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Research Article

Association between Maternal Age and Awarnes of Pregnancy Danger Sign among Pregnant Women (At the Tapa Health Center, Bone Bolango Regency)

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Abstract: Various factors influence pregnant women's knowledge of pregnancy danger signs, including age, education level, occupation, previous pregnancy experience, socioeconomic status, and access to health information. Insufficient knowledge of these signs, often due to limited access to health services and information, increases the risk of delays in managing pregnancy complications, which can negatively impact both maternal and fetal health. The purpose of this study was to explore the relationship between maternal characteristics, specifically age, and awareness of pregnancy danger signs. This quantitative study employed a correlational approach, using a questionnaire as the data collection tool. The study was conducted at the Tapa Health Center in Bone Bolango Regency, from April to August 2024, with 40 participants included. The Spearman statistical test was used to assess the relationship between maternal characteristics based on age and the knowledge of pregnancy danger signs before and after an intervention. The results showed a significant change in the knowledge levels of pregnant women, with the p-value of 0.852 indicating no direct relationship between maternal age and awareness of pregnancy danger signs. Although a positive change was observed in the knowledge levels after the intervention, the study concluded that there was no significant relationship between maternal age and knowledge of pregnancy danger signs. The findings suggest that while interventions can improve awareness, age alone does not appear to be a significant factor influencing knowledge levels. This highlights the importance of focusing on other factors such as education, health access, and targeted health interventions to enhance maternal awareness of pregnancy risks. Further studies with larger sample sizes and additional variables are recommended to provide a more comprehensive understanding of the factors that influence pregnancy-related knowledge.

Keywords: Age; Knowledge; Pregnancy

1. Introduction

The success of maternal health efforts can be seen in the maternal mortality rate (MMR) indicator. MMR is the number of maternal deaths per 100,000 live births caused by pregnancy, childbirth and postpartum or their handling and not due to other causes such as accidents or falls. This indicator is not only able to evaluate maternal health programs but also the level of public health, because it is sensitive to improving access and quality of health services (Listiyani & Ernawati, 2021). The maternal mortality rate (MMR) in Indonesia is still high compared to the MMR of other ASEAN countries. The MMR in Indonesia was 228 per 100,000 live births in 2007 and 248 per 100,000 live births in 2008. The leading causes of maternal mortality were bleeding (28%), gestational poisoning/eclampsia (swelling of the legs and hypertension) up to 24% and infection up to 11%. In 2009, the MMR remained high at 390 per 100,000 live births (Indriyani et al., 2018). The World Health Organization states that maternal deaths are caused by complications during pregnancy and childbirth, most of which can be prevented or treated. There are also complications that may already exist but become

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worse during pregnancy due to inappropriate management. Due to the different effects of pregnancy on the pregnant woman's organs, a physiological pregnancy may eventually turn into a pathological pregnancy. Therefore, it is important to be aware of any danger signs that occur during pregnancy. If these danger signs are not recognized early, it can lead to death in pregnant women (Dewie, 2021)(Fatimah & Solikhatun, 2021).

Various factors influence pregnant women's knowledge of pregnancy danger signs; these include age, education level, occupation, previous pregnancy experience, socioeconomic status, and access to health information(Langapa, 2020). Pregnant women with higher levels of education are more likely to understand danger signs. Conversely, the risk of delays in the management of pregnancy complications increases if this level of knowledge is low due to lack of access to adequate health services and information (Hajri & Aprillia, 2016)(Hajar et al., 2023). Pregnancy complications The common causes of maternal death are "four too" and "three too late". Factor 4 also includes:(1) age below 20 years (too young) (2) age above thirty-five (too high) (3) more than 3 pregnancies (too frequent) (4) less than two years between pregnancies (too close). While factor 3 is late, namely late:(1) Decision making in emergency situations (2) Going to a medical institution (3) Seeking medical assistance (Sari & Sudarmiati, 2020).

Pregnancy class is a means to find out about the health of pregnant women face-to-face in groups, using the MCH book as the main material, and pregnant women's exercises(Sasnitiari & Puspitasari, 2017). The purpose of the pregnant women's class meeting is to improve the knowledge, attitudes, and skills of mothers and families about pregnancy, childbirth, pregnancy care, diseases or complications during pregnancy-delivery and postpartum, and pregnant women's exercises (Biru et al., 2022).

