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The evaluation of risk of bulimia among students of secondary schools in Bialystok

Ocena zagrożenia bulimią wśród uczniów białostockich szkół średnich

Summary
Prolonged stress and social pressure, to which young people are often subjected, combined with low self-esteem due to falsified media images affect the increasing incidence of eating disorders. These disorders can be divided into two groups, non-specific and specific eating disorders: bulimia and anorexia nervosa. The aim of this study was to evaluate the risk of development of bulimia nervosa among secondary school students in Białystok, taking into account sex, weight, and type of school. The study included 573 secondary school students from Białystok, mean of age was 17.91 (+ /- 0.77) years. The group consisted of overwhelming number of students with normal weight, only 8% were overweight or obese, less than 4% were underweight. Forty percent of the surveyed students admitted to eating without feeling hungry, 25% compensated stress by eating, 6% of students, mostly high school students, provoked vomiting after a heavy meal, 3% used laxative tablets. Teachers and parents should pay more attention to the symptoms of bulimia. High schools students, especially girls, are mainly exposed to the development of bulimia nervosa.

Key words: eating disorders, bulimia nervosa, adolescents

Streszczenie
Długotrwały stres i presja społeczna, której często poddawani są młodzi ludzie, jak również zaniżona samoocena spowodowana zafałszowanym przekazem medialnym, wpływa na coraz częstsze występowanie zaburzeń odżywiania o podłożu psychicznym. Zaburzenia te można podzielić na dwie grupy: specyficzne, do których zaliczamy żarłoczność psychiczną (bulimia nervosa) i jadłowstręt psychiczny (anorexia nervosa) oraz niespecyficzne zaburzenia odżywiania. Celem pracy była ocena zagrożenia bulimią wśród młodzieży szkół średnich w Białymstoku z uwzględnieniem płci, masy ciała i rodzaju szkoły. Badaniem objęto 573 uczniów szkół średnich w Białymstoku w wieku 17,91 (+/-0,77) lat. W badanej grupie uczniów przeważająca większość charakteryzowała się prawidłową masą ciała, zaledwie wśród 8% stwierdzono nadwagę i otyłość, natomiast niedowagę wśród niespełna 4%. Czterdzieści procent badanych uczniów przyznało się do jedzenia nie odczuwając głodu, 25% rekompensuje uczucie stresu jedzeniem, 6% uczniów, głównie uczennic liceów, prowokuje wymioty po obfitym posiłku, 3% stosuje tabletki przeczyszczające. Nauczyciele i rodzice powinni zwracać większą uwagę na objawy mogące świadczyć o bulimii, na której rozwój w przyszłości narażeni są głównie uczniowie liceów ogólnokształcących, w szczególności dziewczęta.

Słowa kluczowe: zaburzenia odżywiania, bulimia nervosa, młodzież

Introduction

Healthy eating habits and physical activity are among the most important factors affecting the development of children and youth. The energy needs of young organisms are high, which is why proper balanced diet, rich in all essential nutrients, is of particular importance (Buttriss, Weichselbaum, 2011). Unfortunately, over the last several years the increased supply of readily-available foods, rich in sugar and saturated fats often leads to the development of obesity, which could have fatal consequences in later life (cardiovascular disease, diabetes). Prolonged stress and social pressure, which young people are often subjected to, as well as low self-esteem due to falsified media transmissions, promoting the culture of material and physical beauty affects the increasing incidence of psychiatric eating disorders (Jośko et al. 2010). They can be divided into two groups, non-specific and specific eating disorders, classified as disease: bulimia nervosa and anorexia nervosa. Anorexia is characterized by an obsessive desire to achieve a minimum body weight through various weight loss diets, fasting and even induced vomiting after meals. Bulimia is diagnosed in the case of cyclic, uncontrolled binge eating and then provoking vomiting or use of laxatives (purging type of bulimia), or excessive exercise and fasting (non-purging type). Anorexia and bulimia often develop in the difficult time of adolescence, if untreated may lead to serious complications later in life (depression, anxiety) or even suicide attempts (Hoek et al. 2012). Until recently, it was thought that only girls suffer from these disorders virtually, but as shown by recent studies, eating disorders affect boys more and more often. It is estimated that 1-1.5% of the population suffers from anorexia (of which 9 out of 10 people are women). Bulimia, in turn, is diagnosed four times more often, this percentage may be as high as 10% because of the reluctance of patients to confess about their troubles to both physicians and loved ones (Brown, Keel, 2012).

