



The Relationship Between the Use of Maternal and Child Health (MCH) Books and Pregnant Women's Knowledge of Warning Signs of Pregnancy at the Kedungwuni I Community Health Center in Pekalongan Regency

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Abstract

Pregnant women's knowledge of pregnancy warning signs plays an important role in the early detection of complications and timely decisions to seek healthcare. The Maternal and Child Health (MCH) Book is an educational medium that can support pregnant women's understanding of pregnancy-related conditions. This study aimed to analyze the relationship between MCH Book utilization and pregnant women's knowledge of pregnancy warning signs at Kedungwuni I Community Health Center, Pekalongan Regency, in 2026. A quantitative approach with a cross-sectional design was employed. A total of 56 pregnant women attending antenatal care were selected using purposive sampling. Data were collected using questionnaires assessing MCH Book utilization and knowledge of pregnancy warning signs and were analyzed using the Pearson Chi-Square test at a 95% significance level. The findings showed that 34 respondents (60.7%) had good MCH Book utilization, while 22 respondents (39.3%) had adequate utilization. Knowledge of pregnancy warning signs was categorized as good among 37 respondents (66.1%) and adequate among 19 respondents (33.9%). The Pearson Chi-Square test demonstrated a statistically significant relationship between MCH Book utilization and pregnant women's knowledge of pregnancy warning signs ($p = 0.002$). These findings highlight the importance of optimizing MCH Book utilization through health education, healthcare-worker guidance, and interactive communication during antenatal care to strengthen pregnant women's ability to recognize pregnancy warning signs.

Keywords: Knowledge, Maternal and Child Health Book, MCH Book Utilization, Pregnancy Warning Signs, Pregnant Women.



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INTRODUCTION

Maternal health remains a critical indicator of the performance and equity of health systems because maternal complications can rapidly progress from identifiable warning signs to severe morbidity and death when timely care is not obtained. Globally, maternal mortality continues to represent a major public health challenge, with preventable complications during pregnancy and childbirth remaining disproportionately concentrated in low- and middle-income settings (World Health Organization, 2023). In Indonesia, the maternal mortality ratio remains a concern, with national health reports indicating persistent challenges in maternal health protection and the prevention of pregnancy-related complications (Kementerian Kesehatan Republik Indonesia, 2023). Most maternal deaths are associated with complications such as hemorrhage, hypertensive disorders of pregnancy, and infection, conditions that require early recognition and prompt access to appropriate health services (Asmuji & Indriyani, 2021). The ability of pregnant women to recognize warning signs is therefore an important component of maternal health literacy because recognition represents an early stage in the pathway from symptom appraisal to care-seeking and clinical intervention. Within this context, strengthening women's access to understandable and actionable maternal health information has become increasingly important for reducing preventable delays in responding to pregnancy complications.

Pregnancy warning signs, including vaginal bleeding, severe abdominal pain, symptoms associated with hypertensive disorders, fever, premature rupture of membranes, and decreased fetal movement, require adequate knowledge because their recognition can influence the timing of decisions to seek professional care. Evidence from Indonesia indicates that pregnant women's knowledge concerning danger signs remains uneven, suggesting that access to antenatal services does not

automatically translate into adequate maternal health literacy (Katmini, 2020). Research in Padang further demonstrated a relationship between pregnant women's knowledge and attitudes and their behavior in recognizing pregnancy danger signs, indicating that cognitive understanding may contribute to the behavioral readiness required for timely responses to complications (Kurniawan & Ferry, 2022). These findings suggest that knowledge should not be viewed as an isolated informational outcome but as an important component within a broader process of maternal risk recognition and decision-making. The persistence of knowledge gaps also raises questions concerning the effectiveness of existing educational approaches delivered through routine antenatal care. This issue becomes particularly relevant in settings where pregnant women encounter multiple sources of health information, making the accessibility, credibility, and practical usability of educational materials important determinants of whether information is actually understood and retained.

