Patterns of Disordered Eating and Body Perception Among the Dietetics Student Social Network

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Abstract

Eating disorders are prevalent in dietetics students, which may be due to their determination to meet the "healthy standards" of their profession. ¹Peer groups or relational ties that support thin ideals may also encourage disordered eating behavior.² Dietetics majors have been found to adopt restrained eating habits despite having an adequate understanding of proper nutrition.³ In addition, college breeds a peer centered environment, which can create both positive and negative pressures.⁴ A method of investigating the influence of social environments or relational ties on a behavior is social network analysis.⁵ This study aims to determine if nutrition students adopt restrictive eating behaviors based on their social circle. The data was gathered using social network analysis, which provided a graphic representation of the relational connections between nutrition students' social circles. This analysis determined whether clusters of students display certain eating behaviors and whether there was one person that appeared to initiate certain eating behaviors. The results of this research are discussed in the context of eating disorder tendencies and nutrition students' academic growth in the major.

Key Words: Nutrition Student, Social Network, Eating Behaviors

1. Introduction

Eating disorders are prevalent in the college student population. Nutrition student's eating behaviors are of particular interest because nutrition is the primary focus of their education. The nutrition student population has been found to have higher dietary restriction than students of other majors. ⁶ The motives for restrictive eating behaviors are often adopted by nutrition majors to control body weight, sometimes in an unhealthy manner despite their education.⁶ Nutrition student eating behaviors are important to understand because they are nutrition educators. Restrained eaters are more likely than unrestrained eaters to eat excessive amounts of sweets perhaps indicating that restrained eaters are pre-disposed to bulimia.⁶ In addition, disordered eating behaviors are shameful for nutrition professionals to adopt despite the popularity of dieting and overall body dissatisfaction tendencies in the current westernized culture.⁷ Data suggests that dietetics major's primary reason for wanting to lose weight was because they have accepted society's overvaluation of thinness and they use it to assess their self-worth, in the context of physical appearance.⁸

Several theories purport to explain why nutrition students adopt these disordered eating behaviors. McArthur & Howard found eating disorders are prevalent in dietetics students due to their determination to meet the thin ideal of their profession.⁸ As future professionals in the field of dietetics it is disturbing that nutrition students tend to adopt restrained eating habits despite having an adequate understanding of proper nutrition.³ Rinestine & Koszwwski et al. found nutrition students were at a higher risk for disordered eating behaviors especially during their freshman and sophomore year.⁹ Findings suggests nutrition focused courses have a positive effect of the eating behaviors.⁶

Nutrition student's daily exposure of nutrition focused education might heighten their disordered eating behaviors. Kinzl found that 6% of nutrition students stated that their classes resulted in an increased preoccupation with food and risk for disordered eating behaviors.¹⁰

The ontogeny of the disordered eating habits of nutrition students is still unknown. A social network analysis of nutrition students in relation to their eating behaviors has not yet been determined. Forney, Holland & Keel have found friend's comments about weight and diet have also been found to be a predictor of body dissatisfaction and eating pathology.¹¹ A social network analysis of a of nutrition students is of interest because eating disorders are encouraged by peer groups that support thin ideals.² Longitudinal studies have found that repeated exposure to peers who are dieting significantly increases ones risk for body dissatisfaction and the use of extreme weight control behaviors such as: self-induced vomiting, fasting and binge eating.² Friendship networks have also been identified as a strong predictor of eating disorders such as bulimia.¹²

Social network analysis has the ability to examine the impact of the social environment on ones behaviors.⁵ The focus of social network analysis is the interactions between participants which forms a framework that can be analyzed.⁵ The data collection technique used in this project is called the stoichiometric technique.⁵ This technique requires all participants to report their own eating behaviors, body perception, and perfectionistic qualities and then select friends within the nutrition network with whom they have relational ties to (ie: friends, classmates, roommates, study with one another). Sociometric networking provides both an individualized data set as well as a network data set which allows eating behaviors to be evaluated both on a large and small scale.⁵

This study sought to determine if nutrition students adopt restrictive eating behaviors based on their social ties. This analysis will help to determine if clusters of students display certain eating behaviors and if there is one person that appears to initiate certain eating behaviors.

