

Research Report

# Cognitive dietary restraint is associated with eating behaviors, lifestyle practices, personality characteristics and menstrual irregularity in college women

Judy A. McLean, Susan I. Barr\*

*Human Nutrition, University of British Columbia, 2205 East Mall, Vancouver, B.C., Canada V6T 1Z4*

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## Abstract

This study characterized associations of restraint with selected physical, lifestyle, personality and menstrual cycle characteristics in female university students. The survey instrument, distributed to 1350 women, included standardized questionnaires (Three-Factor Eating Questionnaire, Perceived Stress Scale and Rosenberg's Self-esteem Scale), and assessed weight and dieting history, exercise, lifestyle characteristics, menstrual cycle characteristics and whether participants were following vegetarian diets. Among the 596 respondents included in the analysis (44%), women with high ( $n = 145$ ), medium ( $n = 262$ ) or low ( $n = 189$ ) restraint had similar ages, heights and weights. Despite this, compared to women with low scores, those with high scores exercised more ( $4.6 \pm 5.3$  vs.  $3.2 \pm 3.5$  h/wk), were more likely to be vegetarian (14.5 vs. 3.7%), have a history of eating disorders (13.7 vs. 1.2%), be currently trying to lose weight (80.3 vs. 15.3%), report irregular menstrual cycles (34.7 vs. 17.0%), and have scores reflecting lower self-esteem and higher perceived stress. Menstrual irregularity was an independent predictor of restraint score, and restraint score was the only variable to differentiate women with regular and irregular menstrual cycles. We conclude that women with high restraint may use a combination of behavioral strategies for weight control, and differ from women with low restraint scores in personality characteristics and weight history. Some of these behaviors or characteristics may influence menstrual function.

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*Keywords:* Restrained eating; Vegetarianism; Menstrual disturbances

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## Introduction

Many women consciously try to limit their food intake to achieve or maintain a desired body weight. This is referred to as dietary restraint or cognitive dietary restraint, a type of eating behavior governed by cognitive processes rather than by physiological mechanisms such as hunger and satiety (Gorman & Allison, 1995). Although several scales to assess dietary restraint exist, the Restraint Factor scale of the Three-Factor Eating Questionnaire (TFEQ; Stunkard & Messick, 1985) is considered to be robust and have good psychometric properties (Gorman & Allison, 1995). Typically, women with high scores for restraint are very aware of the amount and type of food they consume although reports vary as to whether their energy intakes are actually lower

than those of women with low restraint scores (Barr, Prior, & Vigna, 1994b; McLean, Barr, & Prior, 2001a; Schweiger et al., 1992; Smith et al., 1998; Tuschl, Laessle, Platte, & Pirke, 1990a).

Previous studies have found women with high restraint scores to be generally similar to those with low restraint scores in terms of age, height, weight and Body Mass Index (BMI) (Barr, Janelle, & Prior, 1994a; Barr et al., 1994b; Laessle, Tuschl, Kotthaus, & Pirke, 1989a; Pirke et al., 1990; Schweiger, Tuschl, Laessle, Broocks, & Pirke, 1989; Van Loan & Keim, 2000). Where a difference has been found has been in menstrual cycle, and particularly ovulatory, characteristics. Several studies have reported that women with high restraint scores were more likely to experience disturbances of ovulation including a higher proportion of anovulatory cycles and short luteal phase or cycle lengths (Barr et al., 1994a,b; Lebenstedt, Platte, & Pirke, 1999; Schweiger et al., 1992).

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\* Corresponding author.

E-mail address: [sibarr@interchange.ubc.ca](mailto:sibarr@interchange.ubc.ca) (S.I. Barr).

