

Sociodemographic factors influencing beliefs and behaviors in herbal medicine use among postpartum mothers in Indonesia

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Abstract

The incidence of herbal medicine consumption is significant among postpartum mothers. However, its long-term use may pose potential risks. This study aimed to investigate the correlation between sociodemographic factors, beliefs, and behaviors related to the consumption of herbal medicine among postpartum mothers in Indonesia. This study employed a cross-sectional correlational

design with a sample of 170 postpartum mothers (1-42 days postpartum), determined using G*Power version 3.1. Purposive sampling was used for participant selection. The variables included sociodemographic factors, beliefs, and behaviors related to herbal medicine consumption. Data were analyzed using the Kruskal-Wallis and Mann-Whitney tests. The findings revealed that residency ($p=0.001$), age ($p=0.043$), education level ($p=0.0001$), number of children ($p=0.0001$), pregnancy complications ($p=0.006$), and labor complications ($p=0.027$) were significantly correlated with beliefs regarding herbal medicine consumption. Meanwhile, age ($p=0.039$) and number of children ($p=0.0001$) were significantly correlated with herbal medicine consumption behavior. This study highlights the strong influence of sociodemographic factors on the use of postpartum herbal medicine. While many mothers perceive herbal medicine as beneficial, monitoring its long-term effects and potential risks is essential. Future research should focus on ensuring safe use of herbal medicine, integrating traditional and modern healthcare practices, and enhancing education on evidence-based postpartum care.

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Introduction

Herbal medicines are used in traditional healthcare systems worldwide.¹ Despite limited scientific evidence regarding their clinical efficacy and safety, herbal remedies are believed to offer various health benefits. However, long-term and excessive use may cause adverse effects and potential interactions with conventional drugs, with severe interactions occurring in approximately 7.1% of cases.² Herbal medicines are derived from various parts of plants, including leaves, stems, flowers, roots, and seeds.^{3,4} The World Health Organization (WHO) estimates that 80% of the global population relies on traditional and complementary medicines for primary healthcare.⁵ The prevalence of herbal medicine consumption varies across countries, with reported usage rates ranging from 40% to 65% in India and China, and 31% in Belgium, 49% in France, and 70% in Canada.⁶ The widespread use of herbal medicine is largely influenced by the perception that it is safe due to its natural origins and long-standing traditional use.^{7,8}

In many cultures, herbal medicine is commonly used during pregnancy, childbirth, and postpartum recovery. Research in Tanzania found that sociocultural beliefs and practices during the perinatal period remain strong, including the use of herbal concoctions after childbirth, which may increase the risk of postpartum infections.^{9,10} Similarly, in Ethiopia, pregnant women frequently consume herbal medicine without prescriptions, citing easy access, affordability, and confidence that their illness is not severe.¹¹ The Indonesian government permits the use of herbal medicine, ensuring its safety and quality through monitoring, evaluation, and regulation.^{12,13} However, prolonged and excessive use may still pose risks, particularly due to potential interactions with pharmaceutical drugs.^{14,15} Some herbal compounds inhibit cytochrome P450 enzymes, leading to unintended pharmacological

effects.^{14,15}

The lack of comprehensive data on the safety of herbal medicine use during pregnancy and postpartum remains a major concern.¹⁶ A study found that 55.7% of women utilized traditional health services during the postpartum period, with 48% consuming pre-packaged herbal remedies and 31.8% preparing their own herbal concoctions. However, improper consumption of certain herbal medicines can be harmful. For example, turmeric consumption during pregnancy may stimulate uterine contractions, potentially leading to miscarriage.¹⁷ Therefore, consultation with healthcare professionals who are knowledgeable about herbal medicine is essential to prevent adverse effects and ensure appropriate medical interventions when necessary.¹⁷ The limited availability of reliable information about herbal medicines further contributes to concerns about their quality and accuracy.¹⁸ To enhance consumer safety, it is crucial for regulatory authorities and manufacturers to prioritize quality assurance and proper labeling of herbal products.¹⁸ Additionally, healthcare providers should routinely document traditional medicine use among pregnant and postpartum women, offering evidence-based guidance to eliminate harmful practices.^{9,10} Sociodemographic factors play a significant role in determining herbal medicine consumption during pregnancy, childbirth, and postpartum. These factors influence women's decisions and behaviors, including income level, education, cultural beliefs, and healthcare access.¹⁹ Research suggests that postpartum herbal medicine use is more prevalent among women from lower-income groups, likely due to cultural traditions or financial constraints.²⁰ Conversely, educated women tend to use herbal remedies more frequently, possibly because they have greater access to information and healthcare resources.²¹