Objective

The aim of this study was to evaluate the risk of bulimia among secondary school students in Bialystok by gender, weight, and type of school.

Materials and Methods

The study included 573 secondary school students from Białystok, 275 girls (48%) and 298 boys (52%), including 191 high school students, 253 students of technical schools and 129 of vocational schools. Mean of age was 17.91 (+ / -0.77), the study was carried out in the years 2010-2011. To assess dietary habits, a questionnaire developed in the Department of Medicine and Environmental Epidemiology in Zabrze, Medical University of Silesia in Katowice in own modification, consisting of 54 questions was used. The questions were of closed type, only possible answers were YES or NO. The questionnaire was divided into four parts: eating habits, socio-cultural factors, disorders of the digestive system and other systems, and imprint.

In the following, partial analysis only student`s responses to the following questions were taken into consideration:

- Do you eat when you’re hungry? (Question 1)
- Have you happened to provoke vomiting after a heavy meal? (Question 2)

- Do you feel guilty after eating large amounts of food? (Question 3)
- Do you eat when you are worried or troubled? (Question 4)
- Have you taken, especially after finished eating, laxative pills to regulate the digestive system? (Question 5)
- Do you control your weight more than once a day? (Question 6)

Students in the imprint, containing questions about gender and place of residence, subjectively marked their height and weight, which allowed for the subsequent calculation of BMI (Body Mass Index = weight [kg]/(height)^2 [m]). Upon this basis, by the applying the results to the centile charts for both sexes, it was possible to assess the occurrence of underweight, overweight and obesity among the respondents. Statistical calculations were performed using the statistical package Statistica v.10.0. The evaluation of the data was made using nonparametric χ^2 test, assuming that the level of significance at $\alpha < 0.05$.

Results

The studied group was characterized by an overwhelming majority of normal weight, only 8% of students were overweight or obese, less than 4% among them were underweight.

Tab. 1 Range of BMI in the studied group by type of school.

Type of school	Sex	Underweight	Normal body weight	Overweight	Obese
High school	F	1,05% (n=6)	19,37% (n=111)	0,35% (n=2)	0% (n=0)
	M	0,52% (n=3)	10,99% (n=63)	0,87% (n=5)*	0,17% (n=1)
Technical school	F	1,22% (n=7)	16,23% (n=93)	0,87% (n=5)	0,7% (n=4)
	M	0,17% (n=1)	21,82% (n=125)	2,09% (n=12)*	1,05% (n=6)
Vocational school	F	0,35% (n=2)	7,5% (n=43)	0,35% (n=2)	0% (n=0)
	M	0,52% (n=3)	12,04% (n=69)	1,57% (n=9)*	0,17% (n=1)
Sum		3,84% (N=22)	87,96% (N=504)	6,11% (N=35)	2,09% (N=12)

*- statistically significant result

There was no statistically significant correlation between the extent of BMI and the different types of schools ($p > 0.05$) or answers to other questions taken into consideration. It was made possible, by excluding body mass of students, to significantly simplify the further analysis. It should be noted that there were significantly more overweight boys than girls ($p < 0.02$), as illustrated in figure 1.

