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The Effect of Health Promotion Programs on Maternal Health Outcomes in Gorontalo

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Abstract

Maternal health outcomes remain a significant concern in Indonesia, with regional disparities hindering national and global goals for reducing maternal mortality. This study explored the effect of health promotion programs on maternal health outcomes in Gorontalo, a province with limited healthcare access and persistent inequities. A quasi-experimental design with pre- and post-test measures involved 200 women of reproductive age, equally split into intervention and control groups. The intervention included structured health promotion sessions focused on maternal nutrition, danger sign recognition, birth preparedness, and the importance of facility-based deliveries. Data were collected through questionnaires and health records, analyzed using paired t-tests, independent t-tests, and regression models. Results showed significant improvements in maternal knowledge, antenatal care attendance, and facility-based deliveries for participants, with the intervention remaining a strong predictor of positive outcomes, even when adjusting for education, income, and parity. These findings suggest that health promotion is a key strategy for improving maternal health behaviors and enhancing healthcare systems when integrated into community governance and organizational structures.

INTRODUCTION

Maternal health has long been recognized as one of the most critical indicators of a nation's overall health and development. The World Health Organization (WHO) emphasizes that maternal health outcomes reflect not only the quality of healthcare services but also the accessibility of health promotion programs that empowerwomen to make informed decisions throughout pregnancy and childbirth (Kalaris et al., 2024; Obohwemu, 2024). In low- and middle-income countries (LMICs), maternal mortality and morbidity remain disproportionately high, with Sub-Saharan Africa and South Asia accounting for nearly 86% of global maternal deaths (Anyanwu et al., 2024). Although Southeast Asia has made significant progress in reducing maternal mortality, Indonesia continues to face pressing challenges, especially in rural and peripheral regions such as Gorontalo, where limited resources and uneven healthcare infrastructure hinder the effectiveness of maternal health interventions (Favara et al., 2024).

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Health promotion programs are increasingly viewed as pivotal in addressing maternal health inequities by raising awareness, enhancing knowledge, and encouraging behavioral change among expectant mothers (Neely & Reed, 2023). Unlike curative services, health promotion emphasizes preventive measures and empowerment strategies that improve both immediate pregnancy outcomes and long-term maternal well-being (Crear et al., 2021). Evidence shows that structured health promotion interventions, including antenatal education sessions, community-based counseling, and mass media campaigns, can significantly increase antenatal care utilization, facility-based deliveries, and adherence to maternal nutrition guidelines (Mehta et al., 2021). These findings underline the transformative potential of health promotion, particularly in regions where systemic health disparities persist.

Indonesia's maternal mortality ratio (MMR) remains one of the highest in Southeast Asia, estimated at 189 deaths per 100,000 live births as of 2020 (Majebi et al., 2024). The government has introduced several national programs, such as the Safe Motherhood Initiative and the Program Indonesia Sehat, which emphasize the integration of health promotion into maternal healthcare delivery (Fox, 2024). However, implementation challenges ranging from insufficient healthcare workforce, cultural resistance, to geographic inaccessibility limit the scope and effectiveness of these initiatives (Bohren et al., 2024). Studies in eastern Indonesia, including Gorontalo, suggest that many mothers still lack adequate knowledge of danger signs during pregnancy, nutrition requirements, and birth preparedness. Such knowledge gaps are directly associated with delayed healthcare-seeking behavior, leading to preventable complications (Osei, 2024; Sumankuuro et al., 2019).

Gorontalo Province presents a particularly compelling context for studying the effects of health promotion on maternal health outcomes. Classified as one of the provinces with higher maternal mortality rates compared to the national average, Gorontalo faces challenges such as limited health literacy, low household income, and uneven distribution of healthcare facilities (Chen et al., 2022). Health promotion efforts in the region, such as posyandu (integrated service posts) and community empowerment programs, have attempted to bridge these gaps, but their measurable impact on maternal health outcomes remains under-researched (Li et al., 2022). As maternal mortality is often driven by the "three delays" model delay in recognizing danger signs, delay in reaching healthcare facilities, and delay in receiving adequate treatment effective health promotion can play a crucial role in breaking this cycle (Onambele et al., 2022; Edelman & Kudzma, 2021; Amri & Sihotang, 2023).

