



Family Empowerment to Improve Dietary Adherence Among Pregnant Women with Gestational Diabetes in the Summersari Community Health Center Service Area, Jember

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Abstract

Gestational diabetes mellitus (GDM) is a growing global maternal health concern that increases the risk of adverse outcomes for both mothers and infants. In Indonesia, the prevalence of GDM continues to rise due to changes in lifestyle, dietary habits, and metabolic risk factors among pregnant women. Dietary management remains the cornerstone of GDM treatment; however, maintaining adherence to dietary recommendations is often challenging because pregnant women must consistently modify long-established eating behaviors. Family involvement is increasingly recognized as an important factor that may enhance adherence to therapeutic diets during pregnancy. This study aimed to analyze the relationship between family empowerment and dietary adherence among pregnant women with GDM in the Summersari Community Health Center service area, Jember. A quantitative study with an observational analytic and cross-sectional design was conducted involving 45 third-trimester pregnant women diagnosed with GDM. All eligible participants were included using a saturated sampling technique. Data were collected through validated questionnaires measuring family empowerment and dietary adherence and were analyzed using the Chi-square test. The results revealed a significant relationship between family empowerment and dietary adherence ($p = 0.000$; $p < 0.05$). Pregnant women who received greater family empowerment demonstrated higher levels of dietary adherence. Strengthening family-centered interventions may improve dietary compliance and support better glycemic control among women with GDM.

Keywords: Dietary Adherence, Family Empowerment, Gestational Diabetes Mellitus, Glycemic Control, Maternal Health.



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INTRODUCTION

Diabetes Mellitus Gestational (GDM) has emerged as one of the most significant maternal health challenges worldwide, reflecting the broader epidemiological transition characterized by increasing rates of obesity, metabolic disorders, delayed maternal age, and sedentary lifestyles among women of reproductive age (Modzelewski et al., 2022). Recent global estimates indicate that approximately 21.1 million live births, equivalent to 16.7% of all births, were affected by hyperglycemia during pregnancy, with nearly 80.3% of these cases attributable to gestational diabetes mellitus (Magliano & Boyko, 2021). The growing prevalence of GDM has transformed the condition from a pregnancy-related complication into a critical public health concern because its consequences extend beyond pregnancy and contribute to long-term metabolic risks for both mothers and offspring (Hod et al., 2025). Diagnostic developments and international screening standards have further expanded the identification of GDM cases, revealing a substantial burden that had previously remained underrecognized in many low- and middle-income countries (World Health Organization, 2013). In Southeast Asia, where the prevalence of hyperglycemia in pregnancy is among the highest globally, the interaction between nutritional transitions and limited preventive interventions has intensified concerns regarding maternal and neonatal outcomes. This situation underscores the need for approaches that move beyond clinical management and incorporate behavioral and social determinants influencing maternal health practices. Effective control of GDM increasingly depends on the capacity of pregnant women and their families to sustain lifestyle modifications throughout pregnancy.

Within the Indonesian context, the burden of GDM continues to increase alongside the growing prevalence of maternal obesity, hypertension, and other metabolic risk factors that collectively heighten

susceptibility to glucose intolerance during pregnancy (Wijayanti & Rahayuningsih, 2025). Epidemiological evidence suggests that GDM prevalence varies across regions and populations, although consistent trends indicate an upward trajectory that warrants serious attention from maternal health services (Umiyah, 2023). Research has demonstrated that dietary behavior remains one of the most influential modifiable determinants in preventing and controlling gestational hyperglycemia, particularly because nutritional intake directly affects glycemic regulation during pregnancy (Nasution et al., 2023). Clinical guidelines consistently emphasize balanced nutrition, regular monitoring, and lifestyle management as the primary non-pharmacological interventions for women diagnosed with GDM (American Diabetes Association Professional Practice Committee, 2026). Screening and early detection initiatives have also been promoted to identify women at risk before severe metabolic complications occur (Julianti & Zahara, 2025). Despite these preventive efforts, adherence to dietary recommendations remains persistently challenging in many communities due to cultural food practices, limited health literacy, and insufficient support systems. The complexity of dietary adherence suggests that individual motivation alone is often inadequate to sustain recommended nutritional behaviors throughout pregnancy.

