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Body Mass Index (BMI), Pregnancy Readiness, and Belief in Healthy Pregnancy

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A B S T R A C T

Before planning a pregnancy, women should prepare themselves optimally in physical, psychological, and social aspects. This study aims to analyze the relationship between BMI and readiness for pregnancy and belief in having a healthy pregnancy. This research is an analytical study using a cross-sectional method with 196 respondents. Bivariate analysis was conducted using the chi-square test, which revealed no significant relationship between BMI and readiness for pregnancy or belief in a healthy pregnancy (p -value >0.05). However, there was a significant relationship between readiness for pregnancy and the belief in a healthy pregnancy (p -value=0.000). BMI is not the primary factor associated with readiness for pregnancy or the belief in having a healthy pregnancy. This may be due to other factors exerting a stronger influence on readiness and belief in a healthy pregnancy. Readiness for pregnancy can enhance positive perceptions of a woman's ability to undergo a healthy pregnancy and influence better behavior and decision-making for a healthy lifestyle during pregnancy. Comprehensive interventions during the preconception period need to be developed to prepare women planning for pregnancy so they are ready and confident in their ability to undergo a healthy pregnancy.

I. INTRODUCTION

Pregnancy is a significant milestone that brings forth new life and transforms one's role into that of a mother, father, or sibling. The pregnancy process requires preparation before conception, encompassing physical, mental, and spiritual aspects. Physically, a woman must prepare her body to be in optimal condition for a healthy pregnancy. One critical factor is monitoring body mass index (BMI), as women of reproductive age (WRA) who are

overweight-obese or underweight are at risk of suboptimal pregnancy and childbirth outcomes. Obesity increases the risk of gestational diabetes mellitus (GDM), pregnancy-induced hypertension (PIH), preeclampsia, and raises the likelihood of labor induction and cesarean section (Mehrukh Zehravi, 2021). Meanwhile, women with low BMI are at risk for small-for-gestational-age (SGA) infants and preterm delivery (Chen et al., 2019; Cornish et al., 2024).

According to the 2023 Indonesian Health Survey (SKI), the obesity rate among Indonesian women aged over 18 is significantly high at 31.2%, with 15.3% categorized as overweight and 6.4% classified as underweight/wasting. In West Java, the percentage of women aged 18 years and above experiencing obesity is even higher than the national figure, reaching 35.7%, while the proportion of underweight women stands at 5.7% (Ministry of Health, 2023).

Pregnancy readiness is crucial not only in physical terms but also in mental-psychological, social, and economic aspects, as physiological and psychological changes occur during pregnancy. Furthermore, preparedness for pregnancy influences the responsibility of child-rearing. Previous research has demonstrated that factors such as the husband's education level, income, and exposure to information significantly impact a mother's readiness for pregnancy (Oktalia & Harizasyam, 2019).

Exposure to information about BMI during the preconception phase should influence of women behavior. Women who are obese, overweight, or underweight would ideally take steps to optimize their condition before becoming pregnant. This study aims to analyze the relationship between BMI and women readiness for pregnancy, as well as their confidence in having a healthy pregnancy. Additionally, it examines the correlation between pregnancy readiness and the belief in a healthy pregnancy, providing insights for developing effective strategies in preconception care services.

II. METHODS

The cross-sectional design was chosen as the approach for the analytical research conducted in this study. The population of this research comprised Women of Reproductive Age (WRA) in the Bandung City area, while the sample included married WRA who were planning to conceive and willing to participate as respondents. The sampling was carried out using a quota sampling technique in Pasteur Subdistrict. The minimum sample size was determined with a 95% confidence level and 5% margin of error, resulting in a minimum of 196 respondents. This research has received a ethical approval from Health Research Ethics Committee Bandung Health Polytechnic Ministry of Health number 05/KEPK/EC/2023.

The determination of Body Mass Index (BMI) was based on the classification set by the Ministry of Health and categorized as underweight ($<18.5 \text{ kg/m}^2$), normal ($18.5\text{--}25.0 \text{ kg/m}^2$), overweight ($25.1\text{--}27.0 \text{ kg/m}^2$), and obese ($>27.0 \text{ kg/m}^2$). Bivariate analysis in this study employed the chi-square test to identify significant relationships between variables, with a significance threshold of 0.05 ($p\text{-value} < 0.05$).

