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Sociodemographic Determinants of Women's Empowerment During Pregnancy: A Cross-sectional Study in Indonesia

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ABSTRACT

Introduction: Women's empowerment related to pregnancy plays an important role in enhancing maternal and infant health, during pregnancy, childbirth and the postpartum period. However, the determinants of women's empowerment in the context of pregnancy are still not fully understood, particularly in middle-income countries. This study aimed to determine the level of women's empowerment related to pregnancy and identify its associations with sociodemographic characteristics.

Methods: This study used a cross-sectional design involving pregnant women who underwent antenatal care at various health facilities in Malang, Indonesia. The Pregnancy Empowerment Scale (PRES) questionnaire has been used to measure the level of empowerment of women to control their health during pregnancy, which consists of four subscales: Provider Connectedness, Skillful Decision-Making, Peer Connectedness, and Getting Voice. This questionnaire has been distributed to 413 pregnant women. Sociodemographic characteristics assessed included age, gestational age, parity, pregnancy risk factors, household income, and average distance to antenatal care centers. The data were analysed using multiple linear regression analysis to determine the relationship between the factors and the level of empowerment.

Results: The results of this study indicate that the majority (95.6%) of pregnant women have high women's empowerment, while the average distance from the antenatal care centre is the only significant and positive sociodemographic factor influencing women's empowerment related to pregnancy. However, the overall contribution of sociodemographic variables to this empowerment is relatively small. The regression model shows $R^2 = 0.041$, allowing for unmeasured psychosocial or cultural factors that could play a role.

Conclusion: Sociodemographic factors play an important role in women's empowerment related to pregnancy. To enhance empowerment, community-based approaches that consider access to health services and improvement of family economic welfare should be considered.

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INTRODUCTION

Empowering women during pregnancy is essential to enhancing the quality of maternal and child health (1,2). Empowerment includes a woman's ability to make decisions related to her health and access to information, health services, and social and economic support (3). Women who have a high level of empowerment are more likely to have a healthy pregnancy and deliver a healthy baby (4,5). Therefore, understanding the factors that influence women's empowerment during pregnancy is very important, especially in the context of developing countries or low to middle income countries.

Pregnancy is a critical period that requires optimal support from various aspects, including social and economic support (6). Empowering women during pregnancy not only impacts the physical health of mothers but also their mental and social well-being (7). These conditions contribute to the delivery process's success and the newborn's health. Additionally, empowering women during pregnancy is closely linked to access to quality healthcare services, a connection that can be understood through Sen's capabilities approach, which highlights the expansion of real opportunities, and Kabeer's empowerment framework, which underscores the interrelated dimensions of resources, agency, and achievements (4). Women with a high level of empowerment tend to be more active in seeking health information, attending regular pregnancy check-ups, and making decisions that support their health (1,8). Therefore, it is essential to identify the factors that hinder or support women's empowerment during pregnancy so that targeted improvement efforts can be made.

Currently, various challenges still hinder women from empowering themselves, such as access to information, decision-making, and active involvement in health services (9). Previous studies have shown that sociodemographic factors are essential in shaping perceptions of women's empowerment, especially those related to pregnancy. A study from Indonesia shows that several sociodemographic factors contribute to the utilisation of antenatal care services, including age, gestational age, parity, pregnancy risk factors, household income, and distance from antenatal care (ANC) centers (10). Past research in African countries revealed that age and reproductive experience (parity) can influence women's self-confidence and ability to make decisions related to health and pregnancy (4,11). Gestational age also has the potential to influence empowerment, as information needs and decision-making may change as pregnancy progresses (12,13). Similarly, a study in Tanzania showed that religion and number of pregnancies (gravidity) were important factors in moderating the effect of group ANC on empowerment (14).

Furthermore, pregnancy risk factors are of particular concern because women with high-risk pregnancies are likely to be more dependent on healthcare providers, which can affect their autonomy in accessing health services (10,15). Household income is an economic indicator directly impacting access to health services and opportunities to obtain accurate information(16). Additionally, distance to antenatal care ANC facilities can influence the frequency of visits and women's engagement in health services, ultimately affecting their empowerment during pregnancy (17).