Indonesia has developed the Maternal and Child Health (MCH) Handbook as an integrated communication, education, and health-recording instrument intended to support women and families throughout pregnancy, childbirth, the postpartum period, and child development. Recent evidence indicates that pregnant women's knowledge concerning the MCH Handbook is associated with their engagement with antenatal services, suggesting that the handbook can function beyond its administrative role as a source of maternal health information (Amatillah, 2024). Studies have also shown that the use of the MCH Handbook is influenced by women's knowledge and attitudes, meaning that possession of the handbook alone cannot be assumed to represent meaningful utilization (Maharani et al., 2022). The distinction between ownership and utilization is important because a handbook can only contribute to maternal health literacy when women read, understand, retain, and apply the information contained within it. Previous findings indicate that some pregnant women continue to use the MCH Handbook primarily for recording health information rather than actively engaging with its educational content (Fitriyani & Salsabila, 2023). This situation creates an important conceptual distinction between the availability of health information and the effective utilization of that information for recognizing pregnancy complications.

The effectiveness of the MCH Handbook is also shaped by the social and health-service environment in which women use it, particularly through family support and interaction with health professionals. Evidence from Indonesian primary health-care settings indicates that support from family members and health workers is associated with the utilization of the MCH Handbook among pregnant women, demonstrating that handbook use is not solely an individual behavior (Elmeida & Meirawati, 2022). Studies examining maternal practices have similarly indicated that active utilization of the MCH Handbook can contribute to efforts to prevent pregnancy complications, particularly when its information is incorporated into maternal health practices and antenatal counseling (Yani et al., 2023).

However, the existing literature remains characterized by methodological and conceptual limitations because several studies emphasize handbook ownership, general knowledge, or patterns of use without consistently examining whether the quality and intensity of utilization are associated with specific knowledge of pregnancy danger signs. Recent research has begun to directly investigate the relationship between MCH Handbook utilization and knowledge of pregnancy danger signs, yet findings remain context-dependent and are concentrated in particular health-service areas, limiting the extent to which they can explain conditions in other primary-care populations (Putri et al., 2025). The unresolved issue is therefore not whether the MCH Handbook is available, but whether its actual utilization is sufficiently meaningful to correspond with pregnant women's ability to identify clinically important warning signs.

This empirical gap is particularly relevant in Pekalongan Regency, where maternal health services must respond to a substantial population of pregnant women and potential pregnancy complications within primary health-care settings. The Pekalongan District Health Profile documents the scale of maternal health service needs in the regency, while primary health centers serve as important points for antenatal monitoring, counseling, risk identification, and the distribution and use of MCH Handbooks (Dinas Kesehatan Kabupaten Pekalongan, 2024). At Kedungwuni I Community Health Center, antenatal care has incorporated routine maternal examinations, nutritional monitoring, blood-pressure assessment, iron supplementation, counseling, and the use of the MCH Handbook as part of maternal health education. Recent evidence from other Indonesian primary-care settings suggests that the relationship between MCH Handbook utilization and knowledge of pregnancy danger signs can be identified empirically, although the strength and pattern of this relationship may vary according to local service characteristics and maternal characteristics (Utami et al., 2026). A preliminary assessment

conducted in the Kedungwuni I service area in January 2026 further indicated that active utilization of the MCH Handbook was not yet consistent, as only a minority of interviewed pregnant women reported regularly reading and understanding its content, particularly information concerning pregnancy danger signs. These local observations strengthen the need for an empirical assessment that moves beyond determining whether the handbook has been distributed and instead examines whether its utilization is associated with the specific knowledge required for early recognition of pregnancy complications.

