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The correlation between family empowerment and the role of family health tasks in preventing anemia during pregnancy

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ABSTRACT

Anemia in pregnancy can harm the mother and baby. Prevention of anemia in pregnant women cannot be separated from the role of the family. Increasing the role of the family requires family empowerment, especially from the husband. This study aimed to analyze the correlation between family empowerment and family role in preventing anemia during pregnancy. This study used a descriptive correlational approach. Sample was 150 of pregnant women who received antenatal care at the Klampis Ngasem and Pacar Keling Health Center, East Java, Indonesia, and were selected using a consecutive sampling method. A statistical test to examine the relationship between independent and dependent variables is conducted using Spearman's Rho. and Chi-square. This study indicates a significant correlation between family empowerment and family role in prevention anemia during pregnancy ($p = 0.000$; $r = 0.578$). There is a relationship between the components of family empowerment and family function. Motivation ($p = 0.000$; $r = 0.643$), cognitive ($p = 0.000$; $r = 0.552$), and personal traits ($p = 0.000$; $r = 0.565$) correlated with family role in preventing anemia during pregnancy. Health workers need to provide education to increase family empowerment to increase the role of the family in the five family tasks in preventing anemia during pregnancy.

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1. INTRODUCTION

Anemia is a condition characterized by decreased hemoglobin levels, often referred to as a lack of blood, with red blood cell hemoglobin levels falling below the normal range [1]. Pregnant women are diagnosed with anemia when their hemoglobin level is below 11 g/dL. According to a 2019 report by the World Health Organization (WHO), the global prevalence of anemia in pregnant women is 36.5%. Despite various efforts, the prevalence of anemia among pregnant women in Indonesia remains high and has increased in 2017 (43.2%), 2018 (43.7%), and 2019 (44.2%). Anemia is prevalent among pregnant women due to a deficiency in essential nutrients required for blood formation, such as iron, folic acid, and vitamin B12. Anemia during pregnancy poses significant risks to both the mother and baby, negatively impacting maternal morbidity and mortality rates [2]. The negative impacts of anemia on mothers include fatigue, impaired immune function, shortness of breath, palpitations, sleep disorders, preeclampsia, miscarriage, and an increased risk of bleeding before and during delivery [3]. The effects of anemia on babies include intrauterine growth retardation (IUGR), premature birth, congenital defects, low birth weight (LBW), and an increased risk of fetal death in the womb [4]. If anemia during pregnancy does not get serious attention, it can

affect the death of the mother and baby [5]. Prevention and treatment of anemia in pregnancy require coordinated actions among multiple stakeholders and partners, especially pregnant women and their family [3]. Families should be aware of potential pregnancy complications and be attentive to the needs of their pregnant members [4]. Therefore, by combining family empowerment, this research can help families to prevent anemia in pregnant women.

The majority of pregnant women are never accompanied by their husband or family during ante-natal care and this make them lazy to take iron supplements regularly [3]. This data shows that families are still not able to carry out family health task well. The family is an effective group to improve health and prevent disease, so the lower the family's ability to carry out family health tasks, the more difficult it is for the family to overcome health problems experienced by family members [6]. Families must support their family members during pregnancy and encourage them to consume iron supplements. Several studies have found that family factors play a significant role in preventing anemia during pregnancy [4]. In this context, the family is considered to be more effective in supervising pregnant women's iron supplement intake, as they are the immediate and closest support network for pregnant women [7].

Anemia in pregnant women can be attributed to various factors, including socioeconomic conditions, lifestyles, and health-seeking behaviors, all of which vary across different cultures [8]. However, in Indonesia, there are cultural differences in each family that contribute to the low awareness of the importance of preventing anemia in pregnant women. Numerous initiatives have been undertaken to prevent anemia in pregnant women. The family's role in preventing anemia can be understood through five key health tasks. The first task involves identifying the health issues of each family member. A lack of family knowledge about proper nutrition or foods that boost hemoglobin levels can contribute to anemia in pregnant women [9]. Second, making appropriate health action decisions; the family must be able to make decisions if something happens to the pregnant woman, such as immediately seeking the nearest health facility [10]. Third, providing care for sick family members; when a pregnant woman experiences illness, the family must be able to care for the pregnant woman such as supporting the treatment. Fourth, modifying a healthy environment; an unhealthy environment is considered a significant risk factor that can jeopardize maternal health during pregnancy. Fifth, utilizing community health facilities; families can carry out family health tasks such as using health facilities to provide ante-natal care for pregnant women, so that pregnant women feel they have support to live a healthy life during pregnancy to prevent anemia [11].