Through a comprehensive approach, this study aims to determine the level of women's empowerment and identify the sociodemographic factors that influence the empowerment of pregnant women in Malang City, Indonesia.

METHOD

Research Type

This cross-sectional study to explore the relationship between sociodemographic variables and women's empowerment associated with pregnancy.

Population and Sample/Informants

The study sample consisted of 413 pregnant women. Participants were included in the study if they were pregnant women aged between 20 and 40 years who were attending antenatal care at selected clinics. Pregnant women who experienced obstetric emergencies such as antenatal haemorrhage or eclampsia were excluded from this study. The sample size was estimated using the Raosoft sample size calculator for single proportion estimation. With a population size of 11,017, the total sample size required for this study was 413 participants. This study used a stratified proportional random sampling method to select the sample, which ensured that the sample size from each stratum was proportional to the population size of each subdistrict. In the initial stage, 50 private midwife clinics from five subdistricts in Malang City were recorded and coded, then selected using purposive sampling to produce 10 selected

clinics according to the criteria. Subsequently, the sample size was adjusted according to the quota proportions calculated for each district. Clinics were selected using purposive sampling, considering criteria such as the number of pregnant patients, consistency of antenatal service provision, and regional representation. This approach was chosen to ensure adequate participant availability, maintain equality in service quality between clinics, and increase methodological transparency by minimizing potential selection bias. The sample size is then adjusted proportionally based on the quota for each sub-district to achieve a balanced distribution of participants. Finally, sampling of pregnant women was conducted at the private midwife clinics using a simple random sampling method adjusted to the number of pregnant women receiving services from each private midwife clinic.

Research Location

This was performed on pregnant women receiving antenatal care services at private midwifery clinics in Malang City, East Java, Indonesia. Data collection was conducted from August 2024 until February 2025.

Instrumentation or Tools

The research instruments were the sociodemographic characteristics information and the Pregnancy-Related Empowerment Scale (PRES) questionnaire. Questions in the demographic section included age, gestational age, education level, occupation, risk factors and complications age over 35 years, anaemia, history of abortion, epilepsy), distance from home to health facilities, and others.

The Pregnancy-Related Empowerment Scale (PRES), developed by Klima et al. (2015) (18,19) was used to assess the degree of self-empowerment in managing maternal health during pregnancy. Comprising 16 positively stated items, the instrument is available in English and Spanish and employs a four-point Likert scale from 'strongly disagree' (1) to 'strongly agree' (4). Women's empowerment in the context of pregnancy is categorized as low for scores between 16 and 32, moderate for scores between 32 and 48, and high for scores between 48 and 64. The questionnaire consists of four domains, including Provider Connectedness, Skillful Decision-Making, Peer Connectedness, and Getting a Voice. The questionnaire was cross-cultural adapted into Indonesian language by our research team. Indonesian adaptation of the PRES questionnaire demonstrated a satisfactory level of content validity, as reflected by an overall content validity index (CVI) of 0.99. The universal agreement index (S-CVI/UA) was recorded at 0.88, while the average congruence index (S-CVI/Ave) reached 0.91. The pilot test of the Indonesian version showed high reliability, with Cronbach's alpha of 0.944 (95% CI: 0.79–0.91), indicating strong internal consistency (20). Meanwhile, construct validity for this instrument has not yet been conducted.

Data Collection Procedures

Data collection involved gathering sociodemographic information and distributing questionnaires related to women's empowerment related to pregnancy. Prior data collection, participants provided informed consent after receiving explanations regarding the study's aims, methods, and the safeguards for their privacy and data confidentiality. The questionnaire takes approximately one hour to complete per participant. Upon completion of pregnancy examinations at private midwife clinics, participants who met the inclusion and exclusion criteria were provided with instructions on how to fill out the Google Form. During the data collection process, efforts were made to ensure that participants can complete the questionnaire flexibly, comfortably, and without any obstacles.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) Version 29 and Stata version 19. Descriptive statistics, including frequencies and percentages, were applied to summarize the data and describe the participants' sociodemographic characteristics and levels of women's empowerment related to pregnancy. Multiple linear regression analysis was employed to explore associations between sociodemographic variables and women's empowerment related to pregnancy. Statistical significance was set at a p-value of less than 0.05.