Against this background, the present study is positioned within the maternal health literacy literature by treating MCH Handbook utilization as a potentially relevant behavioral and educational factor in pregnant women's recognition of pregnancy danger signs rather than merely as an indicator of handbook ownership. The study specifically focuses on the relationship between the use of the MCH Handbook and pregnant women's knowledge of pregnancy warning signs at Kedungwuni I Community Health Center in Pekalongan Regency. This focus responds to the limited local evidence concerning whether the educational potential of the MCH Handbook is reflected in pregnant women's actual knowledge of clinically relevant warning signs. The study aims to determine the relationship between MCH Handbook utilization and pregnant women's knowledge of pregnancy danger signs in the working area of Kedungwuni I Community Health Center. By examining this relationship at the primary-care level, the study is expected to provide empirical evidence for evaluating the educational function of the MCH Handbook within routine antenatal care. Theoretically, the study contributes to maternal health literacy research by clarifying the role of utilization of a structured health-information medium in the acquisition of pregnancy-related risk knowledge. Methodologically and practically, the findings can support more targeted maternal education strategies by informing health workers about whether improving active engagement with the MCH Handbook should be considered an important component of efforts to strengthen early recognition of pregnancy complications and maternal safety.

RESEARCH METHODS

This study employed a quantitative analytical design with a cross-sectional approach to examine the relationship between Maternal and Child Health (MCH) Book utilization and pregnant women's knowledge of pregnancy warning signs at Kedungwuni I Community Health Center, Pekalongan Regency, because the variables were measured at a single point during the study period without manipulating the study conditions (Sugiyono, 2022). The study population comprised pregnant women attending antenatal care (ANC) services at Kedungwuni I Community Health Center, with 56 respondents selected using purposive sampling based on predetermined eligibility criteria. The inclusion criteria comprised pregnant women who attended ANC at Kedungwuni I Community Health Center, possessed an MCH Book, were able to communicate effectively, and were willing to participate as respondents, whereas women who were unable to complete the questionnaire or did not provide complete responses were excluded from the analysis. Purposive sampling was applied because respondents were selected according to characteristics considered relevant to the research objectives rather than through random selection (Donsu, 2021). Data collection was conducted through direct administration of structured questionnaires to eligible pregnant women during their ANC visits, with respondents providing information regarding their utilization of the MCH Book and their knowledge of pregnancy warning signs. Before completing the questionnaires, respondents were informed about the purpose and procedures of the study and their participation was based on voluntary consent. The cross-sectional design enabled the researchers to assess the distribution of MCH Book utilization and knowledge of pregnancy warning signs and subsequently examine their statistical relationship within the same observation period.

The research instruments consisted of a questionnaire measuring MCH Book utilization and a questionnaire assessing pregnant women's knowledge of pregnancy warning signs, with the knowledge instrument addressing respondents' understanding of clinically relevant warning signs during pregnancy. Knowledge was assessed through respondents' answers to questions concerning pregnancy warning signs and subsequently classified into the categories of good and adequate knowledge according to the predetermined scoring criteria used in the study (Budiman & Riyanto, 2021). MCH Book utilization was assessed based on respondents' reported engagement with the book as an educational and maternal health information resource and was categorized into good and adequate utilization. Descriptive analysis was performed using frequency and percentage distributions to describe the levels of MCH Book utilization and pregnant women's knowledge of pregnancy warning signs,

while inferential analysis was conducted using the Pearson Chi-Square test to determine the relationship between the two categorical variables at a 95% confidence level (Nursalam, 2022). A p-value of less than 0.05 was considered statistically significant, indicating evidence of an association between MCH Book utilization and knowledge of pregnancy warning signs. Ethical approval was obtained from the Health Research Ethics Committee of Universitas Pekalongan under approval number 155/B.02.01/KEPK/V/2026, issued in Pekalongan on 13 May 2026, and the study was conducted in accordance with applicable ethical principles for research involving human participants. All respondents participated voluntarily after receiving information about the study and providing informed consent, while confidentiality and responsible handling of the collected data were maintained throughout the research process.