Family are able to change their behavior when they understand that anemia is a serious problem and it will have a negative impact for both the mother and baby [12]. However, families play a crucial role in ensuring maternal health and safe delivery. Involving families in pregnancy-related health education positively impacts the health of both mothers and babies [13]. The family-centered empowerment model can be used as a basic theory to increase the family role in health task to prevent anemia in pregnant women. Family empowerment consists of motivation, cognitive, and personal traits. Currently, there is still limited research on family empowerment which includes motivation, cognitive, and personal traits towards the role of the family through five family tasks in preventing anemia during pregnancy. Thus, this study aimed to analyze the correlation between family empowerment using three variables includes motivation, cognitive, personal traits, and family role in health task to prevent anemia during pregnancy.

2. METHOD

This study employed both a descriptive correlational approach and an analytical approach. A descriptive correlational research design describes the variables and measures the extent of the relationships that occur between and among the variables [14]. The study population consisted of pregnant women who received antenatal care at the Klampis Ngasem and Pacar Keling Public Health Center, East Java, Indonesia from July to August 2024. This study employed the consecutive sampling method, a technique that involves selecting samples from the population that meet the research criteria within a specified period until the desired sample size is achieved [15]. The sample that met the criteria included 150 people. The inclusion criteria used were: pregnant women who had antenatal care at the community health center. This study was approved by the Health Research Ethics Committee of the Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia, number 3323-KEPK.

Prior to data collection, written authorization was secured from the institution where the research took place. Participants were informed about the study through the first page of the survey, prepared by the researchers. Verbal consent was obtained from participants who were briefed about the research and agreed to participate. Informed consent serves as a means for patients to make informed decisions about medical procedures, ensuring that they can provide concrete approval by understanding the information regarding the actions to be undertaken [16].

The demographic data questionnaire consists of 6 parts consisting of the age of the pregnant mother, education, employment, family income, gestational age, parity, and family type. The family empowerment questionnaire consists of motivational, cognitive, and personal traits sub-variables. The motivation questionnaire was developed by researchers and modified from the concept of motivation. This questionnaire uses a Likert scale, with 7 question items. The range of values starts from 1 if strongly disagree and 4 if strongly agree on favorable items, while for unfavorable, it is the opposite. The cognitive questionnaire was developed by researchers and modified from the cognitive questionnaire. This questionnaire uses a Likert scale, favorable statements with a value of 4 = always, 3 = often, 2 = sometimes, and a value of 1 = never. While for unfavorable values, 1 = always, 2 = often, 3 = sometimes, and a value of 4 = never. Cognitive score 76 - 100% = high, 56 - 75% medium, and <56% = low. The personal traits questionnaire was developed by researchers and modified from the attitude questionnaire. This questionnaire uses a Likert scale, favorable statements with a value of 4 = strongly agree, 3 = agree, 2 = disagree, and 1 = strongly disagree. While for unfavorable statements with values of 1 = strongly agree, 2 = agree, 3 = disagree, and 4 = strongly disagree. The family role questionnaire consists of 5 sub-variables, namely recognizing health problems, making decisions regarding the right level of health, caring for pregnant women in preventing anemia, modifying the physical and psychological environment, and utilizing existing health facilities. The family role questionnaire was developed by researchers and modified from the five family health task questionnaire and the anemia prevention questionnaire for pregnant women [17]. The fifth health task is to use existing health facilities for pregnant women in preventing anemia. Respondents choose one of the available answers, namely: yes (1) and no (2). Then the measurement results are categorized into 3, namely: high = 75%, medium = 50 – 74%, and low = <50%.

