

## The Relationship Between Nutritionist Support and Dietary Compliance Among Pregnant Women with Anemia

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### Abstract:

Nutritionist support during pregnancy plays an important role in improving dietary compliance among pregnant women with anemia. Adequate dietary adherence is essential to maintain maternal nutritional status and prevent complications associated with anemia during pregnancy. This study aimed to determine the relationship between nutritionist support and dietary compliance among pregnant women with anemia. This research used an analytical observational design with a cross-sectional approach. The study involved pregnant women with anemia who attended antenatal care services at a selected health center method (purposive sampling N=41). Nutritionist support was measured using a structured questionnaire covering education, counseling, motivation, and monitoring aspects, while dietary compliance was assessed using a dietary adherence questionnaire. Data were analyzed using the Spearman correlation test with a significance level of  $p < 0.05$ . The results showed that most respondents who received good nutritionist support demonstrated higher dietary compliance compared to those who received less support. Statistical analysis indicated a significant relationship between nutritionist support and dietary compliance among pregnant women with anemia ( $p < 0.05$ ), where better nutritionist support was associated with improved dietary adherence. These findings suggest that strengthening nutrition counseling and continuous support from nutritionists may improve dietary compliance and help reduce the risk of anemia-related complications during pregnancy.

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## INTRODUCTION

Anemia in pregnancy remains a major public health problem worldwide and contributes significantly to maternal and fetal morbidity and mortality. The World Health Organization (WHO) defines anemia in pregnancy as a hemoglobin level below 11 g/dL and reports that anemia affects a substantial

proportion of pregnant women globally, particularly in developing countries. In Indonesia, anemia among pregnant women continues to be a serious nutritional health problem (Ishikawa-Takata, 2022). Data from the 2018 Basic Health Research (Riskesdas) showed that the prevalence of anemia among pregnant women in Indonesia reached 48.9%, indicating that nearly half of pregnant women experience anemia during pregnancy. The highest prevalence occurred among pregnant women aged 15–24 years. Recent data from the Indonesian Health Survey (SKI) 2023 reported that 27.7% of pregnant women in Indonesia still experienced anemia, demonstrating that anemia remains a significant maternal health challenge in 2025 despite various government intervention programs (Sungkar, 2022).

Pregnant women with anemia are at greater risk of experiencing complications such as preterm labor, low birth weight, impaired fetal growth, postpartum hemorrhage, and increased maternal mortality. Physiological changes during pregnancy increase the need for iron, folic acid, and other nutrients essential for hemoglobin formation (Dewidar, 2023). However, many pregnant women fail to meet these nutritional requirements because of limited knowledge, poor eating patterns, socioeconomic factors, and low compliance with dietary recommendations. Dietary compliance is an important component in anemia prevention and management because balanced nutrition and adequate iron intake can help maintain optimal hemoglobin levels during pregnancy (Arifah, 2026).

Nutritionists play an important role in improving maternal nutritional status through nutrition education, counseling, dietary planning, and continuous monitoring during antenatal care. Support provided by nutritionists can increase mothers' understanding of healthy dietary practices, motivate behavioral changes, and encourage adherence to nutritional recommendations (Gezimu, 2022). Effective nutrition counseling may improve compliance with iron-rich diets and supplementation programs among pregnant women. Nevertheless, in many healthcare settings, the role of nutritionists in antenatal services is still not optimally implemented, resulting in inadequate nutritional guidance for pregnant women with anemia (Berhane, 2022a). (Hassan, 2022)

Several previous studies have identified factors associated with anemia during pregnancy, including maternal age, parity, nutritional status, and maternal knowledge. A study conducted at Johar Baru Health Center reported a significant relationship between maternal knowledge, nutritional status, and anemia during pregnancy. Another study in Indonesia also demonstrated that maternal age and parity were associated with the incidence of anemia among pregnant women (Wakwoya, 2023). In addition, previous research showed that behavioral and lifestyle factors such as sleep quality may influence hemoglobin levels in pregnant women. However, studies specifically examining the relationship between nutritionist support and dietary compliance among pregnant women with anemia are still limited (Girma, 2022). Most previous studies focused more on biomedical factors and maternal characteristics rather than professional nutritional support as an influencing factor in dietary adherence. Therefore, this study offers novelty by emphasizing the role of

nutritionist support in improving dietary compliance among anemic pregnant women (Hassan, 2022).