Previous studies have increasingly recognized that effective GDM management requires a multidimensional approach integrating self-care education, nutritional guidance, behavioral reinforcement, and family engagement (Haron et al., 2023). Educational interventions based on empowerment frameworks have demonstrated positive effects on improving self-care behaviors and increasing maternal capacity to manage gestational diabetes independently (Lamadah et al., 2022). Prospective studies further indicate that nutritional counseling combined with group-based pregnancy care can significantly improve glycemic outcomes and pregnancy experiences among women with GDM (He et al., 2025). Qualitative investigations reveal that successful self-management is strongly influenced by emotional support, information accessibility, and the ability of family members to facilitate dietary adjustments within the household environment (Efriani & Rokhanawati, 2024). Evidence from broader maternal nutrition programs has shown that family empowerment contributes substantially to improved dietary management and health outcomes among pregnant women by strengthening collective responsibility for nutritional practices (Kasad et al., 2023). The effectiveness of these interventions suggests that behavioral change is more sustainable when responsibility for dietary management is shared within the family unit rather than placed exclusively on pregnant women. Such findings have gradually shifted scholarly attention from individual-centered interventions toward family-oriented empowerment strategies.

Although the literature increasingly acknowledges the importance of family involvement, significant conceptual and empirical gaps remain regarding the mechanisms through which family empowerment influences dietary adherence among women with GDM. Existing studies frequently examine family support as a general psychosocial factor without distinguishing between passive emotional assistance and active empowerment processes that facilitate decision-making, problem-solving, and dietary monitoring within the household (Widiyanti et al., 2025). Research specifically investigating the relationship between family support and dietary adherence among mothers with GDM remains relatively limited and often focuses on correlation rather than intervention-oriented empowerment models (Kusbandiyah & Maghfiroh, 2026). Recent innovations in GDM education have highlighted the necessity of strengthening health literacy among pregnant women, yet the role of family members as co-agents of behavioral change has not been adequately integrated into intervention frameworks (Elizar, 2026). Evidence concerning preventive factors such as family information sources, dietary practices, and lifestyle behaviors has generally been explored independently, resulting in fragmented understanding of how these determinants interact in real-world settings (Komariyah, 2025). The absence of context-specific studies conducted at the primary healthcare level further limits the applicability of existing evidence for community-based maternal health programs. Consequently, important questions remain regarding whether empowering families can effectively enhance dietary adherence among pregnant women living with GDM in local healthcare service areas.

The unresolved nature of this issue carries substantial scientific and practical implications because inadequate dietary adherence among women with GDM is associated with poor glycemic control, increased obstetric complications, and heightened risks of future type 2 diabetes for both mothers and children (Stefanus et al., 2023). Dietary management represents the cornerstone of GDM treatment, making adherence a decisive factor in determining intervention success and long-term health

outcomes (Hod et al., 2025). Emerging evidence suggests that self-family-environment empowerment models may generate more sustainable behavioral changes than conventional education approaches because they simultaneously address individual, familial, and environmental determinants of health behavior (Yang et al., 2025). The significance of family-based interventions is further reinforced by broader chronic disease prevention research demonstrating that household-level engagement can substantially improve compliance with health recommendations and reduce disease-related complications (Pribadi et al., 2024). In rural and semi-urban communities, where family structures often play a central role in daily decision-making, understanding the contribution of family empowerment becomes particularly important for designing effective public health interventions. Generating empirical evidence within community health center settings is therefore essential for informing policy development and strengthening maternal health programs targeting GDM management.

Against this background, the present study positions itself within the growing body of research that seeks to integrate family-centered approaches into gestational diabetes management by specifically examining the relationship between family empowerment and dietary adherence among pregnant women with gestational diabetes in the Summersari Community Health Center service area, Jember. Unlike previous studies that predominantly focused on individual self-management or generalized family support, this research emphasizes family empowerment as an active and structured process capable of influencing dietary behavior during pregnancy. The study aims to generate context-specific evidence regarding the extent to which empowered families contribute to the successful implementation of dietary recommendations among women with GDM. From a theoretical perspective, the research advances the understanding of family empowerment as a behavioral determinant within maternal health and gestational diabetes management frameworks. From a methodological perspective, it contributes empirical insights derived from community-based healthcare settings, thereby enriching the evidence base for designing culturally relevant interventions that strengthen dietary adherence. The findings are expected to support the development of more comprehensive maternal health strategies that combine clinical management with family-oriented empowerment programs to improve pregnancy outcomes among women affected by gestational diabetes.

RESEARCH METHODS

This study employed a quantitative empirical approach using an observational analytic design with a cross-sectional framework to examine the relationship between family empowerment and dietary adherence among pregnant women with gestational diabetes mellitus (GDM) in the Summersari Community Health Center service area, Jember. The cross-sectional design was considered appropriate because it enables the simultaneous assessment of family empowerment and dietary adherence at a specific point in time among pregnant women diagnosed with GDM (Umiyah, 2023). The study population consisted of all third-trimester pregnant women diagnosed with GDM and registered at the Summersari Community Health Center, totaling 45 individuals. Considering the relatively small population size, a saturated sampling technique was employed to include all eligible participants in the study. Participant recruitment was conducted over a three-month period using an accidental sampling approach among pregnant women attending antenatal care services who met the inclusion criteria. Primary data were collected through structured questionnaires administered directly to respondents. The use of questionnaire-based assessment was considered appropriate because family-related factors, including support and empowerment associated with dietary adherence among women with gestational diabetes mellitus, have been successfully measured through structured survey instruments in previous studies (Kusbandiyah & Maghfiroh, 2026).