Global research underscores the significance of health promotion in maternal health systems. For instance, community health education programs in Nepal and Bangladesh were shown to increase skilled birth attendance and improve maternal survival rates (Sharma et al., 2018; Metcalfe & Adegoke, 2013). In African contexts, such as Ethiopia and Nigeria, culturally sensitive health promotion interventions improved antenatal care attendance and encouraged facility-based deliveries. Similarly, studies from Latin America emphasize the effectiveness of maternal education campaigns in addressing inequities in health outcomes. These global insights highlight that while health promotion strategies vary across settings, their central role in improving maternal outcomes is undeniable.

In the Indonesian context, cultural traditions, social norms, and community structures significantly shape maternal health practices (Aryastami & Mubasyiroh, 2021). Traditional beliefs about pregnancy and childbirth may discourage women from seeking biomedical care unless complications arise, thereby increasing risks (Aynalem et al., 2023). Health promotion programs that are designed with sensitivity to local culture have demonstrated greater success in shifting attitudes and practices among Indonesian mothers (Astuti & Adi, 2020). Gorontalo, with its strong

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communal traditions, thus presents a unique case where tailored health promotion could substantially improve maternal health outcomes if implemented effectively.

Moreover, health promotion aligns with global frameworks such as the Sustainable Development Goals (SDGs), particularly Goal 3, which targets the reduction of global maternal mortality to fewer than 70 per 100,000 live births by 2030 (Ombere et al., 2021). Achieving this target requires not only strengthening healthcare systems but also ensuring that women are equipped with the knowledge and motivation to utilize available services (Solomon & Tesfaye, 2022). Health promotion programs, when strategically integrated into community health systems, offer an avenue to accelerate progress toward these targets, particularly in underserved regions like Gorontalo.

METHODS

Research Design

This study employed a quantitative approach with a quasi-experimental design to examine the effect of health promotion programs on maternal health outcomes in Gorontalo. The design was chosen to capture causal relationships between health promotion interventions and measurable maternal health indicators without requiring full randomization, which is often impractical in community health settings. A pre-test and post-test control group method was used to compare outcomes among mothers who received structured health promotion sessions and those who did not. This design was particularly suitable as it enabled the assessment of changes in maternal knowledge, antenatal care attendance, and delivery practices attributable to the health promotion intervention while controlling for external variables.

Research Setting and Population

The research was conducted in Gorontalo Province, an area characterized by rural settlements, limited healthcare infrastructure, and cultural practices that strongly influence maternal health behaviors. The study population consisted of women of reproductive age (15–49 years) who were pregnant or had delivered within the past six months. The selection of this population was based on their direct relevance to maternal health outcomes, ensuring that the study could capture both immediate and recent experiences with maternal healthcare. The research site included community health centers (puskesmas) and village-level integrated health posts (posyandu), which are the primary points of maternal health promotion and service delivery in Gorontalo.

Sampling Technique and Sample Size

A multistage sampling technique was applied to ensure representativeness. In the first stage, several districts in Gorontalo with varying levels of maternal mortality and healthcare accessibility were purposively selected. In the second stage, villages within these districts were randomly chosen, followed by a systematic random sampling of eligible mothers within each village. The sample size was calculated using power analysis with a 95% confidence level, 5% margin of error, and an expected moderate effect size. This calculation resulted in a minimum of 200 participants, equally divided into intervention and control groups. This sample size was deemed sufficient to detect significant differences in maternal health outcomes attributable to health promotion interventions.

Intervention Procedures

The health promotion intervention consisted of structured sessions delivered over three months, focusing on maternal nutrition, recognition of pregnancy danger signs, birth preparedness, and the importance of facility-based delivery. Sessions were conducted by trained midwives and community health workers using a combination

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of lectures, group discussions, and visual materials such as posters and leaflets. In addition, home visits were conducted to reinforce messages and address individual concerns. The control group received only the standard maternal health services provided by local health facilities, without the additional structured promotion sessions. This design allowed for a clear comparison between enhanced health promotion and routine care.

