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# Role of a Low Glycemic Index Diet in the Treatment of Acne Vulgaris

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## INTRODUCTION

### What is Acne?

Acne vulgaris is the most common skin condition, affecting 85% of young adults ages 12-25 across the globe.

### Pathophysiology:

- Increased sebum production
- Release of inflammatory mediators in the skin
- Increased hormones
- Hyperkeratosis
- Colonization by anaerobic *Propionibacterium acnes*

### What is the Glycemic Index?

The glycemic index (GI) is a measure of the blood glucose-raising potential of the carbohydrate content of a food compared to a reference food (usually pure glucose). Carbohydrate-containing foods may be classified as high- ( $\geq 70$ ), moderate- (56-69), or low-GI ( $\leq 55$ ) in comparison to pure glucose (GI=100).

### Why is this an Important topic?

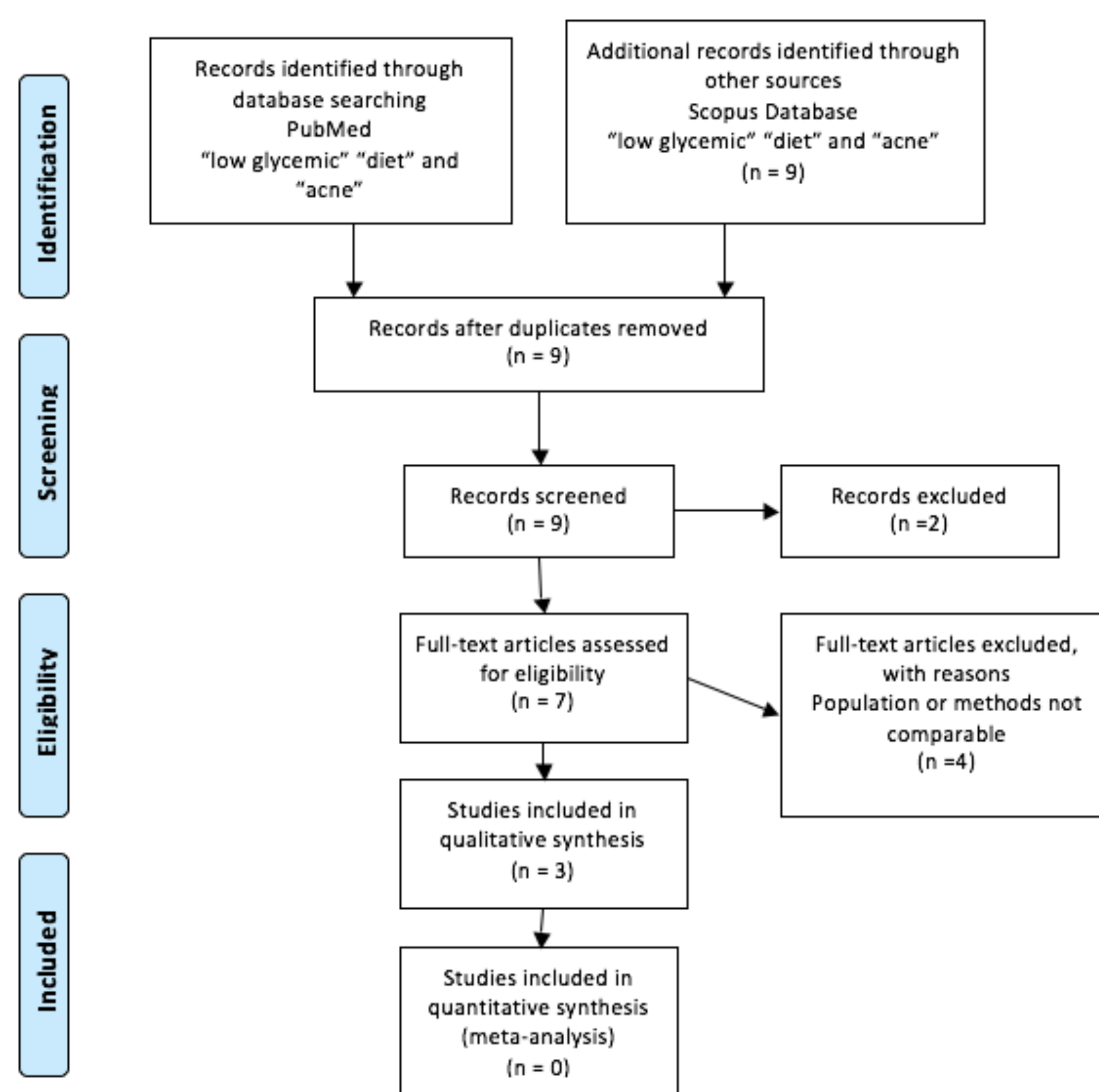
The incidence of acne vulgaris has been increasing dramatically in Western societies without an explanation. One hypothesis to explain the increased incidence of acne in the United States is the influence of the Western diet on acne proliferation. Available pharmacological treatments for acne all have unpleasant side effects. A low glycemic index diet may be a treatment option with the fewest possible adverse effects and the most benefits for the patient.

