Sveučilište u Zagrebu

Filozofski fakultet

Odsjek za psihologiju

EATING DISORDER SYMPTOMS AND ONLINE SEARCHING BEHAVIOR

Diplomski rad

Katarina Prnjak

Mentorica: dr.sc. Anita Lauri Korajlija, doc.

Zagreb, 2018.

TABLE OF CONTENTS

Eating disorder symptoms and online searching behavior
Katarina Prnjak

Abstract: The objective of this study was to determine what topics searched on the Internet can successfully distinguish women who are at risk from those non-risk for an eating disorder development. The connection between three subscales of perfectionism and frequency of online searching for eating disorders related topics has also been examined. Research was conducted online with convenience sample consisting of 228 women. After completing sociodemographic data, participants fulfilled CSS questionnaire for cyberchondria, SCOFF questionnaire for eating disorders, APS-R for perfectionism and short check-list measuring the frequency of certain topic searched on the Internet. Results indicate that risk and non-risk women, according to SCOFF, can be differentiated by searching terms related to food, diets, exercising, body appearance and eating disorders. Discriminant analysis showed that area most successful in a classification of participants into two groups is food. Subscales of APS-R (the Standards, Discrepancy, and Order) were used in the hierarchical regression analysis for prediction of online searched topics frequency. Only Discrepancy subscale, measure of maladaptive perfectionism, appeared as a significant predictor. This relationship is mediated by eating disorder symptoms on SCOFF screener. These findings suggest that women with higher risk of eating disorder development more frequently use the Internet for searching weight-loss methods, especially those related to dieting and food in general.
Key words: eating disorders, online searching, Discrepancy, diets

Simptomi poremećaja hranjenja i *online* pretraživanje

Katarina Prnjak

Sažetak: Cilj ovog istraživanja bio je odrediti koje teme pretraživane na internetu mogu uspješno razlikovati žene rizične za razvoj poremećaja hranjenja od onih nerizičnih. Također je ispitivana povezanost između triju subskala perfekcionizma i frekvencije *online* pretraživanja tema povezanih s poremećajima hranjenja. Istraživanje je provedeno *online* na prigodnom uzorku od 228 žena. Nakon odgovaranja na sociodemografska pitanja, sudionice su dale svoje odgovore na CSS skali *cyberchondrije*, SCOFF upitniku za poremećaje hranjenja, APS-R skali za perfekcionizam i kratkoj listi označavanja koja ispituje frekvenciju pretraživanja pojedine teme na internetu. Rezultati pokazuju da se žene kategorizirane kao one s rizikom i one bez rizika prema SCOFF-u, mogu razlikovati po pretraživanim terminima vezanim uz hranu, dijete, vježbanje, izgled tijela i poremećaje hranjenja. Diskriminacijska analiza pokazala je da su najuspješnije u klasifikaciji sudionica u dvije grupe teme vezane uz hranu. Podljestvice APS-R upitnika (Standardi, Diskrepanca i Red), korištene su u hijerarhijskoj regresijskoj analizi za predikciju učestalosti pretraživanja tema *online*. Samo se Diskrepanca, mjera neadaptivnog perfekcionizma, pokazala značajnim prediktorom. Medijator ovoj povezanosti je izraženost simptoma poremećaja hranjenja na SCOFF-u. Ovi nalazi upućuju na to da žene s povećanim rizikom za razvoj poremećaja hranjenja češće koriste internet za pretraživanje metoda za gubitak kilograma, posebno one povezane s držanjem dijete i hranom općenito.
Ključne riječi: poremećaji hranjenja, *online* pretraživanje, Diskrepanca, držanje dijete

Introduction

Importance of physical appearance and health

In modern society great emphasis is being placed on one's body image and health in general. People are constantly surrounded with advice on how to improve their physical appearance and to be "fit". Topics including food, diet and exercise are being presented in media all the time. For women, the ideal of thinness became strong back in 1970's and still maintains its significance for female body image (Sarwer, Magee, & Clark, 2003). However, the ideal presented in media is often unrealistic and unattainable and yet it influences our beliefs about own body (Sarwer et al., 2003). It is not uncommon for some underweight celebrity to gain attention in media and to be seen in positive light, which could lead to reinforcement of thinness idealization (Shapira, Goldsmith, Keck, Khosla, & McElroy, 2000). Furthermore, in Western societies the dominance of healthy lifestyle promotion through media can be observed. This "ideology" presents social construction called *Healthism* (Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008). Impact of healthy lifestyle can be seen in individuals who limit their food choices to only healthy, nutritious ingredients. This behavior pattern can lead to obsession with healthful eating, recognized in 1997 and called *Orthorexia* (Dunn & Bratman, 2016). Even though orthorexia is not defined as psychiatric disorder, this behavior is usually followed by impairment in quality of life. Also, this eating pattern overlaps with obsessive-compulsive disorder, as well as other eating disorders (Donini, Marsili, Graziani, Imbriale, & Cannella, 2004).

