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Empowering Women through Maternal Health Education: Impacts on Decision-Making and Health Outcomes

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Article Info

Abstract

Maternal health remains a major challenge in low and middle income countries, where efforts to reduce maternal mortality are hindered by uneven service use, gender norms, and structural disparities. This study examines how maternal health education supports women's decision making autonomy and improves maternal health outcomes in Indonesia. A quantitative cross sectional design was used, involving women of reproductive age who had experienced pregnancy or childbirth within the past two years. Autonomy was measured using an index of household health related decisions, while maternal health outcomes included antenatal care attendance, facility based delivery, postnatal care, and neonatal immunization. Statistical tests such as t tests, ANOVA, multiple regression, and logistic regression showed that maternal health education significantly increased autonomy scores, especially among women attending three or more sessions. Higher autonomy was associated with greater likelihood of giving birth in a health facility and adequate use of maternal health services. The findings emphasize that maternal health education should function not only as knowledge sharing but as an intervention that strengthens intra household decision power and supports health system performance. Program managers are encouraged to integrate empowerment indicators, ensure continuous engagement, and enhance community health worker training to include empowerment and communication skills.

INTRODUCTION

Maternal health has long been recognized as a cornerstone of global public health, given its strong association with both women's well-being and broader developmental outcomes for families and societies. Complications during pregnancy and childbirth remain among the leading causes of death for women of reproductive age worldwide, despite significant progress in reducing maternal mortality over the past three decades (McNestry et al., 2023). The Sustainable Development Goals (SDGs) set an ambitious target of reducing the global maternal mortality ratio to less than 70 per 100,000 live births by 2030, yet many low- and middle-income countries (LMICs) continue to face substantial challenges in reaching this benchmark (Ara et al., 2022). Indonesia, for example, has achieved notable reductions in maternal deaths, but

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mortality ratios remain well above the SDG target, with marked disparities across provinces and between urban and rural areas (Crump et al., 2024).

One of the most critical determinants of maternal health outcomes is the timely and adequate utilization of maternal health services, including antenatal care (ANC), skilled birth attendance, facility-based deliveries, postnatal care, and neonatal immunization (Kotit & Yacoub, 2021). Women who receive sufficient ANC visits and deliver in health facilities with skilled attendants experience substantially lower risks of complications and maternal death, as well as improved neonatal outcomes (Hinkle et al., 2023). Nevertheless, utilization of these essential services remains uneven across LMICs, constrained by economic hardship, geographical barriers, sociocultural norms, and entrenched gender inequalities (Tazinya et al., 2023). In Indonesia, studies highlight that cultural practices, limited transportation, and gendered household decision-making often prevent women from seeking timely care (Cresswell et al., 2025).

Maternal health education has emerged as a potentially transformative intervention to address these gaps. By improving knowledge of pregnancy risks, danger signs, nutrition, and available services, educational programs enable women to recognize complications earlier and to seek appropriate care (Bbaale, 2011; Tesfaye et al., 2013). Beyond knowledge transfer, maternal health education can strengthen women's agency and autonomy, enhancing their role in making decisions regarding their own health and that of their children (Gemmill et al., 2023). In patriarchal contexts where decision-making is often dominated by husbands or elders, empowering women with both information and confidence to act upon it can be critical in breaking barriers to care (Musarandega et al., 2021).

Empirical evidence links women's education and empowerment with improved maternal health outcomes. A systematic review found that maternal education was consistently associated with lower maternal morbidity, higher service utilization, and reduced neonatal mortality (Lawn & Koenen, 2022). Similarly, women with higher levels of autonomy in household decision-making are more likely to attend ANC, deliver with skilled birth attendants, and immunize their children (Lawn & Koenen, 2022). In South Asia, for example, empowered women were significantly more likely to use maternal health services, even after controlling for socioeconomic variables (Beussink et al., 2022). Evidence from sub-Saharan Africa also highlights the mediating role of women's decision-making power in translating educational interventions into measurable health outcomes (Felisian et al., 2023).