Women with varying scores for dietary restraint have previously been characterized according to several physical and lifestyle variables which may increase physical or psychological stress and consequently impact on the menstrual cycle (Barr et al., 1994a,b; Laessle et al., 1989; Schweiger et al., 1992; Tuschl, Platte, Laessle, Stichler, & Pirke, 1990b). Unfortunately, many of these studies had small numbers of subjects or used exclusion criteria, which may have limited the findings to a select group. Accordingly, the purpose of this study was to characterize a large, unselected group of university women with regard to dietary restraint, and to assess whether differences existed among women categorized as having low, medium or high restraint in terms of eating behaviors, lifestyle habits, selected personality characteristics and menstrual regularity.

## Subjects and methods

### *Participants*

Female students aged 18 and above at the University of British Columbia were recruited during classes in biochemistry, human nutrition, psychology, family science, nursing and human kinetics. All women students in the selected classes received a questionnaire that they were requested to complete at home and return to class during the following week. There were no exclusion criteria, nor were any incentives provided for participation. The study protocol was approved by the University's Clinical Screening Committee for Research and Other Studies Involving Human Subjects, and the data were gathered during 1997.

### *Questionnaire*

The questionnaire included previously validated, standardized scales designed to assess eating behaviors, perceived stress, and self-esteem. It also sought data on physical and lifestyle characteristics, such as age, height, weight, dieting history, menstrual cycle history, exercise, special diets (e.g. vegetarian), and use of vitamin or mineral supplements.

### *Eating behaviors*

The 51-item TFEQ (Stunkard & Messick, 1985) was used to assess perceptions of three dimensions of human eating behavior: (1) cognitive restraint of eating, (2) disinhibition and (3) hunger. To make the TFEQ suitable for individuals who don't consume meat, the first item was altered from, "When I smell a sizzling steak or see a juicy piece of meat, I find it very difficult to keep from eating, even if I have just finished a meal", to "When I smell my favorite food, I find it very difficult to keep from eating, even if I have just finished a meal". Responses to items on the TFEQ were scored according to the instructions

provided by Stunkard and Messick (1985) and summed to obtain scores for restraint, disinhibition and hunger.

### *Physical and lifestyle characteristics*

Participants reported their present height and weight as well as their highest and lowest adult weights. They were also asked, "At what weight do you feel your best?" which was subsequently referred to as their 'best' weight. From these values, BMI, highest BMI, lowest BMI, and best BMI were calculated in kg/m<sup>2</sup>.

Participants were asked whether they were currently trying to lose weight, had ever tried to lose weight, or had ever been diagnosed with or treated for an eating disorder. Weight fluctuation was determined by the number of times that >5 lbs was lost in the past two years.

Participants were asked whether they were currently having menstrual cycles and if so, whether their cycles were irregular or regular. They were also asked the average length of their cycle and whether they were presently, or had in the past six months, used oral contraceptives.

Lifestyle information included questions regarding alcohol and coffee or tea consumption, cigarette usage, vitamin, mineral and medication use as well as hours of weekly exercise. Participants identified whether they were following lacto-ovo vegetarian, vegan or other special diets.

### *Perceived stress and self-esteem*

The Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983) measures the extent to which situations in one's life are appraised as stressful. It consists of 14 statements asking about the respondents' feelings and thoughts during the last month. Items were scored and totaled according to instructions provided by the authors, with higher scores reflecting higher perceived stress.

Rosenberg's Self-esteem Scale (RSS) is a widely used measure of self-esteem (Rosenberg, 1965). Items were scored according to Rosenberg's original instructions. Higher scores indicate lower self-esteem.

### *Statistical analysis*

Participants with complete responses to the TFEQ restraint scale were included in the analysis, and were grouped according to their restraint scale scores, based on quartiles established in a previous study of this population (unpublished). Those with scores of 0–5 on the TFEQ restraint scale (the first quartile) were grouped as 'low restraint'; scores 6–12 (the second and third quartiles) as 'medium restraint' and scores 13–21 (the fourth quartile) as 'high restraint'. Group comparisons among the low, medium and high restraint groups were made by ANOVA. When significant *F* ratios were present, Duncan's multiple range test was used to determine which means were significantly different. For comparisons of population proportions, chi-square ( $\chi^2$ ) was used. Stepwise multiple regression analysis was used to determine which characteristics independently

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