Eating disorders

In some cases, extreme regime regarding eating behavior can reach criteria for the diagnosis of an eating disorder. Eating and feeding disorders are characterized by eating disturbances which lead to changes in food consumption. Those eating patterns impair physical health and/or psychosocial functioning (American Psychiatric Association, 2013). Eating disorders include anorexia nervosa, bulimia nervosa, and binge eating disorder, as well as pica, rumination and avoidant/restrictive food intake disorder. Also, in 5th edition of Diagnostic and Statistical Manual of Mental Disorders (DSM 5) the category called "other

specified feeding and eating disorders" replaced category "eating disorders not otherwise specified", which helps in classification of those who do not meet all criteria for one of the previously mentioned diagnoses (American Psychiatric Association, 2013).

Eating disorder diagnoses share some features, but can also be distinguished based on some other characteristics. Anorexia nervosa is characterized by extremely decreased energy intake, intensive fear of gaining weight and disturbance in perceived body image – with low body mass index as the central feature (American Psychiatric Association, 2013; Zipfel, Giel, Bulik, Hay, & Schmidt, 2015). Diagnostic criteria for bulimia nervosa are episodes of overeating with inappropriate weight-gain compensation methods, at least once a week for three months. These are followed by self-evaluation based on body shape and weight (American Psychiatric Association, 2013). For binge eating disorder diagnosis, overeating episodes should occur at least once a week through a three-month period with a sense of losing control and followed by personal distress (American Psychiatric Association, 2013).

Not all eating disorders have the same prevalence rate. For example, systematic review by Lindvall Dahlgren, Wisting and Rø (2017) showed that for females, the point prevalence of anorexia nervosa ranged from 0.06 to 1.2 %, of bulimia nervosa from 0.45 to 8.7 % and of binge eating disorder around 4 %. When examining lifetime prevalence, anorexia nervosa ranged from 0.8 to 1.9 %, bulimia nervosa around 2.6 % and binge eating disorder around 3 % (Lindvall Dahlgren et al., 2017). It may seem that eating disorders are not so common in the general population, but many people might experience eating concerns and disordered eating.

In order to lose weight and reshape the body, several methods can be used. Firstly, nowadays many different types of diets are being promoted by the media or nutrition experts. However, dieting behavior is positively connected with binge eating disorder risk (Amianto et al., 2015; Vervaet, Van Heeringen, & Audenaert, 2004). One can overeat in order to compensate for the previous caloric deficit, as well as a result of control disruption (Stice, Presnell, & Spangler, 2002). Secondly, some use the excessive physical activity as a method for weight loss. It has been suggested that exercise could represent a way in which eating

disorder patients deal with anxiety (Holtkamp et al., 2004), and not just a way of expending calories (Taranis, 2010). Overall, weight and shape overvaluation, together with dietary restraint and compensatory exercising, have been found to be reciprocally connected over time (Taranis, 2010). In addition, weight control behavior can also differ between eating disorder diagnoses. Patients who suffer from purgative (using compesatory behavior to eliminate ingested food) anorexia nervosa and bulimia nervosa exhibit more emotional and externally provoked eating, higher novelty seeking behavior and more impulsiveness than the restrictive (reducing energy intake) type of anorexia nervosa (Vervaet et al., 2004).

It is more common for women to have a desire to lose weight and pursue thin idealization, which can be dangerous for health. In men, masculinity has been shown to negatively correlate with eating disorder symptoms (Blashill, 2011). Dieting was found to be more prevalent in females than males, but the rate of dieting in men increases through their twenties (Neumark-Sztainer, Wall, Larson, Eisenberg, & Loth, 2011). Furthermore, even though prevalence rates varied across the research, a generally higher prevalence of binge eating disorder was also found among women rather than men (Lindvall Dahlgren et al., 2017).