Univariate and bivariate analyses are used in data analysis using the SPSS 25 package program. Each variable identified in the research was analyzed using univariate analysis, while bivariate analysis was employed to ascertain the relationships between three or more independent variables and a dependent variable. A statistical test to determine the relationship between independent and dependent variables using Spearman rank correlation and Chi-square with a significance level of $\alpha \leq 0.05$. The Spearman rank test is a non-parametric statistical method used to assess the strength and direction of the association between two ranked variables. It evaluates whether there is a monotonic relationship between the variables, making it suitable for ordinal data or continuous data that do not meet the assumptions of normality [18]. The variable tested using Spearman's rank were family empowerment (motivation, cognitive, and personal traits) and family role in the prevention anemia during pregnancy. Cross-sectional studies are observational studies that examine data from a population at a single moment. They are frequently employed to assess the prevalence of health outcomes, understand health determinants, and describe population characteristics. These studies do not track individuals over time and are typically cost-effective and easy to perform [19]. The variable tested using chi-square is family empowerment and family role in preventing anemia (recognize health problem in the family), family empowerment and family role in preventing anemia (taking decisions for appropriate treatment), family empowerment and family role in preventing anemia (taking care for pregnant mother), family empowerment and family role in preventing anemia (modifying a healthy environment), family empowerment and family role in preventing anemia (utilizing a health service facilities).

3. RESULTS AND DISCUSSION

Table 1 describes that the highest age characteristics of pregnant women are in the age of 20-35 years (82.7%), the highest characteristics of education are in high school (63.3%), the highest employment characteristics are as housewives (46.7%), the highest family income is above regional minimum wage (54.0%), the highest gestational age is trimester 3 (36.0%), parity level is in the parity 1 category (79.3%), family type is in extended family (50.7%).

3.1. Correlation between family empowerment and family role to prevent anemia during the pregnancy

Table 2 describes that there is correlation between family empowerment and family role in prevention anemia during pregnancy ($p = 0.000$; $r = 0.578$). There is a relationship between the components of family empowerment and family role. Motivation ($p = 0.000$; $r = 0.567$), cognitive ($p = 0.000$; $r = 0.448$), and personal traits ($p = 0.000$; $r = 0.565$) correlated with family role in preventing anemia during pregnancy.

The family role will increase when family empowerment is carried out properly during pregnancy. Prevention and treatment of anemia in pregnancy require coordinated actions among multiple stakeholders and partners, such as family [20]. The family is the primary and closest unit to pregnant women, familiar with their condition and engaging in frequent communication. Open, two-way communication within the family greatly supports pregnant women, reminding and motivating them to attend antenatal care, consume nutritious foods, and take supplements to prevent anemia. The family's ability to manage healthcare tasks

reflects their role and capability in addressing health problems among family members. Families that effectively carry out health tasks are capable of resolving health issues within the family [21].

Table 1. Characteristics of pregnant women

No.		Indicator	Frequency (f)	Percentage (%)
1.	Age	< 20 years	7	4.7%
		20 – 35 years	124	82.7%
		> 35 years	19	12.7%
2.	Education	Elementary	3	2.0%
		High school	95	63.3%
		University	52	34.7%
3.	Employment	Self-employed	69	46.0%
		Private employees	1	0.7%
		Government employees	6	4.0%
		Housewife	70	46.7%
		Other	4	2.7%
4.	Family income	< Regional minimum wage	69	46.0%
		> Regional minimum wage	81	54.0%
5.	Gestational age	Trimester 1	46	30.7%
		Trimester 2	50	33.3%
		Trimester 3	54	36.0%
6.	Parity	1	119	79.3%
		≥ 2	31	20.7%
7.	Family type	Nuclear family	74	49.3%
		Extended family	76	50.7%

Table 2. The relationship between family empowerment and family role

Variables	Mean (SD)	p	r
Family empowerment	75.70 (7.490)	0.000*	0.578
Motivation	23.07 (2.885)	0.000*	0.643
Cognitive	34.77 (3.517)	0.000*	0.552
Personal traits	17.86 (2.161)	0.000*	0.565

