

MATERNAL BEHAVIOR AND UTILIZATION OF MATERNITY WAITING HOMES: COMPARATIVE EVIDENCE FROM MOUNTAINOUS AND ISLAND AREAS IN SOUTH SULAWESI PROVINCE

NURGAHAYU NURGAHAYU^{1,2}, MASNI MASNI³, NUR NASRY NOOR⁴, NASRUDIN AM⁵, A. UMMU SALMAH³, RIDWAN THAHA⁶
ABDUL SALAM⁷, ANWAR MALLONGI⁸

¹DOCTORAL STUDENT, DOCTORAL PROGRAM IN PUBLIC HEALTH SCIENCE, FACULTY OF PUBLIC HEALTH, HASANUDDIN UNIVERSITY, MAKASSAR CITY, SOUTH SULAWESI 90245, INDONESIA

²LECTURER, FACULTY OF PUBLIC HEALTH, UNIVERSITAS MUSLIM INDONESIA, MAKASSAR CITY, SOUTH SULAWESI 90231, INDONESIA

³DEPARTMENT OF BIOSTATISTICS/KKB., FACULTY OF PUBLIC HEALTH, HASANUDDIN UNIVERSITY, MAKASSAR CITY, SOUTH SULAWESI 90245, INDONESIA

⁴DEPARTMENT OF EPIDEMIOLOGY, FACULTY OF PUBLIC HEALTH, HASANUDDIN UNIVERSITY, MAKASSAR CITY, SOUTH SULAWESI 90245, INDONESIA

⁵DEPARTMENT OF FACULTY OF MEDICINE, UNIVERSITAS MUSLIM INDONESIA, MAKASSAR CITY, SOUTH SULAWESI 90245, INDONESIA

⁶DEPARTMENT OF HEALTH PROMOTION AND BEHAVIORAL SCIENCES, FACULTY OF PUBLIC HEALTH, HASANUDDIN UNIVERSITY, MAKASSAR CITY, SOUTH SULAWESI 90245, INDONESIA

⁷DEPARTMENT OF NUTRITIONAL SCIENCES, FACULTY OF PUBLIC HEALTH, HASANUDDIN UNIVERSITY, MAKASSAR CITY, SOUTH SULAWESI 90245, INDONESIA

⁸ ENVIRONMENTAL HEALTH DEPARTMENT, FACULTY OF PUBLIC HEALTH, HASANUDDIN UNIVERSITY, MAKASSAR, INDONESIA

Abstract

Introduction: Maternity Waiting Homes (MWH) are recommended by the World Health Organization as an effective strategy to reduce maternal mortality, especially in areas with geographical and transportation barriers. However, their utilization is still not optimal, this is caused by many factors including limited health workers, inadequate RTK facilities and infrastructure, low family support and many other problems related to the socio-ecological conditions of the community.

Results: In the mountainous region, 28.7% of mothers utilized MWH, while 28.2% did so in the island region. Adequate knowledge ($p = 0.180$ vs. $p = 0.257$) and positive attitudes ($p = 0.127$ vs. $p = 0.061$) were not significantly associated with MWH use in either region. Maternal practices showed no significant association in the mountainous region ($p = 0.089$) but were significantly associated with MWH use in the island region ($p = 0.020$), where mothers with negative practices were more likely to stay at MWHs. **Conclusion:** Maternal knowledge and attitudes alone do not predict MWH use in either mountainous or island regions. Rather, maternal practices are key determinants of MWH use in the island context, reflecting adaptive responses to geographic constraints and service access. Therefore, efforts to increase MWH use must move beyond changing information and attitudes to address structural barriers such as transportation, indirect costs, and facility quality and to strengthen the integration of MWH with antenatal and referral services.

Keywords: maternity waiting homes; knowledge; attitudes; practices; mountainous regions; island region

INTRODUCTION

Residents in rural areas (mountains and islands) often face various barriers to obtaining health services, which results in limited access to necessary care. Access to health services is not only defined as the availability of adequate and timely services, but also encompasses a number of other prerequisites. Even when health services are available in an area, there are still factors that can hinder their utilization.

