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# Educational Survey on Eating Disorders in Post-Graduate Pediatric Curriculum

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EDUCATIONAL SURVEY ON EATING DISORDERS IN POST-GRADUATE  
PEDIATRIC CURRICULUM

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science at Virginia Commonwealth University.

by

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## Abstract

### EDUCATIONAL SURVEY ON EATING DISORDERS IN POST-GRADUATE PEDIATRIC CURRICULUM

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A thesis submitted in partial fulfillment of the requirements for the degree of Masters of Science at Virginia Commonwealth University.

Virginia Commonwealth University, 2007

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**Purpose:** The purpose of this study was to assess if the topic of eating disorders is a part of post-graduate pediatric dental residency training curriculum. This study examined if there is a need for increased training of pediatric dental residents regarding the oral manifestations and treatment of patients with eating disorders.

**Methods:** A cross-sectional online survey was used to compare data from all 66 post-graduate pediatric dental residency program directors. After thirty days a second emailing was conducted, with an additional thirty days to reply. Univariate distributions were obtained and percents for all items were based on the total number of respondents.



The university-based programs and the hospital-based programs were compared and analyzed using chi-square analysis based on their percentages.

**Results:** University-based programs were significantly less likely to offer curriculum on anorexia nervosa than hospital-based programs (13% versus 50%,  $p < 0.03$ ). University-based programs were significantly less likely to offer curriculum on bulimia nervosa than hospital-based programs (44% versus 7%,  $p < 0.02$ ). There were no significant differences between the two programs on EDNOS (Eating Disorders Not Otherwise Specified) curriculum (overall 48%). The inclusion of curriculum on oral manifestations of eating disorders did not vary greatly between university and hospital based programs with the exception of “a patient approach for patients who exhibit oral manifestations on eating disorders.” Here, university-based programs were less likely to provide curriculum (33% versus 73%,  $p < 0.03$ ). There was agreement on beliefs regarding secondary prevention of eating disorders and relationships to other agencies for the treatment of eating disorders between university- and hospital-based programs.

**Conclusion:** An increase of clinically applicable eating disorder curriculum in post-graduate pediatric training is needed to enable residents to be more knowledgeable and effective practitioners.

## INTRODUCTION

As the focus on women's health issues continually grows, there is concern over evidence that women's health needs have been neglected.<sup>1</sup> Society's preoccupation with outward appearance and thinness has increased the incidence of many psychological insecurities leading to eating disorders.<sup>2</sup> These eating disorders make up a group of conditions that significantly affect an individual's oral health. Though these disorders can affect both males and females, the majority are women.<sup>1-3</sup> Two of the main illnesses are anorexia nervosa and bulimia nervosa.<sup>4</sup> These psychosocial, pathological diseases stem from an intense preoccupation with food, weight and distorted body image coupled with morbid fear of becoming obese.<sup>5</sup> It is estimated that 3% of young women have an eating disorder and more than twice than that display clinical variants.<sup>3</sup>

Anorexia nervosa begins at the average age of fourteen, and has another peak incidence at age eighteen. Anorexia causes an overwhelming fear of being overweight and drive to be thin which leads to a restriction of calories and this self starvation causes extreme weight loss. Currently there are two subtypes: restricting and binge/purge.<sup>6</sup> Approximately 50% of anorexic patients also practice bulimia.<sup>5</sup> The female to male ratio is 10:1, with approximately 15% of cases being men.<sup>3</sup>

Bulimia nervosa is characterized by unrestrained eating sprees followed by purging, fasting, or vomiting. However it is more difficult to recognize than anorexia

because individuals with bulimia nervosa often exhibit no signs of illness and most are of a normal weight. The prevalence among women is 1-3% while in men 0.1%. Cases of bulimia are usually associated in countries where food is plentiful and preoccupation with thinness in women is apparent.<sup>3</sup>