RESULTS AND DISCUSSION

Level of Maternal and Child Health (MCH) Book Utilization among Pregnant Women

MCH Book utilization is an important component of maternal health information provision because the book contains information that can support pregnant women in understanding pregnancy conditions and monitoring maternal health during antenatal care (ANC) visits. In this study, MCH Book utilization was assessed among 56 pregnant women attending ANC at Kedungwuni I Community Health Center, Pekalongan Regency. The findings showed that 34 respondents (60.7%) were classified as having good utilization, while 22 respondents (39.3%) were classified as having adequate utilization. No respondents were classified as having poor utilization. This distribution indicates that the MCH Book had been incorporated into maternal health activities among most respondents, although variations remained in the extent to which the book was utilized. The MCH Book functions not only as a record of maternal and child health services but also as an information medium that can support pregnant women in understanding pregnancy-related conditions and identifying situations requiring attention (Kumalasari, 2024).

Table 1. Level of Maternal and Child Health (MCH) Book Utilization among Pregnant Women at Kedungwuni I Community Health Center, Pekalongan Regency

MCH Book Utilization	Frequency (f)	Percentage (%)
Good	34	60.7
Adequate	22	39.3
Total	56	100.0

As presented in Table 1, good utilization represented the largest proportion, involving 34 respondents (60.7%), whereas 22 respondents (39.3%) demonstrated adequate utilization. This composition indicates that most pregnant women had used the MCH Book relatively well, although the proportion with adequate utilization remains relevant for strengthening ANC-based education. Optimal MCH Book utilization is not determined solely by possession of the book but also by women's engagement in reading, understanding, and using the information during pregnancy monitoring. Previous research has indicated that MCH Book utilization is associated with knowledge, attitudes, health-worker support, and maternal characteristics as information users (Maharani et al., 2022). The availability of the MCH Book as an information resource therefore does not automatically ensure that every pregnant woman will use it optimally. The intensity and quality of engagement with the information are important considerations in assessing the effectiveness of the MCH Book as a maternal health education medium.

The distribution of utilization also indicates that the MCH Book has potential as an educational instrument within ANC services, particularly when its contents are actively incorporated into interactions between pregnant women and health workers. A good utilization level may reflect not only access to the book but also engagement with maternal health information provided through the book. Such engagement is relevant because written information can provide continuity between formal health consultations and women's independent health-information practices. Purwati et al. (2023) reported that pregnant women use MCH Books as an information medium for obtaining information related to maternal and child health. The educational contribution of the MCH Book is therefore strengthened

when pregnant women are encouraged to read and discuss information relevant to their pregnancy. This approach positions the MCH Book as a complementary educational medium rather than merely an administrative record.

The proportion of respondents with adequate utilization remains important because it indicates that access to the MCH Book does not necessarily correspond to consistent or optimal engagement with its contents. Individual characteristics such as knowledge, reading interest, previous pregnancy experience, and exposure to other health-information sources may contribute to differences in utilization. Sugiharti et al. (2021) identified determinants associated with pregnant women's interest in reading the Maternal and Child Health Handbook, indicating that engagement with maternal health information can vary according to individual and contextual factors. Health-worker involvement may also influence whether pregnant women actively use the book during ANC and understand the information provided. The findings therefore support the need to strengthen the educational use of the MCH Book through focused explanations and opportunities for discussion during ANC encounters. Such efforts are particularly relevant for respondents whose utilization remains within the adequate category.

