

# Determining the Efficacy of Nutrient Supplementation and Diet in Age-Related Macular Degeneration Patient Outcomes: A Systematic Review

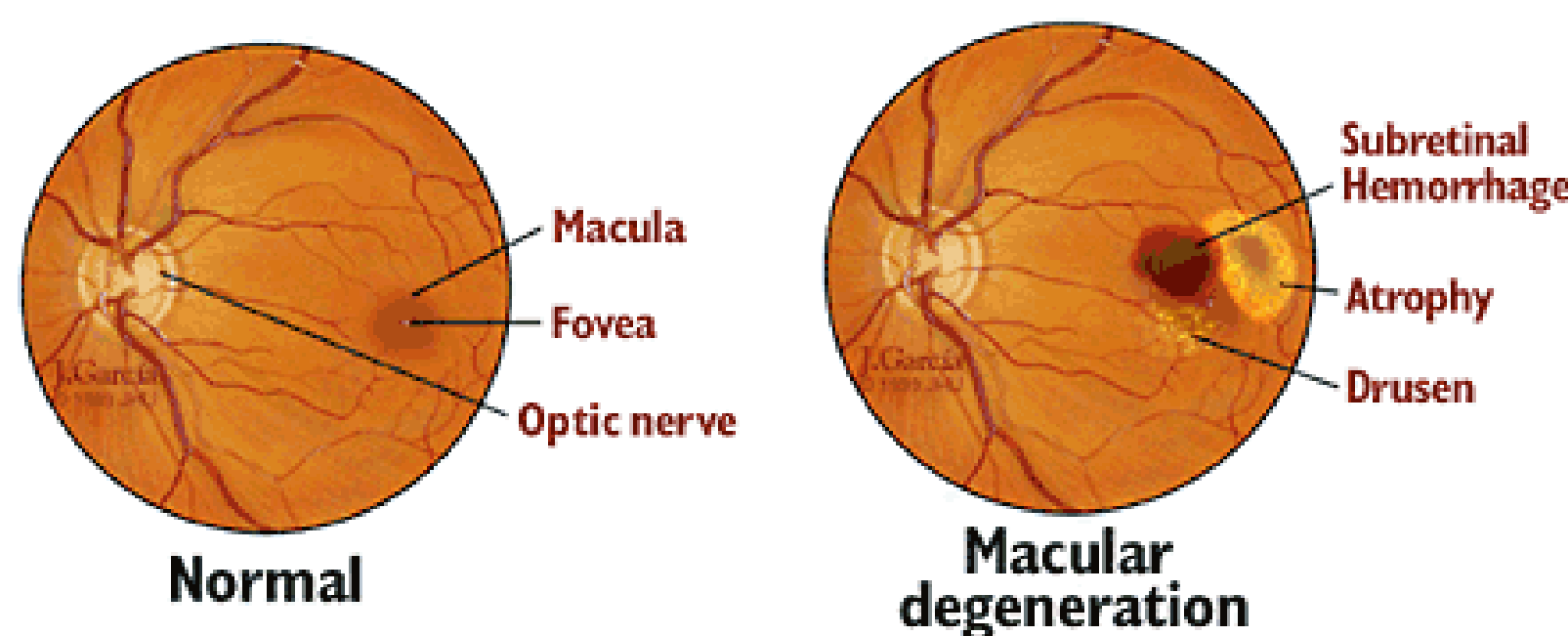
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## Introduction

Age-related macular degeneration (AMD) is a condition of the elderly which rapidly worsens following onset. It is characterized by a loss of central vision.

The purpose of this review is to review experimental and observational literature that investigates the consumption of dietary carotenoids, fatty acids, antioxidants, and minerals and their ability to reduce the risk and rate of progression of the disease.



## Methods

Databases: PubMed, PMC, Academic Search Premier, and CINAHL Plus

<b>Population</b>	Age-Related Macular Degeneration patients over age 50
<b>Intervention</b>	Nutrient Supplementation, Lutein, Zeaxanthin, Omega-3, carotenoids, Vitamin C, E, Minerals, Zinc, antioxidants, Mediterranean Diet, anti-inflammatory diet, polyunsaturated fatty acid, monounsaturated fatty acid, saturated fatty acids
<b>Comparison</b>	Little to no supplementation, no dietary intervention
<b>Outcome</b>	AMD progression (early to intermediate to late-stage), central geographic atrophy (late-stage AMD), presence of choroidal neovascularization (late-stage AMD), visual acuity decline, macular pigment ocular density

## Literature Results

648 studies were screened using the PICOS criteria and Quality Criteria Checklist from the Academy of Nutrition and Dietetics. Following the screening process, 27 met the inclusion criteria.