The theoretical gap in this study lies in the limited evidence regarding how professional support from nutritionists influences dietary adherence behavior in pregnant women with anemia. Although nutritional counseling is recognized as an essential component of antenatal care, there is insufficient research exploring its direct relationship with dietary compliance in the Indonesian maternal health context. Understanding this relationship is important because dietary compliance is influenced not only by knowledge but also by motivation, communication, and continuous support from healthcare professionals (Belay, 2022).

Based on these conditions, this study aimed to determine the relationship between nutritionist support and dietary compliance among pregnant women with anemia. It is expected that the findings of this study will provide evidence regarding the importance of strengthening nutrition counseling services in antenatal care programs. The results may also serve as a reference for healthcare providers in developing interventions to improve dietary adherence and reduce anemia-related complications during pregnancy.

## **RESEARCH METHODS**

This study employed a quantitative research design using an analytical observational method with a cross-sectional approach. The study aimed to determine the relationship between nutritionist support and dietary compliance among pregnant women with anemia. The research was conducted at a selected community health center providing antenatal care services for pregnant women. The unit of analysis in this study was pregnant women diagnosed with anemia during pregnancy based on hemoglobin examination results documented in maternal health records.

The study population consisted of pregnant women with anemia who attended antenatal care services during the research period. Samples were selected using a purposive sampling technique based on inclusion criteria, including pregnant women diagnosed with anemia, willing to participate in the study, and able to communicate effectively. Pregnant women with severe pregnancy complications or incomplete health records were excluded from the study. The respondents served as the primary source of information.

Data collection was conducted using structured questionnaires distributed directly to respondents. The questionnaire on nutritionist support measured several aspects, including nutrition education, counseling, motivation, monitoring, and communication provided by nutritionists during antenatal care services. Dietary compliance was assessed using a dietary adherence questionnaire related to iron-rich food consumption, meal patterns, and compliance with nutritional recommendations during pregnancy. Secondary data regarding hemoglobin levels and maternal characteristics were obtained from medical records and maternal health documentation at the health center.

Before data collection, the research instruments were tested for validity and reliability to ensure the accuracy and consistency of measurements. Data collection procedures were carried out after obtaining permission from the health

institution and informed consent from respondents. Ethical principles such as confidentiality, anonymity, and voluntary participation were maintained throughout the study process.

The collected data were processed and analyzed using the Statistical Package for the Social Sciences (SPSS). Data analysis included descriptive and inferential statistical analysis. Descriptive analysis was used to describe respondents' characteristics, levels of nutritionist support, and dietary compliance among pregnant women with anemia. Inferential analysis was conducted using the Spearman Rank correlation test to determine the relationship between nutritionist support and dietary compliance because the variables were measured using ordinal-scale questionnaires. The significance level used in this study was  $p < 0.05$ . The results of the analysis were presented in tables and narrative explanations to facilitate interpretation and discussion of the findings.

**Table 1. Operationalization of Variables**

Variable	Definition	Indicator	Scale
Nutritionist Support	Support provided by nutritionists during antenatal care	Education, counseling, motivation, monitoring	Ordinal
Dietary Compliance	Pregnant women's adherence to dietary recommendations for anemia	Iron-rich diet, meal pattern, supplement intake	Ordinal

The results of this study describe the characteristics of the main variables, namely nutritionist support and dietary compliance among pregnant women with anemia. Based on data analysis, nutritionist support was categorized into three levels, namely good, moderate, and poor, based on respondents' perceptions of education, counseling, motivation, and monitoring provided by nutritionists during antenatal care services. Most respondents reported receiving moderate nutritionist support, which was characterized by occasional nutrition education, limited counseling sessions, and inconsistent follow-up monitoring. A smaller proportion of respondents received good nutritionist support, where nutrition education, counseling, motivation, and monitoring were provided routinely and comprehensively. Meanwhile, a minority of respondents reported poor nutritionist support, indicating minimal interaction with nutritionists and lack of structured nutritional guidance.

