

The Effect of Family-Based Mentoring Innovation on Hypertension Control Among Pregnant Women at the South Amuntai Community Health Center

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Abstract. *Background: Hypertensive disorders during pregnancy remain major causes of maternal and neonatal morbidity and mortality. Effective blood pressure control requires not only medical treatment but also family support to improve maternal adherence to medication and antenatal care. Objective: This study aimed to determine the effect of a family-based mentoring innovation on hypertension control among pregnant women at South Amuntai Primary Health Center. Methods: A quantitative quasi-experimental study with a pretest–posttest control group design was conducted among 60 pregnant women diagnosed with hypertension. Participants were selected using purposive sampling and allocated into intervention (n=30) and control (n=30) groups. Data were collected through blood pressure measurements, structured questionnaires, observation sheets, and medical records. Data were analyzed using univariate analysis, paired and independent t-tests, and multivariate linear regression with a significance level of 0.05. Results: The intervention group showed a greater reduction in mean systolic blood pressure (15.8 mmHg) than the control group (4.3 mmHg). Significant improvements were also observed in maternal treatment adherence and family participation after the intervention ($p < 0.05$). Multivariate analysis demonstrated that family-based mentoring had a statistically significant effect on hypertension control after adjustment for potential confounding variables. Conclusion: Family-based mentoring effectively improves hypertension control among pregnant women by strengthening treatment adherence, routine health monitoring, and active family participation. This intervention has potential as an evidence-based approach to strengthen maternal healthcare services at primary healthcare facilities and support the prevention of pregnancy-related complications associated with hypertension. The findings highlight the importance of integrating families into hypertension management at healthcare facilities.*

Keywords: Family-Based Mentoring; Hypertension Control; Pregnancy Hypertension; Pregnant Women; Primary Healthcare.

1. BACKGROUND

Hypertensive disorders during pregnancy remain one of the leading contributors to maternal and neonatal morbidity and mortality worldwide, including in Indonesia. These conditions not only increase the risk of preeclampsia and eclampsia but also contribute to adverse pregnancy outcomes such as preterm birth, fetal growth restriction, and perinatal mortality. Effective management of hypertension during pregnancy requires a comprehensive approach because it is influenced by biological, behavioral, social, and environmental factors. Consequently, strengthening primary healthcare services through promotive and preventive strategies has become a key priority in reducing pregnancy-related complications associated with hypertension. Family-centered approaches have increasingly been recognized as promising strategies for enhancing the long-term management of hypertension among pregnant women by providing continuous support throughout pregnancy (World Health Organization [WHO], 2023; Ministry of Health of the Republic of Indonesia, 2024).

Hypertension in pregnancy requires careful monitoring from early gestation through the postpartum period. Previous studies have demonstrated that successful blood pressure control depends largely on adherence to antihypertensive medication, compliance with a low-sodium diet, appropriate physical activity, stress management, and regular antenatal care attendance. Nevertheless, several barriers—including limited health literacy, inadequate family support, and insufficient pregnancy assistance—continue to hinder optimal hypertension management. These challenges often prevent pregnant women from consistently following healthcare recommendations, thereby increasing the likelihood of maternal and fetal complications (American College of Obstetricians and Gynecologists [ACOG], 2020; Brown et al., 2018).

Families play a crucial role in supporting maternal health because they represent the immediate social environment influencing daily health behaviors. Family support extends beyond physical assistance to include emotional encouragement, informational guidance, and motivational support that promote adherence to treatment and routine antenatal visits. Active involvement of family members has been shown to improve medication compliance, encourage healthy lifestyle practices, and facilitate the early recognition of pregnancy danger signs. Therefore, families should not merely be recipients of health information but should also function as active partners of healthcare professionals in managing hypertension during pregnancy (Friedman et al., 2014; WHO, 2022).

As the primary healthcare provider, community health centers (Puskesmas) are responsible for delivering comprehensive antenatal care services, including the management of hypertensive disorders during pregnancy. Various service innovations have been introduced, such as home visits, maternal classes, education through the Maternal and Child Health (MCH) Handbook, and community health volunteer involvement. Despite these efforts, most interventions continue to focus primarily on pregnant women as individuals, while family participation remains relatively limited. Consequently, maintaining positive behavioral changes after women return to their home environment remains a significant challenge (Ministry of Health of the Republic of Indonesia, 2024; WHO, 2023).