Maternity waiting homes (MWHs) are seen as a strategy to improve maternal health, particularly for those who face limited access to obstetric services due to geographic or transportation barriers. MWHs serve as temporary accommodation for pregnant women in the last 2–3 weeks of pregnancy, typically located near or within a health care facility. The World Health Organization (WHO) recommends the use of MWHs as an effort to improve maternal health, particularly in developing countries like Ethiopia (1) . Ethiopia has implemented MWHs for decades. MWHs are used to expand women's access to health facilities in resource-limited areas, but utilization rates in Ethiopia remain relatively low (2) .

Barriers to utilizing maternity waiting homes (MWHs) include distance, limited transportation, cost burdens (including high out-of-pocket expenses), the physical condition of the MWH, cultural barriers, limited knowledge about MWHs, women's negative perceptions of the quality of services at MWHs, and poor interactions between health workers and MWH residents. Meanwhile, a supporting factor for pregnant women to stay at MWHs is the availability of MWHs integrated with midwifery services, accompanied by quality service and compassionate care (3) .

Maternity Waiting Homes (RTKs) with optimal management, characterized by adequate building conditions, friendly service, integration with community health centers (Puskesmas) or hospitals, and a clear referral system, are more likely to be used by pregnant women who previously had relatively low rates of delivery in health facilities. Women who utilize RTKs tend to be those who frequently use ANC during pregnancy. The availability of high-quality services in facilities integrated with MWHs is a key factor in improving maternal and infant health outcomes (4) .

The 2021 Ministry of Health report stated that RTK was initiated to bring pregnant women, especially those living far away or facing geographical barriers, closer to delivery facilities and emergency obstetric services. In the Ministry of Health's performance and planning documents, RTK is encouraged through regional funding (including non-physical DAK) as part of accelerating access to safe delivery. However, implementation and utilization in the field remain uneven (5) (7) .

Overall, the maternal mortality rate (MMR) in South Sulawesi Province in 2021 was recorded at 129 per 100,000 live births, higher than the regional medium-term target of 90 per 100,000 live births (6) . Access to health facilities in Sinjai Regency remains limited. The regency, which consists of nine sub-districts, has only one hospital and six community health centers, a number clearly disproportionate to the number of sub-districts. Furthermore, Pulau IX Sub-district is geographically separated from the mainland of Sinjai and is an archipelago. The sub-district consists of nine islands with an area of approximately 7.55 km² and is approximately 12 miles from the district capital, so local residents face difficulties in reaching health care facilities, including community health centers. The nearest PONED facilities and PONEK hospitals can only be reached by sea transportation with an average travel time of 2 to 3 hours (7) . Gowa Regency still faces the problem of high maternal mortality rates. Based on official data from the Gowa Regency Government, in 2020 the MMR was recorded at 111 per 100,000 live births with a total of 15 maternal deaths. This condition indicates the need to improve access and continuity of maternal health services, especially for pregnant women at risk and those who live far from referral facilities (8) .

OBJECTIVE

1. For know difference connection knowledge And utilization House Wait Birth in the Plains Tall Regency Gowa and Sembilan Islands Regency Sinjai South Sulawesi Province
2. For know difference connection attitude And utilization House Wait Birth in the Plains Tall Regency Gowa and Sembilan Islands Regency Sinjai South Sulawesi Province
3. For know difference connection attitude And utilization House Wait Birth in the Plains Tall Regency Gowa and Sembilan Islands Regency Sinjai South Sulawesi Province

MATERIALS AND METHOD

This quantitative method uses a cross-sectional approach to examine the relationship between each indicator within each socio-ecological dimension in the utilization of Maternity Waiting Homes. The population of this study was all mothers who had given birth in the past year (live or dead) in Tompobulu , Tombolo Pao , Biringbulu Districts, totaling 502 in Gowa Regency and 223 pregnant women in Pulau Sembilan District, resulting in a total population of 726 mothers. The sampling technique in this study was stratified random sampling, with a sample size of 250. Data collection using questionnaires, data analysis using SPSS with the chi-square test.

RESULTS

Based on table 1 In the mountainous region, most mothers with adequate knowledge (117; 70.5%) did not utilize maternity waiting homes (MWH), while only five mothers with poor knowledge did not utilize them. In the island region, the lowest proportion was among mothers with poor knowledge (4), and the highest was among mothers with adequate knowledge (52; 70.3%) who did not utilize MWH. Chi-square analysis showed no significant association between maternal knowledge and MWH utilization in both mountainous ($p = 0.180$) and island areas ($p = 0.257$).