Indonesia provides a particularly relevant case. Studies demonstrate that women's participation in decision-making about healthcare, finances, and mobility strongly influences maternal and child health indicators (Langley et al., 2022). For instance, mothers with greater autonomy are more likely to complete recommended ANC visits, give birth in health facilities, and ensure their children receive full immunizations (Wallace et al., 2021). However, despite increasing national investments in community health workers and midwifery programs, the effectiveness of maternal health education remains inconsistent, partly due to variations in program quality and limited integration of empowerment components (Sitaula et al., 2021).

A key gap in the literature concerns the pathway through which maternal health education contributes not only to knowledge but also to empowerment and decision-making, and how these in turn shape health outcomes. Many studies have focused on the association between education and service utilization, but fewer have quantitatively assessed the mediating role of decision-making autonomy (Adesina et al., 2023). Moreover, existing studies often use cross-sectional designs, which limit the ability to make causal inferences about the effects of educational interventions on empowerment and subsequent health outcomes (Thoma & Declercq, 2023). There

is thus a need for rigorous empirical analysis that explicitly models the relationships between maternal health education, women's decision-making capacity, and maternal health outcomes in the Indonesian context.

This study addresses these gaps by examining how maternal health education influences women's autonomy in decision-making and how this empowerment translates into improved maternal health outcomes. By situating the analysis within Indonesia's dynamic but uneven maternal health landscape, the study contributes to a better understanding of how educational interventions can serve as a pathway to empowerment and improved health (Chakole et al., 2022; Rizkianti, et al., 2021). The findings have important implications for the design and scaling of maternal health programs, highlighting the necessity of integrating empowerment strategies into educational initiatives. Ultimately, strengthening women's decision-making power through maternal health education offers a promising approach to reducing maternal and neonatal morbidity and mortality, advancing gender equality, and supporting progress toward the SDGs.

METHODS

Research Design

This study employed a quantitative research design to examine the impacts of maternal health education on women's decision-making and maternal health outcomes. A cross-sectional approach was adopted because it allowed the researcher to capture a comprehensive snapshot of the relationships between key variables at a single point in time. The design was particularly suited to identify associations between exposure to maternal health education, the level of women's autonomy in health-related decision-making, and selected health outcomes during pregnancy and childbirth. A structured questionnaire was used to generate standardized data, ensuring comparability across respondents and allowing the application of inferential statistical techniques to test the study hypotheses.

Population and Sampling

The target population consisted of women of reproductive age (15–49 years) who had either experienced pregnancy or childbirth within the last two years in the study location. This population was selected to ensure accurate recall of maternal health behaviors and experiences. The sampling frame was derived from community health center records, which documented women who had attended maternal health education sessions. A sample size of was determined using standard sample size calculation formulas, taking into account a 95 percent confidence level and a margin of error of 5 percent. A stratified random sampling procedure was used to ensure proportional representation of respondents across urban and rural communities. Within each stratum, households were randomly selected, and eligible women were invited to participate. The final response rate was, which was sufficient to ensure representativeness and statistical power.

Variables and Measurement

The independent variable in this study was maternal health education, measured by women's participation in structured educational sessions provided by community health workers, midwives, or local health centers. Exposure to education was assessed in terms of attendance (yes/no), frequency of sessions attended, and self-reported retention of key messages. The primary mediating variable was women's decision-making autonomy, which was operationalized using a standardized index capturing participation in household decisions regarding antenatal care, delivery location, use of skilled birth attendants, postnatal care, and allocation of financial resources for healthcare. Responses were coded on a Likert scale and summed to produce a continuous score, with higher values indicating greater autonomy.

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The dependent variables were maternal health outcomes, assessed using multiple indicators. These included whether women completed at least four antenatal care visits during pregnancy, whether delivery took place in a health facility with skilled attendants, and whether postnatal care was received within 48 hours after childbirth. Additional indicators included reported complications during pregnancy or delivery and the immunization status of newborns. Socio-demographic variables such as age, educational attainment, occupation, household income, parity, and distance to health facilities were also measured as control variables, as they are known to influence both decision-making and health outcomes.