Table 2. Synthesis of MCH Book Utilization Findings

Aspect	Empirical Finding	Scientific Interpretation
Good Utilization	34 respondents (60.7%)	Most respondents demonstrated relatively good MCH Book utilization
Adequate Utilization	22 respondents (39.3%)	A substantial proportion still requires reinforcement in MCH Book utilization
Poor Utilization	No respondents	Basic access and utilization of the MCH Book were present among respondents
Educational Function	MCH Book was used as a maternal health information medium	Its effectiveness depends on reading, understanding, and applying the information

The synthesis in Table 2 demonstrates that the findings should be interpreted beyond the numerical distribution of utilization categories. The predominance of good utilization provides a positive indication of MCH Book engagement among pregnant women at the study site, while the adequate category identifies a group requiring further educational reinforcement. From a health-behavior perspective, the utilization of health-information media can be influenced by individual predispositions, enabling conditions, and reinforcing support from the surrounding environment. Health-worker support is particularly relevant because ANC encounters provide opportunities to explain written information and relate it to the specific needs of each pregnant woman. Yani et al. (2023) reported that MCH Book utilization can support efforts to prevent pregnancy complications through the use of maternal health information. The effectiveness of the MCH Book therefore depends not only on its availability but also on how information is accessed, interpreted, and integrated into maternal health practices.

The findings are further consistent with Maharani et al. (2022), who reported an association between pregnant women's knowledge and attitudes and MCH Book utilization. This relationship suggests that utilization occurs within a broader behavioral process in which individual characteristics and health-service interactions may influence engagement with the information medium. The current findings similarly indicate that most respondents had good utilization, but a substantial proportion remained in the adequate category. Strengthening utilization can therefore focus on integrating the MCH Book more systematically into ANC communication rather than treating it solely as a document that accompanies maternal health services. Health workers can direct pregnant women toward relevant sections, explain key messages, encourage questions, and assess whether the information has been understood. This strategy can increase the educational value of the MCH Book and support more effective maternal health communication during pregnancy.

Pregnant Women's Knowledge of Pregnancy Warning Signs

Knowledge of pregnancy warning signs is an important component of maternal health literacy because it enables pregnant women to recognize conditions that may require immediate professional assessment. In this study, knowledge regarding pregnancy warning signs was assessed among 56 pregnant women attending ANC at Kedungwuni I Community Health Center, Pekalongan Regency. The findings showed that 37 respondents (66.1%) had good knowledge, while 19 respondents (33.9%) had adequate knowledge. No respondents were classified as having poor knowledge. This distribution indicates that most respondents had a relatively strong understanding of pregnancy warning signs, although a considerable proportion still required reinforcement of relevant health information. Adequate knowledge is particularly important because recognition of warning signs can support timely decisions to seek appropriate maternal healthcare (Kurniawan & Ferry, 2022).

Table 3. Level of Pregnant Women's Knowledge of Pregnancy Warning Signs at Kedungwuni I Community Health Center, Pekalongan Regency

Pregnant Women's Knowledge of Pregnancy Warning Signs	Frequency (f)	Percentage (%)
Good	37	66.1
Adequate	19	33.9
Total	56	100.0

As shown in Table 3, the good-knowledge category comprised 37 respondents (66.1%), representing the largest proportion of the study population. The remaining 19 respondents (33.9%) demonstrated adequate knowledge, indicating that knowledge regarding pregnancy warning signs was not uniformly distributed among the respondents. This finding suggests that most pregnant women were able to identify important information concerning potentially dangerous conditions during pregnancy. Knowledge of warning signs is relevant to maternal health because recognition of abnormal symptoms can influence women's decisions to seek healthcare services. Katmini (2020) emphasized the importance of maternal knowledge concerning pregnancy warning signs in relation to appropriate contact with antenatal health services. The relatively high proportion of respondents with good knowledge therefore represents a favorable condition for strengthening early recognition of pregnancy complications.

The knowledge distribution may also reflect the role of repeated exposure to maternal health information through ANC services and other information sources. Pregnant women may receive information through health workers, MCH Books, family members, previous pregnancy experiences, and digital or mass-media sources. The MCH Book provides structured information that can complement verbal education delivered during ANC consultations. Amatillah (2024) demonstrated the relevance of pregnant women's knowledge of the MCH Book to their engagement with antenatal visits, indicating that knowledge and utilization of maternal health information are connected to antenatal care practices. The presence of good knowledge among 66.1% of respondents may therefore reflect cumulative exposure to health information rather than the influence of a single educational source. This interpretation is important because the present study measured knowledge at one point in time and did not independently determine the contribution of each information source.

