

# The development of the health promotion program on maternal anemia: Qualitative study

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## Abstract

**Background:** Iron deficiency anemia in pregnant women is a crucial global health problem. Iron deficiency anemia is impacted on health during antenatal, labor and postpartum period. Although the national policy provides the preventive and solving the maternal anemia, the statistics of maternal anemia are still high.

**Purpose:** The aim of the study is to develop a health promotion program that is suitable for maternal anemia.

**Methods:** Qualitative research was used to develop the health promotion program on maternal anemia through in-depth interviews. Ten pregnant women who had hematocrit less than 33 volume percentages or hemoglobin less than 11 g/dl and five healthcare professionals were selected by purposive sampling. A total of fifteen participants were interviewed based on the semi-structured questionnaire for 30-45 minutes per case at the antenatal care clinic, Watbot hospital, Phitsanulok, Thailand. The period of the study was six months from the first of August 2022 until the end of January 2023.

**Results:** Thematic analysis was used to analyze the data and identified three main themes: 1) encouragement the attitude of self-care during pregnancy; 2) accessibility of the program ; and 3) practical use of the program and integrating the program based on the context of pregnant women and healthcare professionals.

**Conclusion:** The health promotion program was developed suitable for maternal anemia. The tailored program should be tested in terms of feasibility, accessibility, and practical use. It will support pregnant women with anemia, develop a key performance index of maternal and child health, decrease risks and complications, and promote maternal and child health based on the various contexts

**Keywords:** anemia; health promotion program; iron deficiency anemia; pregnant women

## Introduction

Maternal anemia in pregnant women is a crucial global health problem (World Health Organization) (WHO, 2012; 2022). Anemia in pregnant women is defined as hemoglobin (Hb) level lower than 11 g/dL or hematocrit (Hct) level lower than 33% and is divided into three classifications of severity as follows: mild (Hb 10-10.9 g/dL), moderate (Hb 7-9.9 g/dL) and severe (Hb <7 g/dL) (WHO, 2011). The Center of Disease Control (CDC) defined in detail that Hb level lower than 11 g/dL or Hct level lower than 33% in the first and third trimester of pregnancy and Hb level lower than 10.5 g/dL or Hct level lower than 32% in the second trimester of pregnancy due to the physiological changes during pregnancy (CDC, 1989; Zofkie et al., 2022).

The Global Health Observatory (GHO) reports indicated that the prevalence of anemia worldwide increased to around 40% of pregnant women in 2016 (Vardell, 2020; WHO, 2016). In Thailand, the prevalence of anemia in pregnant women was 32.2% in 2019 Department of Health

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Klankhajhon, S., et al. (2023)

(DoH2022). One of five cases of anemia in pregnant women is caused by iron deficiency anemia (IDA) (WHO, 2011; 2016). The evidence strongly supports that maternal physiological changes during pregnancy with inadequate iron intake are indicated as common causes of IDA in pregnancy (Tana, 2012; Braymann, 2015; Camaschella, 2015; Pinchaleaw, 2017). Maternal anemia has impacts on maternal health that is related with increasing rate of preterm labor, fetal growth restriction, low birth weight, perinatal mortality and morbidity, postpartum hemorrhage and infection, and postpartum depression (American College of Obstetricians and Gynecologists (ACOG), 2021; Maha, Tondare, & Tondare, 2017; Tandon, Jain, & Malhorta, 2018).

The Thailand national policy aims to decrease the rate of maternal anemia through the DoH and MoPH (DoH, 2023). They provide iron supplement for all pregnant women based on the recommendation from WHO (CDC, 1998; WHO, 2016). Healthcare professionals use the healthcare processes as a health promotion program with groups and individual health education for pregnant women with anemia (Bureau of Nutrition, 2011; DoH, 2011). Health education consists of maternal anemia such as severity, consequences, prevention, treatment, dietary and iron supplement, and self-care during pregnancy (Achebe & Gafter-Gvili, 2017; Food and Drug Administration, 2016). Most of the health promotion programs as health education focused on the knowledge, self-care, and health behavior for taking iron supplements, having food supporting iron intake, and avoiding food with prevention of iron absorption. These studies developed a program based on nursing theory such as: health belief model, self-care theory, health education theory and goal attainment theory (Pipat kul, Sinsuksai, & Phahuwatanakorn, 2015; Senanayake et al., 2010; Sirisopa & Pongchaidecha, 2015; Techakampholsarakit, Kantaruksa, & Sansiriphun, 2018). The prevalence of anemia in Thai pregnant women is still higher than the key performance indicator (KPI). This might indicate that the current healthcare process and health promotion program might not fit with maternal anemia. The systematic review of interventions to promote anemia prevention for pregnant women suggested that an education program should be provided with social support, motivation, and mutual goal setting through the appropriate media. In addition, these health education program or interventions were evidence-based developed only on healthcare professionals' views (Techakampholsarakit et al, 2018). The KPI must be less than 14% for anemia in pregnancy (DoH, 2023) whereas the national statistics report that percentages of anemia in Thai pregnant women are ranged between 10.78-17.33 from 2013 to 2022 (DoH, 2023; WHO, 2022). Therefore, the objective of this study was to develop a health promotion program for maternal anemia based on the Thai context. The insights of pregnant women with