2. Methods

2.1. Participants

All of the participants were undergraduates majoring in nutrition at a mid-sized Midwestern University. The nutrition department is composed of approximately 200 students, 99 of which participated in this study. The prepoderance of literature has found that the majority of nutrition majors are female, data on this demographic was not gathered. The average age of participants was 20.50 years (SD=1.58). Of the participant 14.1% (n=14) were freshman, 19.2% were sophomores (n=19), 23.2% are juniors (n=23) and 32.3% were seniors (n=32). There was also 5.1% (n=5) of the participant that said they were 5 year students. The average GPA of the nutrition students on a four point scale was 3.38/ 4.0 (SD=.36). Of the participants 91.9% (n=91) of the participants were white (Caucasian), and 1% (n=1) are black, 1% (n=1) are Asian American and 1% (n=1) are Hispanic or Latino.

Two educational tracks are offered to nutrition majors: Community Nutrition and Dietetics Nutrition. Of the participants who participated in this study 19.0% (n=19) were enrolled in the Community Nutrition track and 73.7% (n=73) were enrolled in the dietetics track, enabling them to earn their Didactic Program in Dietetics Verification Statement and meet the requirements to become a registered dietitian.

2.2. Procedures

The data for this project was collected using Qualtrics, an online survey tool. The data was collected in two phases. During the first phase the data was collected in a computer lab. Then, during the second phase of data collection a survey was emailed to all of the nutrition majors using a list serve, in order to increase enrollment. The nutrition students were paid \$10 for completing the survey.

2.3. Measures

2.3.1. body shape questionnaire (BSQ):

The body shape questionnaire evaluates self-reported concerns about body shape, specifically regarding the phenomenon of "feeling fat". Participants were asked "We should like to know how you been feeling about your appearance over the past 4 weeks?" The participants rated their responses on a Likert scale (1=Never, 5=Always).¹²

2.3.2 eating pathology symptom inventory (EPSI):

The EPSI is an eight factor scale that evaluates the eating pathology of an individual Subscales of the EPSI consist of: Body Dissatisfaction, Bing Eating, Cognitive restraint, Purging, Restricting, Excessive Exercise, Negative Attitudes towards Obesity, and Muscle Building. The participants rated their responses on a scale of (0=never, 1=rarely, 2=sometimes, 3=often, 4=very often).¹³

2.3.3. *m*-cups:

The M-Cup scale is used to evaluate the personality traits associated with perfectionism. The subscales of M-Cups consist of: High Standards, Perceived Pressure from Others and Reactivity to Mistakes. The participants were asked to rank their feelings on a Likert Scale (1= strongly disagree, 5= strongly agree).¹⁴

2.4. Social Network Analysis:

During the survey the participants were given a list of names of all of the nutrition students in the major at their university. The participant was asked to select students that they considered themselves to be associated with. The student selected from the following relationships: classmate, someone I study with, someone I seek advice from, someone I eat with, someone I would considered to be my best friend in the nutrition major, and someone I live with.

3. Results

Table 1. Body Shape Questionnaire

Patients with Bulimia Nervosa		Probable Bulimia Nervose		Definite No Bulimia No	on-case of ervosa	Nutrition Student		
M	SD	M	SD	М	M SD		SD	ă
136.9	22.5	129.3	17	17.9	23.6	81.3	30.204	0.974

Table 1 depicts the means (M), standard deviations (SD) and alpha ($\check{\alpha}$) values for each subgroup listed. The standards of comparison provided for bulimia nervosa (patients with bulimia nervosa, probable bulimia nervosa⁵, definite non-case of bulimia nervosa) were gathered from the BSQ published scale.¹⁶ The nutrition student⁷ value represents the nutrition student population scores. According to body shape questionnaire the nutrition student sample is not at risk for bulimia nervosa however, they values are higher than the definite non-case of bulimia nervosa population (see table 3). The nutrition student population (M=81.3) had lower mean values than the published mean values for patients with bulimia nervosa (M=136.9) and probable bulimia nervosa (M=17.9).

