Analysis of Factors Influencing the Utilization and Fulfillment of MCH (Maternal and Child Health) Handbook in Gowa Regency, Indonesia

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KEYWORDS

Maternal Child Health (MCH) Handbook, Demographic Factors, Healthcare

ABSTRACT:

Introduction:The Maternal and Child Health (MCH) handbook is a critical tool for improving maternal and child health outcomes. However, its effective utilization and completion in Indonesia's 2020 edition remain understudied. This study investigates factors influencing the use and fulfillment of the MCH handbook among pregnant women and healthcare workers.

Objectives: This study aimed to identify determinants affecting MCH handbook utilization by pregnant women and completion by healthcare workers, focusing on sociodemographic, geographic, and knowledge-related factors..

Methods: A cross-sectional study was conducted from May to June 2024, involving 120 pregnant women and 58 healthcare workers. Data were collected via questionnaires and simulations assessing MCH handbook completion. Chi-square and logistic regression analyses were employed to evaluate associations

Results: Among pregnant women, employment status ($p < 0.05$), urban residence ($p < 0.05$), and maternal knowledge (OR = 16.26, 95% CI: 4.55–58.11, $p < 0.001$) significantly influenced MCH handbook use, with knowledge being the strongest predictor. The first trimester section was most frequently incomplete (59.2%). For healthcare workers, employment duration, training history, and knowledge significantly impacted handbook completion ($p < 0.05$). Urban proximity (<3 km to healthcare facilities) and maternal knowledge facilitated utilization, while employment status hindered it. Healthcare workers training and knowledge enhanced comprehensive completion.

Conclusions: Knowledge was the most influential factor for both groups, underscoring the need for targeted education programs. Addressing employment-related barriers for pregnant women and prioritizing healthcare workers training can optimize MCH handbook utilization. Policymakers should integrate these findings into strategies to enhance maternal and child health documentation in Indonesia.

1. Introduction

Maternal mortality continues to pose a significant challenge for health systems worldwide(Ward et al., 2024). In Indonesia, addressing maternal mortality remains an unfinished agenda and is recognized as a national health development priority. This issue requires heightened attention and a sustained commitment to effective maternal health programs that ensure continuous care. In 2020, Indonesia reported a total of 4,627 maternal deaths, reflecting a 10.25% increase from the previous year's total of 4,197(kemenkes RI, 2021). South Sulawesi is among the ten provinces with the highest maternal mortality rates, with a recorded rate of 133 per 10,000 live births, positioning it as the eighth province with the highest maternal mortality ratio (MMR) in Indonesia (Kemenkes RI, 2021). Furthermore, Gowa Regency emerged as the largest contributor to maternal deaths in South Sulawesi in 2020, accounting for 15 cases, which represents 11.27% of the total maternal deaths in the province.

The Maternal and Child Health (MCH) Handbook is a simple yet effective instrument for Information, Education, and Communication (IEC) aimed at disseminating essential information regarding Maternal and Child Health to families. The MCH Handbook possesses significant potential to improve the knowledge and behaviors of families and mothers concerning reproductive and child health (DEPARTEMEN KESEHATAN RI, 2009). Furthermore, the MCH Handbook functions as an evidence-based resource for the comprehensive and continuous documentation of maternal and child health services, which should be maintained by the mother or family. Consequently, it is imperative that all maternal and child health services, as well as records pertaining to illnesses and developmental issues, are documented thoroughly and accurately(Kementerian Kesehatan Republik Indonesia, 2015). The availability of health records for pregnant women within the MCH Handbook will facilitate healthcare providers in performing screenings and early diagnoses of potential complications, thereby enabling timely referrals to more advanced healthcare facilities.

The Maternal and Child Health (MCH) Handbook serves as a critical resource for enhancing national strategies aimed at reducing maternal mortality rates (MMR) and infant mortality rates (IMR) (DEPARTEMEN KESEHATAN RI, 2009). However, evaluation results from the 2013 Riskesdas (Basic Health Research) indicate that fewer than 50% of pregnant women utilize the MCH Handbook during antenatal care (ANC) consultations with healthcare providers, including midwives, nurses, general practitioners, and specialists. Additionally, data from the 2018 Riskesdas (Basic Health Research) demonstrate that the documentation of service outcomes within the MCH Handbook is inadequate, with only 10.5% of handbooks being fully completed(Kemenkes Rl, 2020). Consequently, this study seeks to analyze the factors that influence the utilization and completion of the 2020 edition of the Indonesian version of the MCH Handbook.