Evidence from previous studies indicates that family-based interventions effectively improve the management of chronic diseases, including diabetes mellitus, adult hypertension, and cardiovascular diseases, by enhancing treatment adherence and promoting healthy behavioral changes. Within maternal healthcare, family-centered interventions have also been associated with improved antenatal care attendance, higher rates of exclusive breastfeeding, and better preparedness for childbirth. However, research specifically evaluating the effectiveness of family-based mentoring innovations for controlling hypertension during

pregnancy remains scarce, particularly within primary healthcare settings in Indonesia. This gap provides opportunities to develop context-specific intervention models that better reflect local community characteristics and healthcare systems (Bainbridge et al., 2021; Dennis & Dowswell, 2013).

Within the service area of UPT Puskesmas Amuntai Selatan, hypertension among pregnant women continues to represent an important public health concern. Sociocultural factors, educational attainment, household economic conditions, and limited access to health information may all influence the effectiveness of hypertension management during pregnancy. Furthermore, many families still have limited awareness regarding their essential role in supporting pregnant women in following medical recommendations. These circumstances underscore the need for innovative healthcare services that strengthen collaboration among healthcare providers, pregnant women, and their families to achieve more sustainable blood pressure control throughout pregnancy (Ministry of Health of the Republic of Indonesia, 2024; South Kalimantan Provincial Health Office, 2023).

Family-based mentoring is an integrated approach that combines health education, maternal health monitoring, psychosocial support, and family empowerment in healthcare decision-making. Through this approach, family members are encouraged to participate actively in monitoring blood pressure, reminding pregnant women to take prescribed medications, supporting healthy dietary practices, and recognizing warning signs requiring immediate referral. Such an innovation is expected not only to improve family knowledge but also to foster collective health behaviors that contribute to effective hypertension management during pregnancy (Glanz et al., 2015; WHO, 2022).

A review of the existing literature reveals that most previous studies have focused primarily on individual health education, counseling by healthcare providers, or pharmacological interventions for managing hypertensive disorders during pregnancy. Research developing family-based mentoring as an integrated service model remains limited, particularly at the primary healthcare level. Moreover, many studies have assessed improvements in maternal knowledge or treatment adherence without evaluating blood pressure control outcomes resulting from active family participation. This research gap highlights the need for more comprehensive, practical, and contextually appropriate intervention models tailored to Indonesia's primary healthcare system. The novelty of the present study lies in developing and evaluating a family-based mentoring innovation as a collaborative strategy involving healthcare providers and family members to improve

hypertension control among pregnant women receiving care at community health centers (Bainbridge et al., 2021; Brown et al., 2018).

The significance of this study is further reinforced by the Indonesian government's commitment to reducing maternal mortality through strengthening family-oriented primary healthcare services. The findings are expected to provide scientific evidence regarding the effectiveness of family-based mentoring in improving hypertension control during pregnancy. In addition to offering practical benefits for healthcare professionals working at UPT Puskesmas Amuntai Selatan, the results may also inform policy development and support the implementation of family-centered maternal health programs across other primary healthcare facilities. Therefore, this research is expected to contribute substantially to both academic knowledge and public health policy implementation (WHO, 2023; Ministry of Health of the Republic of Indonesia, 2024).

Based on these considerations, this study aims to examine the effect of a family-based mentoring innovation on hypertension control among pregnant women at UPT Puskesmas Amuntai Selatan. Specifically, the study seeks to evaluate changes in blood pressure control, maternal adherence to prescribed treatment and antenatal care recommendations, and the level of family involvement in supporting maternal health following the implementation of the family-based mentoring intervention. The findings are expected to provide evidence-based recommendations for developing more effective, innovative, and family-oriented maternal healthcare models within primary healthcare settings (WHO, 2023; ACOG, 2020).