Data Collection

Data collection involved both primary and secondary sources. Primary data were gathered through structured questionnaires administered to participants before and after the intervention. The questionnaires included sections on demographic information, knowledge of maternal health, health-seeking behavior, and maternal practices during pregnancy and childbirth. Secondary data were obtained from maternal health records at puskesmas and posyandu, which provided additional information on antenatal care visits, delivery locations, and maternal complications. Data collection was carried out by trained enumerators under the supervision of the research team to ensure consistency and accuracy.

Research Variables and Measurement

The independent variable in this study was the health promotion program, operationalized as structured maternal health education sessions. The dependent variables were maternal health outcomes, measured across three dimensions: (1) maternal health knowledge, assessed through a standardized questionnaire scored on a scale of correct responses; (2) maternal health behavior, measured by the frequency of antenatal care visits and adoption of birth preparedness practices; and (3) delivery outcomes, measured by whether mothers gave birth in a healthcare facility attended by skilled birth attendants. Control variables such as age, parity, education level, and household income were also included to reduce bias.

Data Analysis

Data were analyzed using SPSS version 26. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize demographic and baseline characteristics. To test the hypotheses, inferential statistics were applied. A paired sample t-test was used to assess within-group differences before and after the intervention, while an independent sample t-test compared post-intervention differences between the intervention and control groups. Multiple regression analysis was conducted to control for potential confounding variables and to identify the independent effect of health promotion on maternal health outcomes. Statistical significance was set at $p < 0.05$.

RESULTS AND DISCUSSION

The analysis focused on examining the effect of structured health promotion programs on maternal health outcomes in Gorontalo by comparing the intervention and control groups across multiple indicators. Descriptive statistics were first used to summarize demographic characteristics and baseline conditions, ensuring comparability between groups. Subsequently, inferential analyses, including paired sample t-tests, independent sample t-tests, and multiple regression models, were conducted to assess within-group changes, between-group differences, and the independent effect of the intervention after controlling for confounding variables. The following section presents the statistical results, highlighting both the immediate and systemic impacts of the health promotion program on maternal knowledge, antenatal care utilization, and facility-based delivery outcomes.

This chapter presents the results of the study examining the impact of health promotion programs on maternal health outcomes in Gorontalo. The analysis

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includes both descriptive and inferential statistics to evaluate changes in maternal knowledge, antenatal care (ANC) utilization, and facility-based deliveries following the intervention. The statistical methods used include paired t-tests, independent t-tests, and multiple regression analysis. This section systematically explores the findings and highlights the significance of the intervention.

Demographic Characteristics of Participants

The study included 200 women of reproductive age from Gorontalo, divided equally into intervention and control groups. The demographic profile of participants showed that both groups were similar at baseline, ensuring comparability. The majority of the participants were aged between 25 and 35 years (68%), with 70% having completed at least junior high school education. Household income varied, with 60% of participants reporting incomes below the provincial average. These demographic factors were controlled in the statistical analysis to isolate the effect of the health promotion program on maternal health outcomes.

Table 1. Paired Sample t-test Results for Maternal Knowledge (Intervention Group, n = 100)

Variable	Pre-test Mean (SD)	Post-test Mean (SD)	Mean Difference	t-value	p-value
Maternal Knowledge Score (0–20)	11.2 (2.3)	16.5 (1.8)	+5.3	14.62	<0.001