anemia and healthcare professionals point of views was explored to tailor a health promotion program that fit with maternal anemia.

## Materials and Methods

### Design

Phenomenological qualitative research can be integrated to explain and describe the ontological meaning and the experience of a particular group of people. This study explores the knowledge and experiences of pregnant women with anemia and healthcare professionals through in-depth interviews. Their knowledge and experiences provided insights to develop a health promotion program for maternal anemia based on the Thai context. The data were collected between the first of August 2022 to the end of January 2023.

### Sample and setting

A total of fifteen participants, consisted of ten women and five healthcare professionals, were selected by purposive sampling for in-depth interviews at the antenatal care clinic, Watbot hospital, Phitsanulok, Thailand. The women sampling grid is shown in Table 1. Women were initially invited by the nurse at ANC. A target sample size was ten to fifteen pregnant women for in-depth interviews (Creswell, 2014; Holloway, Wheeler, & Holloway, 2010). When a pregnant woman expressed willingness to participate in the interviews, they contacted the researcher by telephone (free call) or in person at the ANC during office hours. Then, women interested in participation were given full information by the researcher. The researcher took written consent. The participants were screened through inclusion and exclusion criteria. The inclusion criteria were woman who able to read, speak and understand the Thai language. Pregnant women who diagnosed with maternal anemia, which had Hct level less than 33 volume percentages or hemoglobin less than 11 g/dl, and no complications were eligible for recruitment. Women with any complications and extremely high stress scores (ST-5 score > 8 points) during pregnancy were excluded. Healthcare professionals were initially invited by the assistant researcher at the hospital. When a healthcare professional expressed willingness to participate in the interviews, they contacted the researcher by telephone (free call) or in person at the hospital during office hours. Then, those interested in participation were given full information by the researcher. The researcher took written consent. The participants were screened through inclusion and exclusion criteria. The inclusion criteria were healthcare professionals able to read, speak and understand the Thai language. Healthcare professionals who worked related to maternal and newborn during pregnancy, delivery, and postpartum period for at least two years were eligible for recruitment. Participants were offered a gift voucher of 300 baht to take part in the interviews.

**Table 1. Purposive sampling frame for pregnant women in the interviews**

Variable	Details of variable	
Number of pregnancy	Primigravida (first time)	Multigravida (second or more)
History of anemia during pregnancy	Yes	No
Gestational age (GA) at the first visit	> 12 weeks	< 12 weeks
Antenatal care visit at clinic following the recommendation	Yes	No

**Table 2. Demographic characteristics of pregnant women and HCPs for a in-depth interviews (n=15)**

Demographic characteristics	n	%
<b>Age</b>		
20-34 years	11	73.33
> 35 years	4	26.67
<b>Occupation</b>		
Employee	2	13.33
Self-employed	3	20
Agricultural	2	13.33
Housewife	3	20
	5	33.33
<b>Education</b>		
Secondary school or equal	3	20
High school or college degree	5	33.33
Bachelor degree or equal	4	26.67
	3	20
<b>Income</b>		
< 5,000 Baht	3	20
5,000-10,000 Baht	3	20
10,000-20,000 Baht	4	26.67
>20,000 Baht	5	33.33

