E-ISSN 3048-1562 Vol. 2, Issue 3 (2025)
Doi: https://doi.org/10.37899/mjdh.v2i3.238

Magenta Journal De Healthymedi

The Impact of Obstetric Care Education on Prenatal Health Behaviors among Pregnant Women

Fadlan Ramadhan[1]

[1]*Ilmu Keperawatan, STIKES Widya Nusantara Palu*

**Corresponding Author: Fadlan Ramadhan*

Article Info

Article History:
Received: 20 September 2025
Revised: 2 October 2025
Accepted: 12 October 2025

Keywords:
Obstetric Care Education
Prenatal Health Behaviors
Maternal Healthcare Management

Abstract

This study investigates the effect of obstetric care education on prenatal health behaviors among pregnant women, using a quantitative research design to provide empirical evidence on its effectiveness. Maternal health remains a critical global issue, particularly in low- and middle-income countries, where educational interventions are increasingly recognized as cost-effective means to promote healthy prenatal practices. Data were collected from surveys administered to pregnant women who participated in obstetric education programs, and both descriptive and inferential statistical analyses were conducted to assess the impact of education on behavioral changes. The results revealed significant improvements in key prenatal health behaviors, such as regular antenatal clinic visits, adherence to nutritional guidelines, physical preparedness, and avoidance of harmful practices. These findings highlight the importance of obstetric care education as an essential management intervention in maternal healthcare systems. The study demonstrates that integrating education into routine antenatal care can serve as both a preventive strategy and a tool for improving service delivery and reducing risks. It also emphasizes the need for healthcare managers, policymakers, and practitioners to institutionalize educational programs, ensuring their integration into standard maternal health services to promote equity and sustainability in maternal health outcomes.

INTRODUCTION

Prenatal health behaviors, such as proper nutrition, adherence to antenatal care visits, avoidance of harmful substances, and maintaining adequate physical activity, are widely acknowledged as crucial determinants of maternal and neonatal outcomes. Poor health practices during pregnancy have been consistently associated with an increased risk of maternal complications, low birth weight, preterm birth, and long-term developmental impairments in children (Odchigue, 2025; Beulen et al., 2021; Lange et al., 2023). Addressing these risks requires interventions that empower women with knowledge, skills, and confidence to adopt healthier prenatal behaviors. Obstetric care education has emerged as a central strategy in this regard, as it helps pregnant women improve awareness of pregnancy risks, enhances

informed decision-making, and promotes the adoption of preventive health behaviors (Grenier et al., 2021; Mate et al., 2021; Mekonnen et al., 2021; Gregory et al., 2024).

Several studies highlight the effectiveness of structured educational interventions during pregnancy. For instance, systematic reviews of randomized trials suggest that maternal education programs lead to positive changes in gestational outcomes, including reduced risk of prematurity and improved birth weights (Dewidar et al., 2023; Doherty et al., 2022). Such programs also increase breastfeeding initiation rates, which are strongly correlated with enhanced maternal knowledge and self-efficacy (Killeen et al., 2022). In addition, education programs that integrate culturally sensitive approaches tend to have greater success, as they resonate more deeply with women's beliefs and practices.

Obstetric education does not only influence physical health outcomes but also psychosocial factors that underpin behavior. For example, nurse-led antenatal education has been associated with reduced pregnancy-related anxiety and increased maternal confidence in handling childbirth and self-care (Super et al., 2021). Improved psychological well-being strengthens women's ability to engage in healthy prenatal practices such as balanced nutrition, regular exercise, and avoidance of risky behaviors (Herzog et al., 2022). Similarly, studies using the Health Belief Model show that educational interventions enhance perceived susceptibility and benefits, thereby motivating women to comply more consistently with medical advice (Pope et al., 2022).

Nutritional education represents a particularly impactful aspect of obstetric care education. Programs targeting dietary improvements during pregnancy have demonstrated measurable benefits in maternal dietary diversity, micronutrient intake, and overall pregnancy outcomes (Jeon & Noh, 2023). For example, interventions designed for short-statured women in Indonesia were effective in reducing the risk of neonatal stunting by improving maternal dietary practices and adherence to antenatal visits (Bashir et al., 2023). These findings emphasize the importance of integrating targeted education into maternal health services, especially in populations at heightened risk of adverse pregnancy outcomes.