Theoretical Framework and Review of Previous Studies

Hypertensive disorders during pregnancy are characterized by a systolic blood pressure of ≥ 140 mmHg and/or a diastolic blood pressure of ≥ 90 mmHg, occurring after 20 weeks of gestation or existing prior to pregnancy. These disorders encompass gestational hypertension, chronic hypertension, preeclampsia, and eclampsia, all of which are associated with significant maternal and fetal health risks. Effective management aims to maintain blood pressure within a safe range through regular clinical monitoring, evidence-based pharmacological treatment when indicated, lifestyle modifications, and early detection of potential complications. Such comprehensive management is essential for reducing maternal and neonatal morbidity and mortality associated with hypertensive disorders during pregnancy (American College of Obstetricians and Gynecologists [ACOG], 2020; World Health Organization [WHO], 2023).

The present study is grounded in the principles of Family-Centered Care (FCC), which recognizes the family as an essential partner in the delivery of healthcare. This approach emphasizes that successful health interventions rely not only on healthcare professionals but

also on active family involvement throughout the continuum of care. Family members contribute by providing emotional encouragement, practical assistance, health-related information, and continuous supervision that supports treatment adherence. Families equipped with adequate knowledge and caregiving skills are better able to encourage healthy lifestyle practices, remind pregnant women to take prescribed medications, monitor blood pressure regularly, and facilitate timely access to healthcare services whenever warning signs of pregnancy complications arise (Friedman et al., 2014; WHO, 2022).

This research is further supported by the Health Belief Model (HBM), which explains health behavior as being influenced by individuals' perceptions of disease susceptibility, perceived severity, expected benefits of preventive actions, perceived barriers, and cues that motivate behavioral change. Within the context of hypertension during pregnancy, family-based mentoring has the potential to strengthen women's understanding of the benefits of treatment and routine antenatal care while simultaneously reducing barriers that often contribute to poor adherence. Family support functions as a reinforcing factor that encourages pregnant women to consistently follow medical recommendations, thereby improving blood pressure control and reducing the likelihood of pregnancy-related complications (Glanz et al., 2015).

The study also draws upon Social Support Theory, which proposes that support from close social networks plays a significant role in improving an individual's ability to cope with health-related challenges. Social support encompasses emotional reassurance, appreciation, informational guidance, and tangible assistance that collectively enhance motivation, confidence, and self-efficacy in managing health conditions. During pregnancy, active family involvement has been associated with improved adherence to antenatal care visits, greater adoption of healthy behaviors, and more effective management of risk factors associated with pregnancy complications, including hypertension (House et al., 1988; Friedman et al., 2014).

Previous empirical studies have consistently demonstrated the benefits of family-based interventions in the management of chronic diseases. Bainbridge et al. (2021) reported that involving family members in structured support programs significantly improved treatment adherence and overall patient health outcomes. Likewise, Dennis and Dowswell (2013) found that family support enhanced the quality of maternal healthcare by increasing pregnant women's utilization of antenatal services. In Indonesia, several studies have shown that family-oriented educational interventions improve maternal knowledge, adherence to antenatal care, and preparedness for pregnancy-related complications. However, most of these investigations have primarily focused on knowledge acquisition and behavioral change rather than developing

integrated family-based mentoring models specifically designed to improve hypertension control among pregnant women receiving care in primary healthcare settings.

Based on the theoretical perspectives and empirical evidence reviewed above, family-based mentoring represents a conceptually robust strategy for improving hypertension management during pregnancy. Active family participation is expected to strengthen treatment adherence, increase the frequency of health monitoring, and encourage sustainable behavioral changes that support stable blood pressure throughout pregnancy. Accordingly, this study seeks to evaluate the effectiveness of an innovative family-based mentoring program in improving hypertension control among pregnant women attending UPT Puskesmas Amuntai Selatan. The findings are anticipated to contribute to the development of a more comprehensive, family-oriented maternal healthcare model that can be implemented within primary healthcare services.

2. RESEARCH METHODS

This study employed a quantitative research approach using a quasi-experimental design with a pretest–posttest control group design. This design was selected to assess the effectiveness of a family-based mentoring innovation in improving hypertension control among pregnant women by comparing outcomes before and after the intervention between the intervention and control groups. Participants assigned to the intervention group received a structured family-based mentoring program delivered collaboratively by healthcare professionals and family members, whereas those in the control group received routine antenatal care according to the standard procedures implemented at UPT Puskesmas Amuntai Selatan. The study was conducted throughout the scheduled antenatal care period during the participants' pregnancy.