The research instrument consisted of a family empowerment questionnaire and a dietary adherence questionnaire adapted from validated measures previously employed to assess family empowerment and dietary management among pregnant women (Kasad et al., 2023). Prior to data collection, the instruments underwent validity and reliability testing to ensure their appropriateness for measuring the intended constructs. Content validity was reviewed by experts in maternal and community health, while internal consistency reliability was evaluated using Cronbach's alpha coefficient, with values exceeding the recommended threshold indicating acceptable reliability. Data obtained from completed questionnaires were coded and analyzed using statistical software. Descriptive statistics were employed to summarize respondents' demographic characteristics and study variables, while the association between family empowerment and dietary adherence was examined using the Chi-

square test with a significance level of $\alpha = 0.05$. The selection of dietary adherence as the primary outcome variable was based on evidence indicating that dietary management represents a fundamental component of GDM control and prevention of adverse maternal outcomes (American Diabetes Association Professional Practice Committee, 2026; Hod et al., 2025). Ethical considerations were observed throughout the study by obtaining permission from the Summersari Community Health Center and securing informed consent from all participants before data collection. Participant confidentiality, anonymity, and voluntary participation were maintained in accordance with ethical principles governing maternal and public health research involving human subjects (World Health Organization, 2013).

RESULTS AND DISCUSSION

Respondent Characteristics and Risk Profile of Gestational Diabetes Mellitus

The analysis of respondent characteristics provides an important foundation for understanding the contextual factors associated with gestational diabetes mellitus (GDM) among pregnant women in the Summersari Community Health Center service area. Demographic and socioeconomic variables are frequently recognized as determinants that influence maternal health behavior, access to healthcare services, and adherence to nutritional recommendations during pregnancy. The present findings indicate that most respondents had completed secondary education, while only a small proportion had attained higher education. Educational attainment is often associated with an individual's ability to access, interpret, and apply health-related information in daily life. Women with greater educational exposure generally possess stronger capacities to understand nutritional counseling and disease prevention strategies, although educational status alone cannot guarantee healthy behavioral outcomes. Previous literature has demonstrated that the development of GDM is influenced by the interaction of biological predispositions, environmental exposures, and lifestyle-related practices that extend beyond formal educational achievement (Modzelewski et al., 2022). The distribution observed in this study suggests that educational resources may support disease management efforts, yet additional behavioral and family-related factors remain influential in determining maternal health outcomes.

The age profile of respondents reveals that most pregnant women diagnosed with GDM were between 20 and 35 years old, while a smaller proportion belonged to age groups traditionally categorized as high-risk pregnancies. Although reproductive age between 20 and 35 years is generally considered physiologically favorable for pregnancy, the occurrence of GDM within this age range demonstrates that metabolic complications are not restricted to older mothers. Contemporary evidence indicates that changes in dietary behavior, increasing sedentary lifestyles, and rising rates of overweight and obesity have contributed to the growing incidence of GDM among women across a wider reproductive age spectrum (Wijayanti & Rahayuningsih, 2025). Maternal age remains relevant because insulin sensitivity naturally declines with advancing age, yet the current findings suggest that additional determinants may have stronger explanatory value within this population. The predominance of respondents in the productive reproductive age category also reflects broader demographic trends observed in maternal healthcare services throughout Indonesia. These patterns indicate that preventive strategies should not be directed exclusively toward older pregnant women but should encompass all women who exhibit metabolic and behavioral risk factors. Such an approach would facilitate earlier detection and management of glucose intolerance during pregnancy.

The economic profile of respondents demonstrates that nearly half of participating households reported monthly incomes above the regional minimum wage. Financial capacity is often assumed to facilitate access to healthier food options, regular health examinations, and better living conditions that support maternal well-being. Nevertheless, the relationship between income and health behavior is frequently more complex than anticipated because dietary decisions are influenced by cultural preferences, family habits, and food availability. Several respondents with relatively favorable economic conditions continued to exhibit behavioral characteristics associated with increased GDM risk. This observation suggests that economic resources do not automatically translate into optimal nutritional practices. Research focusing on maternal health determinants has highlighted that socioeconomic status should be interpreted alongside knowledge, attitudes, and family influences when evaluating disease prevention behaviors (Komariyah, 2025). The present findings emphasize that economic advantage may create opportunities for healthier choices, yet the utilization of those opportunities depends substantially on household decision-making processes and health awareness.