Regarding dietary compliance, respondents were also grouped into three categories: high, moderate, and low compliance. The majority of pregnant women with anemia demonstrated moderate dietary compliance, particularly in terms of partial adherence to iron-rich food consumption and irregular meal patterns. Only a small number of respondents showed high dietary compliance, characterized by consistent consumption of iron-rich foods, regular meal patterns, and adherence to iron supplementation. Conversely, some respondents still exhibited low dietary compliance, including inadequate intake of iron-rich foods and poor adherence to dietary recommendations. Overall, the findings

indicate that both nutritionist support and dietary compliance among pregnant women with anemia are generally in the moderate category. These results suggest that although nutrition services are available at antenatal care facilities, their implementation and impact on dietary behavior still require strengthening to achieve optimal maternal nutritional outcomes.

## RESULTS AND DISCUSSION

### Results

The data in this table present the distribution of the main variables in this study, namely nutritionist support and dietary compliance among pregnant women with anemia. Each variable is categorized into ordinal levels based on questionnaire scores, including indicators of education, counseling, motivation, monitoring, iron-rich diet, meal patterns, and supplement intake. The table provides an overview of respondents' conditions and serves as a basis for further statistical analysis to examine the relationship between the two variables

**Table 2. Cross-tabulation of Nutritionist Support and Dietary Compliance**

<b>Nutritionist Support</b>	<b>Low Dietary Compliance</b>	<b>Moderate Dietary Compliance</b>	<b>High Dietary Compliance</b>	<b>Total</b>
Poor (n=8)	6	2	0	8
Moderate (n=22)	4	14	4	22
Good (n=11)	1	3	7	11
Total	11	19	11	41

The cross-tabulation analysis between nutritionist support and dietary compliance among pregnant women with anemia shows a clear pattern of association. Among respondents with poor nutritionist support (n = 8), most had low dietary compliance (6 respondents), while only 2 respondents showed moderate compliance and none demonstrated high compliance. In the group with moderate nutritionist support (n = 22), the majority of respondents had moderate dietary compliance (14 respondents), followed by low compliance (4 respondents) and high compliance (4 respondents). This indicates a tendency toward intermediate dietary behavior in this group. Meanwhile, respondents with good nutritionist support (n = 11) mostly demonstrated high dietary compliance (7 respondents), while 3 respondents showed moderate compliance and only 1 respondent had low compliance. Overall, the results indicate that higher levels of nutritionist support are associated with better dietary compliance among pregnant women with anemia. The pattern across categories suggests a positive relationship, where improved nutritionist support corresponds with increased adherence to dietary recommendations.

**Table 3. The Relationship Between Nutritionist Support and Dietary Compliance**

<b>Variables</b>	<b>Nutritionist Support</b>	<b>Dietary Compliance</b>
Nutritionist Support	1.000	0.612
Sig. (2-tailed)	—	0.000

Variables	Nutritionist Support	Dietary Compliance
N	41	41
Dietary Compliance	0.612	1.000
Sig. (2-tailed)	0.000	—
N	41	41

Based on table 3, the Spearman Rank correlation analysis was conducted to examine the relationship between nutritionist support and dietary compliance among pregnant women with anemia. The results showed a positive correlation between the two variables with a correlation coefficient ( $r$ ) of 0.612. The significance value ( $p$ -value) was 0.000, which is less than the alpha level of 0.05 ( $p < 0.05$ ). This indicates that there is a statistically significant relationship between nutritionist support and dietary compliance among the respondents. The strength of the correlation is categorized as moderate to strong positive, meaning that higher levels of nutritionist support are associated with better dietary compliance among pregnant women with anemia. The number of respondents included in the analysis was 41 ( $N = 41$ ). These findings suggest that nutritionist support plays an important role in improving dietary adherence during pregnancy, particularly among women experiencing anemia

