

Eating behaviour, eating attitude and body mass index of dietetic students versus non-dietetic majors: a South African perspective

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Abstract

Objectives: The objective was to determine and compare the eating behaviour, eating attitude and body mass index (BMI) of dietetic students to those of non-dietetic majors.

Design: This was a cross-sectional, descriptive survey.

Setting: The setting was the University of KwaZulu-Natal.

Subjects: The subjects were a random sample of 83 first-year non-dietetic major students; 24 first-, 20 third- and 18 fourth-year dietetic students.

Outcome measures: Outcome measures were the results of the Three-Factor Eating Questionnaire (TFEQ), Eating Attitudes Test 26 (EAT 26) and BMI.

Results: According to the TFEQ, there was a high prevalence of eating restraint, followed by disinhibition of eating and hunger scores, in first-year dietetic students. Measures of these subscales were similar for non-dietetic majors. A significant difference between the two groups was observed with regard to eating restraint (p -value < 0.001). The mean scores for the EAT 26 from both of the first-year groups were not indicative of an eating disorder. A higher prevalence of disordered eating was observed in first-year dietetic students (p -value < 0.059). Lower levels of eating restraint and disinhibition were documented in dietetic students in subsequent years of study. The mean BMI of all of the participant categories was within the normal range.

Conclusion: There was a higher prevalence of eating disorders in first-year dietetic students than in students taking non-dietetic majors. Eating disorders in these students highlight the need for similar studies to be conducted at other local universities offering dietetics as a subject.

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Introduction

The conceptualisation of personality features is important when matching career choice to prospective students.¹ A preoccupation with food manifests itself through activities such as pursuing a career in nutrition.² The World Health Organization³ (WHO) recognises this relationship and stated that high-risk groups for the development of eating disorders include culinary students. A number of international studies that have investigated the prevalence of eating disorders in dietitians and/or dietetic students have been conducted. While some have indicated that studying dietetics increases the risk of eating disorders developing,⁴⁻⁷ others have not confirmed this relationship.⁸⁻¹⁰ Some authors^{8,11} found that studying dietetics was influenced by personal experience with disordered eating, but that the majority of students chose dietetics as a career path for reasons including an interest in food, nutrition and health, or the desire to be a member of a healthcare team. In addition, it was found that an

increase in nutrition knowledge in the course of majoring in dietetics had a positive impact on eating attitudes and eating behaviour.^{7,8}

However, local studies have not been conducted on the eating behaviour of dietetic students and registered dietitians, so there is no available published evidence describing the eating behaviour of dietetic students and dietitians. This character trait is of interest, as recent concern has been expressed regarding the ethical implications of allowing individuals who have suffered from or are currently diagnosed with an eating disorder or disordered eating, to practise as a registered dietitian.¹² A study conducted by Kinzl et al⁸ on Austrian dietitians found that 7.5% met the Eating Disorder Inventory (EDI) criteria of being at risk of developing an eating disorder. According to Crockett and Litrell,¹³ "if a dietitian has a personal eating problem, then working with similar problems may exacerbate the dietitian's problem and/or interfere with the effective delivery of treatment plans". In addition, an eating disorder may

hinder the ability of a dietitian to perform at his or her best, and an existing eating disorder may influence the nutrition education given.⁴

Although there is no code of conduct that refers to the eating habits of registered dietitians, the American Dietetic Association or Commission on Dietetics Registration code of ethics for the profession of dietetics¹⁴ states in principle 3 that: "The dietetics practitioner considers the health, safety and welfare of the public at all times"; principle 7c: "The dietetics practitioner will not engage in practice when he or she has a condition that substantially impairs his or her ability to provide an effective service to others" and principle 8: "The dietetics practitioner recognises and exercises professional judgement within the limits of his or her qualifications, and collaborates with others, seeks counsel and makes referrals as appropriate".