The interaction between educational attainment and household income creates an interesting context for understanding maternal dietary behavior in this study population. Respondents generally possessed sufficient socioeconomic resources to access healthcare services and obtain information regarding pregnancy-related complications. Despite these advantages, GDM remained prevalent among women whose profiles might conventionally be considered relatively favorable. This situation suggests that the presence of knowledge and resources alone may be insufficient to prevent unhealthy dietary practices when behavioral reinforcement mechanisms are lacking. Family environments frequently influence food purchasing decisions, meal preparation practices, and compliance with nutritional recommendations provided by healthcare professionals. Contemporary maternal health research increasingly emphasizes that sustainable behavioral change requires supportive social structures rather than isolated individual knowledge acquisition (Haron et al., 2023). The findings therefore highlight the importance of examining family dynamics as a complementary factor that may strengthen the translation of health knowledge into practical dietary behavior. Understanding this relationship becomes particularly relevant in studies focusing on family empowerment and adherence to therapeutic diets.

Table 1. Characteristics of Third-Trimester Pregnant Women with GDM in the Summersari Community Health Center Service Area

Characteristic	Frekuensi (n)	Persentase (%)
Basic Education	15	31,4
Secondary Education	26	44,4
Higher Education	4	8,9
<20 years	3	6,7
20–35 years	36	80,0
>35 years	6	13,3
Income below minimum wage	11	24,4
Income equal to minimum wage	12	26,7
Income above minimum wage	22	48,9
Occasional junk-food consumption	16	35,6
Frequent junk-food consumption	29	64,4
Good dietary pattern	15	33,3
Moderate dietary pattern	20	44,4
Poor dietary pattern	10	5,9

One of the most notable findings presented in Table 1 is the high prevalence of junk-food consumption among respondents. More than half of participants reported frequent consumption of fast food or highly processed food products despite receiving antenatal care services. This pattern deserves particular attention because diets rich in refined carbohydrates, saturated fats, and added sugars have been linked to impaired glucose metabolism and increased insulin resistance during pregnancy. Nutritional epidemiology studies consistently identify unhealthy dietary habits as major contributors to metabolic disorders among pregnant women. The persistence of frequent junk-food consumption within this population suggests that nutritional knowledge may not always translate into behavioral compliance. Research conducted among pregnant women in Indonesia similarly identified dietary behavior as a critical determinant influencing the development and progression of gestational diabetes (Nasution et al., 2023). The findings indicate that interventions addressing GDM should focus not only on providing information but also on modifying the social and environmental factors that shape everyday food choices.

The dietary pattern distribution further supports the argument that nutritional behavior remains an important challenge within this population. Although a proportion of respondents demonstrated good dietary practices, the largest group reported only moderate adherence to healthy eating patterns. Moderate dietary behavior may appear acceptable from a general public health perspective, yet it may be insufficient for women who require strict glycemic control due to GDM. Clinical recommendations emphasize the importance of carefully regulating carbohydrate intake, meal frequency, and food quality throughout pregnancy to minimize adverse maternal and fetal outcomes (American Diabetes Association Professional Practice Committee, 2026). The predominance of moderate dietary patterns

therefore suggests the existence of a behavioral gap between recommended dietary standards and actual practices. Similar concerns have been highlighted in recent literature emphasizing the need for individualized nutritional guidance and continuous monitoring among women diagnosed with GDM (Hod et al., 2025). These findings reinforce the importance of strengthening adherence-support mechanisms within maternal healthcare programs.

The coexistence of relatively adequate socioeconomic resources and suboptimal dietary behavior points toward the influence of psychosocial and family-related determinants. Eating behavior during pregnancy is often shaped by family traditions, food preparation routines, and household-level decision-making processes rather than by individual preferences alone. Women may possess sufficient knowledge regarding nutritional recommendations yet encounter challenges in implementing dietary modifications when family support is limited. Qualitative evidence from women experiencing GDM has revealed that emotional encouragement, practical assistance, and family involvement significantly affect self-management behaviors during pregnancy (Efriani & Rokhanawati, 2024). Household members frequently determine food availability, meal composition, and compliance with dietary restrictions, making family participation a crucial component of disease management. The respondent characteristics observed in this study suggest that interventions targeting individual behavior alone may not adequately address the underlying determinants of dietary adherence. Consideration of family empowerment therefore becomes increasingly relevant as a strategy for improving maternal nutritional outcomes.

