The South Asian Indian Women's Weight Loss Study

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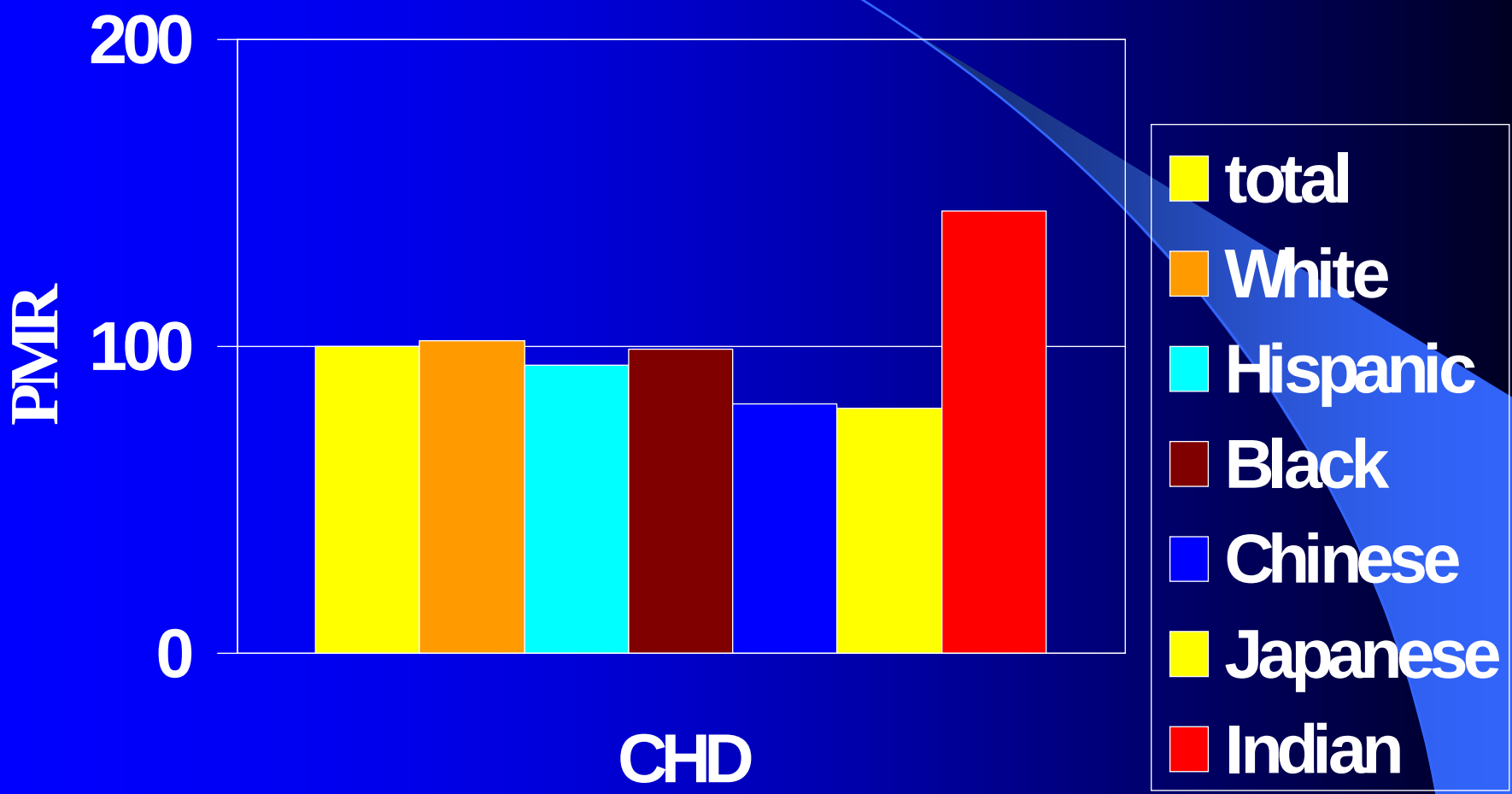
South Asian

Emigrants and second generation from

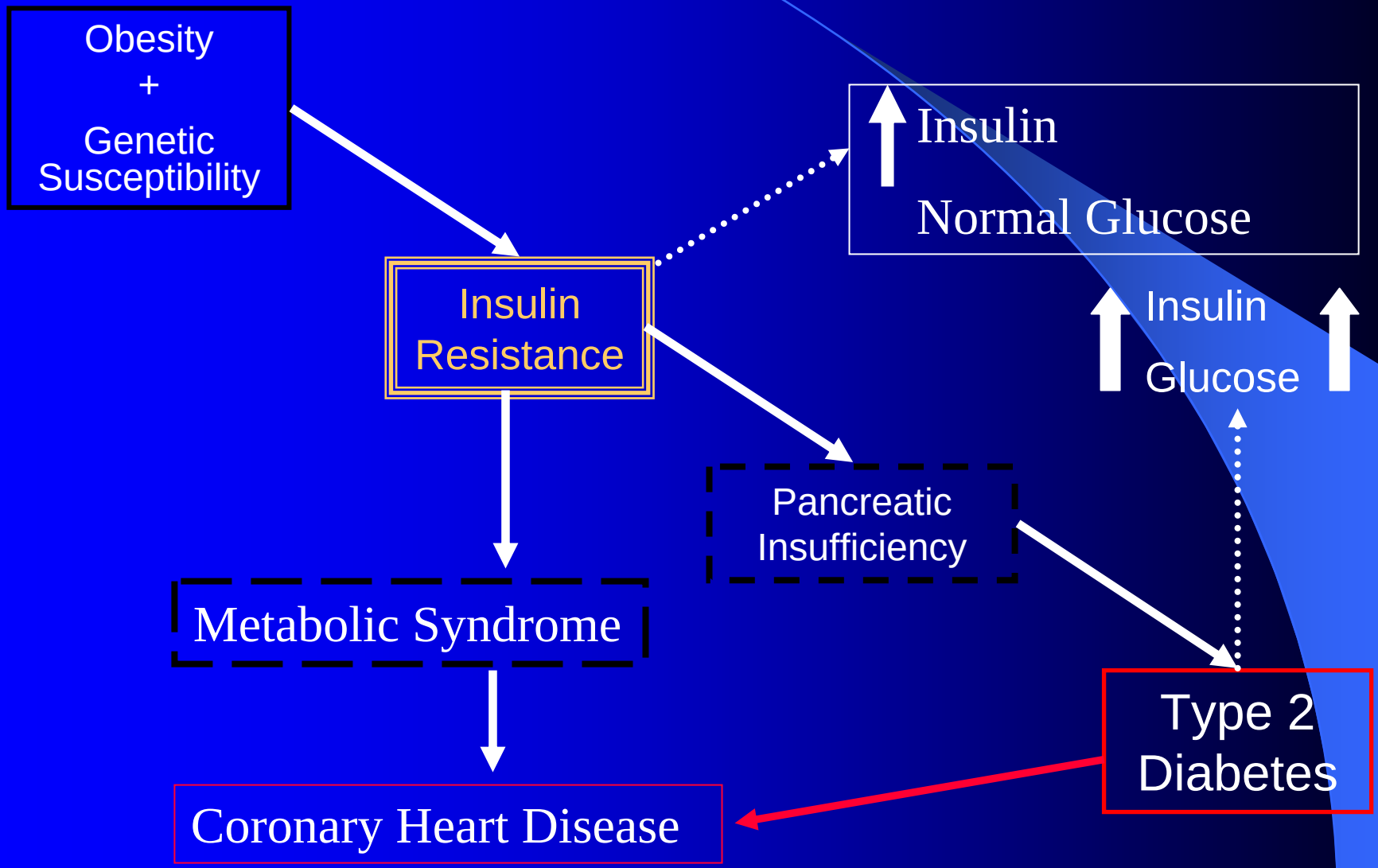
- India
- Bhutan
- Bangladesh
- Maldives
- Nepal
- Pakistan
- Sri Lanka