*Significant with p-value<0.05; Spearman test results

The family's involvement in the care of pregnant women can provide valuable social support for all family members [22]. Research indicates that several factors contribute to poor adherence to iron supplements during pregnancy. These include insufficient knowledge and awareness about anemia, limited access to iron supplements, fear of side effects, underutilization of antenatal care services, inadequate supply of iron supplements, poor counseling, and a lack of support. These barriers collectively hinder pregnant women from following the recommended iron supplementation guidelines [23]. The health behaviors of pregnant women in preventing anemia are influenced by various factors. A key factor is the role of the family, which can be assessed through the execution of family health responsibilities [24]. Family empowerment plays a crucial role in preventing anemia during pregnancy. By consistently reminding pregnant women to take iron supplements regularly, providing nutritious food, offering understanding and motivation, and encouraging adherence to antenatal care, families significantly support this effort. The involvement of family health duties and responsibilities positively influences pregnant women's compliance throughout the pregnancy process.

Motivation is important for preventing anemia in pregnancy, as it can help ensure that pregnant women register early and take iron supplements, and eat a balanced diet. When pregnant women have a strong understanding of pregnancy, it empowers them to be motivated to engage in positive and beneficial activities, leading to the development of positive behaviors as a result of attending prenatal classes [25]. One of the factors that a person can be motivated by is influenced by external factors, namely social support, because the support provided by family or husband can motivate pregnant women to maintain their health during pregnancy, which is shown by empathy, attention, and care [26]. Higher motivation levels lead to greater compliance among pregnant women in taking iron (Fe) tablets. Therefore, it's vital for family members to assist by monitoring, recording, reminding, and supporting pregnant women in their medication regimen. Counseling and motivation provided by health workers also play a significant role in enhancing knowledge. Education and motivation become effective when patients understand the importance of adopting new healthy behaviors. When health workers actively encourage pregnant women to consume iron tablets, it becomes easier for them to adhere to this practice [27].

Education is crucial in preventing pregnancy-related anemia. Educated individuals have better nutrition knowledge and a deeper understanding of pregnancy factors compared to those without access to

education. With this awareness and knowledge, educated people can take better care of themselves and support other women during pregnancy, thereby reducing the risk of anemia [8]. Women's literacy rates are a key determinant in the prevalence of anemia. Educated women generally have better access to healthcare services and facilities, which helps lower their risk of developing anemia [28]. As education levels rise, women gain a deeper understanding of the health risks associated with anemia. Consequently, the more educated women are, the better equipped they are to prevent or manage anemia, thereby reducing its incidence [29]. Educated women tend to be more aware of their health status and are proactive in seeking health information. Literacy enhances women's independence, self-esteem, and their ability to make informed decisions regarding their own health and that of their children. Consequently, educated women are more likely to pursue quality healthcare services and effectively utilize providers that offer superior care [30]. Therefore, information support from various types of media and facilities must be carried out to increase knowledge in preventing anemia in pregnant women.

The family plays a crucial role in health promotion. One of the key factors contributing to high anemia rates in pregnant women is the lack of family awareness regarding the importance of nutrition during pregnancy [31]. Therefore, pregnant women tend to have better family support and better family traits, enhancing their ability to access healthcare services for pregnant women [32]. This is in accordance with research [11], pregnant women can feel motivated to have good behavior to prevent anemia by the involvement of their husband or family. Good personal traits from the family or husband can be done by accessing information from various sources, such as social media. Media exposure can indirectly decreased the likelihood of anemic women by increasing the family's knowledge and awareness of the importance of proper nutrition during pregnancy [33]. According to many healthcare professionals, family must support pregnant women during pregnancy and encourage them to consume iron supplements. They also emphasized that both families and pregnant women need to search for information about anemia during pregnancy and learn how to prevent anemia. Contemporary health-promoting family models can establish scaffolds for shaping health behaviors and can be useful tools for education and health promotion to prevent anemia [34]. To improve anemia prevention among pregnant women, initiatives should focus on strengthening family empowerment through targeted educational programs. These programs could provide information on the importance of nutrition, the role of iron supplements, and the necessity of antenatal care. Engaging families in discussions about health issues and fostering open communication can further enhance support systems for pregnant women. Community health workers can facilitate workshops that emphasize the collective responsibility of families in managing health, thus reinforcing the importance of both education and social support in promoting healthier behaviors during pregnancy.