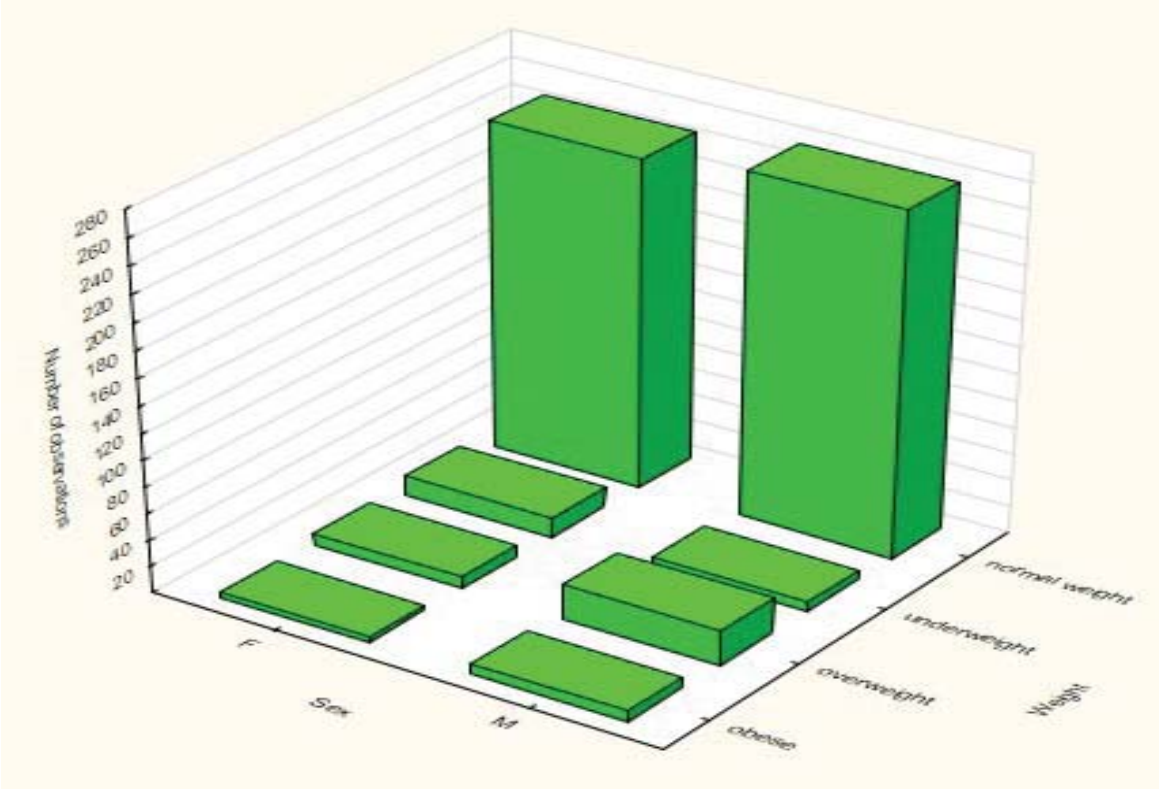


Fig. 1 BMI ranges in the group of students by type of school.

Forty percent of the surveyed students admitted to eating without feeling hungry. The question took into account both snacking between meals and eating regular meals. There were no significant differences according to gender and type of school, the lowest percentage of positive responses was found among students in vocational schools (31.78%).

Tab. 2 Responses to question number 1.

Type of school	Sex	Do you eat when you're hungry?			
		Yes		No	
High school	F	9,95%	(n=57)	10,82%	(n=62)
	M	4,89%	(n=28)	7,68%	(n=44)
Technical school	F	8,38%	(n=48)	10,65%	(n=61)
	M	9,42%	(n=54)	15,70%	(n=90)
Vocational school	F	2,09%	(n=12)	6,10%	(n=35)
	M	5,06%	(n=29)	9,25%	(n=53)
Sum		39,78%	(N=228)	60,22%	(N=345)

Vomiting, after a heavy meal, was provoked by 6% of the students. Even though the number of girls providing a positive response was almost two times more than the boys, this was not a statistically significant relationship. On the other hand, the female high schools students provoked vomiting significantly more often than their colleagues from other schools ($p < 0.03$).

Tab. 3 Responses to question number 2.

Type of school	Sex	Have you happened to provoke vomiting after a heavy meal?			
		Yes		No	
High school	F	1,91%	(n=11)*	18,85%	(n=108)
	M	0,17%	(n=1)	12,39%	(n=71)
Technical school	F	1,04%	(n=6)	17,98%	(n=103)
	M	0,87%	(n=5)	24,26%	(n=139)
Vocational school	F	0,70%	(n=4)	7,50%	(n=43)
	M	1,04%	(n=6)	13,26%	(n=76)
Sum		5,75%	(N=33)	94,25%	(N=540)

*- statistically significant result

Eating heavy meals caused feelings of guilt among 27% of the students, mostly in high school, where the figure was 35%. Responses to this question were strongly associated with gender and type of school ($p < 0.01$). The girls gave more than 77% of all positive responses.

Tab. 4 Responses to question number 3.

Type of school	Sex	Do you feel guilty after eating large amounts of food?			
		Yes		No	
High school	F	10,82%	(n=62)*	9,95%	(n=57)
	M	1,05%	(n=6)	11,52%	(n=66)
Technical school	F	6,98%	(n=40)*	12,04%	(n=69)
	M	3,32%	(n=19)	21,82%	(n=125)
Vocational school	F	2,97%	(n=17)*	5,24%	(n=30)
	M	1,75%	(n=10)	12,57%	(n=72)
Sum		26,78%	(N=154)	73,22%	(N=419)

*- statistically significant result

Problems of almost every fourth student were “overeaten”, while, as in the previous question, this kind of behavior manifested more significantly in girls (76%) and high school students (p <0.01), who generally answered positively (51% of all responses) . This result was also statistically significant.