Based on table 2 In the mountainous region, most mothers with a positive attitude (116; 70.3%) did not utilize maternity waiting homes (MWH), while only six mothers with a negative attitude did not utilize them. In the island

region, the lowest proportion was among mothers with a negative attitude (8), and the highest was among mothers with a positive attitude (48; 68.6%) who did not utilize MWH. Chi-square analysis revealed no significant association between maternal attitude and MWH utilization in either mountainous ($p = 0.127$) or island areas ($p = 0.061$).

Based on table 3 In the mountainous region, most mothers with positive practices (115; 70.1%) did not utilize maternity waiting homes (MWH), while only seven with negative practices did not utilize them. In the island region, five mothers with positive practices (14.7%) utilized MWH, whereas the majority (29; 85.3%) with positive practices did not. Chi-square analysis indicated no significant association between maternal practices and MWH utilization in mountainous areas ($p = 0.089$), but a significant association was found in island areas ($p = 0.020$).

Table 1. Connection Knowledge With Utilization House Wait Birth Mother Who Ever Give birth to 1 Year Old Child Last in the Plains Area Tall Regency Gowa and Sembilan Islands Regency Sinjai South Sulawesi Province

Regional Conditions	Knowledge	Utilization				Total		p			
		No Utilise		Utilise							
		n	%	n	%						
Mountains	Not enough	5	100	0	0	5	100	0.180			
	Enough	117	70.5	49	29.5	166	100				
Total		122	71.3	49	28.7	171	100				
Archipelago	Not enough	4	100	0	0	4	100	0.257			
	Enough	52	70.3	22	29.7	74	100				
Total		56	71.8	22	28.2	78	100				

Source : Primary Data 2025

Table 2. Connection Attitude With Utilization House Wait Birth Mother Who Ever Give birth to 1 Year Old Child Last in the Plains Area Tall Regency Gowa and Sembilan Islands Regency Sinjai South Sulawesi Province

Regional Conditions	Attitude	Utilization				Total		p			
		No Utilise		Utilise							
		n	%	n	%						
Mountains	Negative	6	100	0	0	6	100	0.127			
	Positive	116	70.3	49	29.7	165	100				
Total		122	71.3	49	28.7	171	100				
Archipelago	Negative	8	100	0	0	8	100	0.061			
	Positive	48	68.6	22	31.4	70	100				
Total		56	71.8	22	28.2	78	100				

Source : Primary Data 2025

Table 3. Connection Action With Utilization House Wait Birth Mother Who Ever Give birth to 1 Year Old Child Last in the Plains Area Tall Regency Gowa and Sembilan Islands Regency Sinjai South Sulawesi Province

Regional Conditions	Action	Utilization				Total		p			
		No Utilise		Utilise							
		n	%	n	%						
Mountains	Negative	7	100	0	0	7	100	0.089			
	Positive	115	70.1	49	29.9	164	100				
Total		122	71.3	49	28.7	171	100				
Archipelago	Negative	27	61.4	17	38.6	44	100	0.020			
	Positive	29	85.3	5	14.7	34	100				
Total		56	71.8	22	28.2	78	100				

Source : Primary Data 2025

DISCUSSION

This study analyzes the relationship between maternal knowledge, attitudes, and practices and the utilization of maternity waiting homes (RTB) in mountainous areas (Gowa Regency) and island areas (Sinjai Regency) in South Sulawesi Province. The study findings indicate that maternal knowledge and attitudes were not significantly associated with RTB utilization in both regions, while maternal practices showed a significant association in the island area. Although most respondents had adequate knowledge regarding RTB and pregnancy, this did not significantly impact utilization. These results indicate that knowledge alone is insufficient to drive behavioral change. The Health Belief Model theory suggests that behavioral change related to health is influenced by several components: perceived severity, perceived susceptibility, perceived benefits, and perceived barriers. Individuals with high perceived severity tend to take preventive measures because they are aware of the severity of a disease. Individuals with high perceived

susceptibility tend to adopt preventive behaviors, as individuals feel vulnerable/easily infected with the disease, thus encouraging them to protect themselves. Furthermore, individuals with high perceived benefits tend to adopt preventive measures. This is because individuals who believe in the benefits of an action will be more motivated to do so. Furthermore, perceived barriers are also considered to influence an individual's tendency to adopt preventive measures. Individuals with barriers/limitations in engaging in preventive behavior will find it difficult to perform such actions. It can be said that individuals with low barriers are more likely to engage in preventive measures. These four components of the HBM can then fully explain an individual's tendency to undertake preventive measures (9). This is what occurs in the utilization of RTB, where RTB is presented as a form of preventive effort to prevent maternal deaths due to delays in accessing health services, resulting in delayed assistance.