**Table 3. Demographic characteristics of pregnant women for a in-depth interviews (n=10)**

Demographic characteristics	n	%
<b>Gestational age at the first ANC</b>		
<12 weeks	8	80
>12 weeks	2	20
<b>Pre-pregnancy Body Mass Index (BMI)</b>		
Underweight (BMI < 18.5 kg/m <sup>2</sup> )	2	20
Healthy (BMI 18.5-22.9 kg/m <sup>2</sup> )	4	40
Overweight (BMI 23-29.9 kg/m <sup>2</sup> )	4	40
<b>Hb Level</b>		
7- 9.9 g/dL	1	10
10-10.9 g/dL	9	90

Klankhajhon, S., et al. (2023)

### Data collection

The data were collected through in-depth interviews. The semi-structured questions were developed by the researcher based on the concepts of anemia in pregnancy, research objective, and context. The items of questions were verified by the three experts in maternal and newborn nursing in terms of content, construct, and language based on the scale level content validity index (s-CVI) at 0.85. It calculated the average proportion from all items level content validity index (i-CVI) (Polit & Beck, 2006). The question guide consisted of the designing or tailoring of the health promotion program as a healthcare service for pregnant women with anemia in terms of the main concepts of the program, duration, and feasible to use in real life. Steps in conducting the interviews were as follows: (1) the name, position and contact details of the researcher were introduced to the participants; (2) study information was briefed to the participants on the purposes, benefits and processes of the study, and ethical issues; (3) any questions from the participants were answered by the researcher before starting the interviews; and (4) the main findings from the interviews were summarized for checking accuracy and correction with the participants (Creswell, 2014; Holloway et al., 2010). The interviews ended with eliciting the participants' demographic characteristics. All interviews took about 30 to 45 minutes per participant and were recorded with a digital voice recorder and field notes.

### Data analysis

Thematic analysis was used to analyze data. The

data were managed by the researcher as well as manually. The process in conducting a thematic analysis was as follows (Braun & Clarke, 2006; Holloway et al., 2010). Firstly, the data were fully transcribed. The full transcripts were checked and cross-checked for accuracy. Next, all transcripts were read and reread several times to understand each interview in depth. The data were compared for similarities and differences among participants based on a list of all topics from interviews. Verbatim quotes and manifest data were underlined and highlighted as key words. The data contents were coded. The codes were checked back with the transcripts for accuracy. The codes were grouped according to initial categories and progressed to sub-themes and themes. The themes were examined in terms of relationships in two dimensions between data set and codes; and codes and themes. The themes were defined and named for presenting the overall data in each theme. Lastly, the coding and the themes were examined for accuracy by the researcher, co-researcher and consultant. The process of thematic analysis was reported in relation to the research questions and literature.

### Ethical consideration

Ethical approval for this study was obtained from the Naresuan University Institution Review Board, Naresuan University, Thailand (IRB No. IRB P3-0201-2564), which approves dates between 14 March, 2022 and 14 March, 2023. The decision to participate was made by individual samples independently and without pressure. Participants could withdraw at any time without giving any reason

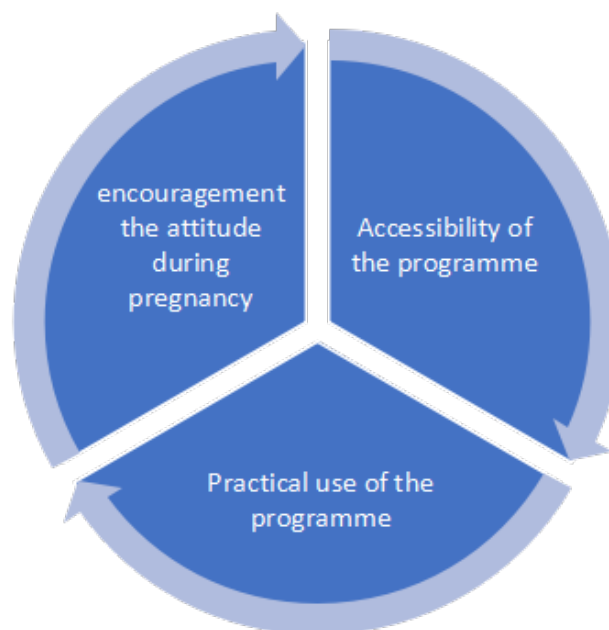


Figure 1. Themes and sub-themes of health promotion programme for maternal anemia

and their withdrawal from the research did not affect the standard of care or their careers. All data in this study were identified by individual codes, except for copies of the consent form which contained the names and contact details of all participants. No data could be accessed by anyone other than the researcher, co-researcher, assistant researcher, and consultant. The data were presented and reported without personal identification. During data collection and analysis, the researcher used a personal notebook with strong password protection. All files and documents were kept securely in the locked storage at Naresuan University, Thailand. Personal information will be kept for one year after the end of the study; all other anonymized data will be kept for a period of ten years after completion of the study in locked storage at Faculty of Nursing, Naresuan University, Thailand.