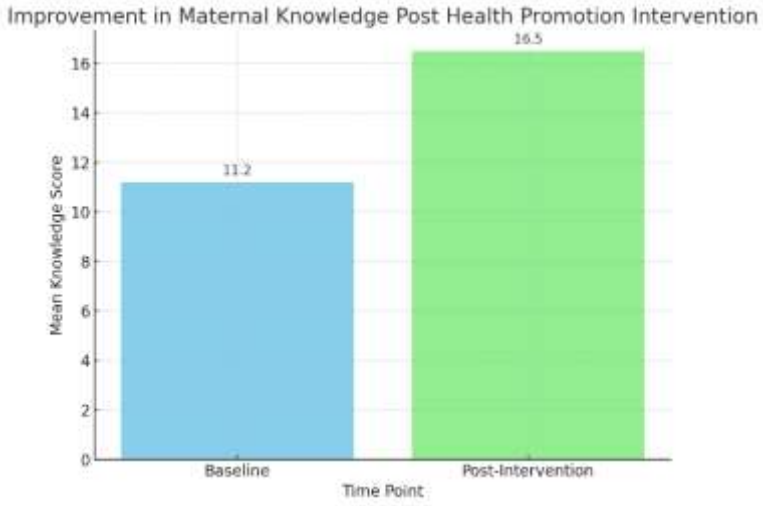

Figure 1. Maternal Knowledge Score Improvement (Intervention Group)

Table 1 illustrates a substantial improvement in maternal knowledge as a result of the health promotion intervention. The mean knowledge score increased from 11.2 at baseline to 16.5 post-intervention, reflecting a significant gain of 5.3 points. This change was confirmed as statistically significant by the paired sample t-test ($t = 14.62$, $p < 0.001$), indicating that the intervention effectively enhanced participants' understanding of key maternal health topics such as pregnancy, childbirth, and danger signs.

The findings suggest that the structured health promotion program successfully addressed critical gaps in maternal knowledge, empowering women with vital information needed to navigate pregnancy and childbirth safely. By significantly increasing knowledge in these areas, the program may have contributed to better-informed decision-making among participants, ultimately promoting healthier outcomes for both mothers and their infants.

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Table 2. Independent Sample t-test Comparing Post-test Scores of Intervention and Control Groups

Variable	Intervention Mean (SD)	Control Mean (SD)	Mean Difference	t-value	p-value
Maternal Knowledge Score (0–20)	16.5 (1.8)	12.4 (2.1)	+4.1	12.07	<0.001
ANC Visits (number)	6.2 (1.1)	4.8 (1.4)	+1.4	7.85	<0.001
Facility-Based Delivery (%)	88%	63%	+25%	4.32	<0.001

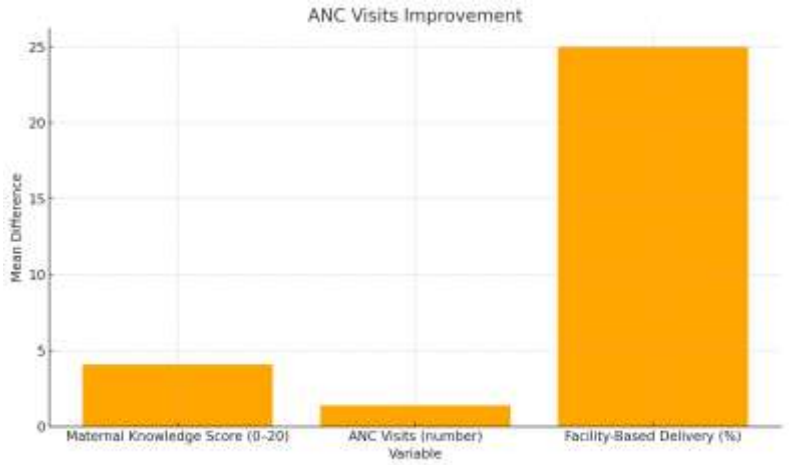

Figure 2. ANC Visits Improvement

Table 2 highlights the notable differences observed between the intervention and control groups following the health promotion program. Mothers in the intervention group demonstrated higher levels of maternal knowledge, with a mean score of 16.5 compared to 12.4 in the control group. Additionally, they attended significantly more antenatal care (ANC) visits, averaging 6.2 visits versus 4.8 in the control group. Most importantly, the intervention group exhibited a much higher rate of facility-based deliveries, with 88% of participants delivering in healthcare facilities compared to just 63% in the control group. These differences were statistically significant, with all p-values being less than 0.001.