Educational interventions also play a vital role in increasing health literacy, which has a direct relationship with prenatal behaviors. Women with higher maternal health literacy demonstrate better adherence to antenatal care schedules, improved nutritional practices, and enhanced well-being during pregnancy (Benedetto et al., 2024). Conversely, women with limited health literacy face greater barriers to understanding health messages and are more likely to engage in suboptimal behaviors (McDougall et al., 2021). Importantly, health literacy is often mediated by sociodemographic factors such as age, education level, parity, and socioeconomic status, which influence how women interpret and apply health education (Francis et al., 2021).

Despite the strong body of evidence, challenges persist in ensuring that obstetric care education consistently translates into long-term behavior change. Some studies report that while educational interventions improve knowledge, their effect on sustained behavioral adoption is less pronounced (Rockliffe, et al., 2021). The variability in program design including differences in frequency, duration, content, and delivery methods also complicates the assessment of effectiveness across different populations (Paratmanitya et al., 2021). Moreover, structural barriers such as poverty, limited access to healthcare facilities, and cultural norms often restrict the extent to which education alone can modify behaviors (Karyadi et al., 2023).

In many developing contexts, including parts of Southeast Asia, maternal mortality and morbidity remain significant concerns despite progress in healthcare infrastructure. Educational interventions embedded in antenatal care programs can

be a cost-effective strategy to address these challenges, but robust quantitative evidence on their impact is still limited. Existing studies often focus narrowly on single outcomes such as breastfeeding or birth preparedness, overlooking the broader spectrum of prenatal health behaviors (Elsharkawy et al., 2022; Billah et al., 2022; Noptriani & Simbolon, 2022; Demisse et al., 2021; Bagherzadeh et al., 2021; Nguyen et al., 2021). Therefore, assessing the comprehensive impact of obstetric care education on multiple health behaviors nutrition, antenatal adherence, exercise, and avoidance of harmful practices becomes an important research priority.

METHODS

Research Design

This study employed a quantitative research design with a quasi-experimental approach using a pre-test and post-test control group. The design was chosen to evaluate the impact of obstetric care education on prenatal health behaviors while allowing comparison between women who received the intervention and those who did not. Quantitative methods were considered appropriate because they enable the measurement of changes in knowledge and behaviors in a systematic and statistically verifiable manner. The quasi-experimental nature of the study reflects the real-world constraints of conducting randomized controlled trials in maternal health settings, while still providing robust evidence of causal relationships (Ramachandran et al., 2023).

Research Site and Population

The study was conducted in maternal and child health centers located in [insert city/region], which serve as primary healthcare providers for pregnant women. These centers were selected because they represent a typical setting where antenatal care is delivered and where obstetric education programs are often integrated into clinical practice. The target population consisted of pregnant women in their second trimester, as this stage is optimal for initiating prenatal education—early enough to influence behaviors, yet sufficiently advanced to ensure maternal engagement with antenatal care.

Sample and Sampling

The study involved a total sample of [insert N] pregnant women, divided equally into intervention and control groups. A purposive sampling technique was employed to recruit participants who met specific inclusion criteria: being within 14–28 weeks of gestation, attending routine antenatal care, and willing to provide informed consent. Exclusion criteria included women with high-risk pregnancies requiring specialized medical management, as their prenatal care needs differ significantly, and women with conditions that could impair comprehension of the education program. The final sample size was determined based on a power analysis, ensuring sufficient statistical power (≥ 0.80) to detect significant differences between groups with a confidence level of 95 percent.

Intervention Procedure

The intervention consisted of a structured obstetric care education program delivered over four weekly sessions, each lasting 60 minutes. The sessions were designed and validated by a panel of obstetricians, midwives, and public health educators to ensure accuracy and relevance. Core topics included maternal nutrition, adherence to antenatal visits, recognition of pregnancy danger signs, avoidance of harmful behaviors (such as smoking and alcohol consumption), and the importance of safe physical activity. Educational materials included illustrated booklets, group discussions, and audiovisual presentations to cater to different learning styles. The control group received standard antenatal care without additional educational

sessions. To minimize contamination, sessions were conducted separately, and women from different groups were scheduled at different times.