Based on the results of the study (Batubara et al., 2023) this shows that age, education, employment status, parity are related to knowledge about danger signs of pregnancy. The conclusion was obtained that the characteristics of pregnant women were related to knowledge about danger signs in pregnancy(Kurniawati & Nurdianti, 2010).

Based on data from the Tapa Health Center, Bone Bolango Regency in April-August, the number of pregnant women was 40 people. based on an initial survey conducted by interviewing 10 pregnant women, there were 5 pregnant women who had insufficient knowledge about the danger signs of pregnancy and 5 people had sufficient knowledge about the danger signs of pregnancy. The purpose of this study was to determine the relationship between the characteristics of pregnant women based on age with pregnancy danger signs at the Tapa Health Center, Bone Bolango Regency in 2024.

2. Preliminaries or Related Work or Literature Review

Pregnant women's knowledge of pregnancy warning signs is an important aspect of early detection of obstetric complications that can endanger the mother and fetus. The age of pregnant women has been proven to have a significant relationship with their ability to

recognize pregnancy warning signs. A study by Larasati (2020) showed that women aged <20 years and >35 years had a higher risk of being unaware of pregnancy warning signs, with an odds ratio of 4.267 ($p = 0.028$). This is supported by an analysis of the 2023 Riskesdas data conducted by Safhira and Ermi (Safhira & Ermi, 2024), which identified age as one of the main determinants of pregnancy complications. The low awareness of pregnancy danger signs in developing countries is further reinforced in a systematic review by Yunitasari (Yunitasari et al., 2023), which concluded that insufficient education and information significantly contribute to the high rate of complications that are not addressed in a timely manner.

Efforts to improve the knowledge of pregnant women through education have proven to be effective. Kundaryanti, Dinengsih, and Budiani (Kundaryanti et al., 2024) reported that the Pregnant Women's Class program significantly improved participants' knowledge of danger signs during pregnancy ($p < 0.001$). However, the effectiveness of educational media still needs to be further studied. Tjandraprawira and Ghozali (Tjandraprawira & Ghozali, 2019) found that the use of the Mother and Child Health Book (KIA) does not automatically improve mothers' understanding of pregnancy danger signs. This suggests that educational approaches should be more interactive and tailored to individual characteristics, including the age of pregnant women. Based on these findings, research examining the relationship between pregnant women's characteristics, particularly age, and their ability to recognize pregnancy danger signs in specific areas such as the Tapa Health Center in Bone Bolango District is important to provide a contextual understanding and foundation for more targeted public health interventions.

3. Proposed Method

This research design is a quantitative study with correctional approach. The data collection instrument used in this study was a questionnaire sheet. Data collection was carried out at the Tapa Health Center, Bone Bolango Regency in April - August 2024. 40 respondent agree to become research samples were given a consent sheet and then signed the consent sheet. Univariate analysis to determine the characteristics of the study was carried out by analyzing the variables descriptively by calculating the frequency distribution and proportions. Bivariate analysis, to see the relationship between the independent variable and the dependent variable. Statistical test analysis using Chi Square with an α value ≤ 0.05.

3.1. Algorithm/Pseudocode

Table 1. Algorithm

Algorithm
1. Start the research process
2. Determine the location and population: Tapa Community Health Center, Bone Bolango District
3. Identify the inclusion and exclusion criteria for respondents
4. Conduct sampling techniques (e.g., total sampling or purposive)

5. Develop and validate a questionnaire instrument on pregnancy warning signs
    1. Collect data on pregnant women's characteristics, particularly age
2. Administer the questionnaire to respondents
3. Classify age data into categories: <20 years, 20–35 years, >35 years
4. Calculate frequency distributions for characteristics and danger signs
5. Use statistical tests (e.g., Chi-square test) to determine the relationship between age and danger signs
6. Interpret the results of the statistical test: p-value and significant relationship
7. Conclude the research results
8. Complete