It is not known what causes eating disorders, but it does seem to be associated with certain genetic attributes and is more common in children who have a first-degree relative with an eating disorder. Other factors that put you at risk are participating in certain competitive activities (dancing, skating, wrestling, running, fashion modeling), where physical appearance is emphasized and highly valued. Having a perfectionist or obsessive personality, or a parent with an eating disorder or weight problem (obesity, frequent dieting) can also contribute.<sup>3,7</sup> Eating disorders are more prevalent in industrialized societies and occur in all socioeconomic classes and major ethnic groups in the United States.<sup>3</sup> Early risk factors for eating disorders include having low self-esteem and being dissatisfied with their body.<sup>7</sup> Depression, affective disorders, anxiety disorders, substance abuse, and a history of sexual abuse may increase the chances of developing bulimia.<sup>3</sup> Despite the serious consequences of eating disorders on physical and psychological health and well-being, these disorders are often difficult to diagnose. Those with eating disorders are often unwilling to admit they have the disorder and seek help.<sup>2,8</sup>

In anorexia, clinical manifestations and symptoms represent secondary effects from starvation and include changes in vital signs.<sup>3</sup> There are many serious complications of anorexia, including hypotension, fainting from low blood pressure,

electrolyte disorders, being intolerant to cold, constipation, decrease in energy, changes in mood, dry skin, lanugo (fine body hair), anemia, kidney failure, osteoporosis, suicide, bradychardia, hypothermia, and even death.<sup>7</sup> In bulimia, overeating associated with binge episodes can stretch the stomach or delay gastric emptying. The purging can induce esophagitis, gastro-esophageal reflux disease, or esophageal rupturing. Functional impairment of the pancreas, renal organs, protein malnutrition, dehydration, electrolyte imbalance, and lipomas on extremities may also occur.<sup>3,9</sup> Predominantly a woman's issue, the increased risk of fertility problems is also a grave concern.<sup>9</sup>

### **Eating Disorders and Oral Health**

Oral manifestations of eating disorders vary in severity, duration, frequency of pathological eating behaviors, diet, and oral hygiene habits. The most common oral health findings affect the dentition, salivary glands, periodontium, and oral mucosa. Oral problems associated with anorexia and bulimia nervosa can manifest as early as six months after a person engages in eating behaviors that disturb caloric intake and vomiting.<sup>10</sup> Holst and Lange defined the term perimylolysis (dental enamel erosion from chronic regurgitation of gastric contents) in 1939, and Helstrom (1974) found that perimylolysis is usually only evident after at least two years of purging.<sup>11</sup> The classic effect is usually seen on the palatal surface of the maxillary anterior teeth and posterior dentition, which can be so severe that there may be pulpal involvement causing dentinal hypersensitivity. Other occlusal changes include anterior open bite and loss of vertical dimension caused by the loss of occlusal and incisal tooth structure. These can lead to

floating restorations or filling extrusions as the actual dentition has been eroded away by gastric acid.<sup>12</sup> Although controversial definitive dental treatment is usually recommended only after purging ceases, with palliative care until then.<sup>3,6</sup> Angular cheilitis, candidosis, glossitis, and mucosal ulceration may also be seen as possible sequelae from nutritional deficiencies incurred by these patients.<sup>4,6,9</sup> Bruxism, clenching, and abnormal swallowing habits can be present. Some physical signs that are found in patients with bulimia include enlargement of the parotid gland (causing chubby cheeks), and occasionally the sublingual and submandibular glands.<sup>12</sup> Xerostomia and calluses on their knuckles (Russell's finger) are other signs of bulimia.<sup>3,6</sup> Due to co-existing mental disorders the xerostomia may be from prescribed medication, and not from the after effects of purging.<sup>6,12</sup> Other signs are having dry brittle hair, losing hair, and muscle wasting.<sup>7</sup> Those who binge and purge may show trauma to the oral mucosal membranes and the pharynx. Objects used to induce vomiting (fingers, pens, combs) can cause injury to the soft palate.

The incidence of caries among persons with eating disorders appears to be variable. Individuals with anorexia tend to ingest a lower than normal amount of food. However, the proportion of carbohydrates to protein and fats is higher than the normal population. Persons with bulimia tend to ingest high amounts of carbohydrates during episodes of bingeing. A high carbohydrate diet can lead to an increase in acid production and increase of caries rate.<sup>3</sup> Helstrom reported contradictory scientific evaluations of caries rates with anorexic patients, with an earlier study stating low, and a subsequent stating moderately high.<sup>11</sup>