Tab. 5 Responses to question number 4.

Type of school	Sex	Do you eat when you are worried or troubled?			
		Yes		No	
High school	F	11,34%	(n=65)*	9,42%	(n=54)
	M	1,57%	(n=9)*	10,99%	(n=63)
Technical school	F	5,58%	(n=32)*	13,44%	(n=77)
	M	3,14%	(n=18)	21,99%	(n=126)
Vocational school	F	2,27%	(n=13)*	5,93%	(n=34)
	M	1,22%	(n=7)	13,09%	(n=75)
Sum		25,12%	(N=144)	74,88%	(N=429)

*- statistically significant result

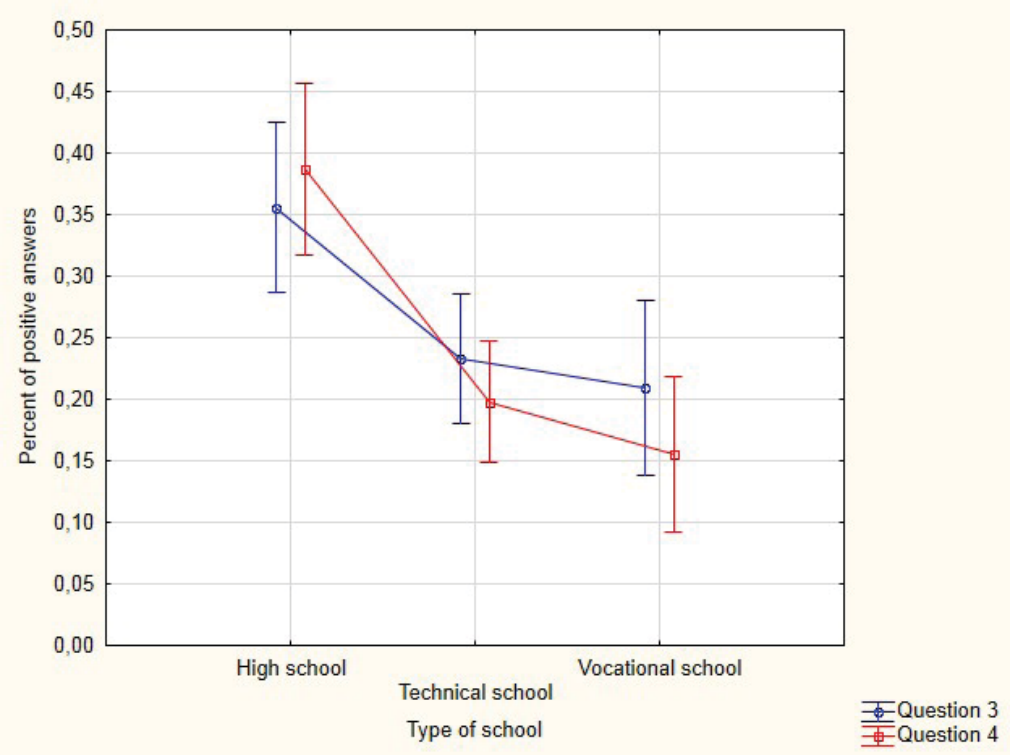


Fig. 2 Answers to question number 3 and 4 by type of school.

Laxative Tablets were used by less than 3% of all of the respondents, there was no statistically significant correlation between gender and type of school ($p > 0.05$).

Tab. 6 Responses to question number 5.

Type of school	Sex	Have you taken, especially after finished eating, laxative pills to regulate the digestive system?			
		Yes		No	
High school	F	1,04%	(n=6)	19,72%	(n=113)
	M	0,17%	(n=1)	12,39%	(n=71)
Technical school	F	0,87%	(n=5)	18,15%	(n=104)
	M	0,35%	(n=2)	24,78%	(n=142)
Vocational school	F	0,0%	(n=0)	8,20%	(n=47)
	M	0,35%	(n=2)	13,96%	(n=80)
Sum		2,78%	(N=16)	97,22%	(N=557)

Nearly 10% of the respondents control their weight more than once a day, these usually vocational school students (12%). There were three times more boys than girls controlling their weight daily, however no statistical relationship between gender and type of school was found.

Tab. 7 Responses to question number 6.