The Health Professions Council of South Africa has similar guidelines in this regard. According to the ethical rules of conduct for practitioners registered under the Health Professions Act 56, 1974, principle 25b states that: "A student, intern or practitioner shall report his or her own impairment, or suspected impairment, to the board concerned if he or she is aware of his or her own impairment, or has been publicly informed, or has been seriously advised by a colleague to act appropriately to obtain help in view of an alleged or established impairment", while principle 27a states that: "A practitioner shall at all times act in the best interests of his or her patients".¹⁵

Although this should be kept in mind when it becomes apparent that a dietetic student or registered dietitian has an eating disorder, some dietitians associate personal experience with an eating disorder or disordered eating with an increased ability to understand these psychiatric conditions, which, in turn, may benefit the client.¹²

Method

A cross-sectional descriptive survey was conducted in April and May 2012, with the following aims:

- To determine and compare the eating attitudes, eating behaviour and body mass index (BMI) of first-year, female dietetic students to those of first-year, female non-dietetic major students.
- To determine the eating attitudes, eating behaviour and BMI of third- and fourth-year female dietetic students, to facilitate a comparison with those held and practised by first-year dietetic majors.

Participants

A random sample of 145 multiracial, female students (age 19.3 ± 3.8 years) was recruited. This included 24 first-year dietetic students (16.6% of the study sample); 83 first-year non-dietetic majors (57.2% of the study sample) representing four non-dietetic study majors and 20 third-year and 18 fourth-year female dietetic majors (26.2% of the study population), based at the Pietermaritzburg campus of the University of KwaZulu-Natal.

Procedure

BMI (weight/height²)¹⁶ was measured by trained fieldworkers in all subjects, after they had completed the following self-administered questionnaires: the Three-Factor Eating Questionnaire (TFEQ) and the Eating Attitudes Test 26 (EAT 26). Fieldworkers were trained in accordance with the International Standards for Anthropometric Assessment, as promoted by the International Society for the

Advancement of Kinanthropometry. In addition, fourth-year dietetic students also completed an open-ended questionnaire to gauge the impact of nutrition knowledge on eating behaviour and to determine why they chose dietetics as a career. Descriptive statistics, independent sample t-tests and chi-square tests were performed to facilitate comparison between the groups.

Three-Factor Eating Questionnaire

The TFEQ,¹⁷ a validated questionnaire to assess eating behaviour, was used to assess perceived hunger, disinhibition and eating restraint.

The questionnaire consists of 51 items, arranged according to three dimensions of human eating behaviour, including:

- Cognitive eating restraint (21 items).
- Disinhibition (16 items).
- Hunger (14 items).¹⁸⁻²⁰

It can be used to study individuals and to detect group differences in eating behaviour. Cognitive eating restraint reflects the extent to which food intake is cognitively restricted (by thought and will power) in order to control body shape and weight, while disinhibition reflects the extent of the inability to control food intake in response to the presence of palatable food, which may result in overconsumption. Other disinhibiting stimuli, such as emotional stress or social eating cues, may also contribute to the inability to resist food intake when not hungry. Hunger reflects the extent of food intake in response to susceptibility to general subjective feelings and perceptions of hunger and the behavioural consequences thereof, including food cravings.^{17,20} Higher scores denote higher levels of restrained eating, disinhibited eating and predisposition to hunger, respectively.¹⁹

Eating Attitudes Test 26

The EAT 26 questionnaire²¹ was developed as a screening tool for the diagnosis of eating attitudes characteristic of anorexia nervosa or disordered eating attitudes,^{7,22} and consists of 26 statements which the subject must rate on a frequency scale. A score of more than 20 indicates the possibility of an eating disorder.

Ethics

Ethical approval for this study was obtained from the Humanities and Social Science Research Ethics Committee (Protocol Reference Number HSS/0289/012M) of the University of KwaZulu-Natal. Subjects signed an informed consent form, after being informed of the nature and scope of the study, and having been told that their participation was voluntary and that their anonymity would be ensured when the study findings were reported.

Results

The mean BMI of the dietetic students and non-dietetic majors is reported in Table I.

Table II details the column percentage of the BMI categories per the sample group subsets.