Table 2.	Eating	Pathology	Symptom	Inventory	(EPSI)
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	Eating Disorder Patient		Average College Student			Nutrition Student			
Subscales	М	SD	ă	М	SD	ă	М	SD	ă
Body Dissatisfaction	20.8	6.9	0.9	11.9	6.4	0.9	19.4	5.9	0.9
Binge Eating	9.1	9.0	0.9	9.6	4.9	0.8	18.1	4.7	0.8
Cognitive Restraint	9.6	3.3	0.9	5.1	2.7	0.8	9.8	2.3	0.6
Purging	5.3	6.0	0.9	0.7	1.7	0.7	7.5	2.6	0.7
Restriction	16.3	6.4	0.9	5.0	4.2	0.8	11.5	3.8	0.8
Excessive Exercise	10.2	7.6	1.0	6.5	5.1	0.9	14.4	4.5	0.9
Negative Attitudes Towards Obesity	10.5	6.9	1.0	10.0	4.6	0.9	11.8	4.4	0.9
Muscle Building	2.0	2.4	0.7	3.4	4.1	0.9	7.9	3.1	0.7

Table 2 depicts the means: (M), standard deviations: (SD) and alpha ($\check{\alpha}$) values for each subgroup listed. The Eating Disorder patient, general psychiatric outpatient and average college student values were obtained from the published EPSI and are listed as comparison values.¹³ The nutrition student results represent the nutrition student population. The EPSI reported that the nutrition student population had higher values than that of an eating disorder patient on all subscales except body dissatisfaction. The mean values of the nutrition student were higher than the scores of an eating disorder patient in the following subscales of the EPSI: binge eating (M=18.1), cognitive restraint (M=9.8), purging (M=7.5), restriction (M=11.5), excessive exercise(M=14.4), negative attitudes towards obesity(M=11.8) and muscle building(M=7.9) (see table 1).

	Average College Student Results			Nutrition Student		
Subscales	М	SD	ă	М	SD	ă
High Standards	24.6	4.6	0.7	18.7	5.6	0.9
Perceived Pressure from Others	18.5	5.1	0.7	25.8	4.2	0.9
Reactivity to Mistakes	17.0	5.5	0.7	21.9	6.9	0.9

Table 2 depicts the means (M) standard deviations (SD) and alpha ($\check{\alpha}$) values for each subgroup listed. The average student results presented in this table were published by Stairs et al. and are listed for comparison purposes.¹⁴ The nutrition student of this sample show the perfectionism qualities of the nutrition student population. The M-cup revealed that the nutrition student population (M=25.8) had higher mean values on the perceived pressure than other sub-scale than the average college student (M=18.5). The nutrition students (M=21.9) possessed a higher mean values on the reactivity to mistakes subscale in comparison to the average college student (N=17.0).

Scales	OutDe	eg	Indeg		Between	
	r	Sig(2 tailed)	r	Sig(2 tailed)	r	Sig(2 tailed)
BSQ	0.03	0.77	0.08	0.46	0.08	0.47
EPSI Body Dissatisfaction	0.04	0.69	0.04	0.72	0.16	0.13
EPSI Binge Eating	0.08	0.87	0.01	0.94	0.01	0.92
EPSI Cognitive Restraint	0.18	0.10	0.09	0.41	0.06	0.60
EPSI Purging	0.02	0.89	0.16	0.15	0.14	0.21
EPSI Restriction	0.15	0.18	0.07	0.50	0.12	0.25
EPSI Excessive Exercise	0.15	0.16	0.01	0.95	0.02	0.87
EPSI Negative Attitudes Towards Obesity	0.06	0.56	0.09	0.42	.220*	0.04
EPSI Muscle Building	0.13	0.21	0.13	0.21	0.13	0.23
M-Cup Perceived Pressure	0.08	0.50	0.16	0.15	0.05	0.66
M-Cup Reactivity to Mistakes	0.09	0.40	0.02	0.84	0.01	0.93
M-Cup High Standards	0.14	0.20	0.17	0.12	0.14	0.14