### Discussion

This study identified a significant relationship between nutritionist support and dietary compliance among pregnant women with anemia. The findings showed a clear pattern of distribution, where respondents with poor nutritionist support were mostly in the low dietary compliance category, while those with good support were predominantly in the high compliance category. Specifically, among respondents with poor support ( $n = 8$ ), 6 had low compliance; in the moderate support group ( $n = 22$ ), most respondents ( $n = 14$ ) had moderate compliance; and in the good support group ( $n = 11$ ), most respondents ( $n = 7$ ) had high compliance. This distribution demonstrates a consistent trend and indicates a strong impact of nutritionist support on dietary behavior among pregnant women with anemia. The statistical analysis supports this pattern, where the Spearman correlation test showed a significant positive relationship between nutritionist support and dietary compliance ( $r = 0.612$ ,  $p = 0.000$ ). This indicates a moderate to strong positive association, confirming that better nutritionist support is linked to higher dietary adherence. The impact and distribution of these findings suggest that improvements in nutritionist services are directly reflected in improved maternal dietary behavior (Taddese, 2023).

The observed impact can be explained through behavioral theories. The Health Belief Model (HBM) suggests that health behavior is influenced by perceived risk and cues to action. In this study, nutritionist support acts as a strong cue to action, increasing awareness of anemia risks and improving perceived benefits of dietary compliance. The unequal distribution of support levels creates different behavioral responses, where stronger support leads to stronger adherence (Anato, 2025). Similarly, Social Cognitive Theory (SCT) explains that behavior is shaped by environmental influences, personal factors,

and reinforcement. Nutritionist support serves as a key environmental factor that provides guidance, feedback, and motivation (Asim, 2022). This enhances self-efficacy among pregnant women, leading to improved dietary practices. The impact of distribution of nutritionist support is therefore reflected in the variation of dietary compliance outcomes across respondents (Reshid, 2024). The Theory of Planned Behavior (TPB) further supports these findings, where attitudes, subjective norms, and perceived behavioral control determine behavior. Nutritionist counseling strengthens positive attitudes toward iron-rich diets, reinforces professional health norms, and increases perceived control over dietary choices, ultimately improving compliance (Merid, 2025).

These findings are consistent with previous research. Studies have shown that structured nutrition counseling significantly improves dietary adherence among pregnant women. Research in antenatal care settings reports that pregnant women receiving regular counseling are more likely to comply with iron supplementation and balanced diets compared to those receiving minimal support (Berhane, 2022b). Similar studies also confirm that maternal knowledge, counseling frequency, and health education quality significantly influence dietary behavior during pregnancy. However, previous literature also highlights that dietary compliance is influenced by additional factors such as socioeconomic status, food accessibility, cultural beliefs, and family support. These factors may affect the distribution and impact of nutritionist support, explaining why some women still show low compliance despite receiving moderate support (Yassin, 2024).

The contribution of this study lies in providing clear empirical evidence of how the distribution of nutritionist support creates a measurable impact on dietary compliance among pregnant women with anemia (Alemu, 2023). The findings emphasize that unequal distribution of nutritionist services may lead to disparities in maternal nutritional behavior and anemia risk (Atinga, 2025). Based on these results, an action plan is recommended to strengthen antenatal nutrition services by ensuring equitable distribution of nutritionist support. This includes standardizing counseling procedures, increasing the frequency of nutrition education sessions, implementing structured follow-up systems, and improving communication strategies (Boynito et al., 2025). Strengthening the impact of distribution of nutritionist support is essential to improve dietary compliance and ultimately reduce the burden of anemia in pregnancy (Azzahro, 2024).

## CONCLUSION

This study concludes that there is a significant relationship between nutritionist support and dietary compliance among pregnant women with anemia, indicating that better nutritionist support is associated with higher levels of adherence to recommended dietary practices. The findings highlight the important role of nutritionists in promoting positive maternal health behaviors through counseling, education, and continuous guidance. These results contribute to the growing body of evidence emphasizing the value of professional nutritional support in improving pregnancy outcomes and reducing the risk of anemia-related complications. The primary limitation of this study is its small sample size, which may reduce the statistical power of the analysis and

limit the generalizability of the findings to broader populations. Additionally, the cross-sectional design prevents the establishment of causal relationships between nutritionist support and dietary compliance. As a practical implication, local health centers should consider integrating structured nutritionist monitoring protocols that combine face-to-face counseling with digital follow-up systems, such as mobile messaging reminders and dietary monitoring tools, to strengthen adherence among pregnant women with anemia. Such an approach may enhance continuity of care and improve the effectiveness of nutrition interventions in maternal health services.

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