III. RESULT

The research was conducted from September to November 2023 with a total of 196 respondents. The data processing results are presented in the form of frequency distribution tables for respondent characteristics and the analysis results between variables, as shown in the following tablet

Table 1. Characteristics of Respondents

Characteristics	N (196)	%	mean	min	max
Age (year)			30,46	18	49
15-18	1	0,51			
19-25	49	25			
26-35	102	52,04			
36-45	41	20,92			
45+	3	1,53			
Education					
Elementery	6	3,06			
Junir High school	26	13,27			
Senior High School	98	50			
Under graduate	33	16,04			
Post graduate	7	3,57			
Occupation					
Housewife	154	79,57			
Employee	22	11,22			
Government employee	4	2,04			
Teacher	8	4,08			
Self employee	8	4,08			
Body Mass Index (BMI)			24,73	16,55	41,01
Underweight (<18.5 kg/m ²)	17	8,67			
Normal (18,5-25,0 kg/m ²)	100	51,02			
Overweight (25,1-27 kg/m ²)	25	12,76			
Obesity (>27 kg/m ²)	54	27,55			

Based on Table 1, the youngest respondent was 18 years old, while the oldest was 49 years old, with an average age of 30.46 years. Regarding the respondents' last educational attainment, the majority (50%) were high school graduates, while majority of occupations (79.57%) were unemployed/housewives. Most respondents' BMI (51.02%) fell into the normal category of 18.5-25 kg/m², with an average BMI of 24.73 kg/m². Table 1 also shows that 40.31% of respondents were classified as overweight-obese, while 8.67% had a BMI categorized as underweight.

Table 2 BMI and Belief in Healthy Pregnancy

Body Mass Index (BMI)	Belief in Healty Pregnancy				Total		p-value
	Yes		No				
	n	%	n	%	n	%	
Underweight (<18.5 kg/m ²)	15	7,65	2	1,02	17	8,67	0,852
Normal (18,5-25,0 kg/m ²)	89	45,41	11	5,61	100	51,02	
Over weight (25,1-27 kg/m ²)	21	10,71	4	2,04	25	12,76	
Obesity (>27 kg/m ²)	49	25	5	2,55	54	27,55	
Total	174	88,77	22	11,22	196	100	

Table 2 provides information indicating that women of reproductive age (WRA) with a BMI greater than 25 (overweight/mild obesity) had a belief in healthy pregnancy at 10.71%, while those classified as obese/severely obese had a belief in healthy pregnancy at 25%. Meanwhile, WRA with a BMI below 18.5 had a belief in healthy pregnancy at 7.65%.

The p-value result for the relationship between BMI and belief in healthy pregnancy was 0.852, indicating that there is no significant relationship between BMI and the belief in healthy pregnancy.

Table 3. Pregnancy Readiness and Belief in Healthy Pregnancy

Pregnancy Readiness	Belief in Healthy Pregnancy				Total		P-value
	Yes	%	No		n	%	
Yes	102	52,1	2	1	104	53,1	0,000*
No	72	36,7	20	10,2	92	46,9	
	174	88,8	22	11,2	196	100	

In Table 3, it is shown that 52.1% of mothers who are ready for pregnancy believe that their pregnancy will be healthy, whereas 36.7% of mothers who are not ready for pregnancy believe the same. The readiness of mothers for pregnancy has a statistically significant relationship with the belief that their pregnancy will be healthy, as indicated by a p-value of 0.000.

IV. DISCUSSION

Pregnancy planning is essential to prepare for a healthy pregnancy, ensuring optimal pregnancy and childbirth outcomes. A woman planning to conceive should prepare herself, including physically, by evaluating her Body Mass Index (BMI). If her BMI is not within the normal range, she should receive counseling or education on how to prepare herself to achieve an ideal condition before pregnancy.

This study found no significant relationship between BMI and pregnancy readiness or the belief in having a healthy pregnancy. This result is noteworthy because BMI does not appear to be a primary factor influencing readiness or belief in a healthy pregnancy, despite many studies highlighting the risks associated with obesity or being underweight. A systematic review reported