Individuals with anorexia or bulimia tend to be relatively young, so they rarely have advanced periodontal disease. However, anorexics may exhibit poorer oral hygiene resulting in increased gingival inflammation and erythema. Generally, persons with eating disorders are more prone to depression and manifest less interest in hygiene. Individuals with bulimia tend to be more concerned about appearances and are more meticulous about their hygiene.<sup>13</sup>

### **Dental Provider Awareness of Eating Disorders**

A 2000 study conducted by DiGiacchino assessed eighteen dentists and nineteen dental hygienists regarding knowledge of oral signs of eating disorders. Although many were familiar with the generalized systemic complications (menstrual/reproductive, GI, anemia, electrolyte imbalance, and esophageal perforations) 22.2 % of the dentists and 15.8% of hygienists were “not sure” about cardiovascular complications, 21.1% of hygienists were “not sure” of the development of periodontal disease. Both dentists (50%) and hygienists (36.8%) were “not sure” of cardiomyopathy in relation to eating disorders, and 66.7% of dentists and 57.9% of hygienists were “not aware” of Russell’s finger as a cardinal sign of bulimia. Regarding oral manifestations 100% of dentists and hygienists identified erosion of dental enamel; 88.9% of dentists and 94.7% of hygienists identified dental caries; 94.4% of dentists and 89.5% of hygienists identified tooth sensitivity; 72.2% of dentists and 84.4% hygienists recognized xerostomia; and 94.4% of dentists and 78.9% of hygienists indicated cheilosis.<sup>14</sup>

A 2003, study assessed the prevalence of mental illness in their dental clinic population. Patient questionnaires and physical evaluation record forms were used to collect medical information on one hundred thirty-six patients. Twenty-seven percent reported at least one mental illness. Hypertension and depression were reported mostly, followed by anxiety, substance abuse, anorexia, bulimia, insomnia, bipolar disorder, and post-traumatic stress disorder. This study established the need for training of dental students to recognize and manage psychologically compromised patients, and the importance of their curriculum to address the issues.<sup>15</sup> It was proposed that an increase in curriculum for these students would allow them to be better practitioners.

In 2006, Debate et al. concluded that in comparing the gender of dentists, women were more knowledgeable regarding oral and physical cues; women had a greater perception of the severity of bulimia and anorexia nervosa; and women indicated greater perceived benefits of engaging in secondary prevention practices.<sup>16</sup> Secondary prevention of eating disorders involves early screening and identification of signs and symptoms of eating disorders, followed by referral to an appropriate health care provider. These secondary prevention practices help reduce the likelihood of the development of the eating disorders via early intervention. Given that dentists may be the first health care provider to assess the physical and oral effects of anorexia and bulimia, they could be the key health care provider in secondary prevention of eating disorders.<sup>17</sup>

### **Eating Disorders in Dental Curriculum**

Gross et al. surveyed twenty-seven accredited dental programs and one hundred thirty-seven accredited dental hygiene programs in the United States and Canada to assess the inclusion of general and oral complications of anorexia and bulimia nervosa. The authors found that 41% of dental programs and 15% of hygiene programs reported no instruction. Among 59% of the dental schools and 85% of the hygiene schools who included eating disorder curriculum, the average time spent on the issue was twenty-four minutes and fifty-two minutes respectively.<sup>18</sup> Respondents agreed that eating disorders were important health issues and that dentists and hygienists have a profession/ethical responsibility to identify patients.

It is important for dental professionals to be aware of the signs and symptoms of eating disorders in addition to being prepared to collaborate with other health professionals to provide appropriate treatment for affected individuals.<sup>2, 18</sup> Since dentists tend to see patients on a regular basis, they may be the first to diagnose the patient based on visible oral evidence or be the provider that the patient confides in.<sup>2,6</sup> It is important to include parents in the discussions concerning an individual suspected of having an eating disorder when a patient is under the age of eighteen. This includes the documentation of oral findings, oral health treatment approaches, and referrals for medical consultation which should be presented to the patient as well as parent/guardian.<sup>3</sup> This intervention needs to be handled carefully as it may become emotional for all involved.<sup>2</sup> The treatment of eating disorders is slow and difficult and may require hospitalization. It should be overseen by a mental health professional that is



familiar with the disorder to begin psychotherapy and behavior modification. Patients with eating disorders also require nutritional and medical intervention to make dietary corrections and allow for steady and appropriate weight gain.<sup>7</sup> Thus oral health providers must be aware of the signs of eating disorders, and be prepared to collaborate with other health care providers to treat them and prevent relapse.<sup>3</sup>