Ethical Approval

This study is part of a larger study and was approved by the Research Ethics Committee of Universiti Teknologi MARA, Malaysia (Reference: REC/08/2024 (PG/MR/382)) and the Health Research Ethics Committee at Poltekkes Kemenkes Malang, Indonesia (Reference No: DP/04.03/F.XXXI.31/0625/2024).

RESULTS

Participants' Socio-demographic Characteristics and Level of Women's Empowerment

A total of 413 pregnant women participated in this study. Majority of the pregnant women (85.2%) were aged between 20 and 35, with an average age of 26.4 years (SD = 5.8). Most of them were in their second trimester (42.1%). Based on parity, 51.8% were primiparous. Most participants (82.3%) had low household incomes (less than 3.494 million rupiah per month), with an average income of 2.8 million rupiah (SD = 3.8). In terms of access to antenatal care (ANC), most women (64.2%) lived within 1–5 km of an ANC center, with an average distance of 4.9 km (SD = 4.7). Regarding the number of ANC visits, 27.1% made only one visit, while 26.9% made 5–7 visits. The average number of ANC visits was 4.1 (SD = 2.8). In terms of education, most respondents had completed secondary school (58.4%). Most (80.6%) reported having at least one risk factor during pregnancy. (Table 1).

Most respondents (95.6%) demonstrated a high level of empowerment, while only 4.4% were in the moderate category. None of the participants were classified as having a low level of empowerment. The mean PRES score was 56.1 (SD = 6.3), with scores ranging from 46 to 64.

Prediction of the Effect of Sociodemographic Factors on Women's Empowerment Related to Pregnancy

The estimation was performed using linear regression with Robust Standard Error, because the ordinary least squares (OLS) method produced residuals that did not meet the assumptions of normality and heteroscedasticity (21). The coefficient of determination (R square) produced by the regression model is 0.041, which means that the contribution of age, gestational age, parity, education, household income, risk factors in pregnancy, the average distance from the antennatal center, and the number of antenatl visits to women's empowerment related to pregnancy is 4.1%, while the remaining 95. 9% is contributed by other factors included in the regression model or not discussed in this study.

The multiple linear regression analysis showed that only the average distance from the antenatal center variable was significantly predicted women's empowerment related to pregnancy (adjusted B = 0.209, $p<0.001$).The average distance from the antenatal center has a positive coefficient, which suggests that the average distance from the antenatal center has a direct relationship with women's empowerment related to pregnancy. This means that the farther the distance from the antenatal center, the higher the women's empowerment related to pregnancy. This means that the greater the distance from the antenatal center, the higher the pregnancy-related empowerment of women. Meanwhile, other variables such as the age of the pregnant woman, gestational age, parity, level of education, household income, risk factors in pregnancy, and number of antenatal care visits show no significant relationship with women's empowerment (Table 3).

Table 1. Socio-demographic characteristics of the respondents (n = 413)

Variable	Variable Category	n (%)	Min.	Max.	Mean (SD)
Age	< 20	27 (6.5)	16	43	26.4 (5.8)
	20 - 35	352 (85.2)			
	> 35	34 (8.2)			
Gestational Age	First Trimester	96 (23.2)	4 (weeks)	40 (weeks)	22 (10)
	Second Trimester	174 (42.1)			
	Third Trimester	143 (34.6)			
Parity	Primipara	214 (51.8)	1 (times)	4 (times)	1.7 (0.9)
	Multipara	199 (48.2)			
	Grademultipara	0 (0.0)			