In accordance with the WHO criteria (18.5-24.9 kg/m²),¹⁶ the mean BMI of all of the subject categories was normal. The BMI distribution within each group of students is provided in Table III. Significantly, more non-dietetic first-year students were overweight than students in the dietetics programme (p-value 0.049). A comparison of the BMI, eating attitudes and eating behaviour of the first-year dietetic

Table I: Mean body mass index of the subjects

Total group, n = 145	First-year dietetic students, n = 24	First-year non-dietetic majors, n = 83	Third- and fourth-year dietetic students, n = 38
23.8 ± 4.8	23.2 ± 4.3	24.2 ± 5.3	23.2 ± 3.7

Table II: Column percentage of body mass index categories per the sample group subsets

WHO BMI category	First-year dietetic students, n = 24	First-year non-dietetic majors, n = 83	Third- and fourth-year dietetic students, n = 38
18.5-24.9 kg/m ²	8.3%	6.1%	8.1%
25-29.9 kg/m ²	66.7%	51.8%	64.8%
30 kg/m ²	25%*	42.1%*	27.1%

BMI: body mass index, WHO: World Health Organization

*: chi-square test

Table III: Comparison of body mass index, eating attitudes and eating behaviour of first-year dietetic students and that of first-year non-dietetic majors

Variables	First-year dietetic students, n = 24	First-year non-dietetic majors, n = 83	p-value
Mean BMI (kg/m ²)	23.2 ± 4.3	24.2 ± 5.3	0.366 [†]
TFEQ results			
TFEQ (restraint)	11.3 ± 5	7.4 ± 4.2	0.001 [†]
TFEQ (disinhibition)	7.2 ± 3	7 ± 2.7	0.824 [†]
TFEQ (hunger)	6 ± 3.5	7.2 ± 3	0.136 [†]
EAT 26 score	14.5 ± 12.2	10.5 ± 9.1	0.158 [†]
Normal	16 (66.7%)	69 (83.1%)	0.059 ^{**}
Eating disordered	8 (33.3%)	14 (16.9%)	

BMI: body mass index, EAT 26: Eating Attitudes Test 26, TFEQ: Three-Factor Eating Questionnaire

†: independent samples t-test

**: chi-square test

Table IV: Comparison of body mass index, eating attitudes and eating behaviour of the first-year dietetic students with that of a pooled sample of third- and fourth-year dietetic students

Variables	First-year dietetic students, n = 24	Third- and fourth-year dietetic students, n = 38	p-value
	Mean ± SD	Mean ± SD	
Mean BMI (kg/m ²)	23.2 ± 4.3	23.2 ± 3.7	0.983 [†]
TFEQ results			
TFEQ (restraint)	11.3 ± 5	9.7 ± 5	0.231 [†]
TFEQ (disinhibition)	7.2 ± 3	6.6 ± 3.7	0.518 [†]
TFEQ (hunger)	6 ± 3.5	6.6 ± 3.2	0.526 [†]
EAT 26 score	14.5 ± 12.2	11.2 ± 10.3	0.272 [†]
Normal	16 (66.7%)	31 (81.6%)	0.151 ^{**}
Eating disordered	8 (33.3%)	7 (18.4%)	

BMI: body mass index, EAT 26: Eating Attitudes Test 26, SD: standard deviation, TFEQ: Three-Factor Eating Questionnaire

†: independent samples t-test

**: chi-square test

students and that of the first-year non-dietetic majors is reported in Table III.

Subscales of the TFEQ showed that dietary restraint was most prevalent in first-year dietetic students, followed by disinhibition and hunger scores. The scores for the three subscales were similar for the first-year non-dietetic majors. However, a statistically significant difference between the two groups was observed for eating restraint (p-value < 0.001). The mean scores obtained from both groups for the EAT 26 did not indicate the presence of an eating disorder.

Subsequent categorisation of the two groups indicated a higher prevalence of disordered eating in dietetic students. A third of first-year dietetic students were considered to have an eating disorder compared to 16.9% of non-dietetic majors (p-value < 0.059).

A comparison of BMI, eating attitudes and eating behaviour of the first-year dietetic students with that of a pooled sample of third- and fourth-year dietetic students is shown in Table IV.

A statistically significant difference between the first-year, third-year and fourth-year dietetic students was not documented for BMI, or subscales of the TFEQ or EAT 26 score. However, an observed trend was that there were lower levels of dietary restraint and disinhibition in those in subsequent years of study, than in students in the first year of study. There was also a higher prevalence of disordered eating in the first-year students.