Women Age 25-84

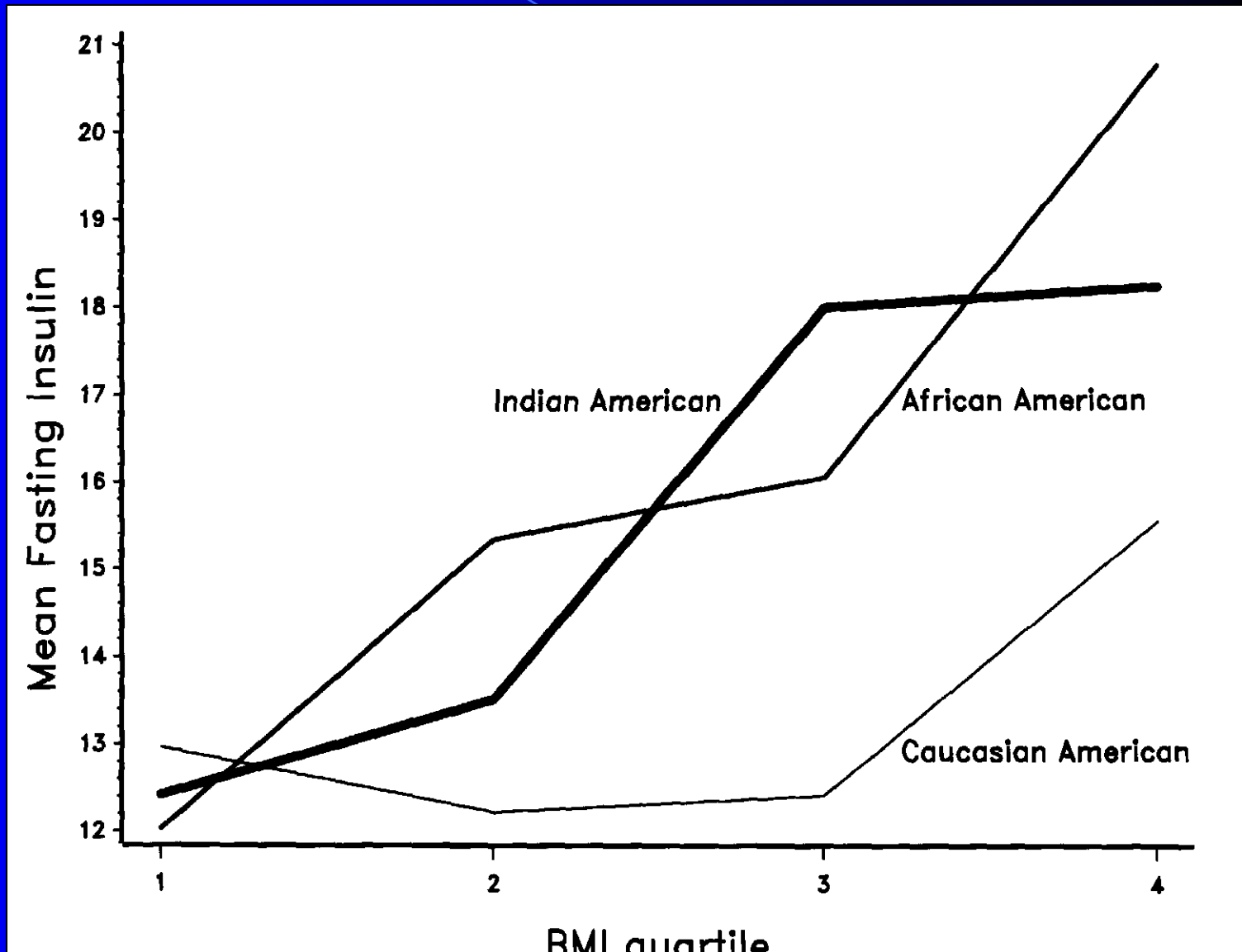


Palaniappan, et al. Annals of Epidemiology. 2004 August;14(7):495-506

Role of Insulin Resistance

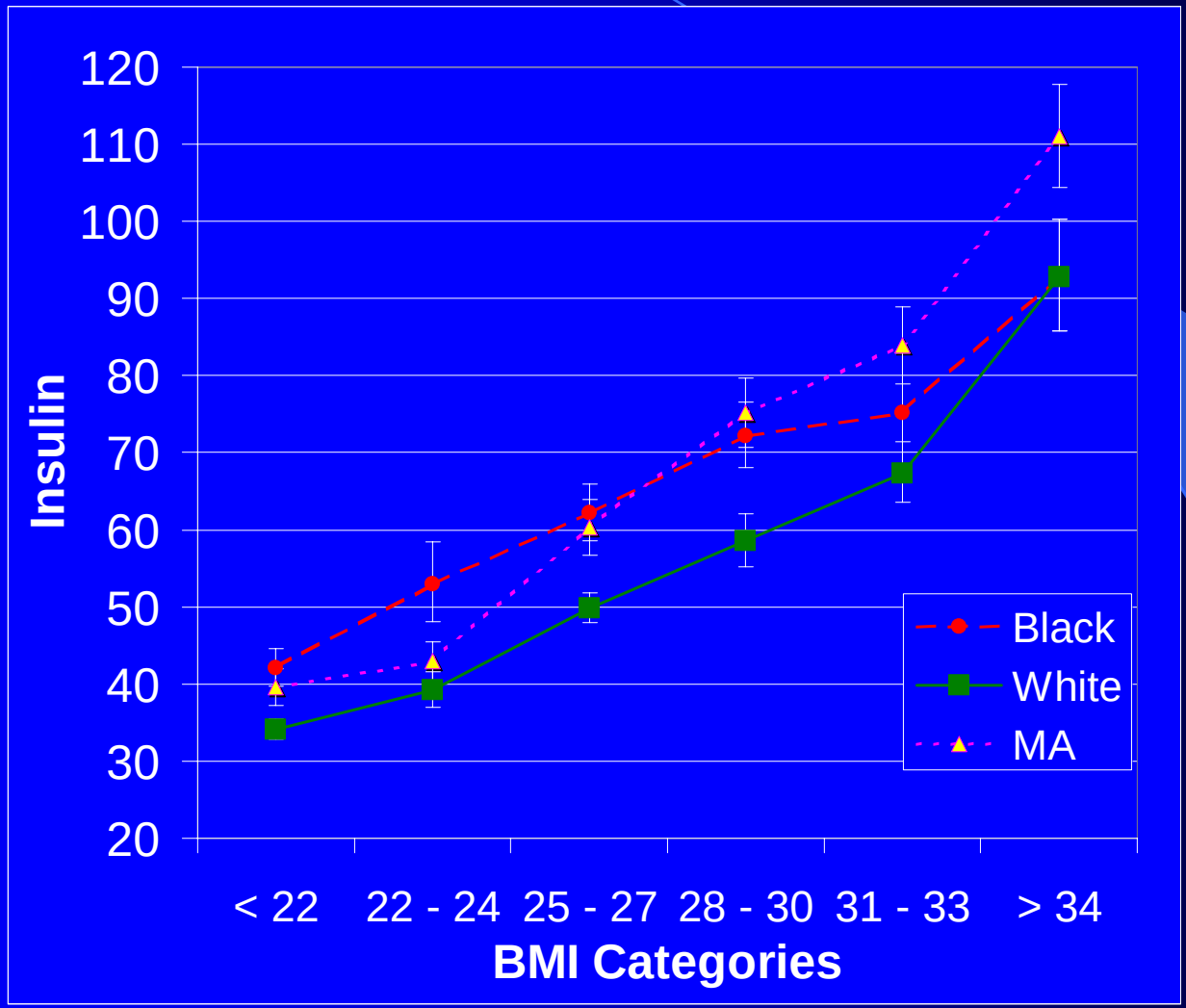


Ethnicity modifies the interaction between insulin and BMI



Palaniappan, et al., AJC, 2001

Insulin by Ethnicity - Women



Palaniappan et al, Diabetes Care. 2002 August;25(8):1351-1357.

Does Obesity operate differently in different ethnic groups?