The results of this study are inconsistent with those in the maritime Euthopia region, which showed that a history of antenatal visits, the distance to the nearest health facility, a history of using maternity waiting homes, always being involved in healthcare decisions, and sometimes being involved in healthcare decisions were significantly related to pregnant women's knowledge of maternity waiting homes. Furthermore, a mother's education level of middle to high, a short distance to the nearest health facility, and a history of antenatal visits were also significantly related to pregnant women's attitudes toward maternity waiting homes (10). In Zambia, the Mother Shelter Alliance (MSA) established 22 maternity waiting homes in three rural provinces Luapula, Southern, and Eastern. The alliance's report showed that between 2016 and 2018, only about 30% of women who gave birth in health facilities utilized the maternity waiting homes (MWHs) available at the intervention sites. This means that approximately 70% of women did not utilize MWHs, as they tended to visit health facilities only when signs of labor appeared or after advice from older family members, even though some of them lived far from health facilities (11). Attitudes and MWH Utilization Positive maternal attitudes toward MWHs were prevalent in both regions but were not significantly associated with their utilization. This gap between attitudes and behavior has been highlighted in studies from Zambia and Malawi, where women expressed positive views of MWHs but reported low utilization due to poor facility conditions, indirect costs, and long distances (12). This suggests that while attitudes can shape intentions, structural barriers often hinder actual utilization.

In contrast to knowledge and attitudes, maternal practices showed a significant association with MWH utilization in island regions ($p = 0.020$). Interestingly, mothers with negative practices were more likely to utilize MWH compared to those with positive practices. This suggests a contextual reality: women facing greater risk or limited access to routine care on remote islands may rely on MWH as an option to overcome limited access to health services. A mixed-methods study in rural Uganda also reported that women with higher obstetric risks were more motivated to remain in MWH despite challenges (13). In Ethiopia, evidence

Limitations

Studies This restricted by design cut its latitude, which prevents inference causal. Measurement knowledge , attitudes, and reported practices Alone Also can create bias. However Thus , the study This give outlook important about determinant behavior And contextual utilization of MWH in Indonesia's diverse environment in a way geographical

CONCLUSION

1. Knowledge And attitude Mother No relate significant with utilization House Wait Birth (RTK) good in the area mountains Regency Gowa as well as in the region archipelago Sembilan Regency Island Sinjai
2. Action Mother relate significant with utilization of RTK in the region archipelago

LIMITATION

While this study makes an important contribution to understanding maternal behavior and the challenges of RTK implementation in areas with difficult topography, future improvements need to involve longitudinal or mixed-method designs, the use of multidimensional validation instruments, and more in-depth multivariate analysis and cultural exploration.

CONFLICT OF INTEREST: The authors declare no conflicts of interest.

ETHICAL CONSIDERATIONS

This study has obtained ethical approval from the Ethics Committee of the Faculty of Public Health, Hasanuddin University, with number: 2176/UN4.14.1/TP.01.02/2024. All informants provided written or verbal consent before participating and were assured of confidentiality throughout the research process.

ACKNOWLEDGMENTS

The researchers would like to thank all parties involved in this research.

The authors would also like to thank the government, through the Indonesian Education Scholarship, which funded this research; the Muslim University of Indonesia for its assistance and support; the South Sulawesi Provincial

Government through the South Sulawesi Provincial Health Office; and Hasanuddin University for the opportunity to continue this research.