Table V depicts tallied responses to the open-ended questions answered by the final-year dietetic students to determine the reasons for their career choice, perceived effect of an increase in nutrition knowledge on their eating behaviour, as well as the reasons for any perceived change in their eating behaviour during the course of their studies.

Major themes that emerged with regard to choosing dietetics as a career path were that students were interested in gaining more nutrition knowledge, had an interest in food and wanted to help people with diet-related problems. The effect of an increase in nutrition knowledge on their eating behaviour during the course of their studies was seen to be an increase in their consumption of fruit and vegetables. Weight control was also a motivating factor. These changes in eating behaviour were predominantly attributed to an increase in nutrition knowledge and that pertaining to weight control.

Discussion

It has been proposed that unusual eating patterns, such as episodic overeating or binge eating, the development of eating disorders and weight gain develop as a result of the stress associated with chronic dietary restraint,²³ with food intake determined by a balance between the desire to eat and an aspiration to lose weight.²⁴ It would seem that cognitive processes override physiological hunger and satiety

Table V: Fourth-year dietetic students' responses to open-ended questions (n = 18)

Most common response	n	Frequency (%)
Reasons for choosing dietetics		
To gain nutrition knowledge	9	50
Have an interest in food	8	44.4
Help those with diet-related problems	8	44.4
Improve food security and malnutrition status	5	27.8
To be a member of the healthcare team	5	27.8
Effect of increased nutrition knowledge on eating behaviour		
Increased fruit and vegetable consumption	12	66.7
Reduced fat intake	4	22.2
Reduced meat intake	4	22.2
Reduced salt intake	3	16.7
Eating breakfast	2	11.1
Reasons for a change in eating behaviour		
Increased nutrition knowledge	12	66.7
Weight control	7	38.9
Feeling better	3	16.7
To lead by example	2	11.1

cues in cases such as these.^{18,19} Internal triggers that lead to the sensation of hunger include thinking and fantasising about food. The level of cognitive activity and hunger sensations relate indirectly to each other.²⁵ However, restrained eating is not the same as dieting.²⁶ In addition, restrained eaters constantly worry about what they eat and chronically restrict their food intake in order to prevent weight gain and often engage in weight-loss behaviour.²⁵ Fedoroff, Polivy and Herman²⁷ found that a consistent dietary pattern in restrained eaters relates to the consumption of more kilojoules and high-fat foods when under stress,^{28,29} whereas intake remains the same or is lower in unrestrained eaters.^{30,31}

In our study, first-year dietetic students exhibited higher levels of eating restraint than non-dietetic majors. This finding is in agreement with that of Korinth, Schiess and Westenhoefer⁶ and Kiziltan and Karabudak,⁷ who reported that dietetic students felt that an "ideal body image" was important in ensuring social recognition as dietitians should have a certain physique. However, the lack of a statistically significant difference in BMI between dietetic students and non-dietetic majors could be explained by the findings that although restrained eaters consume less food than they would like to, they do not necessarily eat less than they need to maintain energy balance.³² Other authors could also not find a statistically significant difference in BMI between dietetic students and non-dietetic majors.^{2,6} However, it is worth noting that the majority of first-year dietetic students (66.7%) had a normal BMI, whereas almost half (42.1%) of the non-dietetic majors were overweight. This could be indicative of the fact that the higher level of dietary restraint documented had an impact on their weight status.

The concept of disinhibition, namely the loss of control over eating, relates to the fact that the self-control of restrained eaters may be temporarily inhibited by disrupting events or "disinhibitors", including specific "cognition" (the perception of having overeaten, or the consumption of forbidden foods), and alcohol or negative emotional states, such as anxiety or depression, that tend to interfere

with self-control and result in overeating.³³⁻³⁵ This relationship was documented in first-year dietetic students who exhibited higher levels of eating restraint and disinhibition than first-year non-dietetic majors. However, neither dietary restraint nor hunger have been consistently associated with BMI or weight change, in contrast to the strong associations reported for disinhibition.³⁶⁻³⁸ The contrary was found in the current study in that first-year dietetic students had higher levels of disinhibition but a lower BMI, while the opposite relationship was documented in first-year non-dietetic majors. Therefore, it is possible that in this particular study sample, the level of restraint practised could have been an overriding factor in BMI outcome when compared to disinhibition and hunger. However, the findings are in agreement with those of Provencher et al,³⁸ who found that increased dietary restraint was associated with higher levels of disinhibition because the individuals became more susceptible to overeating when exposed to rigid dietary restraint.