Eating disorders are occurring increasingly earlier in childhood and can lead to a series of oral manifestations.<sup>12</sup> More so, they are a serious concern in the adolescent population.<sup>19</sup> Pediatric dentists are the primary oral health care provider for infants and children through adolescence, including those with special health concerns.<sup>20</sup> Knowledge of the signs and symptoms for these diseases is important because early diagnosis and treatment can result in more successful therapy.<sup>2,3</sup>

## MATERIALS AND METHODS

### **Design**

A cross-sectional online survey was used to examine the amount of training and curriculum related to eating disorders that is included in post-graduate pediatric dental residency programs. Surveys were electronically sent to all 66 post-graduate pediatric dental residency program directors.

The survey was an adapted version of an instrument used in a previous study by DeBate et al. called "Dental Practitioners and Eating Disorders Prevention" National Institute of Dental and Cranial Facial Research, NIH (Grant Number: 1 R15 DE13963-01A1).<sup>9,16</sup> The questionnaire was based on current beliefs, perceptions and knowledge regarding eating disorders by resident directors. The independent variable analyzed was the type of graduate pediatric dental residency program (university vs. hospital based).

The seventeen item survey was self-administered online using Inquisite (version 7.0, Inquisite, Inc., Austin TX). Part one asked six yes/no questions about secondary prevention curriculum. Part two rated the program director's belief regarding secondary prevention of eating disorders on a five degree scale. The nine statements were rated as one being "strongly agree" and five equaling that they "strongly disagree." Part three categorized the institutional setting (hospital based, university based, other). To increase the response rate, after thirty days a second electronic mailing was conducted, with an

additional thirty days to reply. An additional thirty days was granted for returns of the survey. After these allotted sixty days, the study closed, and only the data collected during this time was incorporated for analysis. This study was approved for Human Subjects by the Virginia Commonwealth University Institutional Review Board.

### **Sample and Data Collection**

The addresses and program director names were collected from the American Academy of Pediatric Dentistry (AAPD) website containing all sixty-six registered post-graduate pediatric residency programs as of 2005. The data collected was analyzed as a whole and separate, based on the program director's description of their institution (university or hospital based).

### **Statistical Analysis**

Generation of descriptive statistics for survey variables and program characteristics were conducted. Univariate distributions were obtained and percents for all items were based on the total number of respondents. The variables of university-based programs and the hospital-based programs were compared using chi-square analysis based on their percentages to test for significance. The level of significance was set at 0.05.

## RESULTS

The aim of this study was to assess if the oral health topic of eating disorders is a part of post-graduate pediatric dental curriculum. This study examined if there is a need for increased training of pediatric dental residents on the oral manifestations and treatment of patients with eating disorders.

There were n=47 surveys completed, with a response rate of 71%; 33% (n = 15) by university-based program directors and 59% (n = 27) by hospital-based programs. Additionally, n = 4 indicated “other” and n = 1 did not indicate which program location. For all summary tables, the missing value and “other” were combined. Percentages and statistical analyses were only done for the two program types (university and hospital, n= 42).

Part one of the survey contained questions about the offering of secondary prevention curriculum concerned with specific eating disorders. Table 1 shows the results of asking “Does your program offer curriculum regarding general characteristics of the following eating disorders?” University-based programs were significantly less likely to offer curriculum on anorexia nervosa than hospital-based programs (13% versus 50%,  $p < 0.03$ ). University-based programs were significantly less likely to offer curriculum on bulimia nervosa than hospital-based programs (44% versus 7%,  $p < 0.02$ ). There was no

significant difference between the two programs on EDNOS (Eating Disorders Not Otherwise Specified) curriculum (overall 48%).