These findings suggest that the health promotion program had a profound and measurable impact on key maternal health behaviors. Specifically, it improved maternal knowledge, encouraged greater engagement with essential healthcare services like ANC, and increased the likelihood of women delivering in safer, healthcare settings. When compared to routine care, the intervention program was associated with substantial improvements in both health-seeking behavior and the adoption of safe delivery practices, underscoring its effectiveness as a strategy for improving maternal health outcomes.

Table 3. Multiple Regression Predicting Maternal Health Outcomes (n = 200)

Predictor Variable	B (Unstandardized)	SE	Beta (Standardized)	t-value	p-value
Health Promotion Intervention (1=Yes, 0=No)	+3.87	0.42	0.51	9.21	<0.001

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Maternal Age (years)	+0.05	0.06	0.04	0.83	0.407
Maternal Education (years)	+0.21	0.09	0.15	2.33	0.021
Household Income (IDR, log scale)	+0.37	0.14	0.12	2.64	0.009
Parity (number of births)	–0.18	0.11	–0.07	–1.64	0.102

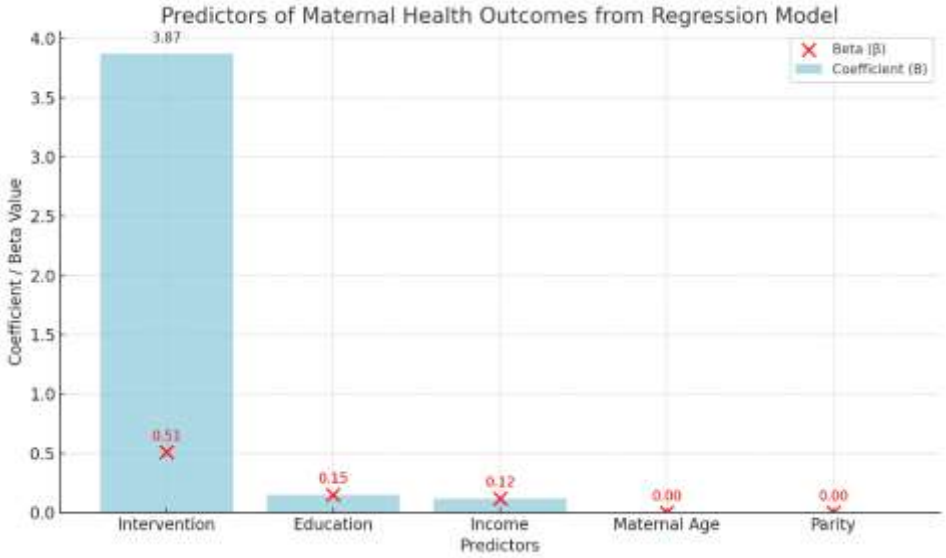

Figure 3. Predictors of Maternal Health Outcomes: Coefficients and Beta Values from Regression Analysis

The regression model explained 42% of the variance in maternal health outcomes (R^2 = 0.42). The intervention was the strongest predictor (B = +3.87, β = 0.51, $p < 0.001$), indicating that participation in the health promotion program significantly increased maternal outcomes scores after controlling for socio-demographic variables. Education (β = 0.15, p = 0.021) and household income (β = 0.12, p = 0.009) also emerged as significant positive predictors, while maternal age and parity were not statistically significant. These findings confirm that health promotion has a robust independent effect on maternal outcomes, beyond the influence of socio-economic factors.

Discussion

The findings of this study demand a reconsideration of how health promotion is managed as a strategic tool for improving maternal health outcomes in regional contexts such as Gorontalo. What emerges most strongly is not simply the effectiveness of educational content delivered to mothers, but the necessity of embedding health promotion programs within broader management systems that align resources, leadership, and governance structures. As scholars in public health management have long argued, interventions only achieve sustainability when they are integrated into institutional frameworks rather than treated asstand-alone initiatives (Adeosun, 2022). The strong effects found here signal both the potential and the managerial responsibility to institutionalize such programs across health facilities and community networks in Indonesia

Health promotion in maternal health is not only about transferring knowledge, but about managing behavioral change processes within complex cultural and organizational environments. Prior studies have demonstrated that individual-level knowledge gains often dissipate if not reinforced through organizational routines and

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community engagement (Clancy et al., 2022). In Gorontalo, this implies that program managers must think beyond training modules and consider how to create systems of follow-up, supervision, and accountability that continuously reinforce maternal health behaviors. Similar lessons have been drawn in African contexts, where health promotion success depended on managers' ability to align community health workers with local cultural dynamics and service delivery protocols (Tabong et al., 2021). This points to the managerial imperative of designing not just content, but processes that sustain behavioral transformation over time.