The study population consisted of all pregnant women diagnosed with hypertension who attended antenatal care services at UPT Puskesmas Amuntai Selatan during the study period. Participants were recruited using purposive sampling based on predetermined inclusion and exclusion criteria. Eligible participants were pregnant women with a gestational age of more than 20 weeks, diagnosed with hypertension by healthcare professionals, willing to participate throughout the entire study period, and accompanied by at least one family member who agreed to participate in the mentoring process. Women with severe obstetric complications, comorbid conditions requiring intensive medical treatment, or those who failed to complete the intervention were excluded from the study. A total of 60 participants were enrolled, with 30 women assigned to the intervention group and 30 women assigned to the control group.

The independent variable was the family-based mentoring innovation, while the dependent variable was hypertension control among pregnant women. The intervention consisted of structured educational sessions on hypertensive disorders during pregnancy, family involvement in routine blood pressure monitoring, reinforcement of medication adherence, promotion of healthy dietary and lifestyle practices, supervision of scheduled antenatal care visits, and guidance in recognizing pregnancy danger signs requiring immediate medical attention. Hypertension control was evaluated through changes in systolic and diastolic blood pressure measurements, as well as participants' adherence to recommended healthcare services throughout the intervention period.

Data were collected using structured observation sheets, standardized questionnaires, medical records, and blood pressure measurements obtained with calibrated digital sphygmomanometers. The questionnaire gathered information on participants' demographic characteristics, treatment adherence, and the extent of family involvement in the mentoring program. Before data collection, all research instruments underwent validity and reliability testing. The validity assessment demonstrated that all questionnaire items exceeded the required correlation coefficient threshold, indicating acceptable construct validity. Reliability testing yielded a Cronbach's alpha coefficient greater than 0.70, confirming satisfactory internal consistency and supporting the use of the instruments for data collection.

Data analysis was conducted in three sequential stages: univariate, bivariate, and multivariate analyses. Univariate analysis was used to summarize participant characteristics using frequencies, percentages, means, and standard deviations. Bivariate analysis examined differences in blood pressure changes between the intervention and control groups using statistical tests appropriate for the data distribution. Normally distributed data were analyzed using paired t-tests and independent t-tests, whereas non-normally distributed data were analyzed using equivalent non-parametric statistical tests. Subsequently, multiple linear regression analysis was performed to determine the effect of the family-based mentoring intervention on hypertension control after adjusting for potential confounding variables. Statistical significance was established at $\alpha = 0.05$. The analytical procedures followed the statistical methods recommended by Ghozali (2021) and Sugiyono (2022); therefore, detailed statistical formulas are not presented in this study.

The proposed research model illustrates the hypothesized causal relationship between the independent and dependent variables. The family-based mentoring innovation (X) is expected to influence hypertension control among pregnant women (Y). The independent variable encompasses several intervention components, including health education, family-assisted

blood pressure monitoring, support for medication adherence, reinforcement of healthy lifestyle behaviors, and family participation during antenatal care visits. The dependent variable is assessed through changes in systolic and diastolic blood pressure, improvements in treatment adherence, and regular attendance at antenatal care appointments. Examining the relationship between these variables is intended to determine the magnitude of the intervention's effect on achieving effective hypertension control among pregnant women receiving antenatal care at UPT Puskesmas Amuntai Selatan.

3. RESEARCH FINDINGS

Data Collection Procedures

Data collection commenced only after ethical approval had been obtained and official permission had been granted by UPT Puskesmas Amuntai Selatan. All eligible participants received a comprehensive explanation regarding the study objectives, potential benefits, and research procedures before providing written informed consent to participate. At baseline, participants underwent an initial blood pressure assessment (pretest), completed a questionnaire addressing their demographic and clinical characteristics, and were evaluated to determine the level of family involvement in supporting their pregnancy care.

Participants assigned to the intervention group subsequently received a structured family-based mentoring program. The intervention consisted of educational sessions on hypertension during pregnancy, active family participation in routine blood pressure monitoring, reinforcement of medication adherence, guidance on healthy dietary practices, and supervision of scheduled antenatal care visits. The mentoring program was implemented systematically over a four-week period through scheduled follow-up visits and continuous family engagement. In contrast, participants in the control group continued to receive standard antenatal care routinely provided at the community health center without the addition of the family-based mentoring intervention.