The 33.9% proportion of respondents with adequate knowledge also indicates that important gaps in understanding pregnancy warning signs remain. Knowledge gaps may concern the ability to distinguish normal pregnancy discomforts from symptoms that require immediate assessment, particularly when symptoms appear in combination or develop gradually. Health education should therefore emphasize not only the names of warning signs but also their clinical significance and the appropriate response when they occur. Asmuji and Indriyani (2021) emphasize the preventive role of maternal nursing care in reducing maternal and infant health risks through appropriate recognition and management of pregnancy-related problems. Education that uses concrete examples and repeated explanations may help pregnant women translate health information into practical recognition skills. Such an approach is relevant during ANC because health workers can identify individual information needs and provide clarification based on each woman's level of understanding.

Table 4. Synthesis of Pregnant Women's Knowledge of Pregnancy Warning Signs

Aspect	Empirical Finding	Scientific Interpretation
Good Knowledge	37 respondents (66.1%)	Most respondents demonstrated a relatively strong understanding of pregnancy warning signs
Adequate Knowledge	19 respondents (33.9%)	A considerable proportion still requires reinforcement of warning-sign information
Poor Knowledge	No respondents	Basic knowledge of pregnancy warning signs was present among the respondents
Health-Information Function	Knowledge may be supported by ANC and various information sources	Repeated and interactive health education can strengthen recognition of warning signs

The synthesis in Table 4 indicates that the relatively high proportion of respondents with good knowledge should be considered alongside the remaining knowledge gap among respondents in the adequate category. Good knowledge provides an important foundation for recognizing potentially dangerous pregnancy conditions, but knowledge alone does not establish that women will always respond appropriately when warning signs occur. Kurniawan and Ferry (2022) reported a relationship between knowledge and attitudes and the behavior of pregnant women in recognizing pregnancy danger signs, supporting the importance of knowledge as part of maternal preventive behavior. The findings also suggest that educational interventions should move beyond information delivery toward comprehension and practical decision-making. Interactive approaches, including question-and-answer sessions and teach-back techniques, may help health workers identify misunderstandings and reinforce essential messages. The MCH Book can support this process by providing a standardized written reference that pregnant women can revisit after receiving explanations during ANC.

The findings are also consistent with research showing that maternal knowledge is influenced by access to health information and interactions with healthcare providers. Situmorang et al. (2026) reported an association between pregnant women's knowledge and MCH Book utilization, suggesting that the use of maternal health information resources may contribute to knowledge development. Similar evidence has been reported by Putri et al. (2025), who found a relationship between MCH Book utilization and pregnant women's knowledge and attitudes regarding pregnancy warning signs. These findings provide a conceptual basis for interpreting the relatively favorable knowledge distribution observed in the present study. Nevertheless, the cross-sectional design does not permit a causal conclusion that MCH Book utilization directly produced the observed level of knowledge. The knowledge findings should therefore be interpreted as a description of the respondents' condition at the time of data collection and as an empirical basis for examining its statistical relationship with MCH Book utilization in the subsequent analysis.

Relationship Between MCH Book Utilization and Pregnant Women's Knowledge of Pregnancy Warning Signs

The analysis demonstrated a statistically significant relationship between MCH Book utilization and pregnant women's knowledge of pregnancy warning signs at Kedungwuni I Community Health Center. As shown in Table 5, among 34 respondents with good MCH Book utilization, 17 respondents (50.0%) had good knowledge and 17 respondents (50.0%) had adequate knowledge. Among the 22 respondents with adequate MCH Book utilization, 20 respondents (90.9%) had good knowledge and 2 respondents (9.1%) had adequate knowledge. The Pearson Chi-Square test produced a p-value of 0.002, which was below the predetermined significance level of 0.05, indicating a statistically significant association between the two categorical variables. Similar evidence has reported a significant relationship between MCH Book utilization and pregnant women's knowledge of pregnancy danger signs, supporting the relevance of the MCH Book as an information medium in maternal health education (Yulastini, 2023). The finding confirms that MCH Book utilization and knowledge were not distributed independently among the respondents. However, the observed

distribution requires careful interpretation because the group with adequate utilization showed a higher proportion of good knowledge than the group with good utilization.