3.2. Correlation between family empowerment and family role: recognize health problems in the family

Table 3 explains that the majority of respondents have strong motivation with recognize health problems in family in the medium category (66.4%). There is no relationship between motivation and the role of the family in recognizing health problems in family (p = 0.777). Majority of respondents have medium cognitive with recognize health problems in family in the medium category (75.2%). There is a relationship between cognitive and the role of the family in recognizing health problems in family (p = 0.004). Majority of respondents have positive personal traits with recognizing health problems in family in the medium category (66.4%). There is no relationship between cognitive and the role of the family in recognize health problems in family (p = 0.928).

Table 3. The relationship between family empowerment and family role in preventing anemia: recognize health problem in the family

Family empowerment		Recognize health problems in the family			p
		High n (%)	Medium n (%)	Low n (%)	
Motivation	Weak	0 (0%)	1 (100%)	0 (0%)	0.777
	Strong	48 (32.2%)	99 (66.4%)	2 (1.3%)	
Cognitive	High	21 (56.8%)	15 (40.5%)	1 (2.7%)	0.004*
	Medium	26 (23.9%)	82 (75.2%)	1 (0.9%)	
	Low	1 (25%)	3 (75%)	0 (0%)	
Personal traits	Positive	46 (32.2%)	95 (66.4%)	2 (1.4%)	0.928
	Negative	2 (28.6%)	5 (71.4%)	0 (0%)	

*Significant with p-value < 0.05; Chi-square results

According to research [6], recognizing family health issues is crucial, as the family is often the first to identify health problems in one of its members. Empowering families is closely linked to enhancing their ability to identify health issues, which in turn is related to overall family health status. In this context,

families also play a significant role in providing psychological support to motivate pregnant women to adopt healthy habits to prevent anemia.

The family's ability to identify health problems extends beyond recognizing illnesses; they must also understand the treatment process, potential issues during treatment and prevention, and the consequences of pregnant women not taking iron supplements or receiving regular antenatal care [11]. Families should be aware that anemia can be dangerous for pregnant women, so families have an important role in providing social support to pregnant women to prevent anemia in early stage of pregnancy [9].

The family's capacity to identify health problems is part of the knowledge acquisition process. This knowledge can be gained through education, and a person's educational level significantly impacts their understanding of issues like health problems. If someone has a higher education, it will make them easier to know and understand. The study conducted by Saeed [35] reported a significant relationship between education level and the level of knowledge on iron deficiency anemia in pregnancy. Improved education for pregnant women, their families, and communities on anemia, including its importance, causes, treatment and prevention, may support better uptake of anemia prevention and treatment strategies. Empowering family members to identify health issues is crucial in determining the necessary steps to address these problems. When families are familiar with health concerns, particularly regarding pregnant women, they can anticipate potential complications during pregnancy and take proactive measures to prevent anemia.

To enhance family recognition of health problems, community-based educational programs should be developed that focus on anemia awareness and prevention. These programs can provide resources and training for families, emphasizing the importance of psychological support for pregnant women. Workshops could include practical information on nutrition, iron supplementation, and the significance of regular antenatal care. Involving local health professionals to deliver these sessions can help build trust and ensure the information is relevant and accessible. Empowering families through education will enable them to take proactive steps in managing health issues, ultimately improving outcomes for pregnant women and their families.

3.3. Correlation between family empowerment and family role: taking decisions for appropriate treatment

Table 4 explains that the majority of respondents have strong motivation with taking decisions for appropriate treatment in the medium category (51.7%). There is no relationship between motivation and the role of the family in taking decisions for appropriate treatment ($p = 0.628$). Majority of respondents have medium cognitive with taking decisions for appropriate treatment in the medium category (62.4%). There is a relationship between cognitive and the role of the family in taking decisions for appropriate treatment ($p = 0.000$). Majority of respondents have positive personal traits with taking decisions for appropriate treatment in the medium category (51%). There is a relationship between cognitive and the role of the family in taking decisions for appropriate treatment ($p = 0.000$).