Type of school	Sex	Do you control your weight more than once a day?			
		Yes		No	
High school	F	1,04%	(n=6)	19,72%	(n=113)
	M	0,87%	(n=5)	11,69%	(n=67)
Technical school	F	2,09%	(n=12)	16,93%	(n=97)
	M	2,62%	(n=15)	22,51%	(n=129)
Vocational school	F	0,70%	(n=4)	7,50%	(n=43)
	M	2,09%	(n=12)	12,22%	(n=70)
Sum		9,41%	(N=54)	90,59%	(N=523)

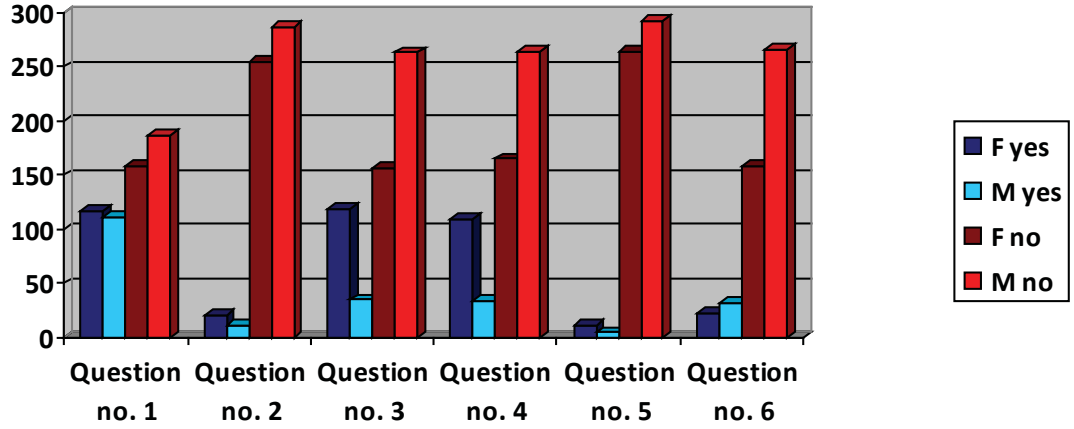


Fig. 3 Responses to all questions by sex.

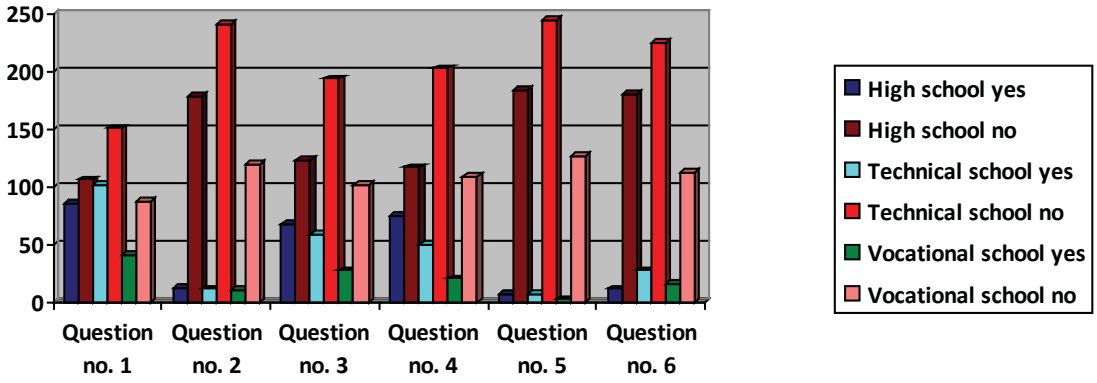


Fig. 4 The answers to all the questions by the type of school.

Discussion

The pressure of the external environment to succeed and the increased demands, put before high school students, combined with the ambition of the students themselves, cause severe stress in the case of failure at school or problems in one`s personal life (family conflicts, lack of acceptance in the group). High school students treat eating as one way of coping with stress, at the same time they feel guilty after eating a hearty meal, which in the long run, paradoxically, lead to an even greater increase in stress. It is one of the vicious circle mechanisms that could directly lead to the development of non-specific eating disorders and bulimia. This problem concerns mainly girls, representing nearly 80% of the students, who could be affected by it. The media, promoting the cult of the beautiful body and idealized success, accelerating socio-cultural changes further deepen this process. “Modern man” should not only be characterized by a great appearance but also by underlain success in his career and family life, by being able to act in any situation and not giving in to any adversities (Patel et al. 2003). The simple availability of various weight loss diets, not always of proven effectiveness, is an easy and quick way to lose weight, preserving negative eating habits on the way. The non-specific eating disorders usually begin to develop at the age of 15-19 years and are a strong predictor of developing anorexia or bulimia later in life (Frojd et al. 2013).