2. Methods

This cross-sectional study was conducted at Samata (as represent urban region) and Bajeng (as represent rural region) Public Health Center, Gowa Regency in May-June 2024. The study was approved by Hasanuddin University Clinical Research Ethics Committee with the protocol number UH19110997 and informed consent was obtained from all participants

Data related to the characteristics of respondents and study variables were collected using a questionnaire through direct interviews with pregnant women and health workers, along with a Self-Assessment Questionnaire to measure the knowledge of respondents. To fulfill the requirements of the MCH handbook by health workers, we conducted filling simulations based on the blank new MCH handbook. Data was collected from pregnant women receiving antenatal care at Public Health Centers, meeting the following inclusion criteria: (1) third-trimester pregnant women who have undergone

Antenatal Care (ANC) at least once at the Public Health Center, (2) willing to participate in the study, and (3) bringing an MCH handbook during the examination. Pregnant women who could not understand Bahasa Indonesia and those who had Antenatal Care (ANC) at more than one Public health centre were excluded from the study. Health workers who filled the MCH handbooks was included in this study.

Maternal knowledge was assessed based on correct answers to a questionnaire and was considered adequate if the correct answers were greater than 80%. MCH handbook utilization was deemed good if the utilization score exceeded 80%. MCH handbook completion was categorized into three levels: not filled at all, partially filled, and considered complete if greater than 80%.

All data collected were and accurate based on observations of laboratory results then the data coded were and entered into MS Excel then analyzed using IBM SPSS Statistic 25 using the Chi-Square test and logistic regression test. The analysis result of P-value ≤ 0.05 was considered statistically significant.

3. Results

A total of 120 pregnant women (63 from Samata and 57 from Bajeng Public Health) and 58 health workers (35 from Samata and 23 from Bajeng Public Health) participated as respondents in this study. All respondents were interviewed to explore their opinions through open-ended questions. The findings indicated that working status, residential area, and maternal knowledge significantly influenced the use of Maternal and Child Health (MCH) handbooks among pregnant women, whereas age, education, and parity did not significant (Table 1).

This study found that working pregnant mother were more likely to exhibit poor utilization of the Maternal and Child Health (MCH) handbook in both bivariate and multivariate analyses. Pregnant women residing in urban areas had an odds ratio (OR) of 7.13 for adequate MCH handbook use; however, this value decreased to 3.3 when multivariate analysis was performed. The distance between the community and the primary healthcare facility was initially found to be insignificant but became significant upon conducting multivariate analysis. Knowledge among pregnant women emerged as the most significant factor influencing the use of the MCH handbook, with an OR of 16.26 (95% Confidence Interval [CI]: 4.55 - 58.11, p-value < 0.001) (see Table 2). Regarding the content of the MCH handbook, specialist services were fully completed (100%) and represented the most comprehensive section. In contrast, the third trimester examination of pregnant women was the most partially filled section, with a completion rate of 87.5%, while the first trimester examination showed the most not filled at all (59.2%). The percentage of completeness of the MCH handbook is illustrated in Figure 1.

In this study, the mean age of the health workers who participated as respondents was 34.13 years, with the youngest respondent being 31 years old and the oldest 40 years old. The characteristics of the health workers who participated are presented in Table 3. The findings indicate that factors such as length of employment, training history, and knowledge of the Maternal and Child Health (MCH) handbook significantly influenced the degree of completion of the MCH handbook, as shown in Table 4.

This study found that the length of employment, after multivariate analysis, did not have a significant effect on the completion of the MCH handbook by health workers. However, an increase in the frequency of training was associated with improved MCH handbook completion rates. Similarly, health workers with better knowledge of the MCH handbook were 25.76 times more likely to complete

it thoroughly. External factors that both support and hinder the completion of the MCH handbook are illustrated in Figure 2.