### Trustworthiness

The rigors of this study was obtained in terms of trustworthiness through credibility, confirmability, objectivity and transferability (Anney, 2014; Holloway et al., 2010). The methods of data collection and data analysis process were reported in rich description of characteristics with the details of research setting, characteristics of participants, and the Thai context. The decision-making of the researcher in each stage was demonstrated so that the research processes and context of the study can be applicable for justification in transferability to other contexts or situations in future research (Anney, 2014; Baillie, 2015; Holloway et al., 2010). The protocols of data collection and data analysis were checked with the researcher, co-researcher and consultant to ensure that they were described well enough in terms of data collection process, raw data, process of data analysis and interpretation of the findings as an audit trial for dependability.

The process of qualitative interviews was checked by consolidated criteria for reporting qualitative studies (COREQ) in three domains: research team and reflexivity; study design; and analysis and findings. The researcher summarized the findings from the interviews, which were re-examined by the researcher, co-researcher, and consultant in each phase of the data analysis, including codes and themes as a peer-debriefing for credibility (Anney, 2014; Baillie, 2015; Holloway et al., 2010). The research process was recorded with a diary by the researcher including the feelings and contexts behind the decision-making for confirmability. The effect of the researcher on the research process was acknowledged because the researcher as an instrument might influence the process of the data collection and data analysis. The data analysis process was demonstrated in rich description to ensure that the findings were interpreted from the interviews (Anney, 2014; Baillie, 2015; Holloway et al., 2010; Shenton, 2004).

## Results

A total of fifteen participants, consisted of eleven pregnant women and five healthcare professionals, participated in the in-depth interviews. One woman withdrew from the study due to their duties and transportation. The demographic characteristics of participants are summarized in Table 2. Five healthcare professionals included three instructors and two Registered Nurses (RN). The age of healthcare professionals ranged from 34 to 52 years. The average income of participants was 30,000 baht a month. They had experience of maternal and newborn care during antenatal, labor, and postpartum period, which ranged from three to fifteen years. Two of them graduated with a bachelor's degree in health sciences such as nursing and public health. Two of them graduated with a master's degree and one of them graduated with a philosophy of nursing. Pregnant women were residents of the Lower Northern region Thailand such as Sukhothai, Pichit, Phitsanulok, and Tak in both the rural (village or countryside) and urban (town) areas. The age of participants ranged from 22 to 45 years. The average income of participants was 12,000 baht a month.

Most of the pregnant women visited as the first antenatal care visit before 12 weeks of gestational age (8, 80%). Nearly half of participants had a healthy pre-pregnancy BMI (4, 40%), four women had an overweight (40%) and two women had an underweight (20%). Most of them also had a mild severity of IDA (Hb 10-10.9 g/dL) (9, 90%). They did not have signs and symptoms of anemia and complications during pregnancy such as sexual transmitted infection (STI) and gestational diabetes mellitus. The demographic characteristics of pregnant women are summarized in Table 3.

Topics of in-depth interviews covered a range of designing or tailoring of the health promotion program for pregnant women with anemia in terms of main concepts of the program, duration, and feasible to use in real life. The themes and sub-themes are shown in Figure 1. Three main themes emerged from the interviews: 1) Encouragement the attitude of self-care during pregnancy; 2) Accessibility of the health promotion program; and 3) Practical use of the program and integrated program based on the context of pregnant women and healthcare professionals.

### Theme 1: Encouragement of self-care during pregnancy

This theme indicated the expression of pregnant women and healthcare professionals that focused on an attitude of pregnant women with anemia. The significant strategy was how to increase their attitude about appropriate self-care during anemia in pregnancy. Attitudes of pregnant women will encourage them to enhance sustainable self-care knowledge and skills during pregnancy such as

Klankhajhon, S., et al. (2023)

nutrition during pregnancy, iron supplement, drug use, and antenatal care visit attendance frequency. Participants, especially healthcare professionals, illustrate that maternal anemia has been an important health issue in Thailand for a long time. Many health promotion programs, were run by Thai national and international policies such as the World Health Organization (WHO), were applied to improve maternal and fetal health in an antenatal care clinic and communities. Unfortunately, it appears to not have worked as the rate of anemia in pregnancy is still high. They expressed that the program should focus on changing and gaining their attitude or mindset of self-care during pregnancy in terms of health awareness. The step of health education should be in enhancing their attitude before anemia knowledge. The content should be adequate and meet needs of pregnant women with anemia. This will support them to get a higher level of attitude.