External locus of hunger refers to hunger that is initiated by external stimuli. As a result, lower levels of external locus for hunger relate to a lower BMI.¹⁹ This relationship holds true for both first-year dietetic students and non-dietetic majors as non-dietetic majors had a higher mean BMI and higher mean hunger score than dietetic students.

The higher prevalence of disordered eating in the first-year dietetic students confirms the findings reported by numerous authors,^{4,6,7,39} and could be an indicator that dietetic students enrol for the course with existing indicators of disordered eating, rather than actually developing an eating disorder in the course of their studies. If the students had developed eating disorders in the course of their studies, a higher percentage of underweight students in the more advanced levels of the dietetics programme would have been reported. This phenomenon could relate to the fact that a preoccupation with food could be a driving force when choosing dietetics as a career path.²

No statistically significant differences were found for BMI between the first-year dietetic students and the pooled results of the third- and fourth year dietetic students using the subscales of the TFEQ or EAT 26 score. However, an observed trend was that there were lower levels of dietary restraint and disinhibition in the subsequent years of study, than there were in the first year of study. There was also a higher prevalence of disordered eating in first-year dietetic students. These results are similar to those reported by Korinth, Schiess and Westenhoefer.⁶ However, these authors found a significantly higher prevalence of dietary restraint in first-year than in fourth-year dietetic students. Reinstein et al⁴⁰ also observed that disordered eating behaviour was more common in first-year dietetic students than in students in subsequent years of study. The above findings could relate to how an increase in nutrition knowledge has a positive effect on EAT 26 scores, as would be the case with those in subsequent years of study in dietetics.⁷

Despite the small sample size (n = 18), the tallied responses to the open-ended questions answered by final-year dietetic students yielded interesting trends. The reasons for career choice, perceived effect of an increase in nutrition knowledge on their eating behaviour, and reasons cited for a change in eating behaviour during the course of their studies, illustrates how an improvement in nutrition knowledge could have a positive impact on eating behaviour. This was illustrated by an increased fruit and vegetable intake and the reduced consumption of high-fat foods and red meat. More than two thirds of the subjects reported that the reason for the change

in their eating behaviour in the course of their studies related to an increase in nutrition knowledge. These findings have been confirmed by Korinth Schiess and Westenhoefer⁶ and Kinzl et al.⁸

Reasons for choosing dietetics as a career related to wanting to enhance nutrition knowledge, having an interest in food and helping those with diet-related problems. These findings do not echo those reported by Hughes and Desbrow¹¹ and Kinzl et al.,⁸ where 14% of surveyed dietitians cited personal experience and an obsession with food, as well as weight problems, as some of the key reasons for choosing dietetics as a career. While nearly a third of first-year dietetic students were motivated to study dietetics because of their personal experience with obesity, eating disorders or both, it was also reported that some of the motivators for studying dietetics included an interest in nutrition, health, helping others, being inspired by prior experience with other dietitians, and family or personal illness.¹¹ The application of the study results was limited by the small sample size. Also, a longitudinal study design would have been more appropriate for an investigation into changes in dietary behaviour as the dietetic students progressed into subsequent years of study.

Conclusion

Based on BMI, eating behaviour and indicators of eating disorders, only a small number of prospective dietetics students enter university with an existing eating disorder. In the same context, it is also true that those who study dietetics are less prone to being overweight than non-dietetic majors.

Even though the prevalence of eating disorders in first-year dietetic students and those in consecutive years is low, it is important to acknowledge that these students are prospective practising dietitians who will eventually need to assist others to achieve a healthy relationship with food. It is also important to acknowledge that poor nutrition is experienced by food-insecure students as a result of inadequate poor-quality diets lacking in diversity and of inferior nutrient quality, as well as unpredictable food intake.^{41,42} Paradoxically, these individuals often consume a diet that contributes to the development of overweight and obesity,⁴³ which could explain the high number of overweight individuals in the non-dietetic group. Therefore, it can be concluded that dietetic students, regardless of the mechanism, enjoy some level of protection against overweight.