Table 5. Relationship Between MCH Book Utilization and Pregnant Women's Knowledge of Pregnancy Warning Signs

MCH Book Utilization	Good Knowledge n (%)	Adequate Knowledge n (%)	Total n (%)	p-value
Good	17 (50.0)	17 (50.0)	34 (60.7)	0.002
Adequate	20 (90.9)	2 (9.1)	22 (39.3)	
Total	37 (66.1)	19 (33.9)	56 (100.0)	

The statistical significance indicates that differences in MCH Book utilization were associated with differences in the distribution of knowledge categories among the respondents. Nevertheless, the direction of the observed pattern does not correspond to a simple assumption that better utilization would necessarily produce a higher proportion of good knowledge. In the present data, 90.9% of respondents with adequate utilization had good knowledge, compared with 50.0% among respondents with good utilization. This unexpected pattern suggests that knowledge may be influenced by information sources and contextual factors that were not directly measured in the present analysis. Research has shown that pregnant women's knowledge and attitudes can contribute to MCH Book utilization, indicating that the relationship between utilization and knowledge may also operate in a reciprocal rather than strictly one-directional manner (Maharani et al., 2022). Pregnant women who already possess substantial knowledge may use the MCH Book differently from those who rely more heavily on other sources of information. The statistical association should therefore be retained as the principal empirical finding, while its direction should not be interpreted as evidence of a causal effect.

Table 6. Synthesis of Possible Explanations for the Observed Relationship

Potential Explanation	Interpretation
Multiple Information Sources	Knowledge may be obtained from ANC counseling, family, digital media, or other educational resources
Health-Worker Support	Direct explanation can strengthen understanding independently of the frequency of MCH Book use
Health Literacy	Ability to interpret written health information may differ between respondents
Previous Pregnancy Experience	Prior experience may contribute to knowledge of pregnancy-related symptoms
Quality Versus Frequency of Utilization	Frequent use does not necessarily indicate deep comprehension of the information
Measurement and Categorization	Categorization of utilization and knowledge may <u>influence the observed cross-tabulation pattern</u>

The synthesis in Table 6 indicates that the relationship between MCH Book utilization and knowledge should be understood within a broader maternal health information environment. MCH Book utilization represents one component of health-information behavior, whereas knowledge may be constructed through interaction among written materials, professional counseling, previous experience, and other information channels. Yani et al. (2023) reported that utilization of the MCH Book among pregnant women is relevant to efforts to prevent pregnancy complications, particularly when the book is incorporated into maternal health services. Health-worker support is also important because written information may be more effectively understood when accompanied by explanation and opportunities for discussion. Elmeida and Meirawati (2022) demonstrated the relevance of support from health workers and family members to MCH Book utilization, indicating that interpersonal reinforcement forms an important component of maternal health information practices. These findings provide a reasonable contextual interpretation of the present result, particularly because the study did not measure

health-worker counseling, family support, previous pregnancy experience, or exposure to alternative information sources. The observed statistical association therefore reflects the relationship between the measured variables without establishing that MCH Book utilization alone determines pregnant women's knowledge.