**9 Nutrient Supplement Experimental Studies (6 RCTs with n > 1000)**  
**12 Nutrient Observational Studies (3 Retrospective, 5 Case-Controlled, 4 Prospective)**  
**6 Mediterranean Diet Observational Studies (1 Retrospective, 2 Case-Controlled 3 Prospective)**

**Richer et al. (2004), Piermarocchi et al. (2011), AREDS2 (2014)**

Lutein and zeaxanthin supplementation resulted in a significant decrease in the risk of progression to advanced AMD and/or improvements to visual acuity and eye health.

**AREDS1 (2001), Chew et al. (2013)**

AMD progression significantly reduced with zinc, vitamin C, and beta-carotene supplementation

**Seddon et al. (1994)**

Those in the highest quintile of carotenoid consumption had a significantly (43%) reduced risk of AMD ( $p < 0.02$ )

Significant inverse association between AMD risk and carotenoid consumption ( $p < 0.008$ ).

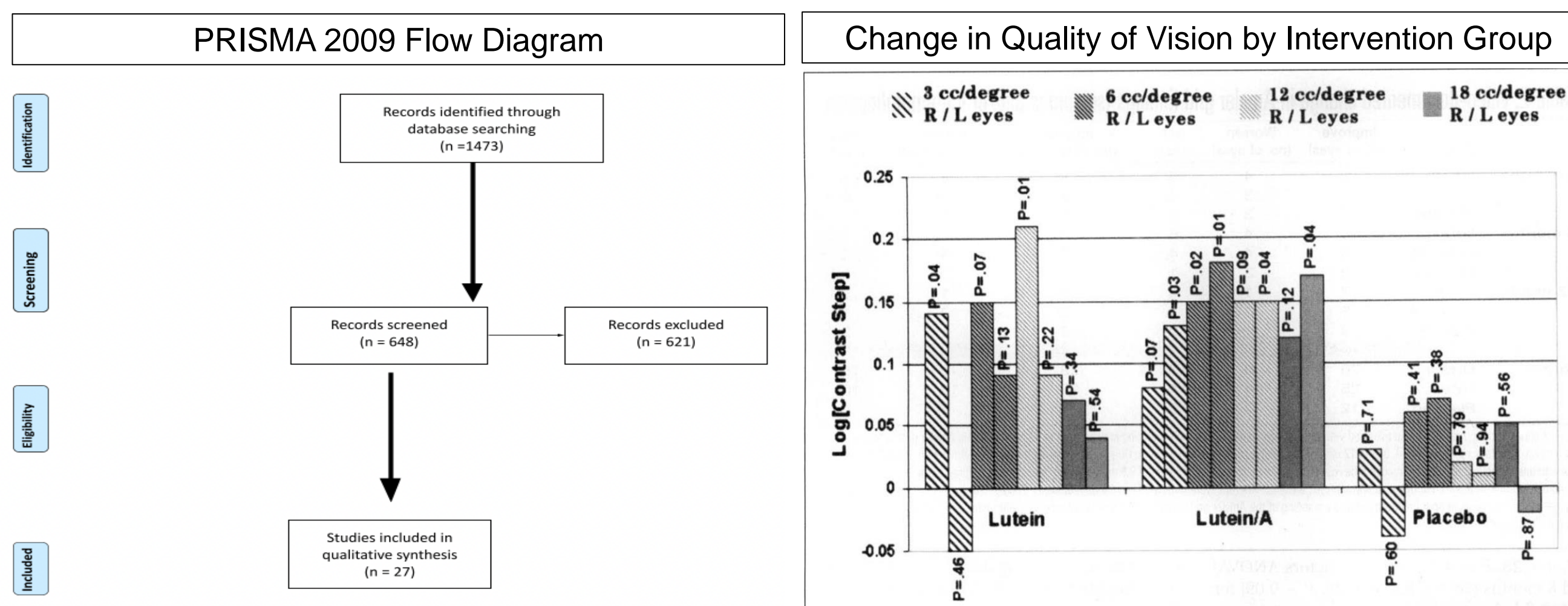
**Cho et al. (2001)**

Total fat intake significantly associated with higher AMD risk in both men and women ( $p = 0.008$ )

Significant direct relationship between linolenic acid intake and AMD ( $p = 0.03$ )

**Nunes et al. (2018)**

High adherence to a Med. diet was significantly associated with a lower risk of AMD in 67.2% of participants that did not have AMD and 32.8% of those that did have AMD ( $p = 0.009$ ) (OR: 0.73) (n=1992, 768 with AMD, 1224 without AMD)



## Conclusion

The primary strengths of this review were the selection of both observational and experimental studies with very large participant populations from over six countries over the last two decades.

Carotenoids such as lutein and zeaxanthin are effective at reducing the risk of progression to advanced AMD. Their effectiveness is further enhanced by antioxidants and mineral supplementation, including zinc.

Mediterranean diet that is rich in vegetables, fruits, nuts, and has been shown to reduce the risk of developing AMD

Supplementation of carotenoids and other nutrients in conjunction with a diet free of excessive fats can reduce the risk of late-stage AMD

## References

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