References

- Hussain S, Abbas M, Shahzad, K, et al. Personality and career choices. *African Journal of Business Management*. 2012;6(6):2255-2260.
- Worobey J, Schoenfeld D. Eating disordered behaviour in dietetic students and students in other majors. *J Am Diet Assoc*. 1999;99(9):1100-1102.
- World Health Organization. Prevention of mental disorders: effective interventions and policy options: summary report [homepage on Internet]. 2004. Available from: <http://www.who.int/iris/handle/10665/43027>
- Drummond D, Hare MS. Dietitians and eating disorders: an international issue. *Canadian J Diet Pract Res*. 2012;73(2):86-90.
- Arroyo M, Basabe N, Serrano L, et al. Prevalence and magnitude of body weight and image dissatisfaction among women in dietetics majors. *Arch Latinoamericanas de Nutrición*. 2010; 60(2):126-132.
- Korinth A, Schiess S, Westenhoefer J. Eating behaviour and eating disorders in students in nutrition sciences. *Pub Health Nutr*. 2009;13(1):32-37.
- Kiziltan G, Karabudak E. Risk of abnormal eating attitudes among Turkish dietetic students. *Adolescence*. 2008;43(171):681-690.
- Kinzl JF, Traweger CM, Trefalt E, et al. Dietitians: are they a risk group for eating disorders? *European Eat Disord Rev*. 1999;7(1):62-67.
- Fredenberg JP, Berglund PT, Dieken HA. Incidence of eating disorders among selected female university students. *J Am Diet Assoc*. 1996;96(1):64-65.
- Johnston CS, Christopher FS. Anorexic-like behaviors in dietetic majors and other student populations. *J Nutr Educ*. 1991;25:148-153.
- Hughes R, Desbrow B. The aspiring dietitians study: a pre-enrolment study of students' motivations, awareness and expectations relating to careers in nutrition and dietetics. *Nutr Diet*. 2005;62(2/3):106-109.
- Houston CA, Bassler W, Anderson J. Eating disorders among dietetic students: an educator's dilemma. *J Am Diet Assoc*. 2008;108(4):722-724.
- Crockett SL, Littrell JM. Comparison of eating patterns between dietetic and other college students. *J Nutr Educ*. 1985;17(2):47-50.
- American Dietetic Association. American Dietetic Association/Commission on Dietetic Registration code of ethics for the profession of dietetics and process of consideration of ethics issues. *J Am Diet Assoc*. 2009;109(8):1461-1467.
- Health Professions Council of South Africa. Ethical rules of conduct for practitioners registered under the Health Professions Act, 1974. Health Professions Act 56 of 1974 [homepage on the Internet]. 2006. Available from: http://www.hpcsa.co.za/downloads/ethical_rules/ethical_rules_of_conduct_2011.pdf
- World Health Organization. Obesity: preventing and managing the global epidemic. Report of the WHO consultation on obesity. Geneva: World Health Organization; 2004.
- Stunkard AJ, Messinck S. The Three-Factor Eating Questionnaire to measure dietary restraint, disinhibition and hunger. *J Psychosom Res*. 1984;29(1):71-83.
- Anglé S, Engblom J, Eriksson T, et al. Three Factor Eating Questionnaire-R18 as a measure of cognitive restraint, uncontrolled eating and emotional eating in a sample of young Finnish females. *Int J Behav Nutr Physical Act*. 2009;6:41.
- Bond MJ, McDowell AJ, Wilkinson JY. The measurement of dietary restraint, disinhibition and hunger: an examination of the factor structure of the Three Factor Eating Questionnaire (TFEQ). *Int J Obes Relat Metab Disord*. 2001;25(6):900-906.
- Karlsson J, Perrson LO, Sjöström L, et al. Psychometric properties and factor structure of the Three-Factor Eating Questionnaire (TFEQ) in obese men and women. Results from the Swedish Obese Subjects (SOS) study. *Int J Obes*. 2000;24(12):1715-1725.