## CLINICAL QUESTION

Among young adults ages 15-25 years old with acne vulgaris, does following a low glycemic index diet as compared to no dietary changes help in treatment of acne vulgaris?

## METHODS

### PRISMA Flow Diagram

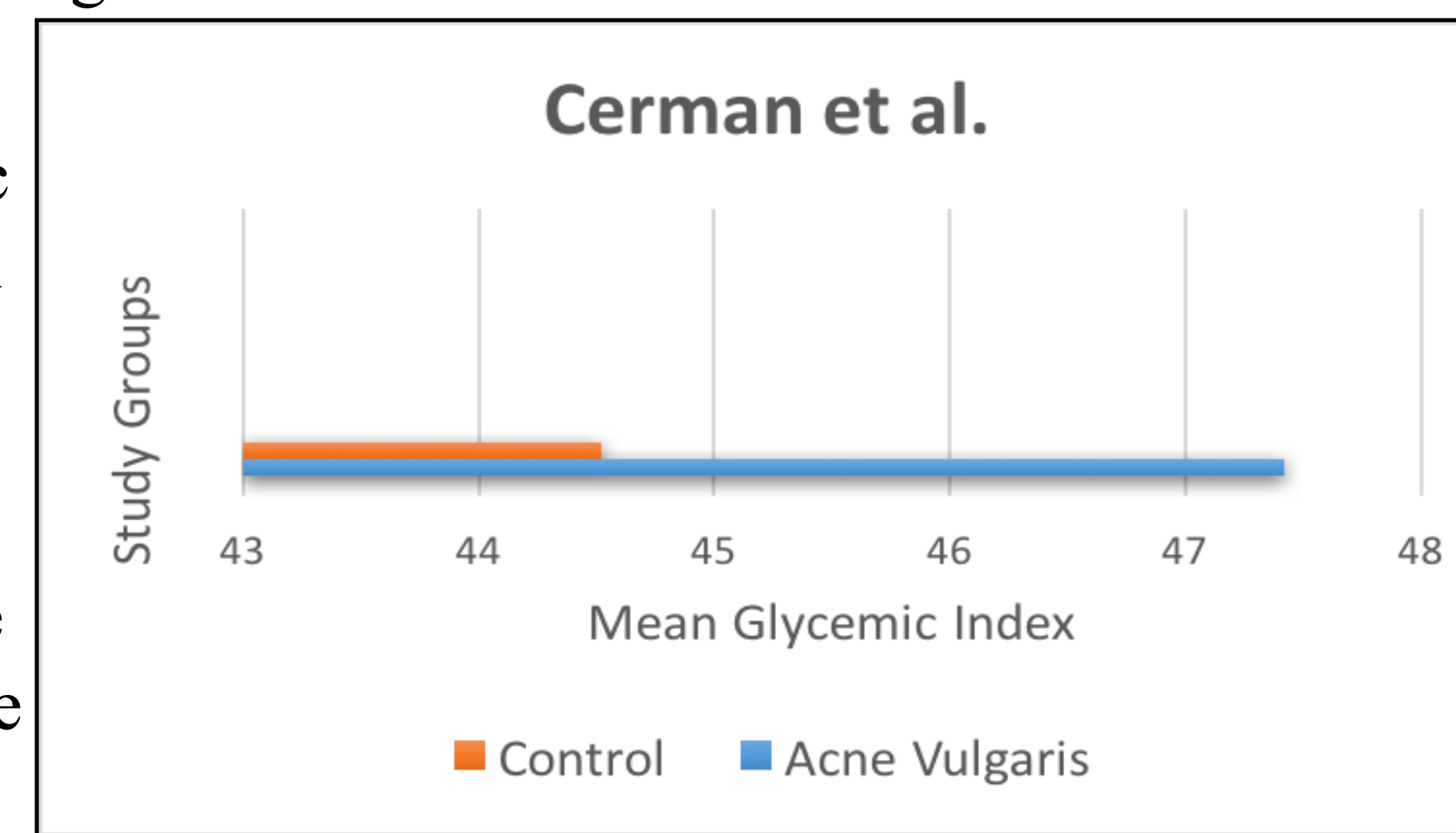


## RESULTS

### Study 1: Dietary Glycemic Factors, Insulin Resistance, and Adiponectin Levels in Acne Vulgaris

**Objective:** The aim of this study was to investigate possible associations among dietary glycemic index, insulin resistance, adiponectin levels, and the glycemic load in the pathogenesis of acne vulgaris

**Result:** Cerman et al discovered that glycemic index and glycemic loads were significantly higher in patients with acne compared to healthy control subjects without acne. This study also showed a positive correlation between acne severity and glycemic index value ( $p = 0.022$ ).