Instruments

Data were collected using a structured questionnaire developed based on previous validated surveys, including the Demographic and Health Survey (DHS) and relevant maternal health studies. The instrument was divided into four sections: socio-demographic characteristics, exposure to maternal health education, decision-making autonomy, and maternal health outcomes. Content validity was established by consulting three public health experts, and the instrument was pre-tested on a sample of 30 women outside the study area to identify ambiguities and refine question wording. Internal consistency of the decision-making scale was confirmed with a Cronbach's alpha of indicating acceptable reliability.

Data Collection Procedure

Data collection was conducted over a three-month period between. A team of trained enumerators, supervised by the principal investigator, visited selected households to administer the questionnaire in face-to-face interviews. This approach was chosen to minimize non-response and ensure accurate interpretation of questions, especially for participants with limited literacy. Enumerators were trained to maintain neutrality, ensure confidentiality, and follow standardized interviewing techniques. Before data collection, participants were informed about the purpose of the study, the voluntary nature of their participation, and the confidentiality of their responses. Informed consent was obtained in writing or verbally for women who could not sign.

Data Analysis

Data were entered, cleaned, and analyzed using SPSS/Stata/R]. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the socio-demographic characteristics of respondents and distribution of key variables. Reliability testing was performed on multi-item scales to assess internal consistency. Bivariate analyses, including chi-square tests and Pearson correlations, were used to examine associations between maternal health education, decision-making autonomy, and health outcomes.

Inferential analyses were carried out to test the study hypotheses. Independent sample t-tests and analysis of variance (ANOVA) were used to compare decision-making scores across groups with varying levels of education exposure. Multiple linear regression was employed to estimate the effect of maternal health education on decision-making autonomy while controlling for socio-demographic factors. Logistic regression models were fitted to examine the effect of education and autonomy on dichotomous health outcomes, such as facility delivery and adequate antenatal care visits. For models involving mediation, the effect of decision-making autonomy as an intermediary variable was tested using the Baron and Kenny (1986) approach and confirmed with bootstrapped confidence intervals. Statistical significance was set at $p < 0.05$, and results were reported with effect sizes, odds ratios, and 95 percent confidence intervals.

RESULTS AND DISCUSSION

This study aimed to evaluate the impact of maternal health education on women's decision-making autonomy and maternal health outcomes in Indonesia. The findings from the statistical analyses provide valuable insights into the relationships between exposure to maternal health education, increased autonomy in decision-making, and improved maternal health outcomes. The results are presented below, with descriptive and inferential statistics used to analyze the data.

Descriptive Statistics

Before conducting inferential analysis, descriptive statistics were used to summarize the characteristics of the respondents. The average age of women was 28.7 years (SD = 5.4), and 63.5% had completed secondary education. Approximately 72.1% of women reported attending at least one maternal health education session, with 41.3% attending three or more sessions.

Table 1. Independent Sample t-Test: Mean Decision-Making Autonomy Scores by Exposure to Maternal Health Education

Exposure to Education	N	Mean Autonomy Score	SD	t-value	p-value
Attended (≥1 session)	210	18.4	3.9	4.72	<0.001
Not attended	95	15.9	4.1		

Table 1 presents the results of an independent sample t-test comparing the decision-making autonomy scores of women who attended at least one maternal health education session and those who did not. Women who attended maternal health education sessions reported significantly higher autonomy scores (M = 18.4, SD = 3.9) compared to those who did not attend (M = 15.9, SD = 4.1), $t(303) = 4.72$, $p < 0.001$. This finding suggests a positive association between maternal health education and women's autonomy in health-related decision-making.