Public health

Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies

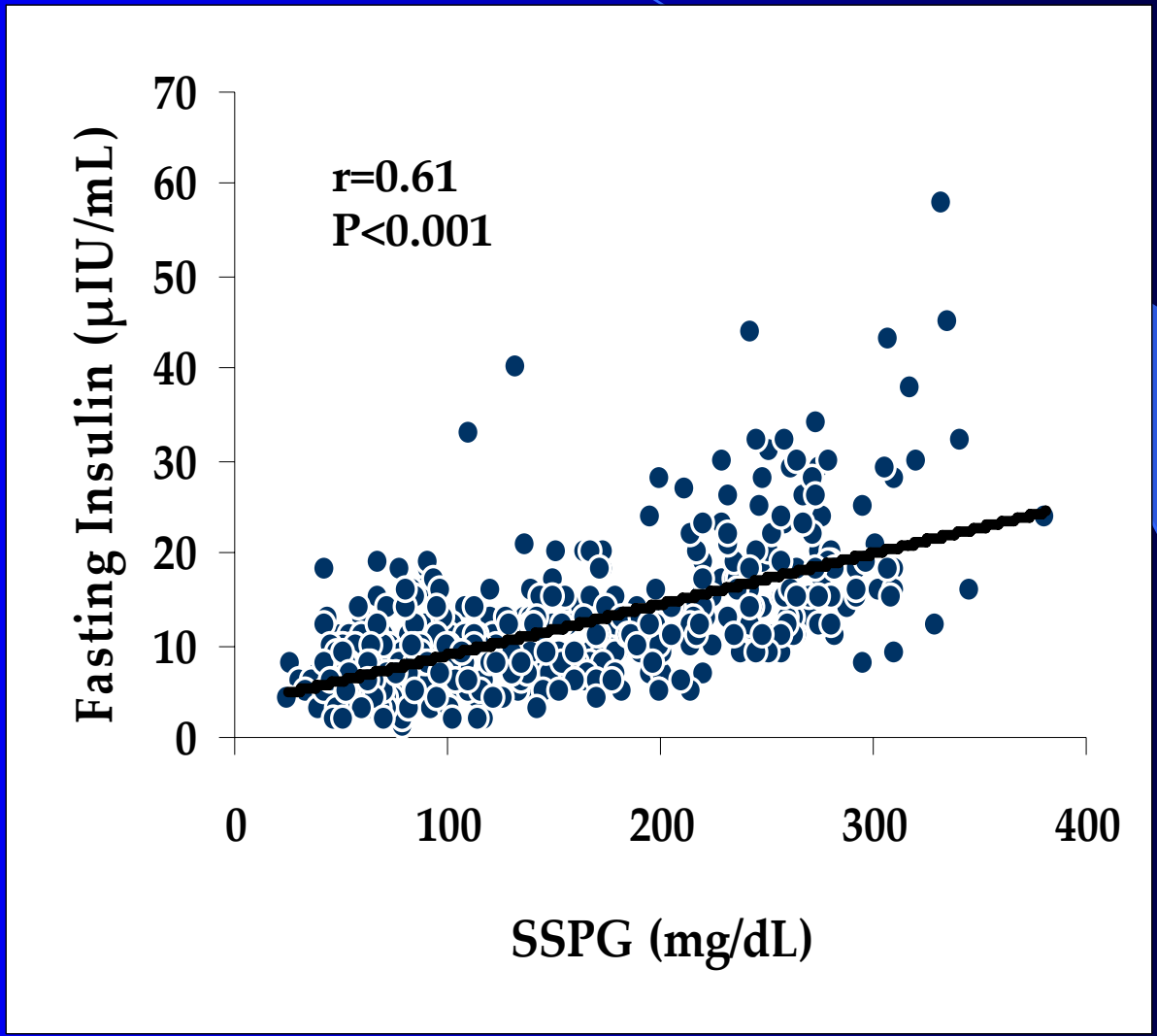
*WHO expert consultation**

A WHO expert consultation addressed the debate about interpretation of recommended body-mass index (BMI) cut-off points for determining overweight and obesity in Asian populations, and considered whether population-specific cut-off points for BMI are necessary. They reviewed scientific evidence that suggests that Asian populations have different associations between BMI, percentage of body fat, and health risks than do European populations. The consultation concluded that the proportion of Asian people with a high risk of type 2 diabetes and cardiovascular disease is substantial at BMIs lower than the existing WHO cut-off point for overweight (≥25 kg/m^2). However, available data do not necessarily indicate a clear BMI cut-off point for all Asians for overweight or obesity. The cut-off point for observed risk varies from 22 kg/m^2 to 25 kg/m^2 in different Asian populations; for high risk it varies from 26 kg/m^2 to 31 kg/m^2. No attempt was made, therefore, to redefine cut-off points for each population separately. The consultation also agreed that the WHO BMI cut-off points should be retained as international classifications. The consultation identified further potential public health action points (23·0, 27·5, 32·5, and 37·5 kg/m^2) along the continuum of BMI, and proposed methods by which countries could make decisions about the definitions of increased risk for their population.

Work to date

- Fasting insulin higher among ethnic minority women than white women at a lower body mass
- Differences not as apparent among men
- Fasting insulin is a strong predictor of diabetes among non-obese (BMI < 30) women
- **Are South Asian Indian women more insulin resistant at lower BMI, and does insulin resistance improve with weight loss?**

Relationship Between Insulin Resistance (SSPG Concentration) and Fasting Insulin Levels in 490 Nondiabetic Subjects



Komshian H. *Diabetes Care.* 2000;23:171-175

SAIWWLS - South Asian Indian Women Weight Loss Study - Microsoft Internet Explorer

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SOUTH ASIAN INDIAN WOMEN WEIGHT LOSS STUDY

Quick Jumps to Areas on this Page:

Hypotheses

- 1. Insulin sensitivity will improve with weight loss in South Asian Indian women.
- 2. Among overweight and obese subjects, the prevalence of insulin resistance will be higher in South Asian Indian women than whites.
- 3. At lower levels of body mass index, South Asian Indian women will be more likely to have insulin resistance

Steady State Plasma Glucose (SSPG)

- 180 min infusion with octreotide (0.27 ug/m2.min), insulin (32 mU/m2·min), and glucose (237 mg/m2·min)
- Suppresses endogenous insulin and every subject receives same insulin concentration based on body surface area
- Blood drawn at 10 min intervals between 150 and 180 min for steady state glucose
- Higher glucose concentration indicates resistance to insulin-mediated glucose disposal

Weight Loss Protocol

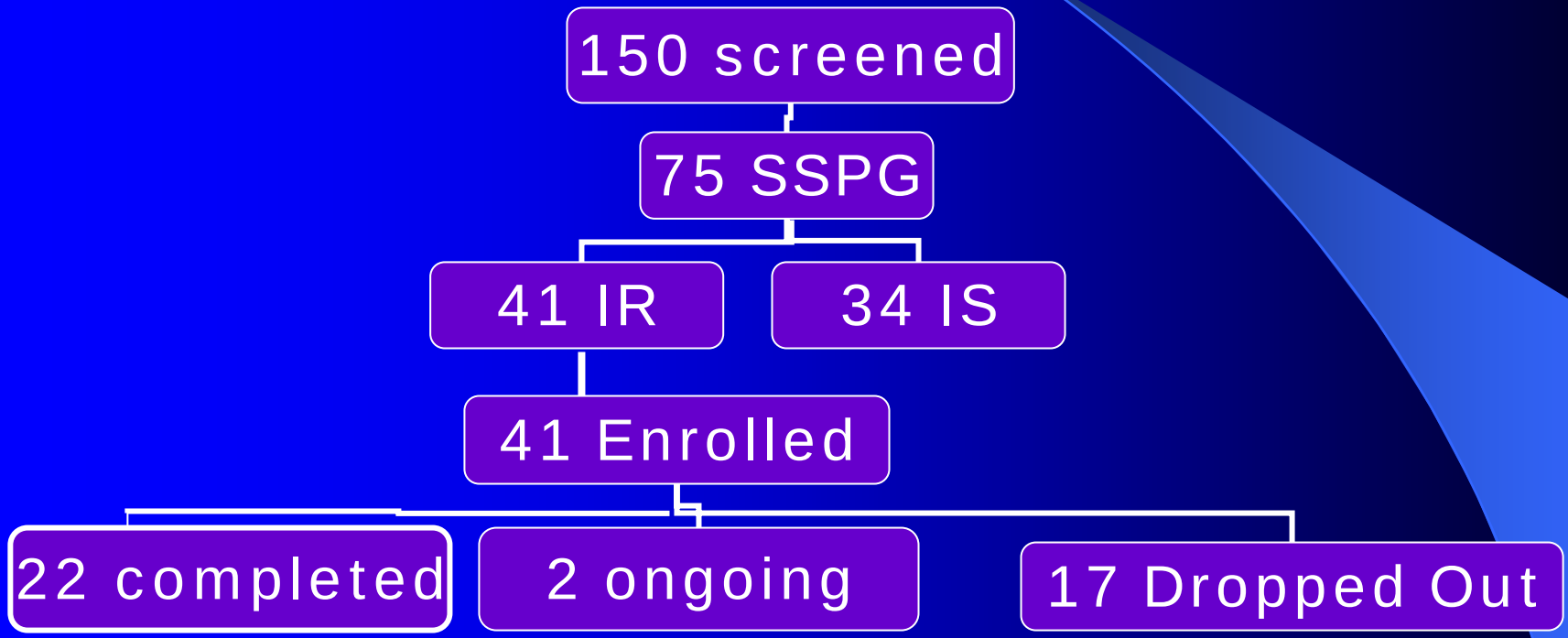
- Baseline metabolic measurements
  - SSPG and Meal Profile (hourly blood draws 8am to 4pm with administration of two standardized test meals
  - Dietary intervention