Taken together, the respondent characteristics illustrate that GDM emerges within a multifactorial context involving demographic, socioeconomic, and behavioral determinants. Educational attainment and economic capacity appear to provide favorable conditions for disease management, yet these advantages do not necessarily prevent the persistence of unhealthy dietary practices. The high prevalence of junk-food consumption and the predominance of only moderate dietary patterns indicate the presence of behavioral vulnerabilities that may contribute to poor glycemic control. Current literature increasingly recognizes that effective GDM prevention and management require integrated approaches addressing both individual and household-level influences (Umiyah, 2023). The findings from this study highlight the need to move beyond conventional educational interventions and consider broader social support mechanisms capable of facilitating sustained behavioral change. Family-centered approaches may provide a practical pathway for transforming nutritional knowledge into everyday dietary practices. This contextual understanding establishes a strong rationale for examining family empowerment as a determinant of dietary adherence among pregnant women with GDM.

Family Empowerment and Dietary Adherence among Pregnant Women with Gestational Diabetes Mellitus

The findings indicate that family empowerment among pregnant women with gestational diabetes mellitus was predominantly categorized as moderate, accounting for 53.3% of respondents, while 37.8% experienced good family empowerment and only 8.9% reported low levels of empowerment. This distribution suggests that most families had already demonstrated a degree of involvement in supporting maternal health during pregnancy, although the quality and intensity of such involvement varied considerably. Family empowerment extends beyond emotional encouragement and includes practical actions such as assisting with meal planning, reminding mothers about dietary schedules, accompanying antenatal visits, and facilitating healthy lifestyle practices. The presence of moderate empowerment among the majority of respondents indicates that family members generally recognized their role in supporting pregnancy-related health management. Nevertheless, moderate empowerment may not always provide sufficient support to sustain the behavioral adjustments required for effective glycemic control. Studies examining maternal health interventions have emphasized that family participation becomes increasingly important when pregnancy is complicated by chronic metabolic conditions that require continuous self-management (Kasad et al., 2023). The findings suggest that strengthening family engagement may create more favorable conditions for achieving optimal dietary adherence among women diagnosed with GDM.

Family empowerment should be understood as a multidimensional construct encompassing emotional, informational, instrumental, and motivational support. Emotional support contributes to reducing maternal anxiety and psychological stress, both of which can influence health-related decision-

making during pregnancy. Informational support helps mothers understand dietary restrictions, glucose monitoring practices, and the importance of maintaining metabolic stability. Instrumental support involves tangible assistance such as preparing meals, purchasing recommended food products, and accompanying women to healthcare appointments. Motivational support reinforces adherence by encouraging persistence in the face of dietary challenges and lifestyle adjustments. Research on empowerment-based interventions has demonstrated that family involvement strengthens maternal confidence and improves self-management capacities among women experiencing pregnancy-related health complications (Lamadah et al., 2022). The predominance of moderate and good family empowerment observed in this study indicates that many respondents benefited from at least some combination of these supportive mechanisms within their household environment.

Table 2. Family Empowerment among Third-Trimester Pregnant Women with GDM

Family Empowerment	Frequency (n)	Percentage (%)
Good	17	37.8
Moderate	24	53.3
Poor	4	8.9
Total	45	100

The pattern presented in Table 2 reflects the growing awareness among families regarding the importance of active involvement in maternal healthcare. Families often serve as the primary social environment in which dietary decisions are made and health behaviors are reinforced. In many households, family members influence food purchasing choices, determine meal preparation practices, and shape the overall nutritional environment experienced by pregnant women. Such dynamics are particularly relevant for women with GDM because dietary management requires consistent behavioral regulation over an extended period. Recent educational innovations in maternal healthcare have emphasized the necessity of involving family members as partners in health promotion rather than limiting interventions solely to pregnant women (Elizar, 2026). The moderate predominance of family empowerment identified in this study suggests that family-centered health education strategies may already be yielding positive effects within the community. Further enhancement of these strategies may contribute to more comprehensive support systems for women managing gestational diabetes.

The assessment of dietary adherence revealed that most respondents complied with recommended dietary guidelines, with 68.9% categorized as adherent and 31.1% categorized as non-adherent. This finding indicates that a majority of participants recognized the importance of dietary regulation in controlling blood glucose levels during pregnancy. Dietary adherence among women with GDM requires sustained behavioral commitment because dietary restrictions often involve modifications to long-established eating habits and cultural food preferences. Maintaining adherence may become particularly challenging during the third trimester, when physiological and hormonal changes can increase appetite and alter food cravings. Successful adherence therefore depends not only on individual motivation but also on the availability of supportive environmental conditions. Evidence from systematic reviews suggests that self-care behaviors among women with GDM improve substantially when educational guidance is accompanied by ongoing social support and practical assistance (Haron et al., 2023). The relatively high adherence rate observed in this study indicates that many respondents were able to implement recommended dietary practices despite the challenges associated with pregnancy-related lifestyle modifications.