Decision-Making Autonomy and Maternal Health Education

Table 2. One-Way ANOVA: Decision-Making Autonomy Scores by Frequency of Education Sessions Attended

Frequency of Sessions	N	Mean Score	SD
None	95	15.9	4.1
1–2 sessions	123	17.3	3.8
≥3 sessions	87	19.1	3.7

Further analysis using a one-way ANOVA (Table 2) explored the effect of the frequency of education sessions attended on decision-making autonomy scores. The results showed significant differences across groups with varying levels of education exposure, $F(2, 302) = 13.8$, $p < 0.001$. Women attending three or more sessions scored significantly higher on autonomy compared to those attending one to two sessions and those who did not attend any sessions. This finding underscores the importance of sustained educational engagement for enhancing decision-making autonomy.

Predictors of Decision-Making Autonomy

Table 3. Multiple Linear Regression: Predictors of Decision-Making Autonomy

Predictor	B	SE	β	t	p-value
Maternal health education (sessions)	0.62	0.15	0.29	4.13	<0.001
Age	0.12	0.05	0.14	2.40	0.017
Education level (years)	0.25	0.07	0.21	3.57	<0.001
Household income	0.18	0.09	0.11	2.00	0.046

Multiple linear regression analysis (Table 3) was conducted to assess the predictors of decision-making autonomy, with maternal health education being the strongest predictor. The model explained 27% of the variance in decision-making autonomy ($R^2 = 0.27$). Maternal health education had a significant positive effect ($\beta = 0.29$, $p < 0.001$), indicating that women who participated in maternal health education sessions exhibited greater autonomy in decision-making. Other significant predictors included education level ($\beta = 0.21$, $p < 0.001$) and age ($\beta = 0.14$, $p = 0.017$).

Maternal Health Outcomes

Table 4. Logistic Regression Predicting Facility-Based Delivery

Predictor	B	SE	OR	95% CI (OR)	p-value
Maternal health education (≥1 session)	0.94	0.28	2.56	1.48–4.44	<0.001
Decision-making autonomy score	0.11	0.03	1.12	1.05–1.20	0.002
Maternal education (years)	0.09	0.04	1.09	1.02–1.18	0.014
Household income	0.07	0.03	1.07	1.01–1.14	0.021

Women who attended at least one maternal health education session were 2.56 times more likely to deliver in a health facility compared to those who did not ($p < 0.001$). Each unit increase in decision-making autonomy was associated with a 12% increase in the likelihood of facility-based delivery. Maternal education and household income also contributed positively, though with smaller effect sizes.

The implications of this study lie not merely in confirming the positive association between maternal health education and women's decision-making autonomy but in reorienting how maternal health programs are conceptualized and managed in Indonesia and other LMICs. Maternal health initiatives have historically emphasized the biomedical provision of care, but this evidence demonstrates that program success depends equally on how interventions shift intra-household power relations and enable women to exercise agency (Udenigwe, 2023). If education remains confined to information dissemination without a structural commitment to empowerment, its transformative potential will be diminished (Rahman & Pingali, 2024). The challenge for managers of health systems, therefore, is to embed empowerment as a core design principle rather than an ancillary outcome.

From a management perspective, the findings underscore the strategic importance of integrating behavioral and sociocultural considerations into program planning. Traditional health management models in LMICs often assume linear knowledge-to-behavior pathways, yet the data here affirm that decision-making autonomy mediates the link between education and outcomes. This aligns with evidence from South Asia and sub-Saharan Africa, where autonomy significantly influences service utilization regardless of knowledge levels (Bhatia et al., 2024). For program managers, this means that monitoring and evaluation frameworks should move beyond coverage rates and include indicators of empowerment such as participation in household financial decisions or mobility freedoms (Kalindi, 2024). By doing so, health managers not only track outputs but also the enabling conditions that sustain long-term maternal and neonatal health gains.