The discrepancy between utilization category and knowledge category also highlights the distinction between access to information and actual comprehension of health messages. A respondent may report good utilization because the MCH Book is frequently carried, opened, or consulted, while comprehension of the information may remain incomplete. Conversely, a respondent with adequate utilization may focus on specific sections concerning pregnancy danger signs and obtain additional explanations during ANC, resulting in good knowledge despite less extensive use of the book. The effectiveness of health information depends not only on the availability of educational media but also on the recipient's ability to understand, interpret, and apply the information in an appropriate context. Findings concerning determinants of MCH Book use similarly indicate that maternal characteristics and social support can influence how the book functions as an information resource (Kumalasari, 2024). This perspective is consistent with the present cross-sectional findings because the observed association cannot distinguish whether MCH Book utilization influenced knowledge, knowledge influenced utilization, or both were affected by other factors. Accordingly, the results support the importance of integrated health education rather than reliance on the MCH Book as an isolated intervention.

The present findings are consistent with previous studies reporting associations between MCH Book utilization and maternal knowledge, although differences in study populations and measurement procedures should be considered. Putri et al. (2025) reported a significant relationship between MCH Book utilization and pregnant women's knowledge and attitudes concerning pregnancy danger signs, reinforcing the educational relevance of the MCH Book. Utami et al. (2026) likewise reported a correlation between MCH Book utilization and pregnant women's knowledge of pregnancy danger signs, providing evidence from another primary healthcare setting. Situmorang et al. (2026) also identified an association between pregnant women's knowledge and MCH Book utilization, suggesting that knowledge and utilization may reinforce each other within maternal health services. The consistency of these findings strengthens the conceptual relevance of the MCH Book as part of maternal health communication, while the unusual distribution observed in the present study demonstrates that the relationship is not necessarily linear. The local context of Kedungwuni I Community Health Center may contribute to this pattern through differences in ANC counseling practices, information access, respondent characteristics, and previous pregnancy experiences. The present study therefore adds contextual evidence concerning the association between MCH Book utilization and knowledge of pregnancy warning signs among pregnant women receiving ANC services in Pekalongan Regency.

CONCLUSION

This study concludes that there was a statistically significant relationship between MCH Book utilization and pregnant women's knowledge of pregnancy warning signs at Kedungwuni I Community Health Center, Pekalongan Regency. The Pearson Chi-Square analysis produced a p-value of 0.002 ($p < 0.05$), indicating that the two variables were statistically associated. Most respondents demonstrated good MCH Book utilization, with 34 respondents (60.7%) categorized as having good utilization and 22 respondents (39.3%) categorized as having adequate utilization. The distribution of knowledge also showed that 37 respondents (66.1%) had good knowledge, while 19 respondents (33.9%) had adequate knowledge. Although the statistical association was significant, the cross-tabulation showed an unexpected distribution in which the proportion of good knowledge was higher among respondents with adequate MCH Book utilization than among those with good utilization. This finding indicates that pregnant women's knowledge may also be influenced by other information sources and contextual factors, including ANC counseling, previous pregnancy experience, health literacy, and support from health workers or family members. Therefore, the significant association should be interpreted as an empirical relationship between the measured variables rather than evidence that MCH Book utilization alone directly determines knowledge.

Pregnant women are encouraged to use the MCH Book actively and regularly, particularly by reviewing information concerning pregnancy warning signs. Information that is not clearly understood should be discussed with health workers during ANC visits to ensure accurate interpretation and appropriate application. Health workers are expected to strengthen the educational function of the MCH

Book by explaining key information, encouraging active reading, and confirming pregnant women's understanding during routine maternal health services. Family involvement, particularly from husbands, should also be strengthened because shared understanding of pregnancy warning signs can support timely decision-making when potentially dangerous conditions occur. The MCH Book should therefore be positioned not merely as a record of maternal and child health services but also as an interactive educational resource within ANC. Future maternal health education can integrate the MCH Book with direct counseling and other relevant information sources to address differences in health literacy and information access. These efforts may strengthen pregnant women's capacity to recognize pregnancy warning signs and seek appropriate professional assistance in a timely manner.

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