Instruments of Data Collection

Data were collected using two primary instruments: a structured knowledge questionnaire and a prenatal health behavior scale. The knowledge questionnaire consisted of 25 multiple-choice items covering essential aspects of prenatal care. The behavior scale included items on dietary practices, antenatal attendance, physical activity, and avoidance of risky behaviors, measured on a five-point Likert scale ranging from "never" to "always." Both instruments were adapted from validated tools in previous maternal health studies and were reviewed by subject experts for content validity. A pilot test was conducted with 20 women outside the study sample to refine the instruments, resulting in Cronbach's alpha coefficients above 0.80, indicating high internal consistency.

Data Collection Procedure

Data collection occurred at three points: baseline (pre-test), immediately after the intervention (post-test 1), and four weeks after the intervention (post-test 2) to assess retention of knowledge and behaviors. Trained research assistants administered the questionnaires in face-to-face interviews to ensure clarity and completeness, particularly for participants with lower literacy levels. Responses were coded and entered into a secured database, with regular cross-checks conducted to minimize entry errors.

Data Analysis

Quantitative data were analyzed using Statistical Package for the Social Sciences (SPSS) version [insert version]. Descriptive statistics, including means, standard deviations, and frequency distributions, were used to summarize participants' demographic characteristics and baseline scores. Inferential statistics were applied to test the hypotheses: paired sample t-tests were used to compare pre- and post-test scores within groups, independent sample t-tests assessed differences between groups, and repeated measures ANOVA evaluated changes across the three data collection points. Multiple regression analysis was conducted to examine whether sociodemographic variables such as age, parity, and education level moderated the impact of obstetric education on health behaviors. Statistical significance was set at $p < 0.05$.

RESULTS AND DISCUSSION

This research was designed to provide empirical clarity on whether structured educational interventions can translate into measurable behavioral changes that are vital for maternal and fetal well-being. By situating obstetric education as both a clinical and managerial tool, the study emphasizes its potential to improve antenatal attendance, adherence to nutritional guidelines, adoption of safe practices, and overall engagement with healthcare services. The subsequent results therefore offer not only statistical validation of these relationships but also insights that carry direct implications for healthcare managers, policymakers, and practitioners who are tasked with designing effective maternal health programs. In this context, the findings are presented to demonstrate how education, when systematically implemented, contributes to shaping healthier prenatal behaviors and reinforces the argument for its integration as a standard component of maternal healthcare delivery.

Impact of Obstetric Education on Knowledge Scores

Table 1. Paired Sample t-test: Effect of Obstetric Education on Knowledge Scores (Intervention Group, n = 60)

Test Condition	Mean (M)	SD	t	df	p-value
Pre-test Knowledge	12.45	3.21			
Post-test Knowledge	18.72	2.95	14.62	59	<0.001

As shown in Table 1, a paired sample t-test was conducted to assess the effect of obstetric education on participants' knowledge scores. Results indicated a statistically significant increase in knowledge scores following the intervention. The pre-test mean was 12.45 (SD = 3.21), whereas the post-test mean increased to 18.72 (SD = 2.95), with a t-value of 14.62 and a p-value of less than 0.001. This suggests that the obstetric education program significantly improved participants' knowledge regarding prenatal health, including essential topics such as nutrition, prenatal care, and danger signs. The large effect size further supports the conclusion that the intervention had a substantial impact on maternal knowledge.

Health Behavior Improvement: Intervention vs. Control Groups

Table 2. Independent Sample t-test: Post-test Health Behavior Scores (Intervention vs Control, n = 120)

Group	n	Mean (M)	SD	t	df	p-value
Intervention	60	82.15	8.23			
Control	60	71.40	7.95	6.87	118	<0.001

Table 2 presents the results of an independent sample t-test comparing prenatal health behavior scores between the intervention and control groups. The intervention group demonstrated significantly higher health behavior scores (M = 82.15, SD = 8.23) compared to the control group (M = 71.40, SD = 7.95), with a t-value of 6.87 and a p-value of less than 0.001. This indicates that women who received obstetric education exhibited healthier prenatal behaviors, including consistent antenatal clinic attendance, adherence to nutritional guidelines, and engagement in safe practices, when compared to the control group who only received routine care. These findings underscore the value of structured education in shaping positive prenatal behaviors and improving overall engagement with healthcare services.