Table 1. Characteristic of pregnant woman

Characteristic	n	%
Age		
< 20 years old	7	5,8
20-35 years old	103	85,8
> 35 years old	10	8,3
Education		
Never attended	4	3,3
Primary School	5	4,2
Junior High School	13	10,8
Senior High School	67	55,8
College/University	31	25,8
Parity		
Primipara	39	32,5
Multipara	80	66,7
Grande Multipara	1	0,8
Employment Status		
Working	39	32,5
Not Working	81	67,5
Distance of Home to public health		
< 3 KM	70	58,3
≥ 3 KM	50	41,7

Source: Author

Table 2. Bivariate analysis of factors influencing the utilization of MCH Handbook by pregnant women.

Variabel	Utilization of MCH Handbook		P value
	Poor	Good	
	N (%)	N (%)	
Age			
<20 or >35 years old	51 (42,5)	52 (43,3)	0,368
20-35 yeard old	11 (9,2)	6 (5,0)	
Education			
≤ 6 years	5 (4,2)	4 (3,9)	0,97
7-12 years	41 (34,2)	39 (32,5)	

>12 tyeras	16 (13,3)	13 (12,5)	
Parity			
Primipara	20 (16,7)	19 (15,8)	1
Multipara	42 (35,0)	39 (32,5)	
Employment			
Working	36 (30,0)	45 (37,5)	**0,037**
Not working	26 (21,7)	13 (10,8)	
Residence			
Rural	19 (15,8)	44 (36,7)	**0,001**
Urban	43 (35,8)	14 (11,7)	
Distance from Home to public health			
< 3 KM	41 (34,2)	29 (24,2)	0,108
> 3 KM	21 (17,5)	29 (24,2)	
Knowledge			
Poor	42 (35,0)	9 (7,5)	**0,001**
Good	20 (16,7)	49 (40,8)	

Source: Author

Table 3. Crude odd ratio and adjusted odd ratio of variables influencing the utilization of MCH Handbook by pregnant women.

Variabel	Unadjusted			Adjusted		
	OR (ExpB)	95%CI	P value	OR (ExpB)	95%CI	P value
Age						
<20 or >35 years old	1	ref		1	ref	
20-35 yeard old	0,53	0,18 - 1,55	0,251	0,95	0,22 - 4,02	0,943
Education						
≤ 6 years	0,85	0,19 - 3,79	0,837	0,53	0,27 – 3,15	0,304
7-12 years	0,93	0,44 - 2,32	0,973	0,65	0,31 - 4,05	0,807
>12 tyeras	1	ref		1	ref	
Parity						
Primipara	1	ref		1	ref	
Multipara	0,97	0,45 - 2,09	0,953	0,94	0,30 - 2,87	0,915
Employment						
Working	0,4	0,18 – 0,88	0,024	0,27	0,81 - 0,91	**0,035**
Not working	1	ref		1	ref	
Residence						
Rural	1	ref		1	ref	
Urban	7,13	3,17 - 15,96	<0,001	3,3	1,16 – 9,64	**0,025**
Distance from home to public health						
< 3 KM	1,95	0,93 - 4,075	0,075	4,06	1,37 - 12,05	**0,011**

> 3 KM	1	ref		1	ref	
Knowledge						
Poor	1	ref		1	ref	
Good	11,43	4,70 - 27, 78	<0,001	16,26	4,55 -58,11	**<0,001**

Source: Author

Table 4. Characteristic of Health Worker

Variable	n	%
Age		
30-35 years old	43	74,1
> 35 years old	15	25,9
Education		
Diploma	33	56,9
Bachelor's degree	21	36,2
Master's degree	2	3,4
Doctoral degree	1	1,7
Duration Working		
<10 years	21	36,2
≥10 years	37	63,8
History of training		
1-2 times	20	34,5
3-4 times	25	43,1
>4 times	13	22,4
Knowledge of fulfillment of the MCH handbook		
Poor	36	62,1
Good	22	37,9

Source: Author

Table 5. Bivariate analysis of factors influencing the fulfillment of MCH Handbook by health worker.