Table 4. Centrality Measures Of Nutrition Student Social Network

Table 4 depicts Centrality analysis was conducted for all of the measures used in the research project to determine how centralized certain behaviors were to the social network. The outdegree, indegree, and between represent the centrality values throughout the social network. A two tailed Pearson correlation (r) was used in order to determine if certain behaviors manifested themselves in one person or several people and if the connections between individuals had an effect on their behaviors. A significant (Sig 2 tailed) values for each measure is also listed for each of the Pearson correlation values. Using a 95% confidence interval (p, the EPSI subscale negative attitudes towards obesity was the only subscale found to have a significant value throughout the social network (Sig 2 tailed =0.04)(r=0.22)(* p<0.05). All other behaviors were not found to have significant centrality measures throughout the social network. The out-degree of nutrition students or how many individuals each student indicated they were connected to (M=2.47)(SD=3.78) was very similar to the in-degree (M=2.47) (SD=2.82) or the average number of times each student was selected by another individual in the network as their friend, classmate etc. The between value (M=83.96) (SD=185.93) for the social network were also gathered, or the person who is the connection between two other individuals with in the network.



Figure 1: nutrition student social network

Figure 1 depicts the nutrition student social network connections. The density of the network (n=0.025) also known as the network strength. The average degree of connections between individuals within the nutrition student social network, or the average amount of individuals each person is tied to was (M=2.47). The total number of ties throughout the social network was 244.



Figure 2. M-Cups Subscale: Perceive Pressure From Others

Figure 2 depicts the M-Cups subscale, perceived pressure from others, values within the social network. The higher values are represented by the larger squares within the network. There was no correlation found between the connections within the social network and the reported M-cup responses. The perceived pressure from others subscale had an out-degree (r=.08) and was not found to be significant (Sig 2 tailed =0.50). The in-degree for perceived pressure from other was found to be (r=.18) and was not found to be significant (Sig 2 tailed =0.153). The between-ness (r=.049) value for the perceived pressure subscale was also not found to be significant (Sig 2 tailed =0.66)



Figure 3. EPSI Subscale: Restriction

Figure 3 depicts the social network in relation to the nutrition student's individual responses to the restriction subscale of the EPSI. There was no correlation that was determined between the nutrition student responses and the social network connections. The higher values reported by each individual, on the restriction subscale of the EPSI, are represented by squares on figure 3. Using a 95% confidence interval the restriction subscale out-degree was not found to be significant (r=.145) (Sig. 2 tailed=.177). The in-degree of the restriction subscale was also not found to be significant (r=.073) (Sig. 2 tailed=.501). Finally, no correlation was found between individuals within the network (r=.123) (Sig. 2 tailed=.254).

4. Discussion

Although there was little correlation between eating behaviors and network ties throughout the nutrition student social network, the eating behaviors values found throughout the nutrition student social network using the EPSI were alarmingly high. The mean values of the nutrition student for EPSI subscales: binge eating (M=18.1), cognitive restraint (M=9.8), purging (M=7.5), restriction (M=11.5), Excessive Exercise (M=4.5), negative attitudes towards obesity (M=4.4) and muscle building (M=7.9) were higher than that of an eating disorder patient. There was 8.1% (n=8) nutrition students in the sample who have received treatment for an eating disorder and 1% (n=1) who are presently receiving treatment for an eating disorder. The nutrition student population percentage who have been diagnosed with eating disorders is comparable to 10.1% of young adults who have been diagnosed with eating disorders.¹⁶