Physiological mechanisms provide additional context for understanding the importance of dietary adherence during pregnancy. As gestation progresses, increasing levels of placental hormones contribute to reduced insulin sensitivity and elevated blood glucose concentrations. Women diagnosed with GDM therefore face greater metabolic demands that require careful regulation of carbohydrate intake and meal composition. Failure to adhere to dietary recommendations may exacerbate insulin resistance and increase the likelihood of adverse maternal and fetal outcomes. Clinical guidelines consistently identify dietary management as the cornerstone of GDM treatment because nutritional control directly influences glycemic stability and pregnancy outcomes (American Diabetes Association Professional Practice Committee, 2026). Effective dietary adherence can reduce the need for pharmacological interventions while supporting healthier fetal development. The relatively high

proportion of adherent respondents observed in this study reflects the potential effectiveness of community-based maternal health services in promoting nutritional awareness and disease management behaviors.

Table 3. Dietary Adherence among Third-Trimester Pregnant Women with GDM

Dietary Adherence	Frequency (n)	Percentage (%)
Adherent	31	68.9
Non-Adherent	14	31.1
Total	45	100

The distribution shown in Table 3 suggests that adherence remains a realistic and achievable goal for many women with GDM when appropriate support systems are available. Although the proportion of adherent respondents exceeded two-thirds of the sample, the presence of non-adherence among nearly one-third of participants highlights the persistence of behavioral challenges. Dietary compliance is influenced by multiple factors, including nutritional knowledge, perceived disease severity, emotional well-being, family involvement, and food accessibility. Women who lack consistent support may encounter greater difficulty maintaining dietary restrictions, particularly when household eating patterns differ from recommended nutritional guidelines. Qualitative research exploring maternal experiences with GDM has shown that emotional fatigue, social pressures, and limited practical assistance frequently undermine long-term adherence efforts (Efriani & Rokhanawati, 2024). These findings indicate that interventions addressing dietary adherence should incorporate psychosocial and family-related dimensions rather than focusing exclusively on individual behavior modification.

The relationship between family empowerment and dietary adherence becomes increasingly apparent when considering the practical realities of disease management during pregnancy. Women rarely make dietary decisions in isolation because household food preparation, meal scheduling, and purchasing behaviors are commonly shared responsibilities. Family members who actively participate in nutritional planning can reduce barriers to adherence by creating supportive environments that facilitate healthier choices. Similar observations have been reported in studies demonstrating that family support significantly contributes to treatment adherence among individuals managing chronic health conditions (Widiyanti et al., 2025). Family empowerment strengthens this process by transforming support from passive encouragement into active participation in health-related decision-making. Such involvement may enhance maternal confidence while simultaneously reducing the psychological burden associated with strict dietary regulation. The findings observed in this study provide preliminary evidence that family engagement constitutes an important component of successful dietary management among women with GDM.

Taken collectively, the findings regarding family empowerment and dietary adherence reveal a generally favorable pattern within the study population while simultaneously identifying areas requiring further improvement. Most respondents experienced moderate to good levels of family empowerment and demonstrated adherence to recommended dietary practices. Despite these positive trends, a substantial proportion of women continued to face challenges related to family support and dietary compliance. Existing literature increasingly emphasizes that sustainable health behavior change emerges from the interaction of individual motivation, family engagement, and environmental support systems rather than from isolated educational interventions (He et al., 2025). The current findings align with this perspective by highlighting the central role of household dynamics in shaping maternal health behavior. Strengthening family empowerment initiatives may therefore provide a practical avenue for improving adherence outcomes among women diagnosed with gestational diabetes. A deeper examination of the statistical relationship between these variables is necessary to determine the extent to which family empowerment contributes to dietary compliance within this population.

Association Between Family Empowerment and Dietary Adherence Among Pregnant Women with Gestational Diabetes Mellitus

The cross-tabulation analysis revealed a statistically significant association between family empowerment and dietary adherence among pregnant women with gestational diabetes mellitus in the

Sumbersari Community Health Center service area. The Chi-square test produced a p-value of 0.000, which was lower than the predetermined significance level of 0.05, indicating that family empowerment was significantly related to adherence to dietary recommendations. This finding demonstrates that variations in dietary adherence were not randomly distributed across empowerment categories but were associated with differences in the degree of family involvement experienced by respondents. Women who reported stronger family empowerment generally exhibited higher levels of compliance with prescribed dietary guidelines compared with those who received limited support. The result reinforces the assumption that dietary management during pregnancy is influenced not only by individual awareness but also by the social environment surrounding the mother. Family members frequently serve as the closest source of encouragement, supervision, and practical assistance throughout pregnancy. The statistical significance observed in this study highlights the relevance of family-centered approaches in supporting behavioral management among women diagnosed with GDM.