Some sociocultural factors might have an impact on how men and women perceive ideal body shape. In almost all cultures women consider thinner figure to be more attractive to men, which differs from what men actually report. Also, in American culture women tend to be less satisfied with their body image than in any other culture, which can partially be explained with media's ideal body portrayals (Swami et al., 2010). Women who approve of traditional gender ideology are more prone to pursuing thinness, which makes them at higher risk for developing an eating disorder (Magallares, 2016). Nevertheless, findings indicate that even athletic-ideal internalization is connected with eating restraints and bulimic symptoms (Bell, Donovan, & Ramme, 2016). Since society believes that men should be muscular and that eating disorders are female related, men have difficulties in recognizing and reporting some problematic behavioral patterns related to eating concerns. The most common is compulsive exercising (Strother, Lemberg, Stanford, & Turberville, 2012). In

addition, most of the instruments for eating disorder assessment were developed for females, indicating that more men-specific scales should be constructed (Darcy & Lin, 2012).

Some personality traits are considered to be connected with the higher risk of developing an eating disorder. According to the recent meta-analysis (Farstad, McGeown, & von Ranson, 2016), strong predictors of eating disorder risk are perfectionism, rigidity, orderliness, and need for control, as well as high neuroticism and low extraversion. Some other consistent predictors include emotional regulation, anxiety, and paranoia (Farstad et al., 2016). Also, some factors that contribute to eating disorder pathology development can be seen in the family environment. Marital conflict seems to be connected with eating disorder development, but the mediating role of high control and the low warmth parent-child relationship has been found as well (Blodgett Salafia, Schaefer, & Haugen, 2014). Dysregulation of parenting functioning can lead to ineffective coping strategies, which results in behavioral expression through eating disturbances (Blodgett Salafia et al., 2014). Furthermore, it is important to emphasize that some cultural determinants also play a role. For example, body dissatisfaction, perceived pressure to be thin and thin-ideal internalization are found to be risk factors (Rohde, Stice, & Marti, 2015). The best evidence for the cultural influence of eating disorder development is the island of Fiji. After the television has been introduced into the everyday life of Fiji inhabitants, the rate of anorexia and bulimia cases has increased more than twice (Keel & Forney, 2013).

Perfectionism and eating disorders

The connection between trait perfectionism and personality pathology is considered robust (Sherry, Hewitt, Flett, Lee-Baggley, & Hall, 2007). Also, the connection between eating disorders and perfectionism is well established, especially in the case of anorexia nervosa, while for bulimia nervosa the results are less obvious. When considering dimensions of perfectionism, mostly used classification includes adaptive and maladaptive perfectionism. Maladaptive perfectionism is connected with higher psychological distress and is therefore associated with various psychopathological conditions, such as depression, anxiety and eating disorders (Lo & Abbott, 2013). Adaptive perfectionism, unlike in other

psychiatric conditions, appears to be elevated among eating disorder patients (Bardone-Cone et al., 2007). Therefore, in the case of eating disorders, both achievement-striving and maladaptive perfectionism are present (Bardone-Cone et al., 2007).

Furthermore, self-oriented perfectionism seems to be a significant predictor of eating disorder symptoms, possibly through increased evaluation of shape and weight (Watson, Raykos, Street, Fursland, & Nathan, 2011). The commitment to "food rules" has also been found to be a mediator between the relationship of self-oriented perfectionism and eating pathology (Brown, Parman, Rudat, & Craighead, 2012). Results of these studies indicate that perfectionism is a risk factor for eating disorder pathology and that personal weight goals might play a greater role in the development of eating disorder, rather than socio-cultural expectations. Additionally, treatment of perfectionism might be a helpful tool for the prevention of eating disorders (Egan et al., 2013; Wilksch et al., 2008).

The role of the Internet

One factor contributes to the maintenance of popular "healthy" lifestyle – that is the Internet. Plenty of information is available to us but also imposed through the Internet. We are provided with numerous data that are meant to improve our life quality. However, sometimes the endless possibilities of the online world can create more damage than good. It has been shown that people who are more prone to online searching health information, are usually younger, with higher incomes and higher education level (Koch-Weser, Bradshaw, Gualtieri, & Gallagher, 2010). Furthermore, it is well known that Internet is widely used by adolescents. Its popularity regarding eating concerns can be seen in the fact that around 40 % of adolescents search diet advice when using the Internet for health reasons (Rodgers, Skowron, & Chabrol, 2012). In addition, as much as the Internet can help in dealing with everyday issues, it can also prompt and reinforce some problems if information sources are chosen badly.