3.2. Formatting of Mathematical Components

a. Prevalence formula (if needed)

b. Chi-square Test Formula

c. Interpretasi P-value

4. Results and Discussion

Table 2. General Data

Variable		n	Frequency (%)
Age			
	<20 or	3	7.5
	20-35 yo	34	85
	>35 Yo	3	7.5
Education			
	Elementary School	3	7.5
	Junior High School	1	2.5
	Senior High School	26	65.0
	College	9	22.5
	Post graduate	1	2.5
Employment			
	House wife	31	77.5
	Private employee	5	12.5
	Government employee	4	10
Parity			
	Primigravida	12	30.0
	Multigravida	13	32.5
	Grande multipara	15	37.5
Trimester			
	1	2	5
	2	16	40
	3	22	55
Knowledge			
	Poor	5	12.5
	Fair	13	32.5
	Good	22	55.0
Total		40	100

Based on the results of table 1 above, it was found that the respondents in this study were pregnant women in trimester 1-3 aged less than <20 years (7.5%), 20-35 years (85%) and >35 years (7.5%). In terms of parity, 37.5% were Grande Multipara, 32.5% Multigravida and 30.0% Primigravida. In terms of education level, most of the pregnant women had secondary education, with 2.5% having a postgraduate degree, 22.5% having a bachelor's degree, 65.0% having a high school degree, while 7.5% had only primary education, and 2.5% had a junior high school degree.

While from the results of the frequency of the level of knowledge of pregnant women regarding danger signs of pregnancy, as many as 55.0%% of pregnant women have good knowledge, 32.5% of pregnant women have sufficient knowledge and 12.5% of pregnant women have less knowledge. These results indicate that the majority of pregnant women in this study had good knowledge of pregnancy danger signs and almost half had sufficient knowledge. (Source: Primary data, 2024)

Table 3. Univariate Analysis

Var 1	n	r	P value	Var 2
Parity	**40**	**0.031**	**0.852**	**Knowledge**
		Spearman		

Based on the data obtained from 40 respondents regarding the level of maternal knowledge based on age, namely pregnant women in trimester 1-3 aged less than <20 years (7.5%), 20-35 years (85%) and >35 years (7.5). In terms of parity, 37.5% were Grande Multipara, 32.5% Multigravida and 30.0% Primigravida. Judging from the level of education, most of the pregnant women had secondary education, with 2.5% postgraduate graduates, 22.5% undergraduate graduates, 65.0% high school graduates, while 7.5% only had primary education, and 2.5% had junior high school education. While from the frequency results of the level of knowledge of pregnant women regarding the danger signs of pregnant women, as many as 55.0%% of pregnant women have good knowledge, 32.5% of pregnant women have sufficient knowledge and 12.5% of pregnant women have less knowledge. These results indicate that the majority of pregnant women in this study have good knowledge of pregnancy danger signs and almost half have sufficient knowledge.

Spearman test results conducted to see the relationship of maternal characteristics based on age with pregnancy danger signs before and after the intervention on 40 respondents showed significant results. The p-value of 0.852 indicated a significant change in the level of knowledge of pregnant women based on age before and after the intervention, with a significance level of 5% (p-value <0.05).

Based on data from 40 respondents, the level of pain felt before the intervention Based on data obtained from 40 respondents regarding the level of maternal knowledge based on age, namely pregnant women in trimesters 1-3 aged less than <20 years (7.5%), 20-35 years (85%) and >35 years (7.5). In terms of parity, 37.5% were Grande Multipara, 32.5% Multigravida and 30.0% Primigravida. Judging from the level of education, most of the pregnant women had secondary education, with 2.5% postgraduate graduates, 22.5%

undergraduate graduates, 65.0% high school graduates, while 7.5% only had primary education, and 2.5% had junior high school education. While from the frequency results of the level of knowledge of pregnant women regarding the danger signs of pregnant women, as many as 55.0%% of pregnant women have good knowledge, 32.5% of pregnant women have sufficient knowledge and 12.5% of pregnant women have less knowledge. These results indicate that the majority of pregnant women in this study have good knowledge of pregnancy danger signs and almost half have sufficient knowledge.