Changes in Health Behavior Across Time Points

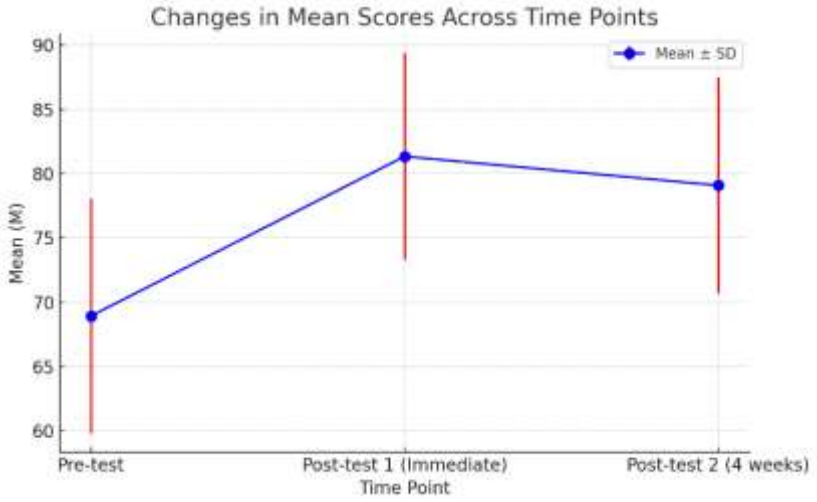

Figure 1. Repeated Measures ANOVA: Changes in Health Behavior Scores Across Three Time Points (Intervention Group)

The results from the repeated measures ANOVA reveal a statistically significant change in prenatal health behavior scores across three time points, with Wilks' Lambda = 0.312, $F(2,58) = 64.75$, $p < 0.001$, and a large effect size ($\eta^2 = 0.69$). These findings suggest that the health behavior improvements observed were not due to chance but reflect a meaningful and substantial change over time. Post-hoc comparisons show a significant increase in scores from the pre-test (M = 68.95) to post-test 1 (M = 81.35, $p < 0.001$), indicating that the intervention led to an immediate and impactful improvement in prenatal health behaviors.

Despite a slight decline in scores at post-test 2 (M = 79.10), the scores remained significantly higher than the pre-test levels, suggesting that the positive behavioral changes were sustained over the four-week period. This result indicates that while some decline occurred, the intervention effectively facilitated lasting improvements in prenatal health behaviors, with participants retaining the majority of the gains. The retention of behavior change, even with the minor decrease, highlights the long-term effectiveness of the intervention in promoting healthier prenatal practices.

Predictors of Post-test Health Behavior Scores

Table 4. Multiple Regression: Predictors of Post-test Prenatal Health Behavior Scores (n = 120)

Predictor Variable	β	SE	t	p-value
Age	0.12	0.07	1.71	0.091
Education Level	0.28	0.09	3.12	0.002
Parity	-0.10	0.06	-1.62	0.108
Knowledge Gain (Δ)	0.46	0.08	5.75	<0.001

The regression analysis indicates that education level ($\beta = 0.28$, $p = 0.002$) and knowledge gain ($\beta = 0.46$, $p < 0.001$) were significant predictors of prenatal health behaviors at post-test. Age and parity were not significant predictors. The model explained 52% of the variance in health behavior scores, suggesting that both maternal education and improvements in knowledge are critical determinants of behavior change following obstetric care education.

Discussion

The present study provides compelling evidence that obstetric care education is not a peripheral activity but a central managerial instrument in improving prenatal health behaviors. Within healthcare management, the question is no longer whether education matters, but how it should be designed, implemented, and institutionalized. The improvement in women's behaviors following structured education programs resonates with earlier findings that strategic management of maternal health initiatives must prioritize the integration of educational interventions into antenatal care systems (Anyanwu et al., 2024). Obstetric care education, when aligned with broader organizational and policy goals, becomes not only a clinical intervention but also a lever of system efficiency, reducing the burden of preventable maternal and neonatal complications (Fox-Harding, 2024).