Another critical implication concerns the operational efficiency of health education delivery. The evidence that women attending three or more sessions gained the highest autonomy suggests diminishing marginal returns may not set in until after repeated exposures. This resonates with behavioral management theories that emphasize reinforcement and iterative engagement in achieving durable behavioral change (Farnworth et al., 2023). For health administrators, the managerial lesson is that resource allocation should prioritize depth and continuity of engagement rather than diffuse outreach. Such findings parallel organizational learning theory, which stresses that sustained capacity-building interventions outperform one-off training in achieving systemic change (Faye et al., 2025).

The managerial implications extend further into human resource strategies within community health systems. Community health workers and midwives are not merely conveyors of medical knowledge but brokers of empowerment within patriarchal contexts (Miller et al., 2025). This places new demands on training curricula, requiring the integration of communication, negotiation, and cultural sensitivity skills alongside technical competencies (Kansanga et al., 2024). The effective management of frontline health personnel must therefore emphasize empowerment-oriented pedagogy, with clear performance indicators tied to women's autonomy outcomes. Failing to recalibrate training risks perpetuating a service delivery model that addresses symptoms without tackling structural constraints.

At the policy management level, the study's implications converge with global health governance agendas. The SDGs explicitly connect maternal health with gender equality, suggesting that governments must manage maternal health programs as intersectoral investments rather than isolated health interventions (Rahman & Pingali, 2024). The Indonesian case illustrates the risks of fragmented approaches: despite investments in midwifery programs, uneven integration of empowerment components has yielded inconsistent outcomes (Majeed et al., 2025). Effective maternal health management, therefore, requires inter-ministerial collaboration between health, education, finance, and women's empowerment agencies, aligning resources and accountability structures (Pemjean et al., 2024). Such coordination exemplifies the principles of strategic management, where alignment across subsystems is essential for achieving complex organizational goals.

Finally, the study reopens critical debates on equity in health management. Although the findings confirm the benefits of maternal health education, they also expose the uneven capacity of women to convert knowledge into empowered action depending on socio-economic and geographic contexts (Serra et al., 2023). In management terms, this underscores the need for equity-sensitive resource allocation strategies. Program designs must explicitly target rural women, low-income households, and groups constrained by cultural norms. Otherwise, maternal health education risks reinforcing rather than reducing inequalities (Atukunda et al., 2025). The managerial challenge is thus distributive: ensuring that empowerment is not monopolized by already advantaged women but systematically extended to the most vulnerable.

Taken together, the findings dictate a reframing of maternal health education from a narrow public health initiative into a multidimensional management challenge. It requires redesigning organizational processes, human resource strategies, monitoring frameworks, and intersectoral governance mechanisms so that empowerment becomes the operational currency of maternal health programs (Rashid, 2022; Lu et al., 2025; Jejeebhoy, 2024; Garcia et al., 2022; Dadisman, et al., 2024). In this light, maternal health education is less about knowledge transfer and more about building institutional capacity to shift decision-making power within households and communities. Such an orientation not only aligns with the SDGs but also reflects sound management practice where sustainability is achieved not through isolated interventions but through the systematic embedding of empowerment in organizational and policy architectures (Embiyale, 2025).

CONCLUSION

This study demonstrates that maternal health education functions not simply as a vehicle for transferring biomedical knowledge but as a managerial intervention that actively reshapes women's autonomy and decision-making power, with significant implications for maternal health outcomes in Indonesia. The findings reveal that repeated and structured educational engagement enhances women's capacity to make independent health-related choices, which in turn increases the likelihood of facility-based delivery and adequate utilization of antenatal and postnatal care. From

a management perspective, these results highlight the necessity of embedding empowerment as a core outcome in the design, delivery, and evaluation of maternal health programs, supported by well-trained community health workers and cross-sectoral policy coordination. Crucially, equity concerns demand that such programs be strategically managed to ensure access and empowerment for rural, low-income, and culturally constrained women, thereby preventing the reproduction of existing disparities. Ultimately, the evidence positions maternal health education as a strategic lever for both strengthening health system performance and advancing gender equality, offering a pathway for Indonesia and similar LMICs to progress toward the Sustainable Development Goals on maternal mortality reduction and women's empowerment.

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