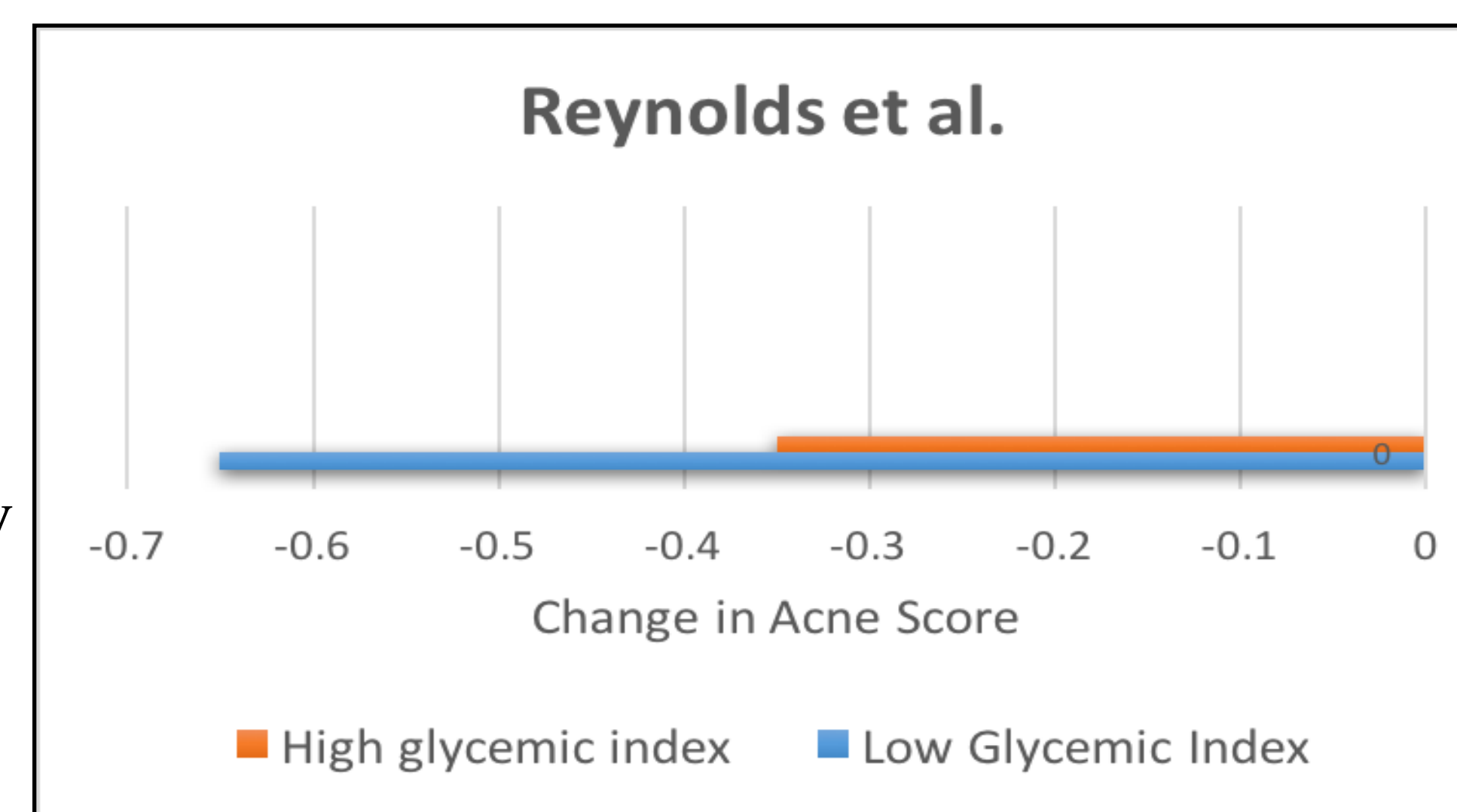


**Critique:** The extensive exclusion criteria is a strength of the study because it decreases potential confounding factors. A major critique of the study is the study type, cross sectional.

### Study 2: Effects of the Glycemic Index of Carbohydrates on Acne Vulgaris

**Objective:** To determine if a low-glycemic index diet improves facial acne severity

**Result:** Reynolds et al did not reach statistical significance. This study did not find a relationship between glycemic index of carbohydrates on acne vulgaris ( $p=0.244$ )