Variable	Fulfillment of MCH Handbook		Nilai *P*
	In N (%)	Cukup N (%)	
Age			
30-35 years old	29 (50,0)	14 (24,1)	
> 35 years old	8 (13,8)	7 (12,1)	0,505
Education level			
Diploma	25 (43,1)	8 (13,8)	
College/University	12 (20,7)	13 (22,4)	0,057
Duration Working			

<10 years	18 (31,0)	3 (5,2)	
≥10 years	19 (32,8)	18 (31,0)	**0,02**
History of training			
1-2 times	18 (31,0)	2 (3,4)	
3-4 times	17 (29,3)	8 (13,8)	**<0,001**
>4 times	2 (3,4)	11 (19,0)	
Public Health			
Rural	13 (22,4)	10 (17,2)	
Urban	24 (41,4)	11 (19,0)	0,513
Knowledge of fulfillment of the MCH handbook			
Poor	28 (48,3)	8 (13,8)	
Good	9 (15,5)	13 (22,4)	**0,011**

Source: Author

Table 6. Crude odd ratio and adjusted odd ratio of variables influencing the utilization of MCH Handbook by pregnant women.

Variabel	Unadjusted			Adjusted		
	OR (ExpB)	95%CI	P value	OR (ExpB)	95%CI	P value
Age						
30-35 years old	1	ref		1	ref	
> 35 years old	1,81	0,54 - 6,01	0,331	3,01	0,361 - 25,07	0,309
Education level						
Diploma	1	ref		1	ref	
College/University	3,3	1,10 - 10,35	0,032	0,91	0,16 - 5,05	0,919
Duration Working						
<10 years	1	ref		1	ref	
≥10 years	5,68	1,42 - 22,63	0,014	3,24	0,36 - 28,77	0,29
History of training						
1-2 times	1	ref		1	ref	
3-4 times	4,23	0,78 - 22,84	0,093	2,97	0,308 - 28,66	0,347
>4 times	49,5	6,07 - 403,65	<0,001	144,311	6,16 - 3380	**0,002**
Public Health						
Rural	1	ref		1	ref	
Urban	0,596	0,20 - 1,77	0,352	0,835	0,16 - 4,30	0,83
Knowledge						
Poor	1	ref		1	ref	
Good	5,05	1,5 - 16,08	0,006	25,76	2,42 - 273,23	**0,007**

Source: Author

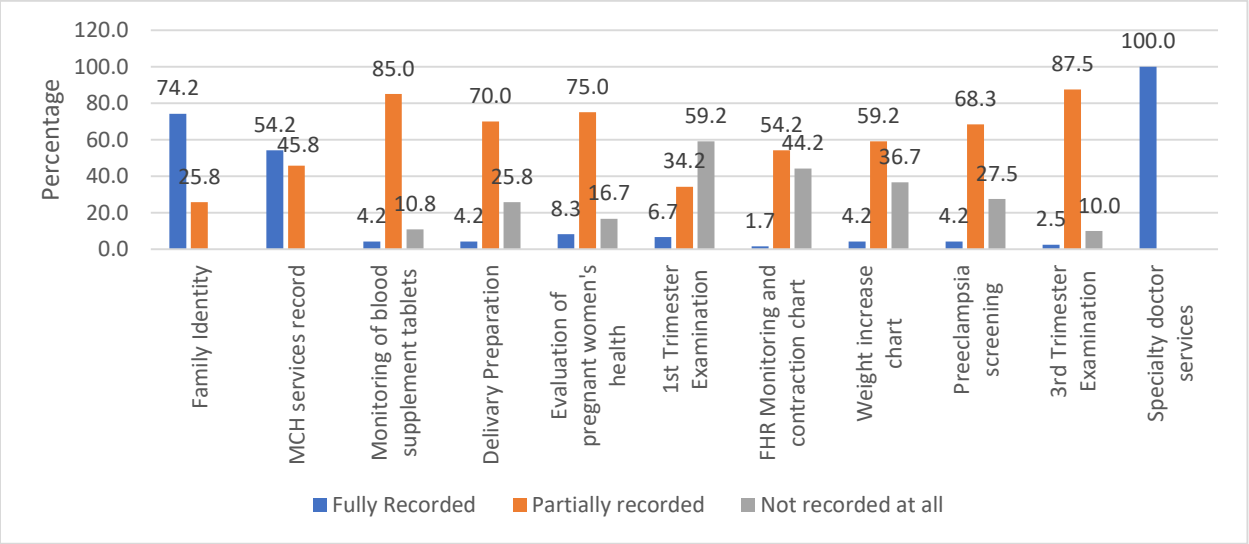

Figure 1. Percentage of recorded of MCH Handbook of pregnant women based on section