    40% CHO, 45% fat, 15% protein, - 750 kcal/d

Weight Loss Protocol Cont'd

- 3 mo of hypocaloric ethnicity specific diet followed by 2 wks eucaloric diet (same macronutrient composition) followed by metabolic testing (SSPG and Meal Profile)
- Compliance monitored with food diaries/weekly visit with dietitian
- No change in baseline exercise

Patient Recruitment and Retention



Baseline Laboratory Characteristics*

Variable Screening Visit	Insulin Sensitive SSPG < 150 (n= 29)	Insulin Resistant SSPG >=150 (n=24)	P-value
Age (yrs)	44 ± 1.8	42 ± 1.9	0.30
Weight (kg)	68 ± 1.8	74 ± 1.5	0.008
BMI (kg/m2)	27 ± 0.6	29 ± 0.8	0.009
Systolic BP (mm Hg) Diastolic BP (mm Hg)	117 ± 3.3 72 ± 1.6	112 ± 2.9 68 ± 1.8	0.14 0.07
Pulse	67 ± 1.5	68 ± 1.6	0.40

* Mean ± SEM

Baseline Laboratory Characteristics*

Variable	Insulin Sensitive SSPG < 150 (n=29)	Insulin Resistant SSPG >=150 (n=24)	P-value
SSPG (mg/dL)	105 ± 6.3	211 ± 10.6	3.6 E -12
Glucose(mg/dL)	92 ± 1.5	95 ± 2.3	0.09
Cholesterol	174 ± 6.5	171 ± 4.9	0.37
Triglycerides	104 ± 12.4	131 ± 11.5	0.059
HDL-C	52 ± 1.9	43 ± 1.8	0.0003
LDL-C	107 ± 4.8	104 ± 4.6	0.36

* Mean ± SEM

Typical South Asian Diet

- **Breakfast**
- **4 idlis**
- **1 cup sambar (dhal)**
- **Tea with half cup full fat milk**
- **Lunch**
- **4 rotis**
- **half cup mateer panner (peas and cheese)**
- **half cup full fat yogurt**
- **1 glass juice**
- **Snack**
- **2 gulab jamuns**
- **Dinner**
- **1 cup cooked rice**
- **half cup full fat yogurt**
- **Dhal**
- **1 cup potato curry**
- **1 cup malai kofta korma**

~2600 kcals

12% Protein

56% Carbohydrate 32% fat

Study South Asian Diet 40% CHO, Lacto-Ovo Veg

- **Breakfast**
- **2 slices whole grain bread**
- **½ banana**
- **1 cup milk (skim or lowfat)**
- **12 almonds**
- **Lunch**
- **2/3 cup cooked basmati rice**
- **1/3 cup dal**
- **1-2 cup vegetables**
- **½ cup yogurt *or* Raitha**
- **Snack**
- **½ mango**
- **20 peanuts**
- **Dinner**
- **1 small Roti *plus* 1/3 cup cooked Rice**
- **1 egg**
- **1.5 cups vegetables**
- **½ cup yogurt-1% lowfat *or* nonfat**
- **2-3 teaspoons olive oil *or* canola oil**

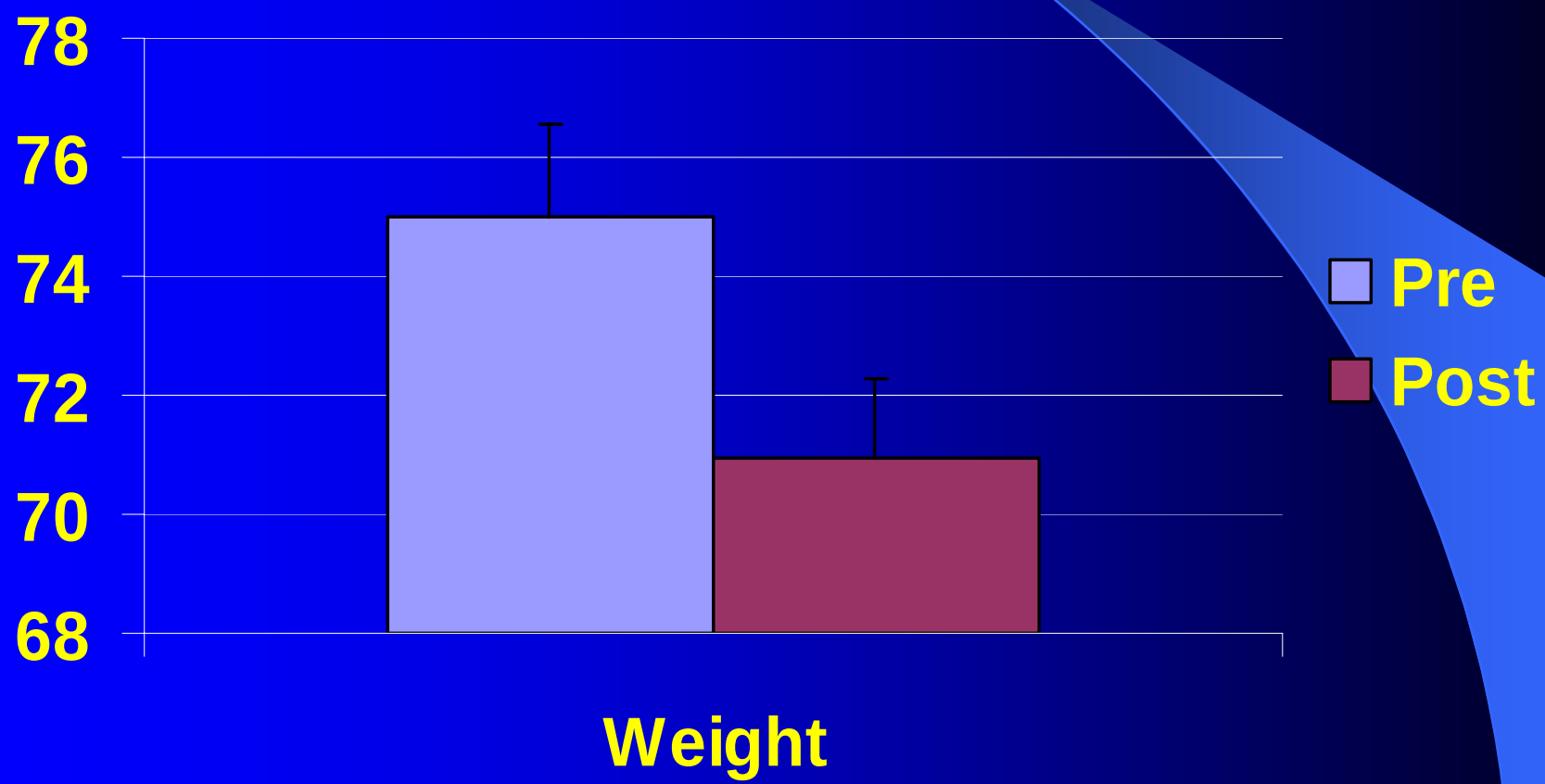
1400 Kcal , 40% CHO, 30% fat, 30% protein

Actual Macronutrient Composition

Food Diary Data Analyzed with USDA Nutrient Database

*data missing for remaining 7% of kcals from fat	South Asian Indian N=15	Caucasian N=27
CHO %	48	41
Protein %	16	18
Total Fat %	35	39
Saturated Fat %	*8	8
Polyunsaturated %	*7	15
Monounsaturated %	*14	17

Change in Weight (kg)