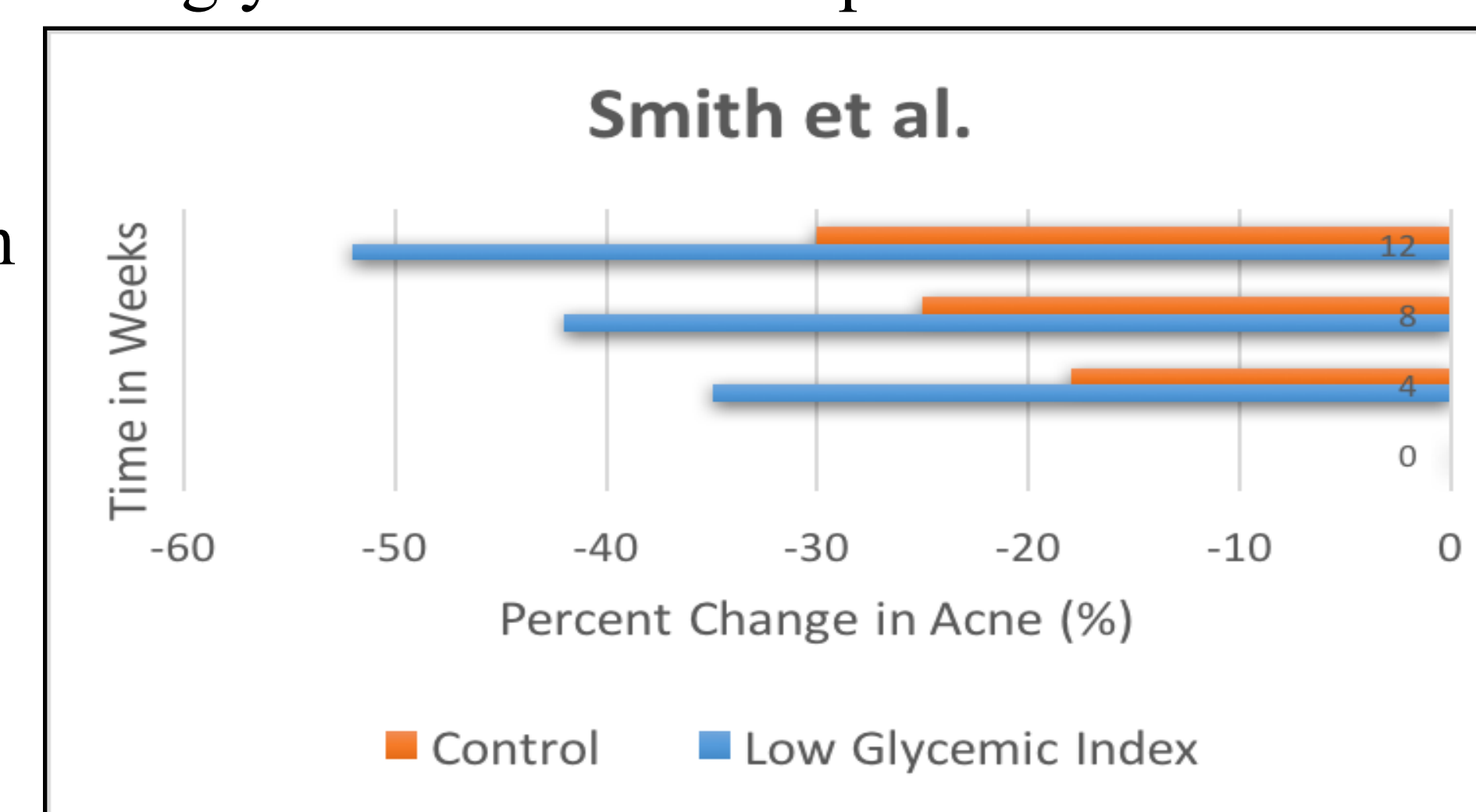


**Critique:** A strength of this study is that it is a randomized control trial. A weakness is the small sample size, use of only male subjects, and subjective acne grading scale.

### Study 3: A Low-Glycemic-load Diet Improves Symptoms in Acne Vulgaris Patients: A Randomized Control Trial

**Objective:** To determine whether a low-glycemic-load diet improves acne lesion counts in young males.

**Result:** Smith et al. showed a statistically significant decrease in inflammatory lesion counts and total acne lesion counts in the intervention group consuming a low glycemic load diet as compared to the control group ( $p = 0.03$ )



**Critique:** This study is a randomized control trial, which is a major strength. Weaknesses of this study include the small sample size, short time period of the study, presence of multiple confounding factors, and use of only male subjects.

Table 8: Comparison of Smith et al, Reynolds et al, and Cerman et al.

	Cerman et al	Reynolds et al	Smith et al
Study Type	Cross-sectional	RCT	RCT
Population Size	86	43	43
Age of Subjects	15-23 y/o	15-17 y/o	15-25 y/o
Gender of subjects	Males, Females	Males	Males
Diet	Patients with Acne: higher glycemic index diet (Mean GI= 47.42) Control subjects: lower glycemic index (Mean GI= 44.52)	Intervention: low glycemic index (Mean GI= 51) Control: high glycemic index (Mean GI= 61)	Intervention: low glycemic index (Mean GI= 43.2) Control: high glycemic index (Mean GI= 56.4)