Household Income	Low Income (< 3.494 Million rupiah per month)	340 (82.3)	0.5	50	2.8 (3.8)
	Middle Income (3.494 - 7 Million rupiah per month)	53 (12.8)			
	Upper Middle Income (7 - 15 Million rupiah per month)	18 9 (4.4)			
	High Income (> 15 Million rupiah per month)	2 (0.5)			
Average Distance from The ANC Center	Very Near distance (< 1 Km)	32 (7.7)	0.2	30	4.9 (4.7)
	Close Distance (1 - 5 Km)	265 (64.2)			
	Medium Distance (6 - 15 Km)	100 (24.2)			
	Long Distance (16 - 30 Km)	16 (3.9)			
Number of ANC Visit (times)	1 - 5	247 (66.3)	1	11	4.1 (2.8)
	6 - 10	123 (29.8)			
	> 10	16 (3.9)			
Level of Education	Elementary School	24 (5.8)			
	Junior High School	80 (19.4)			
	High School	241 (58.4)			
	College/University	65 (15.7)			
	Master	3 (0.7)			
Risk Factors in Pregnancy	Yes (Over 35 Years Old, Anemia, Abortion History, Etc)	333 (80.6)			
	No	80 (19.4)			

Table 2. The level of Women's Empowerment Related to Pregnancy is Assessed Using the Pregnancy-Related Empowerment Scale (PRES) (n=413)

Category	Score Interval	Frequency (%)	Min.	Max	Mean (SD)
Low	16 - 32	0 (0.0)			
Moderate	32 - 48	18 (4.4)	46	64	56.1 (6.3)
High	48 - 64	395 (95.6)			

Table 3. Association between Socio-demographic factors and Women's Empowerment Related to Pregnancy (n=413)

Sociodemographic Variable	Linear Regression			
	B[a] (95% CI)	β[b]	t	p-value
Age	0.037 (-0.11,0.19)	0.033	0.470	0.640
Gestational Age	-0.036 (-0.12,0.05)	-0.057	-0.800	0.423
Parity	-0.028 (-0.92,0.86)	-0.004	-0.060	0.950
Education	-0.088 (-0.85,0.70	-0.011	-0.220	0.827
Household Income	-0.109 (-0.22,0.03)	-0.066	-1.910	0.057
Risk Factors in Pregnancy	-1.109 (-2.66,0.44)	-0.069	-1.400	0.161
Average Distance from the ANC Center	0.209 (0.09,0.32)	0.154	3.650	<0.001
Number of ANC Visit	-0.063 (-0.33,0.36)	-0.028	-0.380	0.708

[a] Adjusted unstandardized regression coefficient with 95% confidence interval
[b] Adjusted standardized regression coefficient
$R^2 = 0.041$

DISCUSSION

One of the prominent findings of this study was the overall high level of empowerment among participants, with 95.6% classified as highly empowered. This distribution could be due to the potential limitations of the instruments in distinguishing more detailed variations in empowerment levels, which could be caused by a homogeneous sample with good access to health care and support, as well as a recruitment process that selected pregnant women who were more prepared or more empowered than the general population. On the other hand, despite economic and social challenges such as low income and limited education among some participants, many women still reported feeling empowered related to pregnancy (22,23). This likely reflects the influence of cultural, community, or health system factors that support autonomy and decision-making capacity during pregnancy childbirth (24–26). Regression analysis demonstrated that sociodemographic characteristics explained only 4.1% of the variation in women's empowerment scores. However, although the overall model is statistically significant, indicating that sociodemographic factors have a combined influence, the relatively low R-square value suggests that empowerment is a multidimensional construct shaped by additional unmeasured factors (4,27,28). These findings suggest that factors beyond sociodemographic characteristics, such as psychosocial and cultural factors, including emotional support from partners, access to information, attitudes of health care providers, social networks, gender norms, and cultural beliefs, may play an important role in shaping women's empowerment. Therefore, further exploration of these psychosocial and cultural aspects as mediators or moderators is needed to gain a more comprehensive understanding of the determinants of empowerment (27,29,30).

This study discovered that the average distance to antenatal care (ANC) centers significantly influenced women's empowerment related to pregnancy (31). Surprisingly, greater distance from antenatal care centers was associated with higher levels of empowerment. These findings suggest that pregnant women who live further away from antenatal care centers actually have higher levels of empowerment, challenging the normative assumption that proximity to services automatically increases empowerment. These conditions indicate that distance can encourage proactivity, negotiation of access, support in health-seeking behavior, and women's independence in health decision-making. Furthermore, these dynamics also include negotiation of access with family or service providers, perceptions that the chosen facility provides better quality care, and the role of relational autonomy gained through support from partners or social networks. Thus, these findings not only expand our understanding of empowerment among pregnant women but also deepen the contribution of this research by aligning it with maternal health, which emphasizes the complexity of interactions between structural, social, and individual factors (32–34).