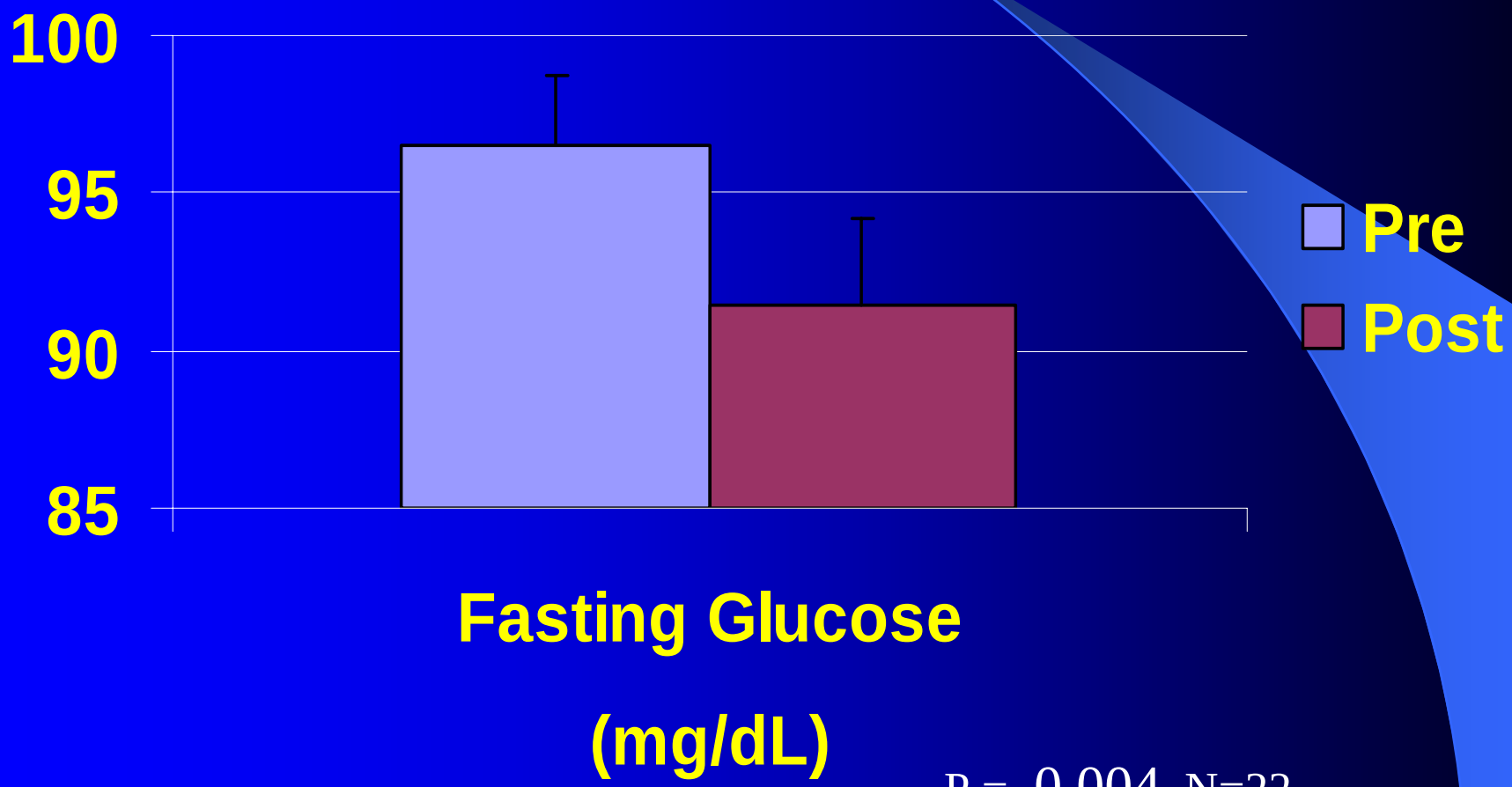


P < 0.0001, N=22

Change in SSPG (mg/dL)