*"Anemia in pregnant women is a significant issue in Thailand for long time. We have a lot of program and strategies to help pregnant women with anemia such as health education, advice, reminder via phone, and teaching, but it's not work. I worked with pregnant women more than ten years; this issue is still high. .... Some years are slightly decreased but it's not sustainability. .... In my opinion, if we gain or change their attitude, it might be better than enhance their knowledge. They will have self-awareness to change their health behavior during pregnancy."* (Healthcare professional (HCP 1, 43 years old)

*"It's been a problem for a long time. ...I worked as a nurse more than 20 years. .... We find ways to educate and support them such as milk, eggs, and vitamin supplements. ....It's noting, if they didn't see. It might not be significant for their life because it's normal. ...We should find how to change their views to see the importance of the problem: anemia during pregnancy. ...It helps to solve this problem."* (HCP 3, 52 years old)

*"I have had this problem since my first-time pregnancy around three years ago. I got health education about the consequences of anemia during pregnancy, how to take iron supplements, and prevention complications. ...I think, noting. ....I believe the another things are more importance than anemia. I have not seen an importance. ....For my current pregnancy, I learn from the previous that anemia during pregnancy is importance. If I didn't have good behavior, it might affect my womb and my baby after birth. ....So, I think, the mindset or attitude is a significant for pregnant women to increase their good health behavior."* (Pregnant woman 4, 30 years old)

*"For me, I need to get how is important for my life and my baby before getting the content about food intake, vitamin or iron supplements. ....Sometimes, I think the content should be focus on our need rather than your need as a pattern of health education. ... It annoy me and impact on my attitude as a boring."* (Pregnant woman 3, 24 years old)

## Theme 2: Accessibility of the health promotion program

Participants illustrated that the health promotion program for pregnant women with anemia should be easy and accessible. They expressed their experiences of another health program for clients and that some programs have many conditions for engagement. This might affect their emotions and attitude to join the program. The health promotion program should be accessed anytime, anywhere, any gestational age and should be participated as a simple process based on their decision.

*"The health promotion program should be design for all pregnant women with anemia. All of them can be engaged if they want. ...It should be designed to register as an easy step."* (HCP 4, 36 years old)

*"...in my second time of pregnancy, I have an anemia due to iron deficiency. I want to join the program for pregnant women who had Hct less than normal, but I cannot join because I have already visited around 32 weeks of gestational age. Nurse told me that I cannot join because your pregnancy closed to the end. ....I think, it might good for all pregnant women to participate in the program. It should be reduced conditions for joining."* (Pregnant woman 10, 45 years old)

*"The program should be easy to access such as we can use or join it anytime, anywhere based on my context. I used to join the program for teenage pregnancy, it annoyed me, .... Complicated process and difficulty to access. I did it every week and not easy to do it."* (Pregnant woman 3, 24 years old)

## Theme 3: Practical use of the program and integrated program based on context of pregnant women and healthcare professionals.

Pregnant women expressed their ideas and their experiences to tailor the health promotion program for maternal anemia that the program should be easy to be applied in the real life in terms of the contents, period of time, and our lifestyles both urban and rural area. They also indicated that the program should be adapted to use in the daily life and flexible for all pregnant women.

*"I want the health promotion program that will be used in my daily life. In my point of view, I feel the health promotion program, that I got from nurse, is an ideal program. It cannot be used in my life. ...For example, they teach me as a student, I learned a lot around 2-3 hours. OMG, I don't have enough time to learn for more than an hour. I know, it's good for me, but I must do my work. It should be applied to my life."* (Pregnant woman 8, 38 years old)

*"Some contents of health education, I don't know how to use it. I have a lot of questions as what I should to do? .... For example, I learn about what kind of meat I should eat when I have anemia during pregnancy. They told me I should eat offal, but I don't like it. In addition, during pregnancy, I cannot eat due to my morning sickness. ....They*

also said, 'you should eat it', it help me to improve health status. I don't know how to do it. I try to eat a lot of iron supplements to replace food with offal. Unfortunately, my Hct is still low." (Pregnant woman 1, 22 years old)

Healthcare professionals strongly indicated that the program should be applied with their duties and responsibilities. It should be integrated with their regular work and office hours. They also expressed that they know the ideal program might support pregnant women to gain their Hct and health behaviors, but it takes time and increases our work, including working overtime. It is the cause of burnout from work. The health promotion program should be practically used for sustainability based on the context of the healthcare system.

