

# Impact of Birth Control Use on Metabolic Syndrome Risk in Female College Students

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## Introduction

Of the 72.2 million women 15-49 years old in the United States, 69.4% report using some form of contraception.<sup>1</sup> Research suggests birth control (BC) use alters blood lipids in women. We know that unfavorable blood lipids can increase the risk for developing cardiovascular disease (CVD).<sup>2</sup> 1 in 5 female deaths is related to CVD, with heart disease being the leading cause of death in the United States for women.<sup>2</sup>



## Metabolic Syndrome

A cluster of risk factors that increases your chance of CVD, diabetes, and other health complications.<sup>3</sup>

An individual is diagnosed with metabolic syndrome if they meet the criteria for three or more of the following, or take medications for it:

- Fasting Blood Glucose (FBG) >100mmHg
- Elevated triglycerides (TG) >150mg/dL
- Decreased high-density lipoprotein cholesterol (HDL-C) <50mg/dL for women
- Elevated blood pressure (BP) ≥130 mmHg systolic or ≥85 mmHg diastolic
- Waist circumference (WC) >35in for women

The prevalence of metabolic syndrome (MetS) in women has increased from 25% in 1988 to over 35% in 2012.<sup>4</sup> Previous studies have examined the relationship between birth control use and their effects on MetS in female subjects, but few in the college population.

## Study Objective

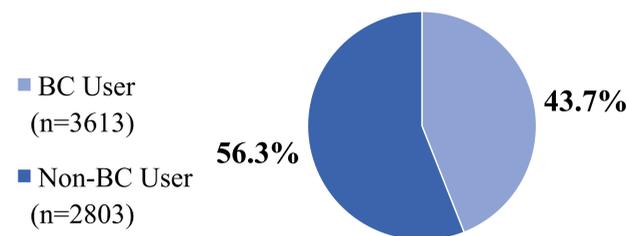
The purpose of this study was to examine the differences in metabolic syndrome risk between birth control users vs. nonusers in a sample of female college students.

## Characteristics for All, Birth Control User, and Non-Birth Control User Participants

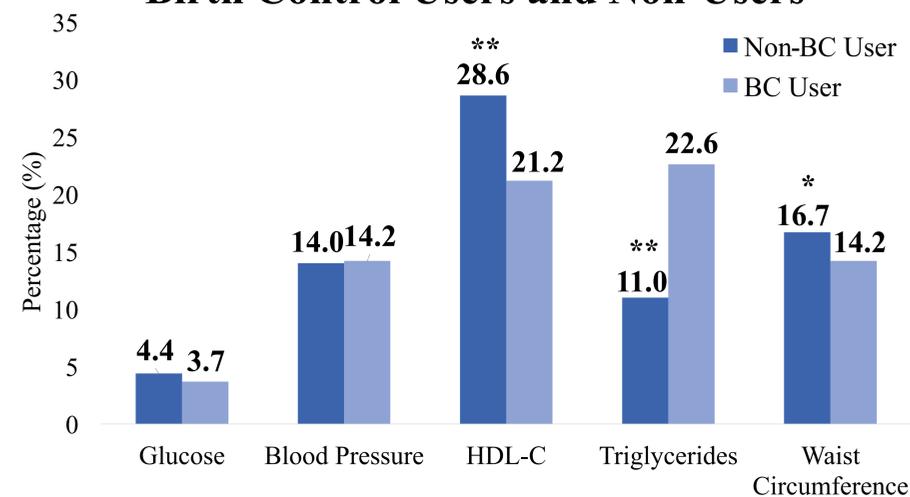
Characteristics	BC user (n=2803)	Non-BC user (n=3613)	All (n=6416)
Age (mean ± SE)	18.8 ± .02	18.8 ± .02	18.8 ± .01
<b>BMI</b>			
Underweight (<18.5 kg/m <sup>2</sup> ) % (n)	3.3 (85)	4.1 (132)	3.8 (217)
Normal (18.5-24.9kg/m <sup>2</sup> ) % (n)	76.1 (1949)	71.6 (2300)	73.6 (4249)
Overweight (>30.0 kg/m <sup>2</sup> ) % (n)	20.6 (527)	24.3 (781)	22.7 (1308)
<b>Class Standing</b>			
Freshmen % (n)	58.4 (1635)	62.2 (2246)	60.5 (3881)
Sophomore % (n)	27.4 (767)	24.8 (896)	25.9 (1663)
Junior % (n)	8.5 (237)	7.8 (283)	8.1 (520)
Senior % (n)	4.7 (131)	3.9 (142)	4.3 (273)
Other % (n)	1.1 (32)	1.3 (46)	1.2 (78)
<b>White % (n)</b>	97.0 (2308)	93.7 (2792)	95.1 (5100)
<b>Smoker % (n)</b>	6.0 (122)	5.7 (146)	5.9 (268)
<b>Major</b>			
Nutrition % (n)	6.6 (185)	7.5 (272)	7.1 (457)
Allied Health % (n)	22.5 (630)	23.4 (847)	23.0 (1477)
Non-Allied Health % (n)	70.9 (1988)	69.0 (2494)	69.9 (4482)
<b>Exercise % (n)</b>	93.4 (2609)	93.6 (3360)	93.5 (5969)
<b>Kilocalories/day (mean ± SE)</b>	1800 ± 9.8	1772 ± 9.0	1784 ± 6.7

\*Continuous variables are presented as means ± standard error. Categorical variables are presented as percent and number of subjects. Kilocalories are average of 3 days.

## Birth Control Use in Undergraduate Females



## Prevalence of MetS Criteria in Birth Control Users and Non-Users



\*p-value <.05, \*\*p-value <.0001 shows statistical significance between users and non-users. Variables are presented as percent of subjects from non-birth control users and birth control users, respectively, who meet the specified MetS criteria. Analyses conducted using chi square test and Fisher's Exact Test.

## Methods

Data are from the College Health and Nutrition Assessment Survey (CHANAS). A continuous, cross-sectional study with available data from fall 2005 to spring 2018.<sup>5</sup> Participants include undergraduate female students 18-24 years old who were enrolled in an introductory nutrition course (n=6416) (UNH IRB# 5524).

- **Assessment of birth control use**
  - Self-reported birth control use via survey
- **Assessment of anthropometric measurements**
  - Waist circumference
  - Measured in duplicate and average recorded
- **Assessment of biochemical measurements**
  - TG, FBG, and HDL-C
  - Measured following a 12-hour, overnight fast
- **Assessment of clinical measurements**
  - Blood pressure
  - Measured in duplicate and average recorded

## Results

- Almost 44% of subjects report using birth control
- BC users vs. non-users were more likely to have at-risk TG levels, but less likely to have at-risk HDL levels
- Non-users had greater abdominal obesity than BC users
- No significant differences were observed for BP or FBG

## Conclusion

Our findings suggest BC use is common and impacts different MetS criteria in college females. College health providers and nutrition educators can utilize research findings to tailor information for female students at risk for MetS and chronic disease.

Birth Control use may increase your risk for the development of MetS and other diseases later in life.

## Acknowledgments

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