

Body mass index (BMI) during pregnancy and gestational diabetes (GDM) in American Samoa

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Background

- **GDM** is a type of diabetes which only occurs during pregnancy.
 - Hormonal change during pregnancy and insulin resistance
- Optimal GDM screening time frame **(2nd trimester, 24 to 28 weeks gestation)**
- **Oral glucose tolerance test (OGTT):** routine GDM screening test
 - 2 hour duration



Background (cont.)

- **Pacific Islanders (AS):** increased risk for GDM, high levels of pregnancy obesity (Hawley et.al, 2019)
- **GDM risk factors:** Age (35 years or older), overweight/obesity, excessive gestational weight gain and family history of diabetes.



Objectives and Hypotheses

- **Objective:** To determine if high BMI (≥ 30 kg/m²) during first trimester of pregnancy is associated with GDM.
- **Hypothesis:** High first trimester BMI (≥ 30 kg/m²) is associated with GDM
 - Null hypothesis: High first trimester BMI is not associated with GDM (Independent factors)
 - Alternative hypothesis: High first trimester BMI is associated with GDM

Methods

- **Descriptive statistics**

- Count or percentages
- Demographics : Age and marital status
- Health indicators: weight and BMI

- **Analytical Statistics**

- Chi-square test (Chi-square statistic, p-value (< 0.05 vs. > 0.05))
- Test association between BMI and GDM.
- Microsoft Excel chi-square functions

- **GDM Dataset**

- Electronic Health Record (EHR) Review, 2017
- GDM prevalence study in AS
- Collaboration: LBJ OBGYN Dept., DOH MCH Division, PIHOA
- Sample size: 147 pregnant women (2016)

Results (Table 1: Demographics)

Variable	Range	Count	Percent
Demographics			
Age	15-43 years		
	<30 years	90	61.2
	≥30 years	57	38.8
	Total	147	
Marital status	Married	89	60.5
	Never married	56	38.1
	Divorced	2	1.4
	Total	147	

Results (Table 2: Health Indicators)

Variable	Range	Count	Percent
Health indicators			
First trimester weight	41-216 kg		
	<100 kg	107	72.8
	≥100 kg	40	27.2
	Total	147	
First trimester BMI	14-71 (kg/m ²)		
	<30 (kg/m ²)	71	48.3
	≥30 (kg/m ²)	76	51.7
	Total	147	
GDM Diagnosis	Not GDM Diagnosed	134	91.2
	GDM Diagnosed	13	8.8
	Total	147	

Results (Analytical Statistics)

- Chi-square test of independence (High BMI and GDM diagnosis)
- Chi square statistic: 4.7935
- p-value: 0.028566
- $p < 0.05$: statistically significant, reject the null hypothesis (2 factors: BMI and GDM are independent or not associated)

Discussion

- **Hypothesis**

- Reject null hypothesis: No association between high 1st trimester BMI and GDM diagnosis
- **Conclude: Alternative hypothesis (There is an association between high 1st trimester BMI ($\geq 30\text{kg/m}^2$) and GDM)**

- **Limitations**

- Small sample size (n=147 women)
- Data availability (gestational weight for each trimester not available in dataset)
- Short project timeline (5-6 weeks)

- **Future plans**

- Gestational weight gain (1st, 2nd, 3rd trimester of pregnancy) and GDM diagnosis

References

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Questions