"It might better to integrate the health promotion program to their routine work. I feel tired doing the extra program that might not fit with my work. I cannot do the program after office hours. ...not good for me. After office hours, it's my time to feel free and enjoy my life. It's not time to work." (HCP 5, 34 years old)

"I am concerned about this problem, anemia in pregnancy. ...However, it good to be concerned my duties. Please, do not increase our workload. I provide nursing care for pregnant women and then do the documents. I run the antenatal care in the early morning every day, I have not enough time to work overtime. I feel burned out." (HCP 4, 47 years old)

## Discussion

The findings of this study illustrate the point of views of pregnant women and healthcare professionals to tailor the health promotion program for pregnant women with anemia. Their views indicated that the program should focus on attitudes of pregnant women, accessibility to the program, practical use and integrated with their real-life for both pregnant women and healthcare professionals. A total of fifteen participants consisted of ten pregnant women and five healthcare professionals participated in the in-depth interviews. One woman withdrew from the study due to their duties and transportation.

From the findings it indicted that women may have had moderate to high level of self-care during pregnancy. This is similar to findings of a study conducted in China with 1,088 pregnant women. The first time visit at antenatal care before 13 weeks of gestation is associated with higher level of self-care than pregnant women who had visit for the first time after gestational age 13 weeks. Women with early visit received health education from healthcare professionals that helped them in decreasing risk of complications, getting information about nutrition during pregnancy, and avoiding alcohol intake and smoking (Ma et al., 2020). Surprisingly, most samples had a mild severity of anemia and they didn't have any signs and symptoms of anemia. They still had a normal life during pregnancy as a routine.

This is similar to findings of pregnant women's experiences who had mild to moderate severity of anemia that they perceived nothing as not normal (Chatterjee & Fernandes, 2014; Klankhajhon et al., 2021). The characteristics of participants will reflect their ideas for designing the program.

Three main themes emerged from the interviews: 1) Encouragement the attitude of self-care during pregnancy; 2) Accessibility of the health promotion program; and 3) Practical use of the program and integrating the program based on the context of pregnant women and healthcare professionals.

This first theme indicated the expression of pregnant women and healthcare professionals that focused on an attitude of pregnant women with anemia. The significant strategy was how to increase their attitude about appropriate self-care during anemia in pregnancy. Attitudes of pregnant women will encourage them to enhance sustainable self-care knowledge and skills during pregnancy such as nutrition during pregnancy, iron supplement, drug use, and antenatal care visit attendance frequency. The findings are similar to a study about the effectiveness of changing health behavior. The key strategy is enhancing their positive attitude. Many studies found that high level of attitude positively related with self-care during pregnancy (Bayisa et al., 2022; Moshi, Kibusi, & Fabian, 2020). In addition, the studies illustrated the experiences of pregnant women with low level severity of anemia associated with negative attitude. It impacts their competency of self-care (Chatterjee & Fernandes, 2014; Klankhajhon et al., 2021).

Participants, especially healthcare professionals, illustrated that maternal anemia has been an important health issue in Thailand for a long time. The issue of anemia with pregnant women is one of the KPI of antenatal care. Healthcare professionals provided many anemia prevention programs and health education programs based on national and international policies. From the statistics, the rate of maternal anemia except pregnant women with thalassemia is continuing at a higher rate than the standards. It shows these programs might not be suited for pregnant women with anemia. It also indicated that these programs might not solve maternal anemia sustainability. In addition, some women in this study had experience of maternal anemia in the previous pregnancy.