Table 4. The relationship between family empowerment and family role in preventing anemia: taking decisions for appropriate treatment

Family empowerment		Taking decisions for appropriate treatment			p
		High n (%)	Medium n (%)	Low n (%)	
Motivation	Weak	0 (0%)	1 (100%)	0 (0%)	0.628
	Strong	71 (47.7%)	77 (51.7%)	1 (0.7%)	
Cognitive	High	28 (75.7%)	9 (24.3%)	0 (0%)	0.000*
	Medium	41 (37.6%)	68 (62.4%)	0 (0%)	
	Low	2 (50%)	1 (25%)	1 (25%)	
Personal traits	Positive	70 (49%)	73 (51%)	0 (0%)	0.000*
	Negative	1 (47.3%)	5 (71.4%)	1 (0.7%)	

*Significant with p-value < 0.05; Chi-square results

The present study demonstrated that decision-making in seeking health services involves interactions between women, partners, and other family members [36]. Previous research has shown that women perceive their partners as important decisional partners and involving them can enhance the quality of the decision-making process regarding pregnancy-related decisions [37]. Furthermore, decisions related to pregnancy influence not just the expectant mother but also her partner in decision-making. At present, there is a lack of understanding regarding the collaborative decision-making process on pregnancy issues among couples, as well as the factors that might impede or promote this process. When both partners participate in decisions that impact them, it is more probable that a wider range of options and perspectives will be considered. This deeper discussion is likely to lead to greater satisfaction with the outcomes of the decision-making process for both partners [38]. A high community wealth index is associated with lower

odds of anemia. Previous studies have also highlighted the positive correlation between community economic status and women's health, noting that economically disadvantaged communities often lack adequate health information and services [39]. Women's autonomy is essential in its own right and plays a crucial role in their health and health-related matters [40]. Evidence indicates that merely increasing access to economic resources is insufficient; enhancing women's decision-making power and control over household resources is equally essential. For women to adopt good health-seeking behaviors, their participation in decision-making on critical issues (like major household purchases or personal healthcare) is crucial. Poor women's welfare hinders the goal of achieving universal health. Thus, significant efforts are needed to reduce anemia among married women, as it adversely affects the well-being of mothers, children, and the entire family [39].

To improve health outcomes, interventions should focus on fostering collaborative decision-making among couples. This could include couple-centered education programs that emphasize shared responsibilities in health-related decisions and empower women to assert their needs. Community initiatives could also aim to provide economic resources alongside training in financial literacy and decision-making skills, ensuring women can actively participate in household discussions. Furthermore, raising awareness about the impact of anemia and other health issues on family well-being can motivate couples to prioritize health services. Addressing these factors holistically will be essential in reducing anemia prevalence and improving overall family health.

3.4. Correlation between family empowerment and family role: taking care for sick family member

Table 5 explains that the majority of respondents have strong motivation with Taking care for pregnant mother in the medium category (57%). There is no relationship between motivation and the role of the family in taking care for pregnant mother (p = 0.688). Majority of respondents have medium cognitive with taking care for pregnant mother in the medium category (62.4%). There is a relationship between cognitive and the role of the family in taking care for pregnant mother (p = 0.000). Majority of respondents have positive personal traits with taking care for pregnant mother in the medium category (55.9%). There is a relationship between cognitive and the role of the family in taking care for pregnant mother (p = 0.000).

Table 5. The relationship between family empowerment and family role in preventing anemia: taking care for pregnant mother

Family empowerment		Taking care for pregnant mother			p
		High n (%)	Medium n (%)	Low n (%)	
Motivation	Weak	0 (0%)	1 (100%)	0 (0%)	0.688
	Strong	63 (42.3%)	85 (57%)	1 (0.7%)	
Cognitive	High	31 (83.8%)	6 (16.2%)	0 (0%)	0.000*
	Medium	35 (32.1%)	74 (67.9%)	0 (0%)	
	Low	0 (0%)	2 (50%)	2 (50%)	
Personal traits	Positive	63 (44.1%)	80 (55.9%)	0 (0%)	0.000*
	Negative	0 (0%)	6 (57.3%)	1 (14.3%)	