Program directors were asked about providing curriculum regarding patients with oral manifestations of eating disorders. These results are shown in Table 2. Ninety-three percent of university programs stated that they did include “curriculum regarding oral manifestations of eating behaviors;” 74% of hospital programs also included this topic. Regarding “curriculum on patient education”, 40% of university programs and 63% of hospital programs did not offer this type of curriculum. When questioned about providing “specific home dental care” the programs did not vary greatly. However, there was statistical significance between university and hospital based programs regarding “patient approach for patients who exhibit oral manifestations on eating disorders.” Here, hospital-based program were less likely to provide curriculum (27 %) versus university based programs (67%,  $p < 0.02$ ).

Relationships to other agencies for treatment were compared next in part one (see Table 3). There were no differences between programs for “identifying referral agencies for those identified with oral manifestations” with a total of 57% of the programs stating that they did not identify a referral agency. In addition, 87% and 78% of university and hospital programs respectively, stated that they did refer patients who “exhibit oral signs and symptoms of behaviors associated with eating disorders.” In response to “referral systems for patients with eating disorders,” predominately both hospital and university-based institutions did not have an “established liaison with an eating disorders clinic or treatment program referral agency”.

Part two of the survey rated the program director's beliefs regarding secondary prevention of eating disorders curriculum. Overall, there was agreement on beliefs regarding secondary prevention of eating disorders between university- and hospital-based programs, as shown in Table 4. Both types of programs "strongly agreed" or "agreed" that "anorexia and bulimia are serious health problems," and that "dental professions have a professional responsibility to identify and refer patients with anorexia, bulimia, EDNOS."

Regarding "legal responsibility to identify patients" 28% of programs responded "neutral" with 66% agreeing and 6% disagreeing. There was an increase in "neutral" responses regarding "liability issues" from both university- and hospital-based program directors. Forty-seven percent of program directors responded "neutral" for "liability in identifying" and "referring patients with eating disorders as an emerging health issue in dentistry", while 44% of programs agreed on these same issues and 6-9% disagreeing.

## DISCUSSION

Despite the crucial role a dentist can have in the early identification of eating disorders and management of patients with these disorders, limited curriculum is devoted to eating disorders in pediatric graduate dental training programs. As a dental health professional, identifying oral symptoms of eating disorders is a provider's responsibility. Another important task is to ensure that the patient receives treatment.

Failed detection of eating disorders and referrals has been documented in the dental setting in the past. In a study of one hundred dentists, Harwood and Newton revealed that only eleven dentists indicated that they would refer a patient with oral manifestations of eating disorders to a physician or health care provider. The authors concluded that overall knowledge of oral manifestations of eating disorders was low among this small sample of dentists.<sup>20</sup> In a study of hospitalized patients with bulimia nervosa, Simmons et al. stated that only 38% of patients had oral manifestations. However, of those who had been identified with manifestations, 80% stated they received routine oral care and 75% reported that their dentist had not identified their oral signs.<sup>16</sup>

Knowledge of oral manifestations of anorexia and bulimia nervosa by dentists and dental hygienists was recently assessed in a study by Debate et al. Results indicated low scores concerning oral cues and physical cues of anorexia and bulimia nervosa among a randomized cross-sectional sample of dentists and hygienists in the United States. It was

reported that more dental hygienists than dentists correctly identified oral manifestations of the eating disorders. This suggests that curriculum changes in training programs in addition to continuing education programs may be needed to increase the amount of education in eating disorders available to dentists, especially those in training programs.<sup>9</sup>

According to this study, education on eating disorders alone, hospital-based pediatric dental programs include more than university-based programs (Table 1). Implications of this study should help post-graduate programs recognize the importance of the inclusion of eating disorder curriculum in their education and training. Pediatric dentists interact with adolescents frequently and have exposure to characteristic signs of eating disorders in the oral cavity. Despite residency director's acknowledgement of the importance of eating disorders (Table 4), many do not have referral agencies or established clinical protocols with institutions for patients that present with these needs (Table 3). The incorporation of this training into post-graduate pediatric dental programs would enable residents to be more knowledgeable and more effective practitioners in the community.