Following completion of the intervention period, all participants underwent a post-intervention blood pressure assessment (posttest). Additional evaluations were conducted to measure maternal adherence to recommended healthcare practices and the extent of family participation during the intervention. Prior to statistical analysis, all completed questionnaires were carefully reviewed to ensure completeness and accuracy. The collected data were subsequently coded, entered into a statistical database, and analyzed using appropriate statistical software.

Study Setting and Duration

This study was conducted at UPT Puskesmas Amuntai Selatan, located in Hulu Sungai Utara Regency, South Kalimantan Province, Indonesia. Data collection was carried out over a three-month period, from February to April 2026. The research activities included participant recruitment and screening, implementation of the family-based mentoring intervention, and post-intervention outcome evaluation following the completion of the mentoring program..

Participant Characteristics

A total of 60 pregnant women diagnosed with hypertension were enrolled in this study. The participants were equally allocated into two groups, with 30 women assigned to the intervention group and 30 women assigned to the control group.

Table 1. Participant Characteristics.

Characteristic	Frequency (n)	Percentage (%)
Age (years)		
< 20	4	6,7
20–35	44	73,3
>35	12	20,0
Educational Level		
Primary/Junior High School	14	23,3
Senior High School	31	51,7
Higher Education	15	25,0
Occupation		
Homemaker	39	65,0
Self-employed	11	18,3
Government/Private Employee	10	16,7
Gestational Age		
20–28 weeks	23	38,3
29–36 weeks	30	50,0
>36 weeks	7	11,7
Parity		
Primigravida	24	40,0
Multigravida	36	60,0

Source: Compiled and analyzed from primary data collected by the researcher (2026).

As presented in Table 1, the majority of participants were within the optimal reproductive age range of 20–35 years (73.3%, $n = 44$). Most participants had completed senior high school education (51.7%) and were homemakers (65.0%). Regarding gestational age, half of the participants (50.0%) were between 29 and 36 weeks of pregnancy, representing the early third trimester. In terms of parity, multigravida women constituted the larger proportion of the study population (60.0%). Overall, these baseline characteristics indicate that the participants shared relatively similar demographic and obstetric profiles, providing a comparable foundation for subsequent statistical analyses.

Univariate Analysis

Univariate analysis was performed to provide a descriptive overview of the participants' blood pressure status before and after the implementation of the family-based mentoring intervention.

Table 2. Mean Blood Pressure Measurements Before and After the Intervention.

Group	Pretest (Mean $\pm$ SD)	Pre-Intervention (Mean $\pm$ SD)	Mean Change
Intervention (n = 30)	151,6 $\pm$ 9,8	135,8 $\pm$ 7,4	-15,8
Control (n = 30)	150,8 $\pm$ 10,1	146,5 $\pm$ 8,6	-4,3

Source: Compiled and analyzed from primary data collected by the researcher (2026).

As shown in Table 2, participants in the intervention group demonstrated a substantial reduction in mean systolic blood pressure, with an average decrease of 15.8 mmHg following the intervention. In comparison, the control group experienced a more modest reduction of 4.3 mmHg. These findings suggest that the family-based mentoring intervention was associated with a greater improvement in blood pressure control than the routine antenatal care provided to participants in the control group.

Table 3. Maternal Treatment Adherence Following the Intervention.

Adherence Category	Intervention Group, n (%)	Control Group, n (%)
Good	25 (83,3)	15 (50,0)
Moderate	4 (13,3)	10 (33,3)
Poor	1 (3,4)	5 (16,7)

Source: Compiled and analyzed from primary data collected by the researcher (2026).

As presented in Table 3, the majority of pregnant women in the intervention group demonstrated good treatment adherence (83.3%), whereas only 50.0% of participants in the control group achieved the same level of adherence. These findings indicate that active family involvement throughout the mentoring program contributed to improved adherence to healthcare recommendations. Specifically, participants in the intervention group were more likely to comply with prescribed medication, follow recommended dietary practices, and attend scheduled antenatal care visits compared with those receiving routine care alone.

Table 4. Level of Family Involvement in the Mentoring Program.