Other factors influencing herbal medicine consumption include perceived health risks, sources and quality of information, vulnerability to health complications, and trust in alternative medicine.²² Some studies indicate that women with positive perceptions of herbal medicine's safety and effectiveness are more likely to use it, whereas those with negative attitudes tend to avoid it. However, even women with negative attitudes may consume herbal medicine if they lack access to conventional healthcare.²¹ Given the cultural and economic diversity in Indonesia, understanding how sociodemographic factors influence herbal medicine consumption is essential for public health interventions. Healthcare professionals must advise expectant and postpartum mothers in a way that is culturally sensitive, evidence-based, and safety-focused. Based on the issues discussed, this study aimed to determine the correlation between sociodemographic factors and beliefs and behaviors regarding herbal medicine consumption among postpartum mothers in Indonesia.

Materials and Methods

Research design

This study employed a cross-sectional correlational design and involved postpartum mothers across primary healthcare in West Java, Indonesia.

Study participant

The sample size was calculated using G-Power Software version 3.1. Hypothesis testing used the assumption of tolerance deviation (α)=0.05, impact size = 0.25, and power level = 0.80 (80%). Based on these calculations, the sample size was determined to be 170. The sampling was conducted using a purposive sampling

technique from March to June 2023. The inclusion criteria in this study were mothers in the postpartum period (1-42 days after delivery), who had a history of consistent consumption of herbal medicines from pregnancy to the postpartum period, were able to read and understand the questionnaire, and were willing to provide informed consent to participate in the study. Exclusion criteria in this study were postpartum mothers who used herbal medicine only occasionally or inconsistently during pregnancy and postpartum, had cognitive or mental disorders that may affect understanding of questions in the questionnaire or interview, and used certain medical therapies that interact with herbal medicine and may cause bias in the study.

Variables

The variables used were sociodemographic, including residence, age, occupation, education level, number of children, income, frequency of antenatal care (ANC), place of delivery, history of last pregnancy problems, history of previous delivery problems, and postpartum problems. The dependent variables were beliefs and behavior on the consumption of herbal medicines.

Instrument

The instrument used in this study was a questionnaire that included sociodemographic variables and dependent variables related to beliefs and behavior regarding herbal medicine consumption. The sociodemographic variables measured included residence (urban and rural), age group (>35 years, 20-35 years, and <20 years), occupation (laborer/employee and housewife), education level (elementary school, junior high school, senior high school, and university), number of children (≤ 3 children and >3 children), income (>IDR 5,257,834 and <IDR 5,257,834, as the regional minimum wage), frequency ANC (≥ 6 visits and <6 visits), place of delivery (at home or at a maternity home/hospital), history of complications during the last pregnancy (yes or no), history of complications during previous births (yes or no), and postpartum complications (yes or no).

The dependent variables include beliefs and behavior regarding herbal medicine consumption. The beliefs variable consists of 12 statements, each rated on a 4-point Likert scale: not believing, somewhat believing, believing, and strongly believing. These statements assess perceptions of whether herbal medicine can enhance health, prevent issues, cure illnesses, and relieve symptoms related to pregnancy, childbirth, and postpartum conditions. The behavior variable consists of 12 statements, each rated on a 4-point Likert scale: never, ever, seldom, and often. These statements describe the frequency of herbal medicine consumption for the same purposes (enhancement, prevention, cure, and symptom relief) during pregnancy, childbirth, and postpartum.

Data collection

Data collection was conducted directly with mothers in the postpartum period (1-42 days after delivery). Before data collection, the respondents were provided with a clear explanation of the research objectives and procedures. After ensuring their understanding, they were asked to provide informed consent before participating in the study.

Data analysis

All data, including sociodemographic factors, beliefs, and behaviors related to herbal medicine consumption, were analyzed using both univariate and bivariate analyses. Sociodemographic characteristics, particularly those analyzed using frequency distribution, were utilized for univariate analysis. In contrast, numerical

data, such as the level of belief and behavior of herbal medicine consumption, were analyzed by central tendency. The bivariate analysis was conducted using mean difference tests in independent groups for categorical data, specifically the Kruskal-Wallis test statistics and the Mann-Whitney test with 95% confidence interval (CI) ($\alpha=0.05\%$).