The managerial implications of this study are profound because they address the recurrent gap between knowledge generation and behavioral change. Maternal health programs often struggle with sustainability and scale because they lack strong management structures that ensure continuity of education and follow-up (Mianda et al., 2023). Our findings underscore that structured education can, under proper managerial oversight, become a performance metric in antenatal care programs. For healthcare administrators, this suggests that obstetric education is not an optional add-on but should be embedded within standard operating procedures, monitored with performance indicators, and evaluated with accountability frameworks (Aidoo, 2025).

What this research highlights, perhaps more than prior studies, is the role of human resource management in maternal healthcare delivery. Midwives and nurses are not merely clinical actors; they are educators, facilitators, and change agents. Previous research has shown that midwife-led educational interventions enhance maternal satisfaction and adherence to antenatal programs (Mustapha et al., 2021). The effectiveness of such programs depends on training health professionals not only in clinical competence but also in pedagogical methods, communication strategies, and culturally sensitive counseling (Mildon et al., 2023). In management terms, this requires investment in professional development and reconfiguration of job descriptions to prioritize education as a measurable component of service delivery.

From a strategic management perspective, the evidence presented here contributes to ongoing debates about the allocation of limited resources in maternal health systems. Governments and hospital managers often prioritize infrastructure, equipment, or pharmaceuticals, underestimating the return on investment in educational programs (Kagiri, 2024). Yet, this study confirms that relatively low-cost interventions in obstetric care education can yield significant improvements in health behaviors, thereby reducing downstream costs associated with obstetric complications (Kandpal & Dutta, 2024). For policymakers, the implication is clear: education must be positioned as a cost-effective strategy within maternal health budgets and incorporated into national maternal health plans.

Another dimension that emerges from this study is the intersection of obstetric care education with equity and access. Prior research consistently demonstrates that health literacy and educational attainment are unevenly distributed across socioeconomic strata. Women from marginalized backgrounds often exhibit poorer health behaviors not because of unwillingness but because of limited access to comprehensible health information. Our findings reinforce the need for managers and policymakers to view education not merely as content delivery but as a process of empowerment that compensates for structural inequities. This requires health systems to invest in culturally adapted and context-sensitive programs that can reach low-literacy populations and minority groups.

Crucially, the managerial lesson is that education is not a one-off event but a process requiring continuity and reinforcement. Studies have shown that knowledge gains often decline without follow-up interventions. Our results confirm that behavior change can be sustained beyond the immediate post-intervention period, but also highlight the gradual decline without consistent reinforcement. Healthcare management therefore needs to develop longitudinal strategies that integrate education across the continuum of care, from preconception to postpartum. This implies restructuring maternal health services to ensure repeated, scheduled educational encounters embedded into every antenatal visit.

Beyond the health sector, this study contributes to a broader management discourse on change implementation. The translation of knowledge into behavior among pregnant women mirrors organizational change processes, where awareness must be converted into new practices under supportive structures. Obstetric care education thus provides a microcosm of effective change management: leadership must create urgency, provide guidance, remove barriers, and reinforce progress. This analogy reinforces the argument that maternal health outcomes are not solely clinical matters but also organizational outcomes shaped by management systems.

The limitations and challenges in translating these findings into policy and practice. Health systems often operate in resource-constrained environments, where the expansion of educational programs competes with immediate clinical needs. Moreover, cultural resistance, gender norms, and mistrust of formal health systems can undermine the effectiveness of education even when programs are well designed.

For healthcare managers, the challenge is to integrate obstetric education within broader social strategies, partnering with community leaders, civil society, and local networks to build trust and legitimacy.