Similar to the findings of this study, Gross et al. found that respondents were more uncertain concerning liability issues and risk level of dental and dental hygiene students for eating disorders. Also, it showed that less than half (43.7%) of responding institutions had identified agencies within their communities that provided psychotherapy for patients eating disorders.<sup>17</sup>

It is well known that the need for control is prominent in patients with eating disorders, and it has been shown that subjects with a strong need for control are



vulnerable to the development of dental fear. From the perspective of dental health there are two major reasons for exploring dental fear in patients with eating disorders. One being that patients with high levels of dental fear state that communication with a dentist is troublesome; secondly, that their dental fear may cause them to postpone or avoid visiting the dentist regularly. This could prevent the patient from receiving proper care that would minimize dental complications from eating disorders.<sup>8</sup>

This study provides evidence that there is a need for increased curriculum and clinical training for the management of eating disorders in post-graduate pediatric dental programs. Dentists, especially pediatric dentists, in collaboration with medical teams can play a primary role in diagnosing and treating eating disorders.<sup>12</sup>

## CONCLUSIONS

The primary aim of this study was to assess if the topic of eating disorders is a part of post-graduate pediatric dental curriculum.

1. University-based programs were significantly less likely to offer curriculum on anorexia nervosa or bulimia nervosa over hospital-base programs.
2. Hospital-based program were less likely to provide curriculum on patient approach for patients who exhibit oral manifestations on eating disorders.
3. There were no differences between programs for identifying referral agencies for those identified with oral manifestations, with a total of 57% of programs stating that they did not identify a referral agency.
4. An increase of clinically applicable eating disorder curriculum in post-graduate pediatric education is needed to enable residents to be more knowledgeable and better practitioners.

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**Table 1:** Program includes curriculum regarding the general characteristics of eating disorders.

<b>Institution</b>	<b>Percent (n)</b>		<b>exact p-value</b>
	<b>No</b>	<b>Yes</b>	
<b>Anorexia Nervosa</b>			
University	13 (2)	87 (13)	
Hospital	50 (13)	50 (13)	
Other	(0)	(5)	
Total	33 (15)	67 (31)	0.0231*
<b>Bulimia Nervosa</b>			
University	7 (1)	93 (14)	
Hospital	44 (12)	56 (15)	
Other	(0)	(5)	
Total	28 (13)	72 (34)	0.0148*
<b>Eating Disorders Not Otherwise Specified (EDNOS)</b>			
University	36 (5)	64 (9)	
Hospital	56 (14)	44 (11)	
Other	(2)	(3)	
Total	48 (21)	52 (23)	0.3203

**Table 2:** Program includes curriculum regarding the oral manifestations of eating disorders.

Institution	Percent (n)		exact p-value
	No	Yes	
Curriculum regarding oral manifestations of eating behaviors?			
University	7 (1)	93 (14)	
Hospital	26 (7)	74 (20)	
Other	(0)	(5)	
Total	17 (8)	83 (39)	0.2225
Curriculum on patient education regarding oral manifestations of eating disorders?			
University	40 (6)	60 (9)	
Hospital	63 (17)	37 (10)	
Other	(2)	(3)	
Total	53 (25)	47 (22)	0.2023
Curriculum on patient specific home dental care for patients who exhibit oral manifestations of eating disorders?			
University	27 (4)	73 (11)	
Hospital	59 (16)	41 (11)	
Other	(3)	(2)	
Total	49 (23)	51 (24)	0.0577
Curriculum on patient approach for patients who exhibit oral manifestations of eating disorders?			
University	33 (5)	67 (10)	
Hospital	73 (19)	27 (7)	
Other	(4)	(1)	
Total	61 (28)	39 (18)	0.0212*

**Table 3:** Program relationships with other agencies for the treatment of eating disorders.

Institution	Percent (n)		exact p-value
	No	Yes	
Referral agencies have been identified for those indicating oral manifestations of eating disorders			
University	60 (9)	40 (6)	
Hospital	56 (15)	44 (12)	
Other	(3)	(2)	
Total	57 (27)	43 (20)	1.0000
Patients who exhibit oral signs and symptoms of behaviors associated with eating disorders are referred for treatment			
University	13 (2)	87 (13)	
Hospital	22 (6)	78 (21)	
Other	(1)	(4)	
Total	19 (9)	81 (38)	0.6888
We have established an institutional liaison with eating disorder clinics and/or treatment programs			
University	87 (13)	13 (2)	
Hospital	81 (22)	19 (5)	
Other	(3)	(2)	
Total	81 (38)	19 (9)	1.0000