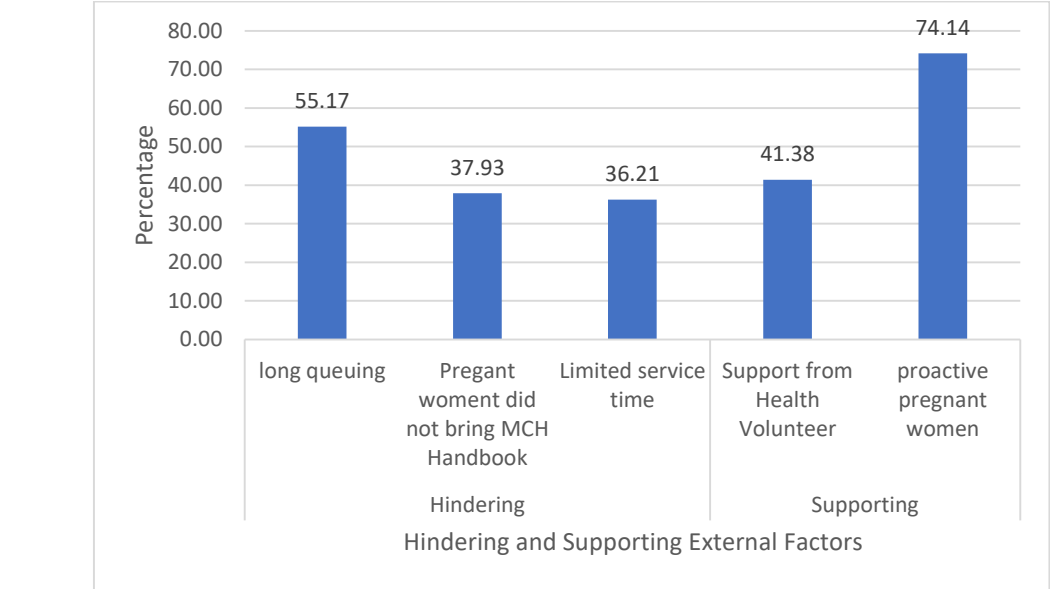

Figure 2. External factors that hinder and support MCH handbook fulfillment by health workers

4. Discussion

The Maternal and Child Health (MCH) Handbook is a home-based record designed to consolidate all information regarding health services provided to mothers, as well as the health conditions of mothers and their children, into a single document. It encompasses all stages of maternal, newborn, and child health, including antenatal care, delivery, postpartum care, child vaccinations, and growth monitoring, while also providing essential health information to parents. Furthermore, MCH handbooks support improvements in the continuum of care (COC)(Balogun et al., 2023). Osaki et al. identified the direct

contribution of MCH handbooks to maternal and child health through an analysis of nationally representative cross-sectional data from the Basic Health Research (RISKESDAS) collected in 2007 and 2010(Osaki et al., 2015)

Ownership of an MCH handbook, both before and after delivery, positively influences health services, leading to improved maternal care during pregnancy and enhanced immunization status(Bhuiyan et al., 2017). Studies of pregnant women in Indonesia who owned an MCH handbook indicated that they were three times more likely to utilize a skilled birth attendant and 2.5 times more likely to participate in a family planning program. Additionally, pregnant women who had read most or all sections of the MCH handbook attended antenatal care (ANC) at least four times (Wignarajah et al., 2021).

The content of the Maternal and Child Health (MCH) Handbook should align with the needs of the community. While illiterate parents are often considered disadvantaged, surveys indicate that less-educated mothers in Indonesia receive more health information from the MCH Handbook compared to their highly educated counterparts. In communities with a significant number of illiterate parents, it is advisable to increase the use of pictures and illustrations (Nakamura, 2010). A study by Kawakatsu et al. found no age-related and educational differences in the ownership of the MCH Handbook(Kawakatsu et al., 2015). This suggests that information about the MCH Handbook may not solely be derived from formal education; rather, the accessibility of information, particularly through the internet, plays a crucial role in enhancing literacy and effective utilization among pregnant women.

In this study, we found that pregnant women who are employed tend to utilize Maternal and Child Health (MCH) handbooks less frequently. To date, no research has specifically examined this issue. We hypothesize that this trend may be linked to the limited time available for pregnant women to read the entire MCH handbook. Research on pregnant women employed in factories indicates that they experience higher levels of stress and emotional strain due to the need to balance work, household responsibilities, and pregnancy. Consequently, working women often have little to no time to access external health services, aside from those provided by their workplace (Akhter et al., 2017).