REFERENCES

1. Boru TM, Tefera EG, Bulto GA, Doba YS, Wakgari N, Roga EY, et al. Maternity waiting for home utilization among women who gave birth in the pastoralist communities of Borana Zone, Ethiopia: A community-based mixed-method study design. *Heliyon* [Internet]. 2024;10(12):e32925. Available from: <https://doi.org/10.1016/j.heliyon.2024.e32925>
2. Kassa BG, Ayele AD, Belay HG, Mihiretie GN, Worke MD. Utilization of maternity waiting homes and its associated factors in Ethiopia: Systematic review and meta-analysis. *Clin Epidemiol Glob Heal* [Internet]. 2021;12(September):100891. Available from: <https://doi.org/10.1016/j.cegh.2021.100891>
3. Gurara MK, Jacquemyn Y, Ukke GG, Van Geertruyden JP, Draulans V. Benefits, barriers and enablers of maternity waiting homes utilization in Ethiopia: an integrative review of national implementation experience to date. *BMC Pregnancy Childbirth* [Internet]. 2022;22(1):1–23. Available from: <https://doi.org/10.1186/s12884-022-04954-4>
4. Pitrianti L, Syakurah RA. Analysis of Health Service Program for Pregnant and Childbirth Women at the Rejang Lebong Health Office. *Jambi Med Journal* ... [Internet]. 2022;81–100. Available from: <https://online-journal.unja.ac.id/kedokteran/article/view/16813%0Ahttps://online-journal.unja.ac.id/kedokteran/article/download/16813/13388>
5. Ministry of Health of the Republic of Indonesia. Regulation of the Minister of Health No. 21 of 2021. Ministry of Health of the Republic of Indonesia [Internet]. 2021;(853):1–36. Available from: <https://peraturan.bpk.go.id/Details/314519/permekes-no-21-tahun-2021>
6. Wenang S, Yogyakarta UM, Dewi A, Muhammadiyah U, Ova Y, Gadjah EU, et al. Key Success Factors in Maternity Waiting Home Implementation: A Qualitative Study in Rural Indonesia. 2023;1–13. Available from: <https://doi.org/10.21203/rs.3.rs-2711966/v1>
7. Asriadi A, Asriadi S, Jusniaty J. Effectiveness of Utilization of Bahari Birth Waiting Home (RTK) in Sinjai as a Form of Public Service Innovation. *J Gov Insight*. 2021;1(1):38–48.
8. Department of Communication and Informatics S & PKG. GOWATA MAGAZINE.pdf. 2021.
9. Wahyusantoso S, Chusairi A. The Relationship between Health Belief Model and Preventive Behavior during the Covid-19 Pandemic among Young Adults. *Bul Ris Psychol dan Kesehat Ment*. 2021;1(1):129–36.
10. Anteneh TA, Solomon AA, Tamiru AT, Tibebu NS, Abegaz MY, Temesgan WZ, et al. Knowledge and attitude of women towards maternity waiting homes and associated factors among women who gave birth in the last twelve months in Dega Damot district, northwest Ethiopia. *Front Glob Women's Heal*. 2023;4(February):1–10.
11. Mwansa MK, Chimpinde K, Naidoo M. A priority not guided by policy? A scoping review of policy and strategic framework on Maternal Waiting Homes. *medRxiv* [Internet]. 2025;(10):2025.01.08.25320219. Available from: <https://www.medrxiv.org/content/10.1101/2025.01.08.25320219v1%0Ahttps://www.medrxiv.org/content/10.1101/2025.01.08.25320219v1.abstract>
12. Kebede KM, Mihrete KM. Factors influencing women's access to the maternity waiting home in rural Southwest Ethiopia: A qualitative exploration. *BMC Pregnancy Childbirth*. 2020;20(1).
13. Tesfay N, Tariku R, Zenebe A, Woldeyohannes F. Critical factors associated with postpartum maternal death in Ethiopia. *PLoS One* [Internet]. 2022;17(6 June):1–23. Available from: <http://dx.doi.org/10.1371/journal.pone.0270495>
14. Dereje S, Yenus H, Amare G, Amare T. Maternity waiting homes utilization and associated factors among childbearing women in rural settings of Finfinnee special zone, central Ethiopia: A community based cross-sectional study. *PLoS One* [Internet]. 2022;17(3 March):1–12. Available from: <http://dx.doi.org/10.1371/journal.pone.0265182>
15. WHO U. WHO recommendations on maternal health: guidelines approved by the WHO Guidelines Review