The significance of this relationship can be understood through behavioral and social support theories, which suggest that health-related decisions are shaped by interactions between individual motivation and environmental reinforcement. Dietary adherence requires continuous commitment because recommended dietary modifications often conflict with established eating habits and cultural food preferences. Pregnant women who receive encouragement and practical support from family members are more likely to maintain consistency in implementing nutritional recommendations. In contrast, women with limited family engagement may face greater difficulties in regulating food intake and maintaining dietary discipline over time. Family empowerment contributes to behavioral reinforcement by creating accountability mechanisms that support long-term adherence. Previous studies have similarly demonstrated that family support is positively associated with treatment compliance among individuals managing chronic metabolic conditions (Widiyanti et al., 2025). The present findings extend this evidence by demonstrating that family empowerment also plays a significant role within the context of gestational diabetes management.

Table 4. Cross-Tabulation of Family Empowerment and Dietary Adherence Among Pregnant Women with GDM

Family Empowerment	Adherent n (%)	Non-Adherent n (%)	Total n (%)	p-value
Poor	1 (3.0)	3 (25.0)	4 (27.8)	0.000
Moderate	21 (63.6)	3 (25.0)	24 (19.6)	
Good	11 (33.3)	6 (50.0)	17 (52.6)	
Total	33 (73.3)	12 (26.7)	45 (100)	

The pattern displayed in Table 4 demonstrates that respondents with moderate and good levels of family empowerment accounted for the majority of dietary adherence cases. Although dietary adherence was also observed among a small number of respondents experiencing limited family empowerment, the overall distribution suggests a tendency for adherence to increase when families become more actively involved in disease management. Family empowerment provides a framework through which household members contribute to the implementation of dietary recommendations, monitor behavioral consistency, and facilitate healthier lifestyle choices. These forms of support become particularly important during pregnancy because women often experience physical discomfort, emotional fluctuations, and increased nutritional demands. Research examining family-based dietary interventions has reported that household participation significantly improves adherence to nutritional guidelines among women with GDM (Yang et al., 2025). Similar findings were reported by Kusbandiyah and Maghfiroh (2026), who identified a positive relationship between family support and dietary compliance among mothers experiencing gestational diabetes. The consistency between those findings and the current study strengthens the empirical argument that family engagement constitutes a critical determinant of successful dietary management.

The observed association also aligns with empowerment theory, which emphasizes the capacity of social systems to enhance individual control over health-related decisions and behaviors. Empowerment-oriented interventions encourage families to become active participants rather than

passive observers in healthcare processes. Such involvement creates opportunities for collaborative problem-solving when mothers encounter challenges in maintaining dietary restrictions. Families that understand the implications of uncontrolled blood glucose levels are more likely to provide practical assistance and reinforce adherence-related behaviors. Educational intervention studies have demonstrated that empowerment-based strategies improve self-care practices, confidence, and health outcomes among women diagnosed with GDM (Lamadah et al., 2022). The effectiveness of these interventions derives from their ability to strengthen both individual competencies and supportive social relationships. The present findings provide empirical support for the application of empowerment principles within community-based maternal healthcare settings.

Another important interpretation concerns the role of family empowerment in facilitating maternal self-management. Effective GDM management requires continuous monitoring of food intake, physical activity, and overall lifestyle behaviors throughout pregnancy. These responsibilities may become overwhelming when mothers attempt to manage them independently. Family empowerment helps distribute these responsibilities across household members, reducing the burden placed on pregnant women while improving adherence opportunities. Research focusing on self-care education has consistently emphasized that sustainable behavioral change emerges when educational interventions are supported by ongoing social reinforcement and practical assistance (Haron et al., 2023). Group-based pregnancy care programs that integrate nutritional guidance and social support have also demonstrated positive effects on glycemic control and maternal health outcomes (He et al., 2025). The present findings suggest that empowerment-oriented family involvement may serve as an effective mechanism for translating health education into consistent behavioral practice.

From a clinical perspective, improved dietary adherence has important implications for preventing adverse pregnancy outcomes associated with GDM. Dietary regulation remains the primary non-pharmacological strategy for maintaining glycemic stability and minimizing complications during pregnancy. Failure to control blood glucose levels may increase the risk of fetal overgrowth, delivery complications, and future metabolic disorders among both mothers and children (Hod et al., 2025). Long-term evidence further suggests that women who experience poorly managed GDM are at greater risk of developing type 2 diabetes after pregnancy, making adherence during the gestational period particularly important (Stefanus et al., 2023). International clinical guidelines continue to emphasize dietary management as a central component of GDM care because of its direct influence on maternal and neonatal outcomes (American Diabetes Association Professional Practice Committee, 2026). The significant association identified in this study indicates that family empowerment may function as an important protective factor supporting successful implementation of dietary recommendations. Strengthening family participation could therefore contribute to improved metabolic control and healthier pregnancy outcomes.