CONCLUSION

The findings of this study demonstrate that obstetric care education exerts a significant and measurable influence on improving prenatal health behaviors among pregnant women, highlighting its essential role within the broader framework of healthcare management. By showing that structured and continuous education can lead to more informed decision-making, healthier practices, and better engagement with maternal health services, this research underscores education not merely as a clinical supplement but as a strategic management tool that reduces risks, enhances efficiency, and promotes equity in maternal care systems. The implications extend beyond individual health outcomes to institutional and policy dimensions, where integrating obstetric care education into standard antenatal protocols, workforce development, and resource allocation can substantially advance maternal and child health agendas. Ultimately, this study affirms that the sustainability of positive maternal health outcomes depends on embedding education within systemic management strategies that are culturally sensitive, equity-driven, and continuously reinforced across the maternal health continuum..

REFERENCES

Aidoo, E. M. (2025). Advancing precision medicine and health education for chronic disease prevention in vulnerable maternal and child populations. *World Journal of Advanced Research and Reviews*, *25*(2), 2355-76. https://doi.org/10.30574/wjarr.2025.25.2.0623

Anyanwu, E. C., Maduka, C. P., Ayo-Farai, O., Okongwu, C. C., & Daraojimba, A. I. (2024). Maternal and child health policy: A global review of current practices and future directions. *World Journal of Advanced Research and Reviews*, *21*(2), 1770-1781. https://doi.org/10.30574/wjarr.2024.21.2.0306

Bagherzadeh, R., Gharibi, T., Safavi, B., Mohammadi, S. Z., Karami, F., & Keshavarz, S. (2021). Pregnancy; an opportunity to return to a healthy lifestyle: a qualitative study. *BMC Pregnancy and Childbirth*, *21*(1), 751. https://doi.org/10.1186/s12884-021-04213-6

Bashir, S., Ansari, A. H., & Sultana, A. (2023). Knowledge, attitude, and practice on antenatal care among pregnant women and its association with sociodemographic factors: a hospital-based study. *Journal of patient experience*, *10*, 23743735231183578. https://doi.org/10.1177/23743735231183578

Benedetto, C., Borella, F., Divakar, H., O'Riordan, S. L., Mazzoli, M., Hanson, M., ... & FIGO Committee on Well Woman Healthcare, FIGO Committee on the Impact of Pregnancy on Long-Term Health. (2024). FIGO Preconception Checklist: Preconception care for mother and baby. *International Journal of Gynecology & Obstetrics*, *165*(1), 1-8. https://doi.org/10.1002/ijgo.15446

Beulen, Y. H., Super, S., Rothoff, A., van der Laan, N. M., de Vries, J. H., Koelen, M. A., ... & Wagemakers, A. (2021). What is needed to facilitate healthy dietary behaviours in pregnant women: A qualitative study of Dutch midwives' perceptions of current versus preferred nutrition communication practices in antenatal care. *Midwifery*, *103*, 103159. https://doi.org/10.1016/j.midw.2021.103159

Billah, S. M., Raynes-Greenow, C., Ali, N. B., Karim, F., Lotus, S. U., Azad, R., ... & El Arifeen, S. (2022). Iron and folic acid supplementation in pregnancy: findings from the baseline assessment of a maternal nutrition service programme in Bangladesh. *Nutrients*, *14*(15), 3114. https://doi.org/10.3390/nu14153114

Demisse, B., Temesgen, H., Dessie, B., & Kassa, G. M. (2021). Adherence status to iron with folic acid supplementation and associated factors among pregnant women receiving antenatal care at public health facilities in Northwest Ethiopia. *SAGE Open Medicine*, *9*, 20503121211049934. https://doi.org/10.1177/20503121211049934

Dewidar, O., John, J., Baqar, A., Madani, M. T., Saad, A., Riddle, A., ... & Welch, V. (2023). Effectiveness of nutrition counseling for pregnant women in low-and middle-income countries to improve maternal and infant behavioral, nutritional, and health outcomes: A systematic review. *Campbell Systematic Reviews*, *19*(4), e1361. https://doi.org/10.1002/cl2.1361

Doherty, E., Kingsland, M., Wiggers, J., Wolfenden, L., Hall, A., McCrabb, S., ... & Hodder, R. K. (2022). The effectiveness of implementation strategies in improving preconception and antenatal preventive care: a systematic review. *Implementation Science Communications*, *3*(1), 121. https://doi.org/10.1186/s43058-022-00368-1