The management perspective also compels us to interrogate resource allocation and prioritization. Maternal health outcomes are often undermined by resource fragmentation, where multiple actors government, NGOs, and local institutions deliver overlapping programs without coherent coordination. The Gorontalo case illustrates that health promotion programs, when systematically managed, can produce measurable improvements even in resource-constrained environments. This resonates with findings from Bangladesh and Nepal, where community-based maternal health programs achieved sustainability when resource planning was integrated into district-level management systems (Adeosun, 2022). Hence, the managerial challenge is not the scarcity of resources per se, but the fragmentation and lack of alignment in how they are utilized.

Another implication concerns leadership and governance. The effectiveness of health promotion initiatives depends on whether local leaders and managers can foster trust, legitimacy, and ownership within communities. In Gorontalo, traditional leaders and midwives play critical roles in shaping maternal behaviors. If program management does not actively include these stakeholders in planning and implementation, then the long-term sustainability of positive maternal outcomes will be jeopardized. Evidence from Indonesia and other LMICs shows that health interventions gain durability when embedded into existing governance networks rather than imposed externally. Thus, program managers must rethink health promotion as a co-governed enterprise, where authority is distributed across formal health institutions and informal community leaders.

From a strategic management standpoint, health promotion programs represent an underutilized lever for system performance improvement. Health systems are often criticized for over-emphasizing curative services at the expense of preventive and promotive interventions. Yet the evidence from Gorontalo demonstrates that well-managed promotion initiatives can directly affect maternal service utilization and facility-based deliveries. This aligns with organizational theory suggesting that preventive strategies yield higher returns on investment when embedded in system design. Managers, therefore, should reposition health promotion as a central strategy for maternal health system strengthening, not as a peripheral add-on.

At the same time, the findings invite critical reflection on issues of equity and inclusion. Health promotion programs, if poorly managed, can inadvertently reinforce inequalities by privileging mothers with higher literacy, better access to health facilities, or stronger social support networks. The Gorontalo results suggest positive outcomes overall, but careful management is required to ensure that marginalized women those in remote rural villages or lower socio-economic strata are equally reached. Prior research indicates that participatory management models, where communities co-design health promotion activities, can mitigate inequities and enhance program legitimacy. For Gorontalo, this means that managers should not only deliver content but also adapt processes to diverse local realities, ensuring equity as a core performance indicator.

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One of the most compelling managerial implications concerns the measurement and evaluation of health promotion programs. Traditionally, program evaluation has been treated as a donor-driven accountability exercise rather than a management tool for continuous improvement. The statistical results from this study show measurable improvements, but the challenge for managers is to build evaluation systems that are embedded in routine operations. International experience demonstrates that when evaluation is internalized as part of management cycles, programs can adapt dynamically to contextual changes. In Gorontalo, this means transforming health promotion evaluation into a feedback system that continuously informs managerial decision-making and resource allocation.

CONCLUSION

This study demonstrates that well-structured and strategically managed health promotion programs significantly improve maternal health outcomes in Gorontalo, underscoring the necessity of embedding such initiatives within broader systems of health governance and organizational management. The evidence affirms that the effectiveness of health promotion is not merely a function of knowledge transmission but of managerial capacity to coordinate resources, integrate cultural dynamics, and institutionalize behavioral change processes. For policymakers and health managers, the implication is clear: maternal health gains will be sustainable only if promotion programs are repositioned as central strategies within health system management rather than peripheral interventions. Beyond immediate improvements in knowledge, service utilization, and facility-based deliveries, the broader contribution of this study lies in reframing health promotion as a managerial innovationone that demands leadership, accountability, and adaptive systems capable of ensuring equity, continuity, and resilience in maternal health services.

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