that obese women are at risk of developing gestational diabetes mellitus (GDM) (Rahnemaie et al., 2022). This finding is supported by theories suggesting that pregnancy causes a threefold increase in insulin resistance compared to non-pregnant women, which is linked to hormonal changes during pregnancy. This condition is exacerbated if the woman is already obese before pregnancy (Plows et al., 2018). If GDM occurs, it increases the risk of fetal macrosomia, which in turn heightens the risks of preterm delivery, shoulder dystocia, and neonatal hypoglycemia (Kc et al., 2015). Obesity also increases the risk of preeclampsia during pregnancy (Mehrukh Zehravi, 2021). The occurrence of preeclampsia has many proposed theories, one of which is the inflammatory theory. According to this theory, obesity is associated with inflammation resulting from the biosynthesis of cytokines by adipose tissue, leading to systemic inflammation, endothelial dysfunction, and hemostatic dysfunction. Increased levels of triglycerides, LDL, and free fatty acids, along with decreased HDL levels, which are predominantly observed in obesity, are linked to a higher risk of atherosclerotic cardiovascular disease. The study also indicates that weight loss before pregnancy can reduce the risk of preeclampsia (Poniedziałek-Czajkowska et al., 2023).

Women of reproductive age with a low body mass index (BMI) or underweight condition also face an increased risk of small-for-gestational-age (SGA) infants and preterm delivery (Cornish et al., 2024). Adequate nutrition is essential for fetal development. If the mother is underweight, it can affect the growth of the fetus. An intervention study providing nutritional supplements for three months before conception was associated with a 44% reduction in stunting, a 24% reduction in wasting, and a 26% reduction in SGA cases (Cornish et al., 2024).

A woman's health before pregnancy impacts birth outcomes. Therefore, women preparing for pregnancy need to identify factors that can affect their health, the health of the fetus, pregnancy development, and delivery process. This study found no relationship between BMI and readiness for pregnancy. This could be due to a lack of awareness among women about the importance of health, particularly preconception BMI, in influencing pregnancy outcomes. Emerging research indicates that preconception interventions can significantly improve pregnancy outcomes (Loveness Mwase-Musicha, Michael G. Chipeta, Judith Stephenson, 2022).

The increased risks during pregnancy and childbirth due to excessive BMI, whether overweight or obesity, as well as low BMI, should be a consideration for women of reproductive age (WRA) planning to conceive. The lack of a significant relationship between BMI and confidence in having a healthy pregnancy may indicate a lack of exposure to information about how BMI affects pregnancy, suggesting the need to enhance maternal knowledge on this matter. Women planning to conceive should receive sufficient information about pregnancy preparation to minimize risks that could negatively impact both maternal and fetal health.

The lack of a significant relationship in the findings of this study may be due to other factors that have a greater influence on readiness for pregnancy, such as psychosocial support, access to health information, and personal perceptions of risk that are more relevant. Obesity or low BMI often affects confidence in pregnancy health; however, other factors, such as access to education and preconception services, can act as mediators to enhance confidence. Therefore, programs should not only focus on improving nutritional status but also adopt a more comprehensive approach, including increasing knowledge and addressing psychological and social aspects that influence women's readiness for pregnancy and belief in having a healthy pregnancy. This effort is supported by the government through preconception services, whose implementation needs to be evaluated.

This study also shows that a woman's readiness for pregnancy plays a role in forming positive beliefs about a healthy pregnancy, as demonstrated by statistically significant results (p -value = 0.000). Optimal readiness enhances the mother's positive perception of her ability to have a healthy pregnancy. Positive beliefs about pregnancy are linked to better behaviors and decision-making for a healthy lifestyle during pregnancy, such as maintaining a nutritious diet, regularly attending antenatal check-ups, and avoiding risky habits. Mental and emotional readiness for

pregnancy also directly impacts lower stress levels during pregnancy. Low stress contributes to the positive belief that the pregnancy will be healthy.

This study has limitations as the researchers did not deeply explore women's opinions or knowledge regarding their understanding of the impact of BMI on readiness for pregnancy and perceptions of a healthy pregnancy.

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This study has limitations as the researchers did not deeply explore women's opinions or knowledge regarding their understanding of the impact of BMI on readiness for pregnancy and perceptions of a healthy pregnancy.

V. CONCLUSION

A woman's readiness for pregnancy affects her belief in having a healthy pregnancy. This finding underscores the importance of providing education and counseling to expectant mothers regarding pregnancy preparation, including physical, psychological, and emotional aspects. Pregnancy preparation programs, such as preconception education classes, can help increase mothers' belief in their ability to experience a healthy pregnancy. This research can also serve as a foundation for efforts to improve public health interventions, particularly in the field of reproductive health, to optimize the readiness of expectant mothers for pregnancy.

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