**Table 4:** Program director's beliefs regarding secondary prevention of eating disorders.

Institution	Percent (n)					p-value
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	
Anorexia nervosa and bulimia nervosa are serious health problems.						
University	87 (13)	13 (2)	0 (0)	0 (0)	0 (0)	
Hospital	67 (18)	30 (8)	4 (1)	0 (0)	0 (0)	
Other	(5)	(0)	(0)	(0)	(0)	
Total	77 (36)	21 (10)	2 (1)	0 (0)	0 (0)	0.3407
Dental professions have a professional responsibility to identify patients with anorexia nervosa, bulimia nervosa, or EDNOS.						
University	67 (10)	27 (4)	7 (1)	0 (0)	0 (0)	
Hospital	63 (17)	30 (8)	7 (2)	0 (0)	0 (0)	
Other	(3)	(2)	(0)	(0)	(0)	
Total	64 (30)	30 (14)	6 (3)	0 (0)	0 (0)	0.9716
Dental professionals have a professional responsibility to refer patients with anorexia nervosa, bulimia nervosa, or EDNOS.						
University	53 (8)	40 (6)	7 (1)	0 (0)	0 (0)	
Hospital	63 (17)	30 (8)	7 (2)	0 (0)	0 (0)	
Other	(4)	(0)	(1)	(0)	(0)	
Total	62 (29)	30 (14)	9 (4)	0 (0)	0 (0)	0.7911
Dental professions have a legal responsibility to identify patients with anorexia nervosa, bulimia nervosa, or EDNOS.						
University	27 (4)	40 (6)	20 (3)	13 (2)	0 (0)	
Hospital	33 (9)	30 (8)	37 (10)	0 (0)	0 (0)	
Other	(1)	(3)	(0)	(1)	(0)	
Total	30 (14)	36 (17)	28 (13)	6 (3)	0 (0)	0.1752
Liability in identifying patients with eating disorders is an emerging health issue in dentistry.						
University	0 (0)	53 (8)	47 (7)	0 (0)	0 (0)	
Hospital	7 (2)	37 (10)	52 (14)	4 (1)	0 (0)	
Other	(0)	(2)	(1)	(2)	(0)	
Total	4 (2)	43 (20)	47 (22)	6 (3)	0 (0)	0.5095
Liability in referring patients with eating disorders is an emerging health issue in dentistry.						
University	7 (1)	33 (5)	53 (8)	7 (1)	0 (0)	
Hospital	7 (2)	37 (10)	52 (14)	4 (1)	0 (0)	
Other	(0)	(3)	(0)	(2)	(0)	
Total	6 (3)	38 (18)	47 (22)	9 (4)	0 (0)	0.9732

## APPENDIX

**Appendix A: Inquisite Survey Invitation letter**

Dear Graduate Program Director:

Virginia Commonwealth University is conducting a study to assess post-graduate pediatric dental curriculum regarding identification and dental treatment of oral manifestations due to eating disorder behaviors and referral to treatment.

We are asking the 66 post-graduate programs in the United States to complete a 5 minute, 13-item survey. The information you provide will be used to assist us in identifying areas to include in future continuing education curriculum. Collected information will be aggregated to maintain confidentiality.

Please complete this on-line survey, there is no individual identifying information contained in the survey or in the process of completing the survey on-line. Your participation is critical to the success of this information-gathering effort. It is our goal to assure that the report reflects current information.

Respectfully,

Michael D. Webb DDS, Graduate Program Director  
Priya Patel DDS  
Tegwyn H. Brickhouse DDS PhD

Department of Pediatric Dentistry  
School of Dentistry  
Virginia Commonwealth University  
Richmond, Virginia



**Appendix B: Inquisite Survey Reminder letter**

Dear Graduate Program Director:

This a reminder notice regarding the on-line survey you were invited to participate in pertaining to post-graduate pediatric dental curriculum regarding identification and dental treatment of oral manifestations due to eating disorder behaviors and referral to treatment. If you have already completed this survey, please disregard this reminder and thank you for your participation.

It is a short 13-item survey. The information you provide will be used to assist us in identifying areas to include in future continuing education curriculum. Collected information will be aggregated to maintain confidentiality.

Please complete this on-line survey, there is no individual identifying information contained in the survey or in the process of completing the survey on-line. Your participation is critical to the success of this information-gathering effort. It is our goal to assure that the report reflects current information.