In this study, pregnant women residing in urban areas demonstrated a greater utilization of Maternal and Child Health (MCH) handbooks. Disparities between urban and rural regions often arise from inequalities in development between these two types of locations. Research indicates that individuals living in urban areas typically have access to superior health services (Wulandari et al., 2021). Conversely, residing in rural areas can hinder access to advanced obstetric and neonatal care, potentially leading to adverse outcomes for both mothers and infants. Health disparities between urban and rural areas are exacerbated as some rural communities become increasingly isolated due to urban migration. Several factors contributing to the urban-rural divide in poor birth outcomes have been identified, including higher smoking rates, disparities in health service availability, and increased exposure to environmental hazards(Mehrnoush et al., 2023). This study suggests that improved accessibility to health centers may encourage pregnant women to engage with information regarding the MCH handbook and its practical application.

Theory of Planned Behavior posits that an individual's actions are influenced by three primary factors: attitudes toward the behavior, subjective norms, and perceptions of behavioral control (Pourmand et al., 2020). In the context of utilizing the Maternal and Child Health (MCH) handbook, the level of knowledge that pregnant women possess regarding the benefits and significance of the handbook can significantly impact their attitudes and perceptions related to its use. Greater knowledge correlates with more positive attitudes and perceptions, thereby increasing the likelihood of utilizing the MCH handbook.

The completion of the revised 2020 Maternal and Child Health Handbook (MCH Handbook) by health workers is influenced by various interrelated factors. One of the primary factors is the training and knowledge possessed by these health workers. Those who receive training on the 2020 MCH Handbook revision tend to have a better understanding of the importance and correct procedures for

filling it out, enabling them to complete each section of the MCH Handbook accurately. Additionally, familiarity with the latest health protocols, recording procedures, and the significance of accurate data also impacts the thoroughness of the completion process(Krull & Kurniasari, 2020).

Workload and time availability play a crucial role in the completion of the Maternal and Child Health (MCH) handbook. Health workers with high workloads often lack the time necessary to fill out the MCH handbook comprehensively, particularly when faced with a demanding schedule and a large patient caseload. Conversely, having adequate time enables health workers to complete the MCH handbook more thoroughly and with greater attention to detail. Support from other health workers and community health cadres is vital to ensure the handbook's completion. Additionally, periodic evaluations help identify shortcomings and provide constructive feedback for improvement.

In addition, the format and complexity of the information to be recorded significantly influence the process. MCH handbooks that are easy to understand and complete facilitate the work of health workers, whereas formats that are overly complex or not user-friendly may hinder accurate completion. External factors, such as family and community support, as well as government policies that promote health data recording and reporting, also play a crucial role in the completeness of MCH handbook documentation. By adopting a holistic approach and ensuring effective coordination among various stakeholders, the completeness of MCH handbook records can be enhanced. The incompleteness of MCH handbook documentation can be attributed to multiple factors. A study conducted by Krull and Kurniasari identified several elements that contribute to the incompleteness of MCH handbook records, including midwives' knowledge, attitudes, training, and supervision. The study revealed that a significant majority of midwives (78.5%) lacked sufficient knowledge regarding the completeness of recording. Despite having received training, many midwives still exhibited gaps in MCH handbook documentation(Krull & Kurniasari, 2020).

The strength of this study is the first study to show factors that influence the utilization and fulfillment of the 2020 edition Indonesian version of the Maternal and Child Health (MCH) handbook. It would lead to a be the basis for government decision-making to form policies to increase the utilization of MHC handbooks and later can impact maternal mortality in Indonesia. There are several limitations of this study. First, the sample size was small because it is a single-center cross sectional study. Second, we did not examine the frequency of ANC in pregnant women, and some questions are subjective (self-report) so it can be biased.

5. Conclution

This study showed that urban areas, distance of public health from home and knowledge are supporting factors while working status is a factor inhibiting the use of MCH books in pregnant women. Pregnant women's knowledge about the MCH book was the biggest factor. In health workers, training history and knowledge of health workers are supporting factors for more complete MCH book filling. Knowledge of health workers is the biggest factor that most influences the MCH book filling by health workers. Thus, educating pregnant women and increasing training of health workers may be an option for strategies to increase the utilization and fulfillment of the MCH handbook.

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