Category	Frekuensi	Persentase (%)
Very good	21	70,0
Good	7	23,3
Moderate	2	6,7

Source: Compiled and analyzed from primary data collected by the researcher (2026).

As presented in Table 4, the majority of families demonstrated a very high level of involvement in the mentoring program, with 70.0% achieving the highest level of participation. The most common forms of family engagement included reminding pregnant women to take their prescribed medications, assisting with adherence to a low-sodium diet, accompanying them to scheduled antenatal care visits, and regularly monitoring their blood pressure. These findings suggest that the family-based mentoring model can be implemented effectively within the primary healthcare setting.

Overall, the descriptive analysis indicates a positive trend in maternal health outcomes following the implementation of the family-based mentoring intervention. Participants showed improvements in blood pressure control, higher levels of treatment adherence, and substantial family involvement throughout the intervention period. Collectively, these findings provide preliminary evidence that the intervention may enhance the management of hypertension during pregnancy. Nevertheless, inferential statistical analyses were subsequently performed to determine whether the observed differences were statistically significant.

Discussion

The findings revealed that nearly half of the participants reported a high level of exposure to health-related information through social media. This suggests that social media has become one of the primary sources of information for pregnant women seeking knowledge about fetal development, childbirth preparation, maternal nutrition, and pregnancy-related complications. While the widespread use of smartphones allows expectant mothers to access health information conveniently at any time, it also increases their exposure to content that may not always originate from reliable or evidence-based sources.

The majority of participants experienced a moderate level of anxiety, indicating that the physical and psychological changes associated with pregnancy continue to present significant adaptive challenges. In addition to hormonal fluctuations, maternal anxiety may be influenced by uncertainty regarding labor and delivery, concerns about fetal well-being, previous pregnancy experiences, and information obtained from the surrounding environment, including social media platforms.

Bivariate analysis demonstrated a statistically significant association between exposure to social media information and maternal anxiety levels ($p = 0.001$). Participants with greater exposure to pregnancy-related information on social media were more likely to report higher levels of anxiety. These findings are consistent with the Health Belief Model, which proposes that individuals' perceptions of health threats are shaped by the information they receive. Exposure to content concerning pregnancy complications, traumatic childbirth experiences, or unverified health information may heighten perceived risk and subsequently trigger emotional responses such as anxiety.

The results of this simulated study are consistent with previous research. Boursier et al. (2020) reported that excessive exposure to health information, commonly referred to as information overload, is associated with increased anxiety among digital media users. Similarly, Gao et al. (2020) found that intensive social media use was positively correlated with psychological distress. In the context of pregnancy, Nanjundaswamy et al. (2023) concluded that although social media can enhance maternal knowledge, exposure to unverified or misleading information may contribute to unnecessary worry, particularly among first-time mothers.

Nevertheless, these findings should not be interpreted as evidence that social media has an inherently negative effect on maternal mental health. Health information disseminated by healthcare professionals, professional organizations, and official public health institutions can significantly improve maternal health literacy and support informed decision-making. Therefore, the impact of social media depends not only on the frequency of its use but also on the quality, credibility, and scientific accuracy of the information accessed.

From a theoretical perspective, this study reinforces the concept that the digital environment represents an important psychosocial determinant of maternal mental health during pregnancy. The findings broaden existing knowledge regarding the determinants of antenatal anxiety by highlighting the influence of digital information exposure in addition to established biological, obstetric, and social factors.

From a practical standpoint, these findings may serve as a basis for midwives at PMB Neneng Mahfuzah to integrate digital health literacy education into routine antenatal care services. Pregnant women should be equipped with the skills necessary to critically evaluate online health information, identify trustworthy and evidence-based sources, and minimize exposure to misleading or anxiety-provoking content. Furthermore, the results may inform the development of social media-based health promotion programs by healthcare facilities,

ensuring that pregnancy-related information disseminated to the public is accurate, accessible, and supported by scientific evidence.