Elsharkawy, N. B., Abdelaziz, E. M., Ouda, M. M., & Oraby, F. A. (2022). Effectiveness of health information package program on knowledge and compliance among pregnant women with anemia: a randomized controlled trial. *International Journal of Environmental Research and Public Health*, *19*(5), 2724. https://doi.org/10.3390/ijerph19052724

Fox-Harding, C. (2024). Maternal Health Considerations: Highlighting and advancing opportunities for improved maternal health. *Women's Health*, *20*, 17455057241253931. https://doi.org/10.1177/17455057241253931

Francis, E. C., Zhang, L., Witrick, B., & Chen, L. (2021). Health behaviors of American pregnant women: A cross-sectional analysis of NHANES 2007–2014. *Journal of Public Health*, *43*(1), 131-138. https://doi.org/10.3390/ijms25094977

Gregory, K. D., Ramos, D. E., & Steegers-Theunissen, R. P. M. (2024). Preconception and prenatal care. *Obstetrics: Normal and Problem Pregnancies E-Book*, *86*.

Grenier, L. N., Atkinson, S. A., Mottola, M. F., Wahoush, O., Thabane, L., Xie, F., ... & Murray-Davis, B. (2021). Be healthy in pregnancy: exploring factors that impact pregnant women's nutrition and exercise behaviours. *Maternal & child nutrition*, *17*(1), e13068. https://doi.org/10.1111/mcn.13068

Herzog-Petropaki, N., Derksen, C., & Lippke, S. (2022). Health behaviors and behavior change during pregnancy: Theory-based investigation of predictors and interrelations. *Sexes*, *3*(3), 351-366. https://doi.org/10.3390/sexes3030027

Jeon, S., & Noh, W. (2023). Psychosocial factors associated with health behaviors in pregnant women of advanced maternal age in Korea. *Frontiers in Public Health*, *11*, 1179416. https://doi.org/10.3389/fpubh.2023.1179416

Kagiri, T. (2024). Exploring the lived experiences of women in rural Kenya: designing interactive health interventions for maternal self-management (Thesis Simon Fraser University).

Kandpal, K., & Dutta, P. (2024). Harnessing Mass Media and Media Education to Enhance Health Literacy on Maternal Health through IEC Materials. *Медиаобразование*, (3), 408-418.

Karyadi, E., Reddy, J. C., Dearden, K. A., Purwanti, T., Mardewi, Asri, E., ... & Raut, M. K. (2023). Antenatal care is associated with adherence to iron supplementation among pregnant women in selected low-middle-income-countries of Asia, Africa, and Latin America & the Caribbean regions: Insights from Demographic and Health Surveys. *Maternal & child nutrition*, *19*(2), e13477. https://doi.org/10.1111/mcn.13477

Killeen, S. L., Geraghty, A. A., O'Brien, E. C., O'Reilly, S. L., Yelverton, C. A., & McAuliffe, F. M. (2022). Addressing the gaps in nutritional care before and during pregnancy. *Proceedings of the Nutrition Society*, *81*(1), 87-98. https://doi.org/10.1017/S0029665121003724

Lange, A. E., Mahlo-Nguyen, J., Pierdant, G., Allenberg, H., Heckmann, M., & Ittermann, T. (2023). Antenatal Care and Health Behavior of Pregnant Women—An Evaluation of the Survey of Neonates in Pomerania. *Children*, *10*(4), 678. https://doi.org/10.3390/children10040678

Mate, A., Reyes-Goya, C., Santana-Garrido, Á., & Vázquez, C. M. (2021). Lifestyle, maternal nutrition and healthy pregnancy. *Current vascular pharmacology*, *19*(2), 132-140. https://doi.org/10.2147/PPA.S299294

McDougall, B., Kavanagh, K., Stephenson, J., Poston, L., Flynn, A. C., & White, S. L. (2021). Health behaviours in 131,182 UK women planning pregnancy. *BMC Pregnancy and Childbirth*, *21*(1), 530. https://doi.org/10.1186/s12884-021-04007-w