- Garner DM, Garfinkel PE. The Eating Attitude Test: an index of the symptoms of anorexia nervosa. *Psychol Med*. 1979;9(2):273-279.
- Mintz LB, O'Halloran MS. The Eating Attitudes Test: validation with DSM-IV eating disorder criteria. *J Personal Assess*. 2000;74(3):489-503.
- Herman CP, Polivy J. Restrained eating. In: Stunkards AJ, editor. *Obesity*. Philadelphia: WB Saunders, 1980; p. 208-225.
- Ruderman AJ. Dysphoric mood and overeating: a test of restraint theory's disinhibition hypothesis. *J Abnorm Psychol*. 1985;94(1):78-85.
- Murray M, Vickers Z. Consumer views of hunger and fullness. A qualitative approach. *Appetite*. 2009;53(2):174-182.
- Lowe MR, Timko CA. What a difference a diet makes: towards an understanding of differences between restrained dieters and restrained nondieters. *Eat Behav*. 2004;5(3):199-208.
- Fedoroff IDC, Polivy J, Herman CP. The effect of pre-exposure to food cues on the eating behaviour of restrained and unrestrained eaters. *Appetite*. 1997;28(1):33-47.
- Wardle J, Steptoe A, Oliver G, et al. Stress, dietary restraint and food intake. *J Psychosom Res*. 2000;48(2):195-202.
- McCann BS, Warnick GR, Knopp RH. Changes in plasma lipids and dietary intake accompanying shifts in perceived workload and stress. *Psychosom Med*. 1990;52(1):97-108.
- Rutledge T, Linden W. To eat or not to eat: affective and physiological mechanisms in the stress-eating relationship. *J Behav Med*. 1998;21(3):221-240.
- Cools J, Schotte DE, McNally RJ. Emotional arousal and overeating in restrained eaters. *J Abnorm Psychol*. 1992;101(2):348-351.
- Stice E, Cooper JA, Schoeller DA, et al. Are dietary restraint scales valid measures of moderate- to long-term dietary restriction? Objective biological and behavioral data suggest not. *Psychol Assess*. 2007;19(4):449-458.
- Hays NP, Roberts SB. Aspects of eating behaviours "disinhibition" and "restraint" are related to weight gain and BMI in women. *Obesity*. 2008;16(1):52-58.
- Canetti L, Bachar E, Berry EM. Food and emotion. *Behav Proc*. 2002;60(2):157-164.
- Lowe MR. The effects of dieting on eating behaviour: a three-factor model. *Psychol Bull*. 1993;114(1):100-121.
- Bellisle F, Clément K, Le Barzic M, et al. The Eating Inventory and body adiposity from leanness to massive obesity: a study of 2509 adults. *Obes Res*. 2004;12(12):2023-2030.
- Drapeau V, Provencher V, Lemieux S, et al. Do 6-y changes in eating behaviors predict changes in body weight? Results from the Québec Family Study. *Int J Obes Relat Metab Disord*. 2003;27(7):808-814.
- Provencher V, Drapeau V, Tremblay A, et al. Eating behaviors and indexes of body composition in men and women from the Québec Family Study. *Obes Res*. 2003;11(6):783-792.
- Rosenberg IH. On whether eating disorders run high among dietitians. *Tufts University Health and Nutrition Letter*. 1999;17(9):6.
- Reinstein N, Koszewski WM, Chamberlin B, et al. Prevalence of eating disorders among dietetic students: does nutrition education make a difference? *J Am Diet Assoc*. 1992;92(8):949-953.
- Hughes R, Serebryanikova I, Donaldson K, Leveritt M. Student food insecurity: the skeleton in the university closet. *Nutrition & Dietetics*. 2001;68:27-32.
- Hoddinott Y. Dietary diversity as a food security indicator. *Food Consumption and Nutrition Division Discussion Paper*. 2002;136:1-94.
- Wilde P. Understanding vulnerability: food security analysis. World Food Programme [homepage on the Internet]. 2012. c2013. Available from: <http://documents.wfp.org/stellent/groups/public/documents/communications/wfp252355.pdf>