Respectfully,

Michael D. Webb DDS, Graduate Program Director  
Priya Patel DDS  
Tegwyn H. Brickhouse DDS PhD

Department of Pediatric Dentistry  
School of Dentistry  
Virginia Commonwealth University  
Richmond, Virginia



**Appendix C: Inquisite Survey****VCU Medical Center**

Virginia Commonwealth University

**Survey of Education on Eating Disorders in Dental Post-Graduate Pediatric Curriculum**

Please complete this on-line survey. Participation in the research study is voluntary. All information and responses are confidential. Your participation is critical to the success of this information-gathering effort. It is our goal to assure that the report reflects current information.

If you have any questions, please contact: Dr. Priya Patel, PatelPJ@vcu.edu (804) 828-9095.

If you may have any questions about your rights as a research subject you may contact: Office of Research Subjects Protection Virginia Commonwealth University 800 East Leigh St., Suite 111 PO Box 980568 Richmond, VA. 23298

**Part One: Secondary prevention Curriculum**

Does your program offer curriculum regarding general characteristics of the following eating disorders?

1A Anorexia Nervosa

No

Yes

1B Bulimia Nervosa

No

Yes

1C Eating Disorders Not Otherwise Specified (EDNOS)

No

Yes

2 Does your program offer any curriculum regarding oral manifestations of eating behaviors?

No

Yes

3 Does your program provide any curriculum on patient education regarding oral manifestations of eating disorders?

- No
- Yes

4 Does your program provide any curriculum on patient specific home dental care for patients who exhibit oral manifestations of eating disorders?

- No
- Yes

5 Does your program provide curriculum on patient approach for patients who exhibit oral manifestations of eating disorders?

- No
- Yes

Within our dental program:

6A Referral agencies have been identified for those indicating oral manifestations of eating disorders

- No
- Yes

6B Patients who exhibit oral signs and symptoms of behaviors associated with eating disorders are referred for treatment

- No
- Yes

6C We have established an institutional liaison with eating disorder clinics and/or treatment programs

- No
- Yes

**Part Two: Beliefs regarding Secondary Prevention of Eating Disorders**

7 Anorexia nervosa and bulimia nervosa are serious health problems.

- 1 Strongly Agree
- 2 Agree
- 3 Neutral
- 4 Disagree
- 5 Strongly Agree



8 Dental professions have a professional responsibility to identify patients with anorexia nervosa, bulimia nervosa, or EDNOS.

- 1 Strongly Agree
- 2 Agree
- 3 Neutral
- 4 Disagree
- 5 Strongly Agree

9 Dental professionals have a professional responsibility to refer patients with anorexia nervosa, bulimia nervosa, or EDNOS.

- 1 Strongly Agree
- 2 Agree
- 3 Neutral
- 4 Disagree
- 5 Strongly Agree

10 Dental professions have a legal responsibility to identify patients with anorexia nervosa, bulimia nervosa, or EDNOS.

- 1 Strongly Agree
- 2 Agree
- 3 Neutral
- 4 Disagree
- 5 Strongly Agree

11 Liability in identifying patients with eating disorders is an emerging health issue in dentistry.

- 1 Strongly Agree
- 2 Agree
- 3 Neutral
- 4 Disagree
- 5 Strongly Agree

12 Liability in referring patients with eating disorders is an emerging health issue in dentistry.

- 1 Strongly Agree
- 2 Agree
- 3 Neutral

- 4 Disagree
- 5 Strongly Agree

**Part Three: Institution-**

13 How would you describe your program?

- University based
- Hospital based

Thank you for your participation in this important project.

If you have any questions, please contact: Dr. Priya Patel, PatelPJ@vcu.edu (804) 828-9095.

## Vita

Priya Jitendraprasad Patel was born on January 8, 1980 in Merthyr Tydfil, Wales. She moved to the United States in 1986. In 1997, she graduated from Richmond's gifted and talented high school, The Governor's School for Government and International Studies, and entered into the Virginia Commonwealth University School of Dentistry's Guaranteed Admittance program in Dentistry. After receiving her Bachelor of Science in Biology *magna cum laude* from the university, she attended the dental school and received her Doctor of Dental Surgery *cum laude* in 2005.