

Sexual Dysfunction Among Young Men: Overview of Dietary Components Associated With Erectile Dysfunction

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ABSTRACT

Background: Sexual dysfunction is relatively common in young men, presenting in diverse manifestations, including erectile dysfunction (ED), for which dietary modifications, including increased intake of dietary antioxidants, have been suggested as promising and cost-efficient approaches.

Aim: To assess the consumption of selected dietary antioxidants, in particular flavonoids, in relation to ED symptoms in young men.

Methods: Men 18 to 40 years old were invited to complete an anonymous web-based questionnaire for this case-control study. ED was diagnosed with the International Index of Erectile Function (IIEF) and flavonoid intake was recorded using food-frequency questionnaires, with an emphasis on flavonoid-rich foods such as coffee, fruits, etc. Participants without ED (IIEF score ≥ 26 ; $n = 264$) formed the control group and those with ED (IIEF score < 26 ; $n = 86$) formed the case group.

Outcomes: Dietary flavonoid intake.

Results: Men with ED reported a lower median monthly intake of total flavonoids (-2.18 g, 95% CI = -3.15 to -1.21 , $P < .001$) and all flavonoid subclasses ($P < .001$) compared with controls. Adjustment of intake for age and body mass index showed that consumption of flavonoids 50 mg/day lowered the risk for ED by 32% (odds ratio = 0.68, 95% CI = 0.55–0.85, $P < .001$). Of all recorded flavonoids, flavones appeared to contribute the most to healthy erectile function. Controls reported a greater consumption of vegetables and fruits, a lower intake of dairy and alcoholic beverages, and a less intense smoking habit compared with cases ($P < .001$).

Clinical Implications: Increased intake of fruits, vegetables, and flavonoids decreases the risk of ED in young men.

Strength and Limitations: The strength of this study stems from the innovative hypothesis, the young age of participants, and the suggested therapeutic effects of cheap dietary components against ED. Limitations include the relatively small sample and cross-sectional design.

Conclusion: Low flavonoid—in particular flavone—intake is associated with ED in young adult men.

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INTRODUCTION

According to the World Health Organization, sexual health is “a state of physical, emotional, mental and social well-being in relation to sexuality” and not merely the absence of disease, infirmity, or dysfunction.¹ Healthy sexuality is an integral part of human life and can undoubtedly contribute to an ameliorated quality of life. However, in recent decades, sexual health seems to have been in crisis.² Several sexual dysfunctions, such as low sexual desire, erectile dysfunction (ED), inability to achieve

orgasm, and premature ejaculation, are relatively common in men^{3,4} even at a young age. Modifiable risks factors, such as atherosclerosis and coronary artery disease, diabetes, cardiovascular (CV) disease (CVD), increased blood pressure, obesity, stress, and depression, have been included as risk factors leading to several aspects of sexual dysfunctions in younger men.^{2,5–8}

Improvements in erectile function can be achieved by the adoption of healthier lifestyle habits. In particular, dietary modifications,⁹ such as adherence to a Mediterranean diet¹⁰ and increased intake of dietary antioxidants¹¹ and caffeine,¹² seem to be the most promising and cost-efficient approaches to ED therapy. The hypothesis behind the consumption of antioxidants in ameliorating ED symptoms is the fact that ED is often a precursor of impending CV problems, with antioxidant compounds having known beneficial effects in lowering CV risk.¹³

The present study assessed the consumption of selected dietary antioxidants, in particular flavonoids, in relation to ED symptoms, in young adult men. In addition, the consumption of antioxidant-rich food groups, such as vegetables and fruits, was assessed in men with ED compared with controls.

METHODS

Population

An invitation to join the study was sent via e-mail to 1,385 individuals listed in the faculty of medicine registries. 422 men responded by completing the questionnaire during the second half of 2015. 17 participants were excluded from the sample for having comorbidities known to affect ED. Specifically, 1 man had injuries affecting the pelvic area, 1 had spinal cord trauma from a recent road accident, 4 had diabetes or prediabetes, 1 had congenital heart disease, 2 were diagnosed with hypertension, 1 was receiving antiepileptic medications, 3 had hyperlipidemia, 1 had hypogonadism, and 3 reported a diagnosis of depression. An additional 31 men were excluded from the sample for complete lack of sexual intercourse and 24 for straight-lining of responses, a common problem in internet-based surveys¹⁴ that decreases overall accuracy and increases type I errors.¹⁵ Thus, the final sample consisted of 350 adult men. Participant characteristics are presented in [Table 1](#).

Ethical permission for the study was obtained from Aristotle University Ethics Committee and all data were handled according to the Declaration of Helsinki.

Tools

Each participant was asked to complete a web-based questionnaire anonymously, consisting of 3 domains, with predefined answers provided as options from a dropdown list. In the initial part of the questionnaire, general information concerning age, level of education, relationship status, occupation, body weight and height, incidence of diagnosed disease(s), and smoking status of participants was reported. Body mass index (BMI) was calculated for each participant as reported body weight (kilograms) divided by reported height (meters) squared.

Table 1. Participants' characteristics (N = 350)*

Age (y)	28 (23.0–34.0)
BMI (kg/m ²)	25.0 (23.5–27.7)
Smoking status	
Non-smoker	259 (74.0)
Smoker	91 (26.0)
Education	
≤12 y (secondary)	140 (40.0)
>12 y (tertiary)	210 (60.0)
Relationship status	
Casual	130 (37.2)
Long term	220 (62.9)
Employment status	
Unemployed	43 (12.3)
Employed or student	307 (87.8)
Erectile dysfunction (IIEF score < 26)	86 (24.6)

BMI = body mass index; IIEF = International Index of Erectile Function.

*Data are presented as median (25th–75th quartile) or count (percentage).

The 2nd part assessed ED using the International Index of Erectile Function (IIEF).¹⁶ The IIEF consists of a standardized and validated 15-item self-evaluation scale appraising erectile and orgasmic function, sexual desire, satisfaction during sexual intercourse, and general satisfaction. In the present sample, ED was diagnosed in participants with an IIEF score lower than 26. Of those with ED, mild ED was defined as an IIEF score from 22 to 25, mild to moderate ED was defined as an IIEF score from 17 to 21, moderate ED was defined as an IIEF score from 11 to 16, and severe ED was defined as an IIEF score from 6 to 10.¹⁷

The 3rd part of the survey assessed the dietary habits of participants using a semiquantitative food-frequency questionnaire. The frequency of consumption of 67 food items, commonly consumed in the geographic area, was recorded. For each item, participants selected an answer from 8 distinct frequency intake categories in a Likert scale, ranging from “never or hardly ever” to “6 or more times a day.”

For each of the selected food items, the flavonoid and saturated fat contents were calculated based on the US Department of Agriculture food composition tables.¹⁸ Flavonoid intake of each participant was estimated by summing the flavonoid content of each food and then multiplying each sum according to the frequency and serving size consumed.

Statistical Analyses

Participants with ED formed the case group (n = 86) and those who were free of ED composed the control group (n = 264). Predictive Analytics Software (PASW; SPSS, Hong Kong, China) was used for data analyses. Significance was set at a *P* value less than 0.05 and 2-sided tests were performed. Distribution of variables was assessed with the Kolmogorov-Smirnov test. Continuous variables were described as median and interquartile range and categorical variables were presented as count

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