Ethical clearance

This study has received approval from the Health Research Ethics Committee of the Bandung Politeknik Kesehatan Remakes Bandung No. 62/KEPK/EC/V/2023. The respondents were provided with a study explanation, signed informed consent, and granted the right to withdraw if any unacceptable aspects were present.

Results

Demographic characteristics

Based on Table 1, the majority of respondents lived in urban areas (56.4%), belonged to the age group 20-35 years (96%), worked as housewives (94.7%), had education from elementary school (38.2%), had a number of children ≤ 3 (71.2%), and had income below the minimum wage (84.4%). Regarding the place of delivery, the majority of mothers (94.1%) gave birth in a maternity home or hospital, while only a small proportion (5.9%) delivered at home. For pregnancy complications, 11.8% of mothers reported experiencing complications during their last pregnancy, whereas 88.2% had no such issues. Similarly, when examining birth-related complications, 15.5% of mothers experienced problems during delivery, while 84.7% reported no complications. In terms of postpartum complications, 5.9% of mothers experienced health issues following childbirth, whereas 94.1% reported no postpartum complications.

Table 2 presents the mean scores, CI 95%, and standard deviations (SD) for beliefs and behaviors regarding herbal medicine consumption among 170 postpartum mothers. The findings indicate that postpartum mothers generally have strong beliefs about herbal medicine, but their actual consumption behavior is lower and more varied.

The mean score for beliefs about herbal medicine consumption is 57.071 (95% CI: 54.12-60.01, SD=19.42), suggesting that most mothers have a positive perception of herbal medicine and its potential benefits. The relatively moderate standard deviation indicates some variation in responses, but overall, the majority of postpartum mothers believe in herbal medicine.

In contrast, the mean score for behavior related to herbal medicine consumption is 40.99 (95% CI: 37.68-44.29, SD=21.82), which is notably lower than the belief score. This suggests that although many mothers believe in the benefits of herbal medicine, their actual consumption is less frequent. The higher standard deviation (21.82) compared to beliefs (19.42) indicates greater variability in consumption behavior, implying that some mothers consume herbal medicine regularly, while others rarely or never use it despite their beliefs.

The results in Table 3 showed that mothers in rural areas had significantly higher mean ranks for beliefs (103.20, $p=0.0001$) and behavior (103.61, $p=0.0001$) compared to mothers in urban areas. It indicates that rural mothers are more likely to believe in and consume herbal medicine than urban mothers. Older mothers (>35 years) had higher belief (99.92, $p=0.043$) and behavior scores (100.82, $p=0.039$) compared to younger age groups. Older mothers

tend to have stronger beliefs in and a higher tendency to consume herbal medicine compared to younger mothers. Mothers with elementary school education had the highest belief scores (105.76, $p=0.0001$) compared to those with higher education levels. However, behavior scores were not significantly different across education levels ($p=0.142$). Lower education levels are associated with stronger beliefs in herbal medicine, but actual behavior (consumption) does not significantly differ. Mothers with more than 3 children had significantly higher belief scores (120.93, $p=0.0001$) and behavior scores (110.44, $p=0.0001$) than those with fewer children. Mothers with more children tend to believe in and consume herbal medicine more than those with fewer children. Mothers who gave birth at home had higher belief scores (109.40, $p=0.111$) and higher behavior scores (108.30, $p=0.119$) than those who delivered in maternity homes/hospitals, but these differences were not statistically significant. Place of delivery is not a strong predictor of beliefs or behavior regarding herbal medicine. Mothers who experienced pregnancy complications had significantly higher belief scores (113.95, $p=0.006$) and marginally higher behavior scores (104.95, $p=0.052$) than those without complications. Mothers who experienced birth complications had significantly higher belief

Table 1. Sociodemographic of postpartum mothers (n=170).

Demographic variables (n=170)	Frequency	Percent (%)
Residence		
Urban	96	56.4
Rural	74	43.6
Age group		
>35 years	45	26.5
20-35 years	115	67.6
<20 years	10	5.9
Occupation		
Laborer/employee	9	5.3
Housewife	161	94.7
Education level		
Elementary school	65	38.2
Junior high school	58	34.1
Senior high school	42	24.7
University	5	2.9
Number of children		
≤ 3 children	121	71.2
>3 children	49	28.8
Income		
$\geq$ IAP 5.257.834	30	17.6
<IDR 5.257.834	140	82.4
Frequency of ANC		
≥ 6 visits	129	75.9
<6 visits	41	24.1
Place of delivery		
Home	10	5.9
Maternity home/hospital	160	94.1
History of complications during the last pregnancy		
Yes	20	11.8
No	150	88.2
History of complications during previous delivery		
Yes	26	15.5
No	144	84.7
Postpartum complications		
Yes	10	5.9
No	160	94.1

ANC, antenatal care.

scores (104.96, $p=0.027$) but no significant difference in behavior ($p=0.519$). Mothers who had pregnancy complications are more likely to believe in herbal medicine, but their consumption behavior is only slightly affected. Birth complications increase beliefs but do not affect behavior significantly.