*Significant with p-value < 0.05; Chi-square results

A study conducted by Triharini *et al.* [41] shows that the family's influence significantly shapes the behavior of pregnant women in anemia prevention. To enhance their supportive role, health workers should focus on promoting health practices that target families. Anemia in pregnant women can affect the growth and development of the fetus. Hemoglobin levels are crucial in pregnant women as they play a key role in transporting oxygen throughout the body, supporting both maternal and fetal health [42]. Adequate hemoglobin levels help prevent anemia, a common condition in pregnancy that can lead to severe fatigue, preterm delivery, and low birth weight [25]. Therefore, understanding the impact of family empowerment on improving hemoglobin levels can provide valuable insights into effective strategies for enhancing prenatal care and maternal well-being. Family support enhances family values, concerns, and objectives. For pregnant women, this support manifests by addressing anemia-related issues, making timely decisions regarding treatment or visits to health services, ensuring proper diet maintenance, and providing daily iron (Fe) tablets [43]. Empowerment interventions for families can increase knowledge, motivation, and self-confidence, which can increase knowledge and technical skills, as well as the ability to perform early detection of high-risk pregnancies [44]. Interventions should focus on educational programs that equip families with knowledge and resources to support pregnant women effectively. This could include workshops on nutrition, the importance of iron supplements, and strategies for managing anemia. Additionally, creating community support networks where families can share experiences and resources may enhance motivation

and self-confidence. Health workers should be trained to engage families actively in prenatal care discussions, fostering a collaborative approach to maternal health.

3.5. Correlation between family empowerment and family role: modifying a healthy environment

Table 6 explains that the majority of respondents have strong motivation for modifying a healthy environment in the high category (50.3%). There is a relationship between motivation and the role of the family in modifying a healthy environment (p = 0.000). The majority of respondents have medium cognitive with modifying a healthy environment in the medium category (61.5%). There is a relationship between cognitive and the role of the family in modifying a healthy environment (p = 0.000). The majority of respondents have positive personal traits with modifying a healthy environment in the high category (51.7%). There is a relationship between cognitive and the role of the family in modifying a healthy environment (p = 0.000).

Family empowerment is an effort to create a family that has a quality of life in a healthy environment [45]. Enhancing and maintaining health is vital, particularly through the commitment to modifying the family environment and lifestyle. An unhealthy environment is a significant risk factor that can jeopardize maternal health during pregnancy and negatively impact pregnancy outcomes. Modifying the environment can include providing nutritious food for pregnant women, facilitating pregnant women to do exercise, and providing social support. A study conducted by Midigo [46] revealed that women who failed to take iron supplements and nutritious food during pregnancy also had anemia; such restrictions were linked to socio-economic factors. Environmental support creates opportunities to implement anemia prevention behavior. Social support from several important sources, such as husbands, family, and health workers, strengthens mothers' motivation to prevent anemia. The ability to modify the health environment will improve the health status of pregnant women. Creating a healthy and supportive home environment will encourage pregnant women to sustain their beneficial habits of consuming nutritious foods, taking iron supplements, and exercising, thereby helping to prevent anemia during pregnancy. Thus, families need to possess strong skills in creating a healthy environment for pregnant women to ensure better adherence to antenatal care programs. Families should be educated on practical ways to create supportive environments, such as meal planning, organizing group exercises, and fostering open communication about health needs. Additionally, community programs could provide resources and workshops to enhance families' skills in promoting maternal health.

Table 6. The relationship between family empowerment and family role in preventing anemia: modifying a healthy environment

Family empowerment		Modifying a healthy environment			p
		High n (%)	Medium n (%)	Low n (%)	
Motivation	Weak	0 (0%)	0 (0%)	1 (100%)	0.000*
	Strong	75 (50.3%)	73 (49%)	1 (0.7%)	
Cognitive	High	31 (83.8%)	6 (16.2%)	0 (0%)	0.000*
	Medium	42 (38.5%)	67 (61.5%)	0 (0%)	
	Low	2 (50%)	0 (0%)	2 (50%)	
Personal traits	Positive	74 (51.7%)	69 (48.3%)	0 (0%)	0.000*
	Negative	1 (14.3%)	4 (57.1%)	2 (28.6%)	