The body dissatisfaction subscale is the only subscale in which the eating disorder patients (M=20.8) have higher mean scores than the nutrition student population (M=19.4). Interestingly, 17.4% (n=16) of the nutrition student population when asked "Rate the happiness with your weight" answered "unhappy", 6.5% (n=6) answered completely happy, 36.4% (n= 36) answered happy and 33.3% (n=33) answered neutral. Body dissatisfaction has consistently been found to be a predictor of clinical eating disorders. ¹⁷ Figure dissatisfaction, specifically in female college students, has been found to be a predictor of intensified disordered eating habits during the college years. ¹⁷ These results are congruent with past findings that state 14% of students who chose dietetics as a major did so due to a previously existing eating disorder or weight problem.¹⁰

However, 22% of nutrition students said that their nutrition classes improved their eating habits and 6% of respondents stated that their classes resulted in an increased preoccupation with food and risk for disordered eating behaviors.¹⁰ Dietetics majors have been found to adopt restrained eating habits despite, having an adequate understanding of proper nutrition.³ Disordered eating behaviors are prevalent not only in nutrition students but in 40% of practicing dieticians and event 7% of practicing dietitians were even found to be at risk for an eating disorders.¹⁰

The M-Cup revealed that the nutrition student population (M=25.8) had higher scores than the average college (M=18.5) student in regards to perceived pressure from others. The nutrition students (M=21.9) also scored higher on the reactivity to mistakes subscale of the M-Cup than the average college student (M=17.0). High scores on perfectionism scales especially reactivity to mistakes behavior subscale has been found to be significantly correlated with anorexia and bulimia nervosa.¹⁸ Those who have eating disorders have been found to be more likely to be preoccupied with their weight, to possess binge eating behaviors and be stressed out about upcoming deadlines.¹⁹ These results are supported by Crockett & Littrell and Drake who observed that nutrition students are more likely to have anorexic-like eating behaviors.³

The BSQ values revealed nutrition students (M=81.3) do not possess the same concerns about body shape when compared to a patient with bulimia nervosa (M=136.9). However, for most college women restriction and dieting is due to an intense preoccupation of body size as well as societies definition of attractiveness and appearance.²⁰ Women who have higher scores on the BSQ scores and have the desire to have a smaller figure and have been found to have higher EAT-26 scores or rather are at higher risk for having disordered eating behaviors.¹⁹

Contrary to the hypothesis, the centrality measures did not reveal a single data point, or individual, to be responsible for initiating specific eating behaviors throughout the network. The EPSI revealed there was no correlation between the 8 factor questionnaire results and the centrality measures. The M-Cup and BSQ did not reveal any correlation throughout the nutrition student network. The lack of correlation may be due to the small sample size or the inability to compare the results against a control group. Future research should be conducted with a wide range of college student, from a variety of majors, in order to determine how centrality measures compare.

This study is not without limitations. Only 99 out of the 200 nutrition students in the nutrition student network completed the survey. Full compliance may have resulted in statistically significant results within the network. Out of the participant population considered themselves to be 91.9% (n=91) white (Caucasian). Future research should be conducted with a more diverse population. Future research should also be conducted within the nutrition student population at other institutions to determine if disordered eating behaviors manifest themselves in all nutrition programs. Further research should also be conducted to identify if students entering the nutrition major due to past disordered eating habits or if the nutrition education encourages disordered eating habits.

5. Conclusion

Further research should be conducted at other universities to determine if social ties are a predictor of eating behaviors. Body dissatisfaction has been found to be a predictor of disordered eating behaviors. The nutrition student BSQ values and the EPSI body dissatisfaction subscale values indicate nutrition students are not facing the same kind of body dissatisfaction as clinically diagnosed eating disorder patients. The difference between clinically diagnosed eating disorder patients and nutrition majors should be further investigated in order to determine if body dissatisfaction the sole trait that differs between the two populations.

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