Discussion

This study highlights the influence of sociodemographic fac-

tors on beliefs and behaviors regarding herbal medicine consumption among postpartum mothers. The key findings indicated that place of residence, age, education level, number of children, history of complications during pregnancy, and complications during previous deliveries were significantly associated with beliefs and consumption of herbal medicine for managing postpartum conditions. The findings reveal a trend where older mothers (above 35 years) are more likely to believe in and consume herbal medicine than younger mothers. This aligns with research in Japan, where nearly 90% of respondents with higher education levels reported

Table 2. Scores of beliefs and behaviors regarding herbal medicine consumption among postpartum mothers.

Variables (n=170)	Mean	CI 95%	SD
Beliefs about herbal medicine consumption	57.071	Min: 54.12 Max: 60.01	19.42
Behavior related to herbal medicine consumption	40.99	Min: 37.68 Max: 44.29	21.82

CI, confidence interval; SD, standard deviation.

Table 3. The correlation between sociodemographic factors and beliefs and behavior regarding herbal medicine consumption in postpartum mothers (n=170).

Sociodemographic variable	Belief in herbal medicine			Behavior consumption of herbal medicine		
	n	Mean rank	Sig (p-value)	n	Mean rank	Sig (p-value)
Residence						
Urban	96	71.85	0.0001*	96	71.54	0.0001*
Rural	74	103.20	($\alpha \leq 0.05$)	74	103.61	($\alpha \leq 0.05$)
Age group						
>35 years	5	99.92	0.043**	45	100.82	0.039**
20-35 years	115	79.05	($\alpha \leq 0.05$)	115	80.53	($\alpha \leq 0.05$)
<20 years	10	94.80		10	73.65	
Job						
Laborer/employee	9	75.11	0.513*	9	72.72	0.409*
Housewife	161	86.08	($\alpha < 0.05$)	161	86.21	($\alpha < 0.05$)
Education						
Elementary school	65	105.76	0.0001**	65	96.25	0.142**
Junior high school	58	75.92	($\alpha \leq 0.05$)	58	79.73	($\alpha \leq 0.05$)
Senior high school	42	68.82		42	78.37	
University	5	73.30		5	72.60	
Number of children						
≤ 3 children	121	71.15	0.0001*	121	75.40	0.0001*
>3 children	49	120.93	($\alpha \leq 0.05$)	49	110.44	($\alpha \leq 0.05$)
Income						
IDR 5.257.834	30	73.93	0.153*	30	85.25	0.975*
<IDR 5.257.834	140	87.98	($\alpha \leq 0.05$)	140	85.55	($\alpha \leq 0.05$)
Frequency of ANC						
≥ 6 visits	41	93.78	0.213*	41	82.51	0.645*
<6 visits	129	82.87	($\alpha \leq 0.05$)	129	86.45	($\alpha \leq 0.05$)
Place of delivery						
Home	10	109.40	0.111*	10	108.30	0.119*
Maternity home/hospital	160	84.01	($\alpha \leq 0.05$)	160	84.08	($\alpha \leq 0.05$)
History of complications during the last pregnancy						
Yes	20	113.95	0.006*	20	104.95	0.052*
No	150	81.71	($\alpha \leq 0.05$)	150	82.91	($\alpha \leq 0.05$)
History of complications during previous delivery						
Yes	26	104.96	0.027*	26	91.06	0.519*
No	144	81.99	($\alpha \leq 0.05$)	144	84.50	($\alpha \leq 0.05$)
Postpartum complications						
Yes	10	103.15	0.239	10	97.30	0.420*
No	160	84.76	($\alpha \leq 0.05$)	160	84.76	($\alpha \leq 0.05$)

ANC, antenatal care; **Kruskal-Wallis test; *Mann-Whitney test.

using herbal medicine primarily for health maintenance.²³ Similarly, a study in Taiwan found that higher education levels positively correlate with herbal medicine use during the postpartum period, suggesting that educated women are more receptive to integrating traditional and modern medical practices.²⁴