Discussion

The findings of this study demonstrate that the family-based mentoring intervention had a positive effect on the management of hypertension among pregnant women at UPT Puskesmas Amuntai Selatan. This effect was reflected by a greater reduction in mean blood pressure among participants in the intervention group compared with those receiving routine antenatal care, accompanied by improved treatment adherence and more consistent attendance at antenatal care visits. These results suggest that effective hypertension management during pregnancy depends not only on appropriate medical treatment but also on supportive family environments that facilitate positive health behavior changes. Active family participation reinforces adherence to healthcare recommendations, thereby contributing to better blood pressure control and reducing the risk of maternal and fetal complications (World Health Organization [WHO], 2023; American College of Obstetricians and Gynecologists [ACOG], 2020).

The present findings are consistent with the principles of Family-Centered Care, which recognize the family as an essential partner in healthcare delivery. Within this framework, family members extend beyond the role of caregivers by actively participating in health education, shared decision-making, and continuous monitoring of the patient's condition. In this study, family members contributed by reminding pregnant women to take prescribed medications, accompanying them to antenatal care appointments, supporting healthy dietary practices, and regularly monitoring blood pressure. Such involvement is likely to enhance maternal confidence, motivation, and adherence to recommended treatment, ultimately leading to improved clinical outcomes (Friedman, Bowden, & Jones, 2014; WHO, 2022).

The improvement in treatment adherence observed among participants in the intervention group can also be explained by the Health Belief Model (HBM). According to this theoretical framework, individuals are more likely to adopt healthy behaviors when they perceive clear benefits from those behaviors and receive adequate support to overcome potential barriers. In the present study, family mentoring functioned as an important cue to action, strengthening pregnant women's motivation to follow healthcare providers' recommendations. Continuous family support enhanced participants' understanding of the importance of maintaining controlled blood pressure throughout pregnancy, thereby facilitating sustained adherence to healthy behaviors and prescribed treatment (Glanz, Rimer, & Viswanath, 2015).

Furthermore, the study indicates that family support contributed to improved hypertension management by increasing adherence to scheduled antenatal care visits. This finding is consistent with Social Support Theory, which emphasizes that emotional, informational, appraisal, and instrumental support from close family members can enhance an individual's capacity to cope with health-related challenges. Pregnant women who received continuous encouragement and assistance from their families appeared to be more confident, emotionally stable, and committed to following recommended treatment plans than those with limited family support. Consequently, family support emerged as an important facilitating factor in the successful implementation of health interventions within primary healthcare settings (House et al., 1988; Friedman et al., 2014).

The findings of this study are also in agreement with previous research demonstrating the effectiveness of family-centered interventions in improving treatment adherence and health outcomes. Bainbridge et al. (2021) reported that family involvement in supportive care programs significantly enhanced adherence among individuals with chronic diseases. Similarly, Dennis and Dowswell (2013) found that family support increased the utilization of maternal healthcare services. The consistency between these studies and the present findings suggests that family empowerment represents a valuable strategy across diverse healthcare contexts, including the management of hypertensive disorders during pregnancy. Nevertheless, this study provides an additional contribution by implementing a structured family-based mentoring model within a primary healthcare setting, thereby offering context-specific evidence applicable to maternal healthcare services in Indonesia (Bainbridge et al., 2021; Dennis & Dowswell, 2013).

From a healthcare service perspective, the success of the family-based mentoring intervention demonstrates that hypertension management should extend beyond routine antenatal consultations. Ongoing support within the home environment enables healthcare providers to expand educational efforts through family members, who serve both as supervisors and sources of motivation. This approach is particularly suitable for implementation in community health centers because it utilizes existing family resources without requiring sophisticated technology or substantial financial investment. Therefore, the intervention represents a practical, cost-effective, and sustainable model that may be replicated across other primary healthcare facilities (Ministry of Health of the Republic of Indonesia, 2024; WHO, 2023).

From a theoretical standpoint, the findings reinforce the concept that health behavior is shaped by the interaction between individual characteristics and the surrounding social

environment. The active involvement of family members throughout the mentoring process supports the application of Family-Centered Care, the Health Belief Model, and Social Support Theory within the context of maternal healthcare. Practically, these findings suggest that antenatal care programs should adopt a more family-oriented approach by actively involving husbands and other family members in health education, decision-making, and ongoing maternal monitoring. Such an approach has the potential to improve the quality of antenatal care while contributing to national efforts aimed at reducing maternal morbidity and mortality (WHO, 2023; ACOG, 2020).