Forty percent of the students admitted to eating, even when not feeling hungry, mostly sweets and other snacks eaten between meals. Binge eating, characteristic for bulimia, can not be ruled out. Frequent fast-food snacking between meals, promotes the development of obesity and also leads to the formation of a negative habit replacing healthy meals with unhealthy snacks. Simultaneously, reducing snacks to only the "light" type of products result in shortages of all essential nutrients (Medar et al. 2006).

A small percentage of students used laxative tablets to provoke vomiting after meals. Although such behavior is not widely spread, it is a clear warning signal, evidential of a serious eating disorder. This is one of the most common symptom of purging type of bulimia. This is a particularly dangerous type of the disease as long induced vomiting can cause severe health side effects, starting with damage to the tooth enamel by impairment of the gastrointestinal duct (heartburn, reflux) to the rupture of the esophagus. Negative effects of bulimia affect one`s health in a variety of ways, both from the physiological and psychological side (Trujillo, 2012). Fatigue, lethargy, sudden mood swings or concentrating difficulties especially affect young people. Problems with learning caused by bulimia leads to a feeling of loss of control over their own lives, confusion and anxiety. High blood pressure, loss of bone structure, muscle weakness, or electrolyte imbalance does not result in a sudden deterioration in health, but in the long run, can cause diverse cardiovascular diseases or cancer. Dry skin, hair loss and frequent headaches are some of the more easily noticeable symptoms of bulimia (Carney et al. 2003). Parents and teachers, recognizing these alterations in young people, combined with changes in behavior, may suspect the development of eating disorders. Of the most importance, is the attitude of understanding and empathy through honest dialogue to persuade young people to share their problems. Even rare and not highly specific symptoms are valuable information to prevent development of the disease (Hardy et al. 2010).

Treatment of bulimia nervosa is an arduous, complicated and lengthy process. Diagnosis of this disease is not easy, patients are trying to hide their ailments from those around, even though there are usually quite aware of them. Avoiding situations and impulses that could lead to seizures of binge eating, cause the patient to withdraw from social life, decrease self-esteem and promotes long-term stress (Poterucha, Wine-Mieczan, 2010), which only leads to a further increase in negative symptoms (feeling of shame, depression, substance abuse) . Studies in schools in Białystok allowed to conclude that the most vulnerable group to the development of bulimia are high schools students, especially girls. High requirements they put in front of them, not coming along with expected achievements, indirectly force even more work on themselves. Through the dissemination of stereotype, according to which eating disorders are not viewed as a real disease, the society treats people suffering from anorexia or bulimia as they may simply "pull oneself together" to get rid of their ailments without any help from the outside (Kelly et al. 2011). Identification of the problem in this way only enhances the sense of shame and discourage young people from seeking professional help. Genetic factors may also affect the development of bulimia, however, their effect is not fully acknowledged and requires further investigation. The treatment process, in addition to a obligatory physician and psychologist participation, must involve all of the immediate family members (Crouter et al. 2006). Regular psychotherapy, in conjunction with

pharmacological agents, has positive results. Unfortunately, there are also frequent cases of remission, even after many years. The effective involvement of parents in the treatment process has an especially positive effects, control of meals and change in the current eating habits lead to the elimination of seizures of binge eating. Affirmation in accepting the teenager increases their motivation, reduces feelings of shame and stress (Fitzpatrick, Lock, 2009).

One in ten students weighs themselves more than once a day, it is worth pointing out that there are several times more boys in this group than girls. This surprising result may reflect not so much a desire to confirm the speed of weight loss as it`s increase. Development of the gyms in recent years and trends promoting athletic silhouette encourage young boys to intense weight training. Increasing muscle mass and improve one`s condition is a source of pride, provided that the exercise will be conducted under the guidance of an experienced instructor (Faigenbaum, Myer, 2010).

Conclusions

1. High school students, especially girls, are mainly exposed to the development of bulimia nervosa in the future.
2. One in four surveyed students from all types of schools compensated feelings of stress by eating and 6% of students provoked vomiting after a hearty meal, which could lead to the development of purging type of bulimia.
3. Teachers and parents should pay more attention to the symptoms that may indicate the development of bulimia nervosa.

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