, based on parity, gestational age and pregnancy complications. Nurses/midwives need to assess women's perceptions about the risk of pregnancy and instigate frequent discussions about this to promote health during prenatal visits. Such discussions should be undertaken in a sensitive and respectful assessment of their understanding and perception of risk and fitted to the needs of the women of advanced age. Suggestions for further study include the need to determine how perception of risk influences healthcare professionals' communication with women of advanced age as well as the development of effective risk communication programs to ensure better pregnancy outcomes.

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การรับรู้ภาวะเสี่ยงของการตั้งครรภ์และปัจจัยด้านสูติศาสตร์ที่เกี่ยวข้องในสตรีตั้งครรภ์อายุมาก

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บทคัดย่อ: สตรีตั้งครรภ์อายุมากมีจำนวนมากขึ้นในอนาคต การตั้งครรภ์อายุมากมีภาวะเสี่ยง เพราะเกิดภาวะแทรกซ้อนหลายอย่างต่อมารดาและทารก รายงานการวิจัยนี้เป็นส่วนหนึ่งของผลการวิจัยเชิงพรรณนา ผลการวิจัยนี้เป็นการศึกษาการรับรู้ภาวะเสี่ยงของสตรีตั้งครรภ์อายุมาก และปัจจัยด้านสูติศาสตร์ที่เกี่ยวข้อง ซึ่งได้แก่ การวางแผนตั้งครรภ์ จำนวนครั้งของการคลอด อายุครรภ์ และภาวะแทรกซ้อนของการตั้งครรภ์ กลุ่มตัวอย่างเป็นสตรีตั้งครรภ์อายุตั้งแต่ 35 ปีขึ้นไป ที่มารับบริการฝากครรภ์ในโรงพยาบาลระดับตติยภูมิ 3 โรงพยาบาล เขตภาคตะวันออกของประเทศไทย จำนวน 190 ราย คัดเลือกกลุ่มตัวอย่างตามความสะดวก เก็บข้อมูลตั้งแต่เดือนมกราคมถึงมิถุนายน พ.ศ. 2561 เครื่องมือวิจัยประกอบด้วยแบบสอบถามข้อมูลส่วนบุคคลและข้อมูลทางสูติศาสตร์ และแบบสอบถามการรับรู้ภาวะเสี่ยงของการตั้งครรภ์ฉบับภาษาไทย วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา สถิติสัมประสิทธิ์สหสัมพันธ์ของเพียร์สัน และสถิติสัมประสิทธิ์สหสัมพันธ์พอยท์ไบซีเรียล

ผลการศึกษาพบว่า กลุ่มตัวอย่างมีค่าเฉลี่ยของการรั บรู้ภาวะเสี่ยงของการตั้งครรภ์ เท่ากับ 32.90 ซึ่งอยู่ในระดับต่ำ ปัจจัยด้านสูติศาสตร์ที่มีความสัมพันธ์กับการรับรู้ภาวะเสี่ยงของการตั้งครรภ์ ได้แก่ จำนวนครั้งของการคลอด อายุครรภ์ และภาวะแทรกซ้อนของการตั้งครรภ์ แต่การวางแผนตั้งครรภ์ไม่มีความสัมพันธ์กับการรับรู้ภาวะเสี่ยงของการตั้งครรภ์ ผลการวิจัยเสนอแนะว่า บุคลากรทางสุขภาพควรตระหนักว่า การรับรู้ภาวะเสี่ยงต่อการตั้งครรภ์ของสตรีตั้งครรภ์อายุมากอาจแตกต่างกันไปตามจำนวนครั้งของการคลอด อายุครรภ์ และภาวะแทรกซ้อนของการตั้งครรภ์ พยาบาลและผดุงครรภ์ควรประเมินการรับรู้ภาวะเสี่ยงของการตั้งครรภ์และกระตุ้นให้เกิดการอภิปรายร่วมกันบ่อย ๆ เกี่ยวกับเรื่องนี้ เพื่อส่งเสริมสุขภาพสตรีตั้งครรภ์อายุมากระหว่างที่มาฝากครรภ์ การวิจัยครั้งต่อไปควรศึกษาเกี่ยวกับการติดต่อสื่อสารระหว่างบุคลากรทางสุขภาพและสตรีตั้งครรภ์อายุมากมีผลต่อการรับรู้ภาวะเสี่ยงของการตั้งครรภ์อย่างไร และพัฒนาโปรแกรมการสื่อสารภาวะเสี่ยงของการตั้งครรภ์ที่มีประสิทธิภาพ เพื่อให้เกิดผลลัพธ์ของการตั้งครรภ์ที่ดี

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