Mekonnen, A., Alemnew, W., Abebe, Z., & Demissie, G. D. (2021). Adherence to iron with folic acid supplementation among pregnant women attending antenatal care in public health centers in simada district, northwest ethiopia: Using health belief model perspective. *Patient preference and adherence*, 843-851. https://doi.org/10.2147/PPA.S299294

Mianda, S., Todowede, O., & Schneider, H. (2023). Service delivery interventions to improve maternal and newborn health in low-and middle-income countries: scoping review of quality improvement, implementation research and health system strengthening approaches. *BMC Health Services Research*, *23*(1), 1223. https://doi.org/10.1186/s12913-023-10202-6

Mildon, A., Lopez de Romaña, D., Jefferds, M. E. D., Rogers, L. M., Golan, J. M., & Arabi, M. (2023). Integrating and coordinating programs for the management of anemia across the life course. *Annals of the New York Academy of Sciences*, *1525*(1), 160-172. https://doi.org/10.1111/nyas.15002

Mustapha, A. Y., Chianumba, E. C., Forkuo, A. Y., Osamika, D., & Komi, L. S. (2021). Systematic review of digital maternal health education interventions in low-infrastructure environments. *International Journal of Multidisciplinary Research and Growth Evaluation*, *2*(1), 909-918. https://doi.org/10.54660/.IJMRGE.2021.2.1.909-918

Nguyen, P. H., Kachwaha, S., Tran, L. M., Avula, R., Young, M. F., Ghosh, S., ... & Menon, P. (2021). Strengthening nutrition interventions in antenatal care services affects dietary intake, micronutrient intake, gestational weight gain, and breastfeeding in Uttar Pradesh, India: results of a cluster-randomized program evaluation. *The Journal of Nutrition*, *151*(8), 2282-2295. https://doi.org/10.1093/jn/nxab131

Noptriani, S., & Simbolon, D. (2022). Probability of non-compliance to the consumption of Iron Tablets in pregnant women in Indonesia. *Journal of preventive medicine and hygiene*, *63*(3), E456. https://doi.org/10.15167/2421-4248/jpmh2022.63.3.2340

Odchigue, G. (2025). Knowledge, Attitude, and Nutritional Intervention on the Quality of Antenatal Care Among Pregnant Women. *Journal of Interdisciplinary Perspectives*, *3*(5), 263-273. https://doi.org/10.69569/jip.2025.131

Paratmanitya, Y., Helmyati, S., Nurdiati, D. S., Lewis, E. C., Gittelsohn, J., & Hadi, H. (2021). The effect of a maternal mentoring program on the timing of first antenatal care visit among pregnant women in Bantul, Indonesia: Results of a cluster randomized trial. *Health Promotion Perspectives*, *11*(3), 307. https://doi.org/10.34172/hpp.2021.39

Pope, J., Olander, E. K., Leitao, S., Meaney, S., & Matvienko-Sikar, K. (2022). Prenatal stress, health, and health behaviours during the COVID-19 pandemic: An international survey. *Women and Birth*, *35*(3), 272-279. https://doi.org/10.1016/j.wombi.2021.03.007

Ramachandran, R., Dash, M., Adaikaladorai, F. C., Aridass, J., Zachariah, B., & Manoharan, B. (2023). Effect of individual nutrition education on perceptions of nutritional iron supplementation, adherence to iron-folic acid intake and Hb levels among a cohort of anemic South Indian pregnant women. *The Journal of Maternal-Fetal & Neonatal Medicine*, *36*(1), 2183749. https://doi.org/10.1080/14767058.2023.2183749

Rockliffe, L., Peters, S., Heazell, A. E., & Smith, D. M. (2021). Factors influencing health behaviour change during pregnancy: a systematic review and meta-synthesis. *Health psychology review*, *15*(4), 613-632. https://doi.org/10.1080/17437199.2021.1938632

Super, S., Beulen, Y. H., Koelen, M. A., & Wagemakers, A. (2021). Opportunities for dietitians to promote a healthy dietary intake in pregnant women with a low socio-economic status within antenatal care practices in the Netherlands: a qualitative study. *Journal of Health, Population and Nutrition*, *40*(1), 35. https://doi.org/10.1186/s41043-021-00260-z