Therefore, the findings indicated that attitude of health behavior is the main point in the health promotion program for pregnant women with anemia. The program should be designed with questions and answers, and a knowledge sharing section. It will helps to improve their attitude, knowledge, and skills. This is also similar to a literature review of health behavior modification in pregnancy which gained their attitude, knowledge, and empowerment (Boguszewski et al., 2018; Grant, Morgan, & Mannay, 2019). However, the empowerment in pregnancy wasn't mentioned in this study. This may be because most of the pregnant women had an early

Klankhajhon, S., et al. (2023)

antenatal care visit before 12 weeks of gestation. They got support and prenatal education from nurses, healthcare professionals, and their family members as social support. Furthermore, most of them had low level severity of anemia without any signs and symptoms. So, it is strongly expressed to focus on attitude that should be included as a key point to improve health behavior and Hct level in pregnant women with anemia and that the program should focus on changing and gaining their attitude or mindset of self-care during pregnancy in terms of health awareness.

The step of health education should be in enhancing their attitude before anemia knowledge. The content should be adequate and meet the needs of pregnant women with anemia. It will support them to get a higher level of attitude. The study illustrated that the first fifteen minutes are good to provide health education because this is the best time as being alert in terms of attention and perception. Normally, a lecture including health education will take around 50–60 minutes (Bradbury, 2016). Participants revealed that the health promotion program for pregnant women with anemia should be easy and accessible. The health promotion program should be accessed anytime, anywhere, any gestational age and should be participated as a simple process based on their decision. The findings are similar to a study about the health promotion program that it should be accessible and result in increasing facilities and reducing barriers (WHO, 2022). All pregnant women with anemia should have a chance to participate in the program without limitation of gestational age, maternal age, and others except the limitation due to their health status and complications during pregnancy. The program should be easy to participate in without complicated process based on their context. These factors will affect participation adherence and attitude of pregnant women in the program.

Pregnant women expressed that the program should be easy to be applied in their real life in terms of the contents, period of time, and lifestyles, both urban and rural area. They also indicated that the program should be adapted to use in daily life and flexible for all pregnant women. The study of the effects of health promotion program on health behavior found that the context of family, community and healthcare system should be considered (Smith, Portela, & Marston, 2017; Zinsser et al., 2020). The real-life context should be concerned for both clients and healthcare providers when designing the health promotion program for pregnant women with anemia in terms of time, cost, duties, and implication for both rural and urban areas.

Healthcare professionals also illustrated that the program should be applied with their duties and responsibilities as a regular work during office hours. In addition, the health promotion program should be practically used for sustainability based on the context of workload and healthcare system. The program should be designed to apply to prenatal

education and integrated with daily duties both online and onsite. The statement “Do not increase their workloads at antenatal care clinic” is the key point that should be concerned about nurses and healthcare professionals’ responsibilities. A cross-sectional study by Diehl et al. (2021) revealed that 497 registered nurses had a lot of work and this was positively associated with high level of fatigue and burn out. During the COVID-19 pandemic, the workload of registered nurses who work at an intensive care unit was positively related with occupational exhaustion (OE). It led to burn out and quitting the job as a nurse (Aljanfawi, 2022; Cho et al., 2022).

The setting for collecting the data was a secondary care at a community hospital. The service covers the treatment of uncomplicated diseases, health promotion, health prevention, and rehabilitation for all age groups. The environment of this setting might influence the findings in term of healthcare professionals as a nurse or midwife. They take on a multifunction role in the antenatal care clinic as nursing care, basic treatment, healthcare educator, and documentation.

## Conclusion

The findings from pregnant women and healthcare professionals are both necessary and timely for informing the health promotion program tailored specifically for pregnant women with anemia. It was useful for healthcare professionals to better understand their expressions and ideas to solve the maternal anemia issue. This study will be applied in clinical practice of health education in antenatal care clinics for designing and developing a lesson plan and learning outcomes of pregnant women. For the nursing administration, the health promotion program on maternal anemia will be established based on pregnant women-centered and concerned on enhancing attitude of pregnant women, accessibility for all of them, and practical use and integrated with the context of both women and healthcare professionals. The limitation of this study should be considered. The small size of the pregnant women and healthcare professionals might affect the generalizability of the findings. Most of the pregnant women represented a low to medium level of education and family income including living in rural area. These factors may have limitations to represent the entire population. In future study, the program will be tested in terms of feasibility, accessibility, practical use, and outcomes. The tailored program will support developing a key performance index of maternal and child health, decrease risks and complications, and promote maternal and child health based on the context.

## Declaration of Interest

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analysis or interpretation of data or writing of this report.

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### Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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