This study is in line with research (Batubara et al., 2023), showing that the younger generation is quicker to accept new innovations. Pregnant women under the age of 35 may think they are better trained and have more experience. As a result, they may not be interested in knowing more about what they know about their pregnancy. On the other hand, someone older than 35 years old will have a decreased ability to receive information and knowledge as a result of the increasing age factor.

The broader a person's knowledge, the more positive his or her attitude in dealing with a problem. Knowledge has a close relationship with the ability to recognize pregnancy danger signs. In other words, the better a mother's understanding, the greater her tendency to conduct early detection of pregnancy danger signs.

Expectant mothers should also know about pregnancy danger signs. If they know about these signs, they will be more alert and careful to check their pregnancy regularly. This allows pregnant mothers to detect pregnancy complications early (Mothers, CharacteristicsWithand 2010).

Danger signs in pregnancy include vaginal bleeding, severe abdominal pain, reduced fetal movement, swelling (edema), visual disturbances, severe headaches, fever, excessive vomiting, and sudden vaginal discharge. Meanwhile, risk factors in pregnant women include age less than 20 years or more than 35 years, number of children four or more, pregnancy spacing less than two years, and a history of previous problematic pregnancies. These conditions are influenced by various factors, both from the health aspects of the mother and baby and external factors, including the support provided to the mother(2018). Any pathological condition during pregnancy, labor and the postpartum period will show danger signs before it develops into a serious condition. If these signs are recognized early, then the lives of mothers and their babies can be saved (Indriyani et al., 2018).

Overall, these data suggest that the interventions implemented show that there is an association of age-based characteristics of pregnant women with pregnancy danger signs.

5. Comparison

This study builds upon and differs from prior research in several key ways. Previous studies such as Larasati (2020) and Safhira & Ermi (2024)(Safhira & Ermi, 2024) have identified maternal age as a risk factor for poor awareness of pregnancy danger signs using

national or urban datasets. However, these studies were conducted in highly urbanized health centers or used large-scale secondary data, which may not reflect local or rural realities.

In contrast, this study focuses specifically on a community-based health center (Puskesmas Tapa, Bone Bolango Regency), offering a more contextualized understanding of maternal characteristics and health literacy in a semi-rural setting. Unlike broader studies, our research includes direct primary data collection and applies practical, locally validated instruments, enhancing ecological validity and real-world applicability.

Additionally, while Kundaryanti et al. (2023)(Kundaryanti et al., 2024) emphasized the role of antenatal education in raising knowledge levels, they did not disaggregate findings by maternal age group. This study provides specific insights into how different age groups (<20, 20–35, >35 years) vary in their ability to identify pregnancy danger signs, thus contributing to more targeted health promotion strategies

5.1 Contributions of this research:

This study contributes to the growing body of maternal health research in several ways:

a. Local Evidence Generation:

It provides empirical data on the relationship between maternal age and recognition of pregnancy danger signs in an under-represented rural region of Eastern Indonesia, filling a geographic and contextual research gap.

b. Policy Implications:

The findings offer direct implications for maternal health programming at the primary care level, particularly in tailoring antenatal education based on age-specific needs.

c. Clinical Relevance:

By identifying specific age groups that are at higher risk for low awareness, midwives and community health workers can implement targeted interventions during antenatal visits.

d. Methodological Contribution:

The study applies a clear analytical framework using a validated danger sign checklist and chi-square analysis, which can be replicated in similar settings for program monitoring and evaluation.

e. Foundation for Future Research:

This research can serve as a baseline for longitudinal studies or intervention trials aimed at improving health literacy and reducing maternal morbidity through age-sensitive education programs.

6. Conclusions

There is no relationship between the characteristics of pregnant women based on age and pregnancy danger signs at Puskesmas Tapa, Bone Bolango Regency with a p value of 0.852 indicating that there is no significant relationship in the level of knowledge of pregnant women based on age before and after the intervention. These results indicate that age is not the main determinant of maternal understanding of pregnancy danger signs. Instead, other

factors such as education level, previous pregnancy experience, and access to health information may play a greater role in improving pregnant women's knowledge.

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