Interestingly, this study found that mothers with lower education levels have stronger beliefs in herbal medicine, a trend also observed in systematic reviews, where women with lower education levels were twice as likely to consume herbal medicine for treating conditions like diabetes, constipation, and skin diseases.^{14,25} This suggests that while education improves knowledge, cultural and familial influences play a stronger role in shaping herbal medicine consumption.²⁶

Mothers with larger families (more than three children) were found to have higher beliefs and consumption of herbal medicine. This may be influenced by traditional family structures, where older family members, such as grandmothers or elders, pass down herbal knowledge. In Sierra Leone, more than one-third of mothers use herbal medicine during breastfeeding, often under the guidance of family traditions.²⁷ Similarly, research in Myanmar and Cambodia highlights that traditional postpartum practices remain common, regardless of urban or rural residency, suggesting that cultural transmission plays a crucial role in the use of herbal medicine.^{28,29}

The study found that rural mothers are more likely to believe in and consume herbal medicine compared to urban mothers. This finding is consistent with research in Ethiopia, where rural mothers are three times more likely to use herbal medicine due to ease of access, cultural beliefs, and the perception that certain illnesses do not require modern medical intervention.¹⁰ In West Java, Indonesia, traditional medicine is highly valued, not only for its therapeutic effects but also for dietary and cultural preservation, reinforcing the role of traditional knowledge in shaping herbal medicine consumption.³⁰

Mothers who experienced complications during pregnancy or delivery were found to have stronger beliefs in herbal medicine. A similar trend was observed in Morocco, where postpartum traditions include herbal medicine use for pain relief and recovery.³¹ Many mothers believe that herbal treatments help ease postpartum pain, support breastfeeding, and improve overall maternal well-being.³² Studies also indicate that more than 20% of women in Japan receive herbal treatments from midwives or traditional practitioners during childbirth,²³ demonstrating how herbal medicine is integrated into maternal care. However, despite strong beliefs, actual consumption of herbal medicine does not always increase significantly among women with pregnancy-related complications. Studies indicate that mothers with pregnancy complications receive more careful medical monitoring, which may lead them to be more cautious about using herbal medicines.²⁰ This highlights the need for healthcare providers to educate postpartum mothers on safe herbal medicine use.

Although many postpartum mothers use herbal medicine, some women decrease their consumption during pregnancy and labor due to safety concerns. Research from Turkey indicates that higher education and income levels influence attitudes toward complementary and alternative medicine, with higher-income mothers demonstrating more selective use.²⁷ Similarly, women in Taiwan and Malaysia with higher education levels tend to integrate herbal medicine cautiously, balancing traditional remedies with modern medical recommendations.²⁰ A key concern is the lack of discussion between patients and healthcare providers. Studies show that only 5.3% of women disclose their herbal medicine use to healthcare professionals, raising safety risks due to potential

herbal-drug interactions.¹⁶ Therefore, healthcare providers must actively educate mothers on the benefits and risks of herbal medicine use during the postpartum period. Herbal medicine is often used not only for postpartum recovery but also for maternal health benefits, such as increasing breast milk production,²⁰ enhancing maternal well-being,²¹ preventing postpartum infections and fatigue,³³ treating sleep disturbances, anxiety, and pain,²⁷ and regulating blood sugar and cholesterol levels.³⁴

The widespread use of herbal medicine is influenced by regional diversity, cultural traditions, and the availability of local medicinal plants. Research in Ethiopia found that parity (number of children), residence, and pregnancy-related health experiences significantly affect herbal medicine use.³³ Similarly, in Myanmar, traditional postpartum herbal medicine is deeply rooted in cultural practices, regardless of urban or rural residency.²⁸ Further research is needed to understand how medical supervision, cultural beliefs, and access to healthcare interact to shape herbal medicine use in postpartum mothers across different contexts.

Conclusions

Beliefs and behaviors regarding herbal medicine consumption for managing pregnancy, childbirth, and postpartum issues are strongly influenced by sociodemographic factors, including place of residence, age, education level, parity, and previous pregnancy or delivery complications. Rural mothers, older mothers, those with larger families, and those with pregnancy complications tended to have higher beliefs and consumption of herbal medicine, often driven by cultural traditions, accessibility, and family influence. Although herbal medicine remains a widely accepted complementary approach, its long-term effects, safety, and potential interactions with modern medicine require further research. Integrating scientific validation with traditional practices can help ensure that herbal medicine is both safe and beneficial for postpartum mothers.

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