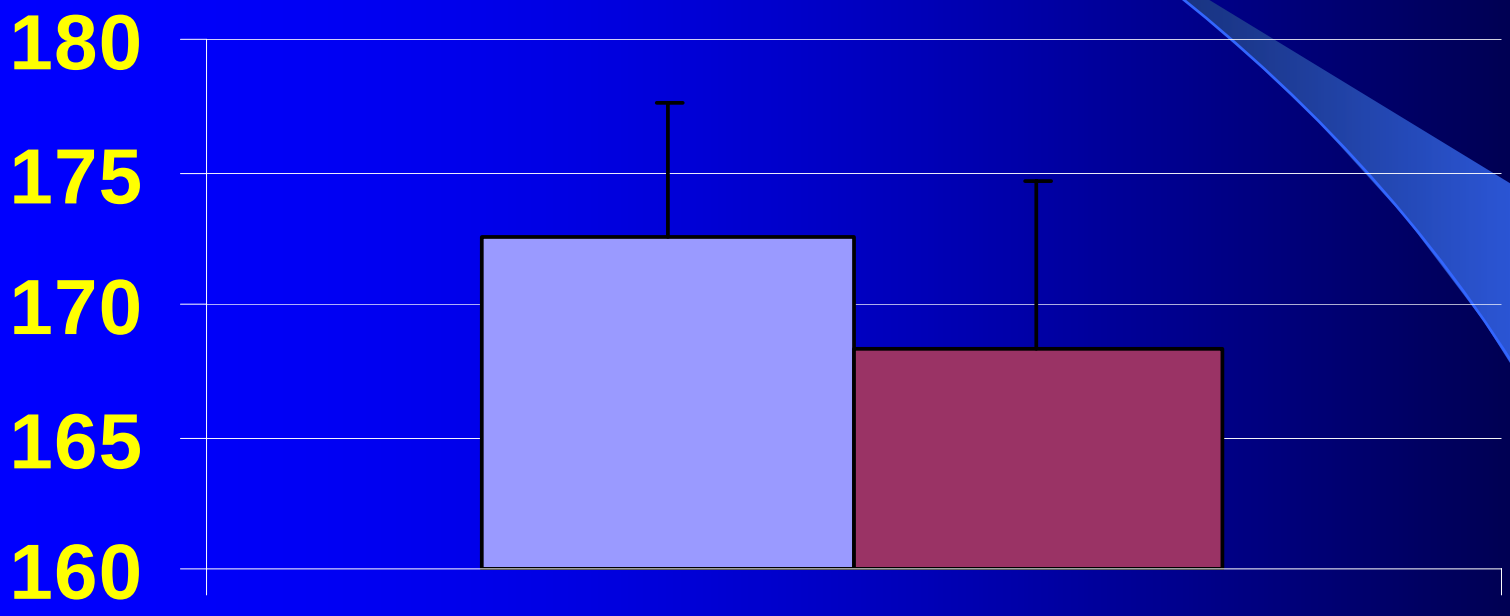
P < 0.0001, N=22

Change in Fasting Glucose



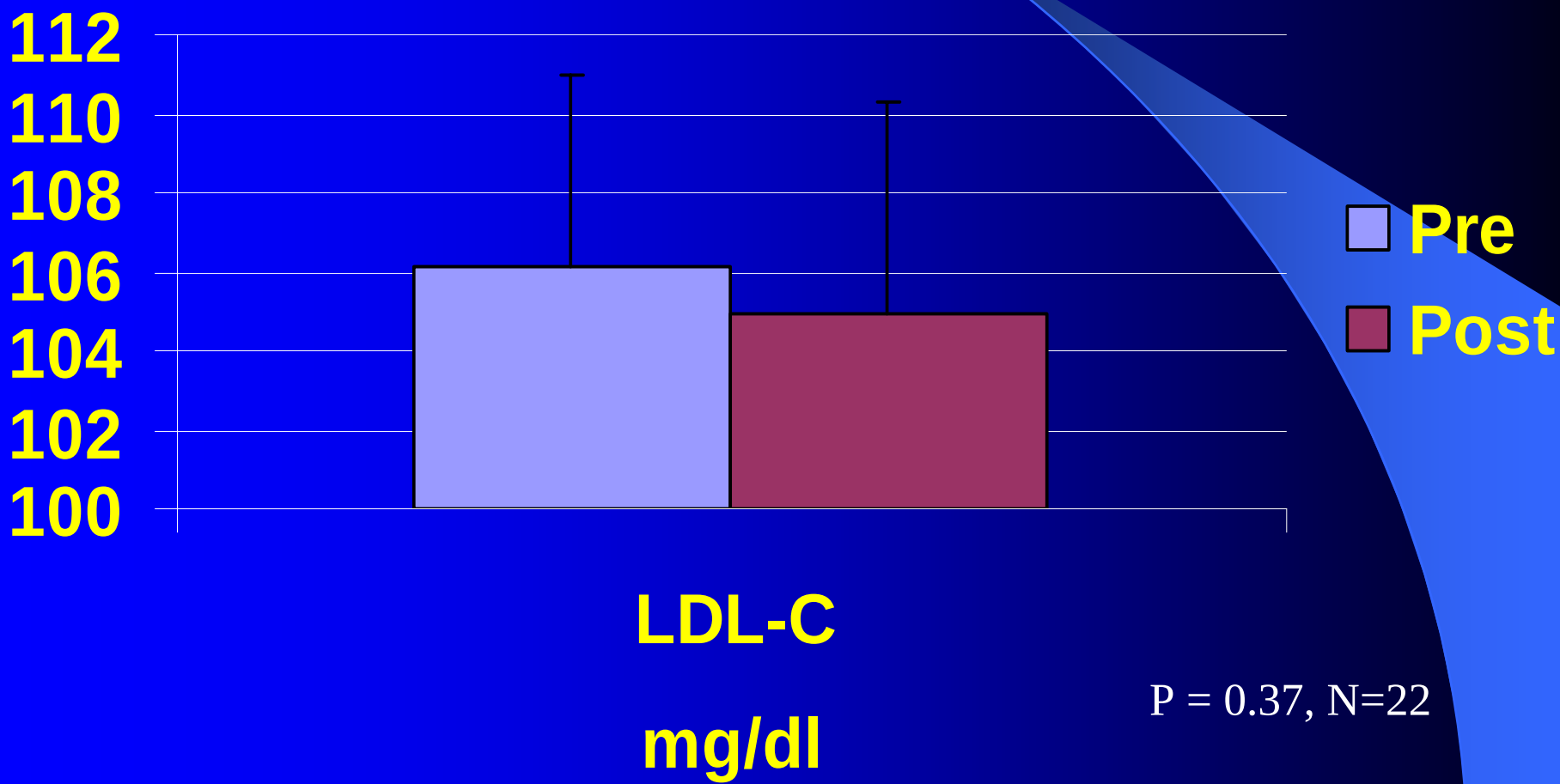
P = 0.004, N=22

Change in Cholesterol



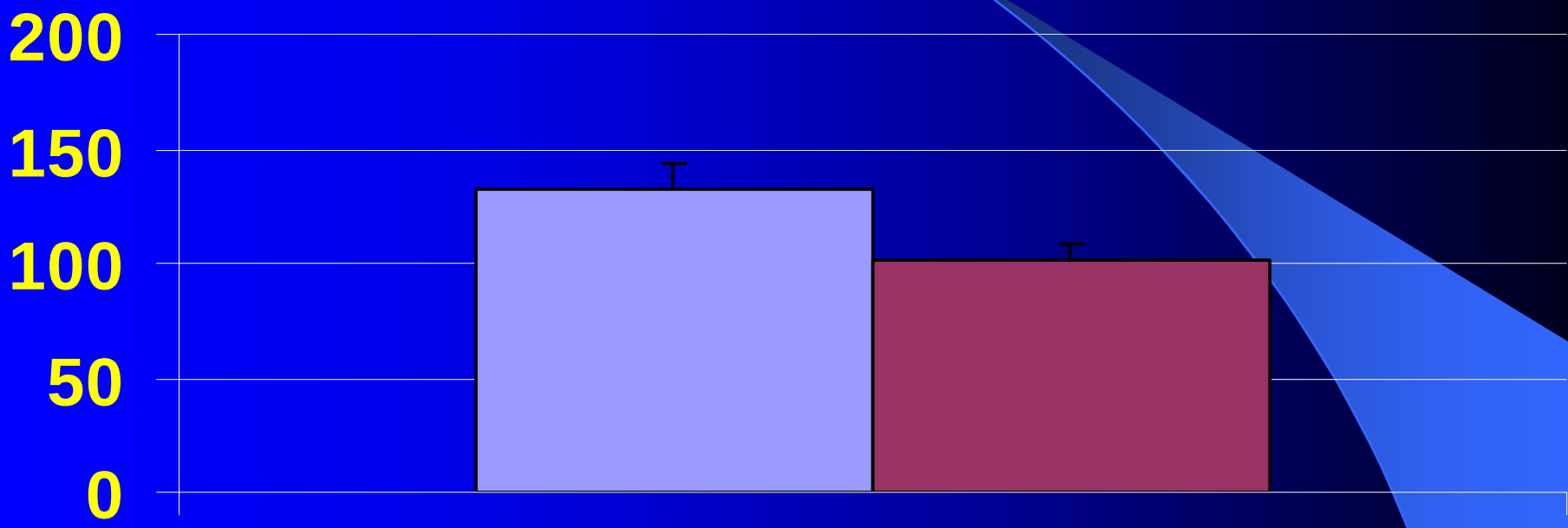
P = 0.2, N=22

Change in LDL-C



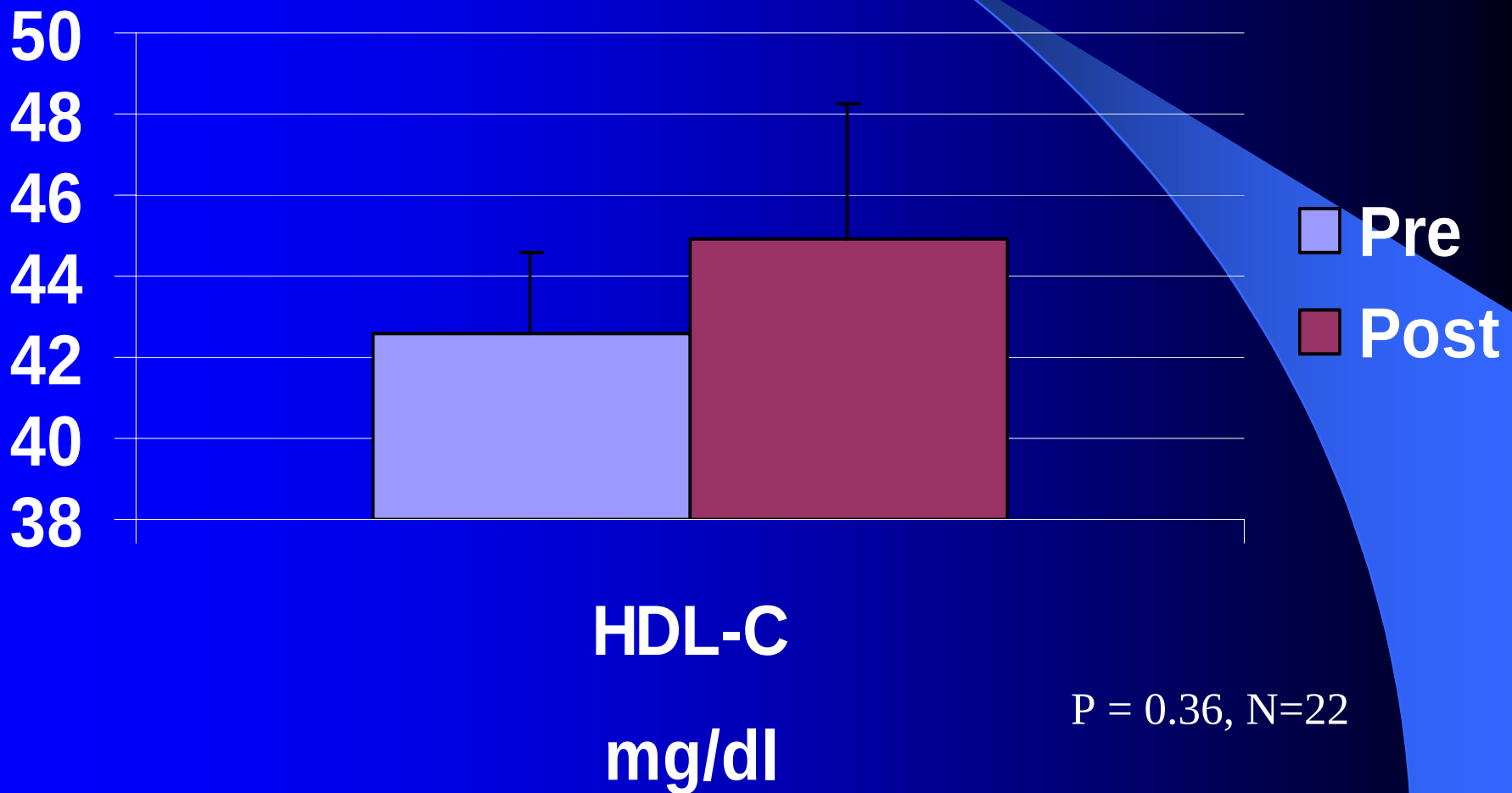
P = 0.37, N=22