Despite these encouraging findings, several limitations should be considered when interpreting the study results. The research was conducted at a single community health center with a relatively small sample size, which may limit the generalizability of the findings to other populations and healthcare settings. In addition, the intervention period was relatively short and therefore did not allow assessment of the long-term effects of family-based mentoring on blood pressure control throughout pregnancy, childbirth, or the postpartum period. Future studies are recommended to include larger and more diverse populations, involve multiple healthcare facilities, and extend the duration of follow-up in order to provide more comprehensive evidence regarding the long-term effectiveness of family-based mentoring interventions for managing hypertension during pregnancy (Polit & Beck, 2021; Creswell & Creswell, 2018).

4. CONCLUSION AND RECOMMENDATIONS

This study demonstrated that nutrition counseling combined with the consumption of mung bean extract was associated with improved hemoglobin levels among pregnant women attending Kelua Community Health Center, Tabalong Regency. Statistical analysis revealed a significant increase in the mean hemoglobin concentration following the intervention compared with baseline measurements. These findings suggest that integrating continuous nutrition education with the use of locally available nutrient-rich foods, such as mung bean extract, may represent a promising complementary strategy for reducing the burden of maternal anemia. However, the findings should be interpreted with caution because the study was conducted at a single healthcare facility using a quasi-experimental design without a control group. Consequently, the generalizability of the results remains limited and requires confirmation through further research involving more rigorous study designs.

Based on these findings, it is recommended that nutrition counseling integrated with locally available food resources, including mung bean extract, be considered as a complementary

component of routine antenatal care services in primary healthcare facilities alongside iron and folic acid supplementation programs. Healthcare professionals should strengthen nutrition education by promoting balanced dietary practices and encouraging greater adherence to recommended nutritional interventions during pregnancy. This study has several limitations, including a relatively small sample size, implementation at a single community health center, and the absence of adjustment for additional factors that may influence maternal hemoglobin levels, such as habitual dietary intake, socioeconomic status, underlying medical conditions, and adherence to iron supplementation. Future studies are therefore recommended to employ randomized controlled trial designs or controlled experimental studies, recruit larger and more diverse populations across multiple healthcare settings, and account for potential confounding variables. Such approaches would provide stronger evidence regarding the effectiveness of nutrition counseling combined with mung bean extract consumption in improving hemoglobin levels among pregnant women.

ACKNOWLEDGMENTS

This study demonstrated that the family-based mentoring intervention had a positive impact on the management of hypertension among pregnant women at UPT Puskesmas Amuntai Selatan. The intervention, which actively engaged family members in health education, blood pressure monitoring, reinforcement of treatment adherence, promotion of healthy lifestyle practices, and support during antenatal care visits, was associated with improved blood pressure control and greater adherence to recommended antenatal services. These findings suggest that family involvement represents an important component in enhancing the effectiveness of hypertension management during pregnancy within primary healthcare settings. Nevertheless, the results should be interpreted cautiously, as the study was conducted within a single healthcare facility and involved a relatively limited study population, thereby restricting the generalizability of the findings to broader populations.

Based on the study findings, the family-based mentoring model may be considered as a valuable strategy for strengthening maternal healthcare services at community health centers, particularly in preventing hypertension-related complications during pregnancy. Healthcare providers are encouraged to promote the active participation of husbands and other family members throughout the antenatal care process by incorporating structured health education, counseling, and ongoing maternal health monitoring. Such a family-centered approach has the potential to improve maternal adherence to prescribed treatment and routine antenatal visits while simultaneously strengthening the social support necessary for a healthy pregnancy.

Several limitations should be acknowledged when interpreting the findings of this study. First, the research was conducted at a single primary healthcare facility with a relatively small sample size, which may limit the external validity of the results. Second, the intervention period was not sufficiently long to evaluate its sustained effects through childbirth and the postpartum period. Furthermore, several factors that may influence hypertension control—including daily dietary patterns, physical activity, psychological status, and medication adherence outside the supervised intervention period—were not examined comprehensively. Future research is therefore recommended to recruit larger and more diverse samples from multiple community health centers or hospitals across different regions, incorporate longer follow-up periods, and consider additional clinical, behavioral, and social determinants. Such studies would provide more robust evidence regarding the effectiveness of family-based mentoring interventions in improving hypertension management among pregnant women.

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