The findings also possess practical implications for primary healthcare services responsible for maternal and child health programs. Community health centers frequently serve as the first point of contact for pregnant women and therefore represent strategic settings for implementing family-centered interventions. Screening initiatives, nutritional counseling, and educational programs may become more effective when family members are actively involved in the learning process. Previous community-based studies have emphasized the importance of early identification of GDM risk factors and comprehensive educational efforts aimed at strengthening maternal health literacy (Julianti & Zahara, 2025). Family participation can amplify the impact of these interventions by ensuring that health messages are reinforced within the household environment. Diagnostic and management frameworks recommended by the World Health Organization (2013) increasingly recognize the importance of integrating behavioral and social determinants into maternal healthcare strategies. The current findings support the incorporation of family empowerment components into routine antenatal care services for women at risk of, or diagnosed with, gestational diabetes.

The relationship identified in this study also resonates with broader evidence demonstrating that family engagement contributes to improved management of chronic health conditions. Studies investigating hypertension and other non-communicable diseases have shown that supportive family environments facilitate adherence to treatment recommendations and promote healthier lifestyle behaviors (Pribadi et al., 2024). Similar mechanisms appear to operate within the context of gestational diabetes, where family involvement influences daily dietary decisions and reinforces adherence-related behaviors. Family empowerment creates a supportive ecosystem that enables pregnant women to

navigate the complex demands of disease management while maintaining psychological well-being. The statistical evidence generated by this study confirms that family empowerment constitutes a meaningful factor associated with dietary adherence among women with GDM. These findings contribute to the growing body of evidence supporting family-centered healthcare approaches and underscore the importance of integrating family empowerment into maternal health promotion programs. Future intervention-based research may further explore the causal pathways through which empowerment strategies influence adherence and long-term metabolic outcomes among pregnant women.

CONCLUSION

This study confirms a statistically significant relationship between family empowerment and dietary adherence among third-trimester pregnant women with gestational diabetes mellitus (GDM) in the Summersari Community Health Center service area, Jember. The findings demonstrate that pregnant women who received stronger family empowerment tended to exhibit higher levels of adherence to recommended dietary management practices. Family empowerment was reflected through active participation in meal preparation, dietary supervision, emotional support, accompaniment during antenatal care visits, and encouragement to maintain healthy lifestyle behaviors throughout pregnancy. These forms of involvement contributed to the successful implementation of dietary recommendations aimed at controlling blood glucose levels and reducing the risk of metabolic complications. The results indicate that dietary adherence is not solely determined by individual motivation or knowledge but is also strongly influenced by the supportive role of family members within the household environment. The statistical evidence generated by this study reinforces the importance of integrating family-centered approaches into maternal healthcare services, particularly for women diagnosed with GDM. Family empowerment should therefore be recognized as an important behavioral and social determinant that supports effective gestational diabetes management.

The study also highlights the critical role of dietary regulation in maintaining glycemic stability during pregnancy. Adherence to nutritional recommendations, including limiting simple sugars, reducing excessive carbohydrate intake, increasing dietary fiber consumption, and minimizing the consumption of highly processed foods, contributes to better glucose control and supports healthier pregnancy outcomes. Effective dietary management may reduce the likelihood of adverse maternal and neonatal complications, including excessive fetal growth, delivery-related difficulties, and long-term metabolic disorders. The findings further suggest that emotional well-being should be considered an integral component of GDM management because psychological stress may negatively affect metabolic regulation and adherence-related behaviors. Supportive family environments can help pregnant women cope with emotional challenges, maintain motivation, and sustain healthy routines throughout pregnancy. This interaction between nutritional behavior, emotional support, and family involvement demonstrates the multifactorial nature of gestational diabetes management. Efforts to improve maternal health outcomes should therefore address both physiological and psychosocial dimensions of care.

The implications of this study extend beyond individual clinical management and contribute to the development of community-based maternal health strategies. Healthcare professionals should strengthen educational interventions that actively involve family members rather than focusing exclusively on pregnant women as the primary recipients of health information. Family-centered counseling programs may enhance the effectiveness of dietary education by ensuring that health recommendations are reinforced within the household context. The findings also suggest that empowerment-based approaches can serve as practical and sustainable strategies for improving adherence to therapeutic diets among women with GDM. Future research is encouraged to examine additional determinants of dietary adherence and gestational diabetes management, including health literacy, nutritional knowledge, physical activity, psychological factors, socioeconomic conditions, and access to healthcare services. Longitudinal and intervention-based studies may provide deeper insights into the causal mechanisms linking family empowerment and maternal health outcomes. Expanding the scope of investigation will contribute to a more comprehensive understanding of how family and environmental factors influence the prevention and management of gestational diabetes in diverse community settings.

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