Change in Triglycerides



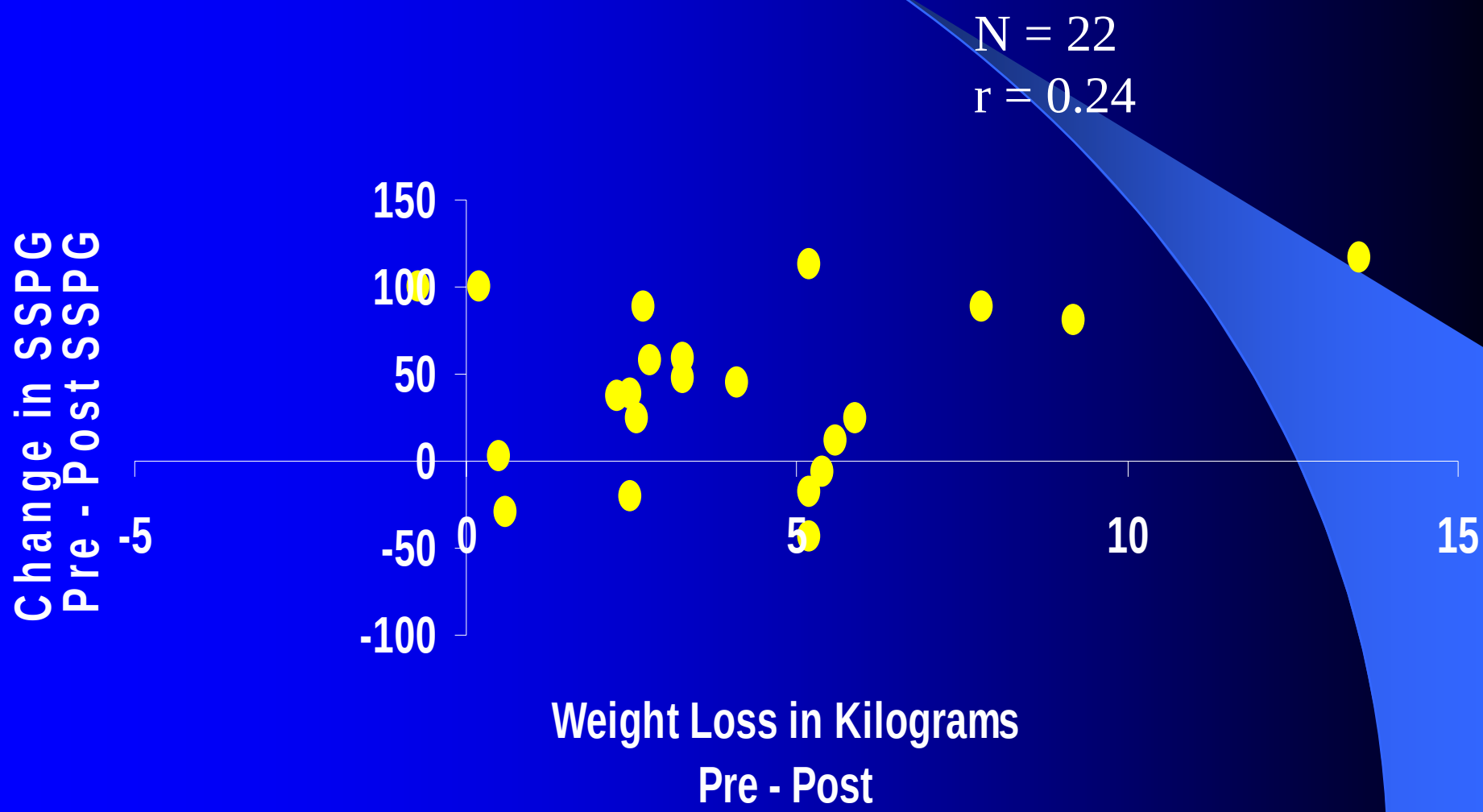
P = 0.003, N=22

Change in HDL-C

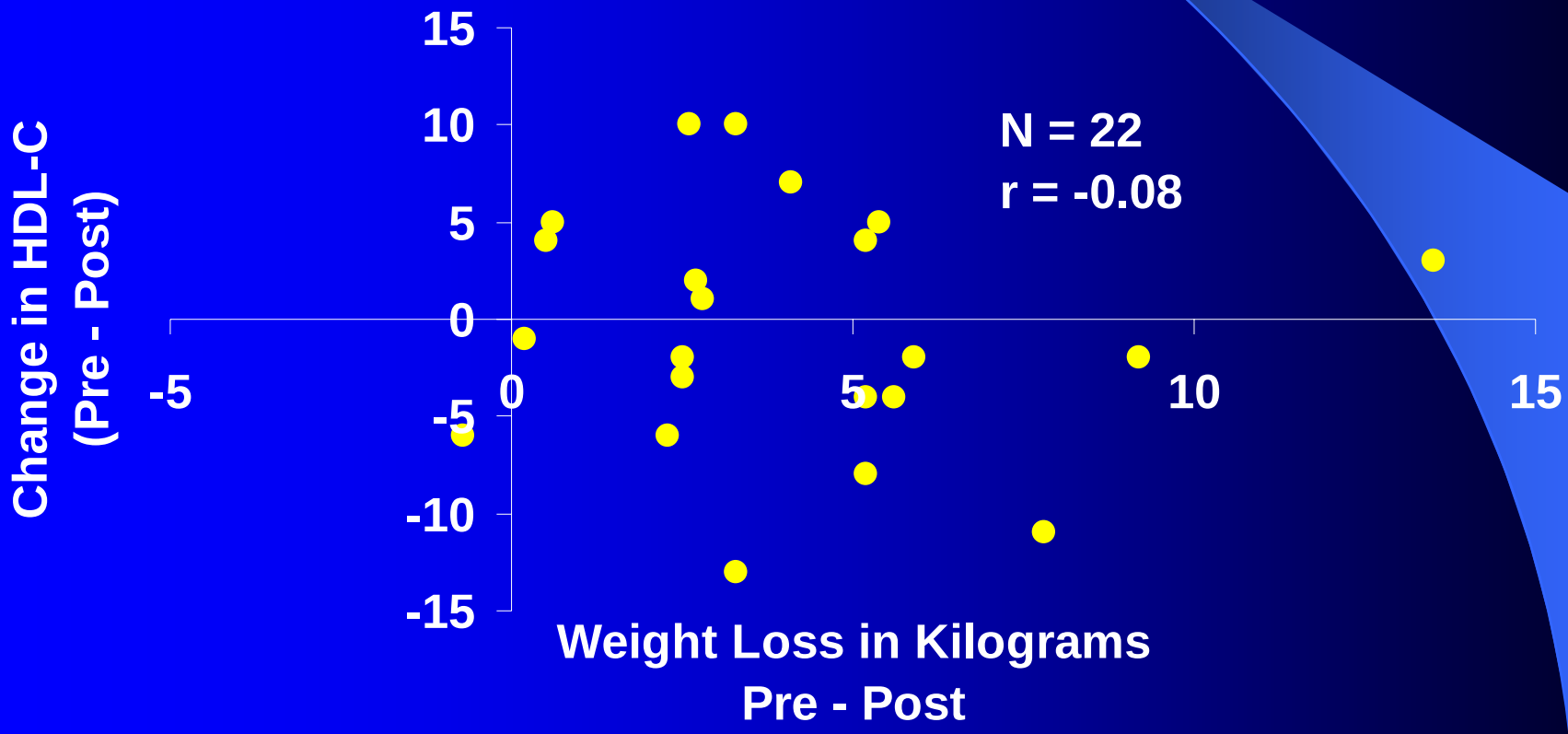


P = 0.36, N=22

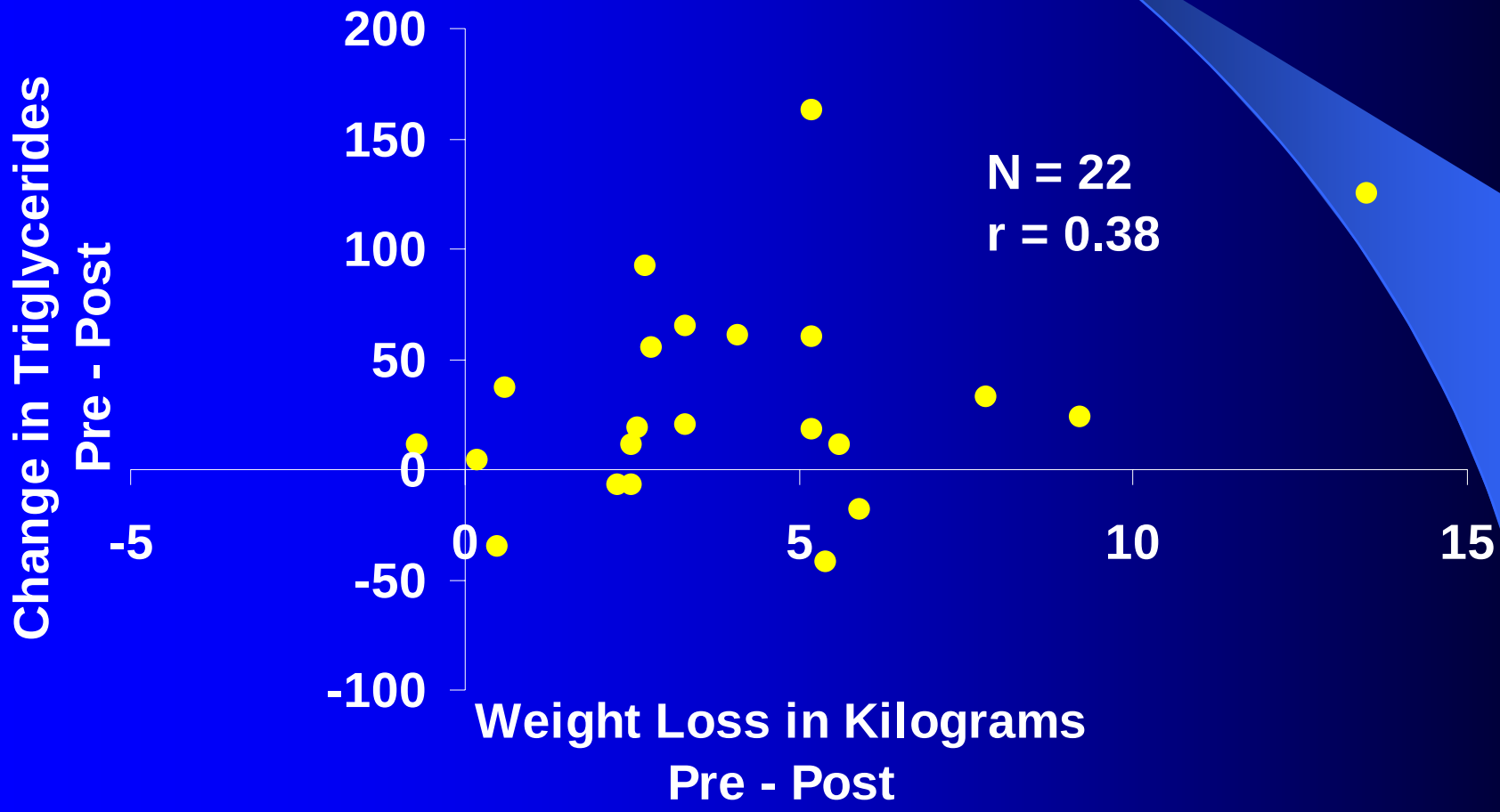
Correlation of Weight Loss and Change in SSPG



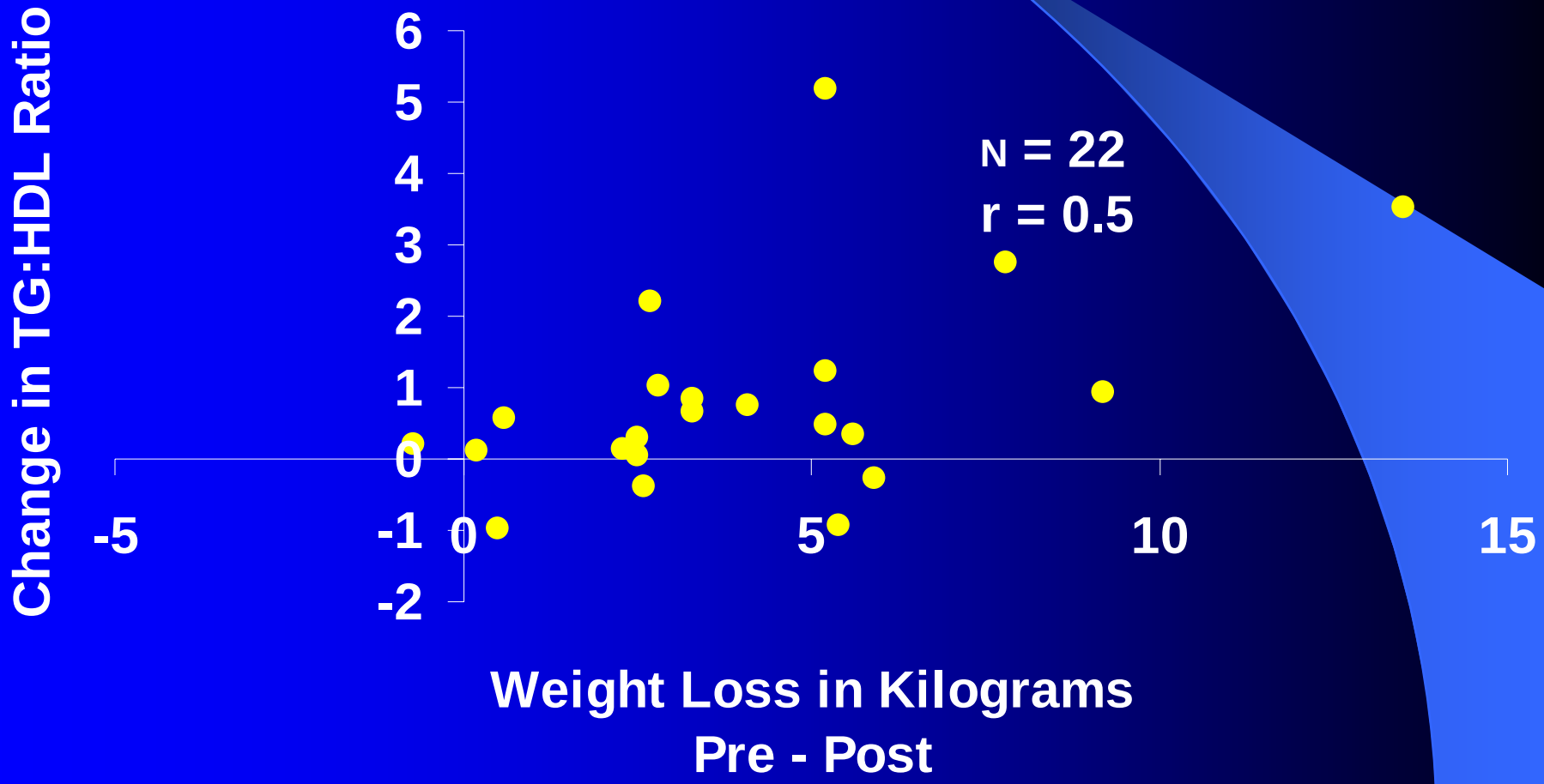
Correlation of Weight Loss and Change in HDL-C



Correlation in Weight Loss and Change in Triglycerides



Correlation of Weight Loss and Change in TG:HDL Ratio



Thanks!

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- GCRC Nurses and Staff
- Dr. Marcia Stefanick for support and mentorship