Acne Assessment	3 categories: mild, moderate, severe, included non-inflammatory and inflammatory lesions	Dermatologist blinded, acne severity determined by number and degree of only inflammatory lesions and graded 0-3. 0; no acne to 3; severe	Dermatologist blinded, total and inflammatory acne lesions were counted
Adjunct Treatment	None	Not standardized, patients continued washing regimen	Cetaphil gentle topical cleanser started 2 weeks prior to study
Length of Study	1 week	8 weeks	12 weeks
Follow-Up	None	Baseline (0 weeks) and 8 weeks	Baseline, 4 weeks, 8 weeks, 12 weeks
p-values	P = 0.022	P= 0.244	P= 0.03

RCT= randomized control trial, GI= glycemic index, y/o= years old

## CONCLUSIONS

- Of the studies analyzed, one randomized control trial and one cross sectional study reached clinical significance suggesting there is a significant relationship between glycemic index and acne vulgaris proliferation.
- Although a low glycemic index diet has not been proven to treat acne, there are no adverse risks associated with the consumption of a low glycemic index diet.
- Benefits of a low glycemic index diet include weight loss and improved insulin sensitivity. Indirect benefits of weight loss include the prevention of chronic illness such as diabetes mellitus, hypertension, and dyslipidemia.
- Further research must be conducted in order to identify low glycemic diet as the variable responsible for improvement of acne versus confounding factors such as weight loss and improved insulin sensitivity.
- Longer duration trials and larger sample sizes are necessary in future studies for more conclusive results.

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