*Significant with p-value < 0.05; Chi-square results

3.6. Correlation between family empowerment and family role: utilizing health service facilities

Table 7 explains that the majority of respondents have strong motivation for utilizing a health service facility in the medium category (55%). There is a relationship between motivation and the role of the family in utilizing a health service facility (p = 0.000). The majority of respondents have medium cognitive with utilizing a health service facility in the medium category (73.4%). There is a relationship between cognitive and the role of the family in utilizing a health service facility (p = 0.000). The majority of respondents have positive personal traits with utilizing a health service facility in the medium category (53.8%). There is a relationship between cognitive and the role of the family in utilizing a health service facility (p = 0.000).

Empowering families is a key factor in shaping lifestyle habits and health behaviors that positively influence pregnancy outcomes. Women who had high levels of family empowerment were also found to have higher levels of access to and utilization of at least four antenatal visits [47]. A similar study showed that economic and demographic factors underlie women's considerations for accessing maternal healthcare services in both urban and rural areas [48]. As a result, individuals living in poverty are at a higher risk of

underutilizing maternal health services. To enhance the usage of these services, it is essential for health professionals to reach out to and support mothers in impoverished conditions.

In this study, it was found that the majority of family education and maternal education have completed the mandatory 12 years of education in accordance with the education program in Indonesia. Educational background is well known to influence health-seeking behavior [49]. Similar to other studies [50] find that higher educational attainment of both women and their husbands, exposure to mass media, and household wealth were positively associated with utilization of maternal healthcare services. During pregnancy, women require family support to achieve optimal maternal and fetal health outcomes. The consistent use of maternal healthcare services by expectant mothers remains a significant challenge for healthcare systems worldwide. Ensuring adequate utilization of these services is essential for reducing maternal mortality and enhancing the well-being of pregnant women [50]. Given that women's healthcare utilization is significantly influenced by their husbands or family members, it's crucial to involve men in these efforts to educate them about the importance of health services, thus fostering and maintaining the family's overall well-being [51].

Hence, we recommend that health education interventions should be directed at both men and women simultaneously to enhance their understanding and awareness. Interventions should focus on community-based programs that engage both men and women in health education. Strategies could include workshops that educate families about the importance of maternal healthcare, the role of supportive partners, and practical ways to overcome barriers to access. Additionally, involving local health workers to provide targeted outreach in impoverished areas can help improve service utilization and promote healthier behaviors among expectant mothers.

Table 7. The relationship between family empowerment and family role in preventing anemia: utilizing a health service facility

Family empowerment		Utilizing a health service facility			p
		High n (%)	Medium n (%)	Low n (%)	
Motivation	Weak	0 (0%)	0 (0%)	1 (100%)	0.000*
	Strong	66 (43.3%)	82 (55%)	1 (0.7%)	
Cognitive	High	32 (86.5%)	5 (13.5%)	0 (0%)	0.000*
	Medium	29 (26.6%)	80 (73.4%)	0 (0%)	
	Low	2 (50%)	1 (25%)	1 (25%)	
Personal traits	Positive	66 (46.2%)	77 (53.8%)	0 (0%)	0.000*
	Negative	0 (0%)	5 (71.4%)	2 (28.6%)	

*Significant with p-value < 0.05; Chi-square results

4. CONCLUSION

This increased family empowerment is expected to increase the family role in preventing anemia during pregnancy. Strong motivation, adequate knowledge, and positive personality traits can increase the effectiveness of the family's role in maintaining the health of pregnant women and preventing anemia. The family's involvement in executing the five key tasks for preventing anemia in pregnant women is crucial for maintaining both maternal and infant health. This finding not only contributes to the prevention of anemia in pregnant women but also highlights the importance of family support and responsibilities. Empowering families alongside pregnant women is essential and can be facilitated by healthcare providers during ANC visits by utilizing technology in the digital era. Additionally, our research offers a comprehensive model that integrates the health belief model with family support and responsibilities, providing a framework for future research and interventions aimed at reducing anemia rates among pregnant women.

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