The finding of a positive relationship between distance to ANC facilities and women's empowerment levels provides a new perspective in understanding the dynamics of maternal health-seeking behavior. In the context of middle-income countries, women's willingness and ability to travel longer distances to obtain ANC services may reflect autonomy in decision-making, control over resources (e.g., transportation and costs), and social support from partners or families. This suggests that empowerment is not only measured by geographical accessibility but also by women's capacity to overcome such barriers independently or collectively (35,36).

Additionally, the possibility of differences in quality or trust in antenatal care facilities, which may vary depending on their proximity, is a reason for choosing a health service location. Women who are more empowered may have certain preferences for health service providers that they consider to be of higher quality, even if they are located further away. Women who seek services at more distant locations may be those who are better informed, have a higher awareness of the importance of antenatal care, and can negotiate with their social environment to ensure their health needs are met. However, it is important to note that these findings do not imply that greater distance always has a positive impact on empowerment. In other contexts or among women with economic and social limitations, distance can instead become a serious barrier that reduces access to healthcare services, potentially worsening pregnancy outcomes (37–39).

The non-significant relationships between other sociodemographic variables (such as age, parity, education, and income) and empowerment highlight the complexity of measuring empowerment in the context of maternal health (28,34). Although education and income are traditionally considered enablers of empowerment, their insignificant impact here suggests that other contextual or intrinsic factors likely have a more influential role among this population (22,40).

This study has not identified the potential role of internal psychological factors such as self-confidence, perceived control over health, and intrinsic motivation that are likely to influence women's empowerment related to pregnancy. These elements are rarely measured through traditional sociodemographic metrics but can significantly shape how women navigate pregnancy and the health system (4). Additionally, social support networks, including spousal support, family involvement, and peer influence, may serve as key empowerment factors not measured in this study (41). Pregnant women who receive emotional and material support will likely feel more confident and capable, regardless of their economic or educational background (42,43).

Since respondents were recruited after pregnancy check-ups at private midwife clinics, the results of this study may not fully represent pregnant women who receive services at public facilities or those who do not receive any pregnancy care at all. Participants from private clinics tend to have higher socioeconomic backgrounds, which may affect their level of empowerment and access to information.

CONCLUSION

This study examined associations between socio-demographic factors, including age, gestational age, parity, education level, risk factors, infrequent antenatal care, and others, in relation to women's empowerment related to pregnancy. Although sociodemographic factors do contribute to women's empowerment during pregnancy, these factors only partially explain variations in empowerment. The significant role of distance to antenatal care centers as a predictor of empowerment highlights the importance of considering the physical and psychosocial dimensions of access to health services to strengthen the empowerment of pregnant women. Furthermore, future research must integrate qualitative approaches to uncover more profound insights into the real experiences and driving factors of empowerment among pregnant women.

AUTHOR'S CONTRIBUTION STATEMENT

Erni Dwi Widyana contributed to the conception and design of the study, data collection, data analysis and interpretation, and writing and finalisation of the manuscript.

Siti Nor Ismalina Isa contributed to the methodological framework, statistical analysis, data interpretation, and critical revision of the manuscript.

Siti Khuzaimah Ahmad Sharoni contributed to the literature review and critical revision of the manuscript.

Suryanto contributed to the statistical analysis and critical revision of the manuscript.

CONFLICTS OF INTEREST

This research was conducted independently, and the authors affirm that no competing interests influenced the outcomes or publication of this manuscript

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

In the process of preparing and refining this manuscript, the authors selectively used artificial intelligence (AI)-based tools, including ChatGPT, Grammarly, and DeepL, to improve language clarity, correct sentence structure, and support overall readability. The use of this technology was limited to linguistic assistance and remained under the full control and critical evaluation of the authors. All intellectual content, including ideas, interpretations, and analyses, reflects the original work of the authors. This disclosure is made in accordance with the authors' commitment to academic integrity, ethical publication standards, and the promotion of transparency in responsible scientific writing.

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