Young people sometimes want to know about others who are in the same situation as them, and therefore, seek support online. Unfortunately, unlimited freedom and possibilities of the Internet allowed the creation of websites that promote anorexia and

bulimia as a lifestyle. Communities that don't perceive anorexia and bulimia as dangerous eating disorders are formed and gathered on websites called *Pro-ana* and *Pro-mia*. Participants of these websites state that, for them, an eating disorder is inseparable from their identity (Csipke & Horne, 2007). There is a rising concern regarding the influence of mentioned websites on a recovery of eating disorder patients. It has been found that exposure to these websites leads to impairment of self-esteem and body image (Bardone-Cone & Cass, 2007; Tiggemann, Churches, Mitchell, & Brown, 2018). When examining why young people participate in *Pro-ana* and *Pro-mia* websites, multiple reasons appear on the surface. They perceive these websites as supportive, safe place, where personal issues regarding weight loss can be put forward without a feeling of condemnation (Mulveen & Hepworth, 2006). Since online support seeking is usually not approved by clinicians nor family members, "pro-anas" often visit these sites in secret. It is also common that finding comfort online eventually leads to decreased support seeking offline – within the family and close friends (Haas, Irr, Jennings, & Wagner, 2011). These websites remain to exist and contribute to eating disorder pathology maintenance, despite the effort to eliminate them (Chesley, Alberts, Klein, & Kreipe, 2003).

When talking about the online world, it has been found that 15% of current and 35% of lifetime eating disorder patients are prone to problematic Internet use, defined as uncontrollable, time-consuming and life-quality impairing behavior (Shapira et al., 2000). Social media has become very popular in the last years, but their contribution to body dissatisfaction might be worrisome. It has been shown that time spent on the Internet is positively correlated with a drive for thinness and body surveillance, while Facebook users had significantly greater body image concerns (Tiggemann & Slater, 2013). Especially concerning are Pro-Eating Disorder websites and the exposure to them has an effect on dieting behavior, body dissatisfaction, and negative affect, although not on bulimic symptoms (Rodgers, Lowy, Halperin, & Franko, 2016).

Furthermore, weight loss advice are usually intended for those who struggle with being overweight. Thus the Internet is considered to be a useful tool for weight loss interventions and programs (Weinstein, 2006). However, obese individuals are prone to

relying on quick, unrealistic weight loss advices presented on certain websites (Lewis et al., 2011). The underlying problem could be the lack of nutrition knowledge among those who suffer from eating disorder or want to lose weight. Some findings indicate that adolescents with an eating disorder, as well as their parents, don't have enough basic knowledge about nutrition and "healthy" diets (Castillo, Feinstein, Tsang, & Fisher, 2015).

To our knowledge, no research has yet explored the relationship between topics searched on Internet and eating disorder symptoms. It would be of great interest to examine online searching behavior related to food and health in general. Yet, little is known about what kind of searching behavior differentiates between individuals who are at risk and those without risk of developing an eating disorder.

The aim of the study

The aim of this study was to examine the differences in Internet searching behaviors between women who are at risk for development of an eating disorder and those who do not show enough symptoms for that diagnosis. More specific, the aim of this study was to determine what topics are more commonly being searched online by women who experience symptoms of an eating disorder. Since eating disorder patients more often use websites that promote eating disorders (Wilson, Peebles, Hardy, & Litt, 2006), it seems intuitive that women at risk for eating disorder development will search for eating disorder-related topics (such as dieting, exercise, etc.) more frequently. Also, women who show risk for development of an eating disorder could use the Internet in order to search for symptoms they notice in their own behavior. Since women usually search the Internet topics related to nutrition value of food, diets, exercise and body image, the idea of this research was to find out which of the mentioned areas represent the bigger concern for those who experience symptoms of eating disorder. It would be important to examine which of these topics is more relevant for someone with the potential eating disorder, especially since no research was yet conducted on this subject. Also, it might be beneficial to identify in which aspects of disordered eating these frequencies of online searching topics differ the most.

Finally, finding out what aspect of perfectionism contributes to online searching for eating disorder-related topics might be important if this behavior characterizes disordered eating. Adaptive and maladaptive perfectionism might be positively correlated with searching for these topics on the Internet due to the fact that perfectionistic tendencies are positively correlated with motivation for goal achievement (Watson et al., 2011), which could induce online searching for methods that will help a person in attaining that goal. Furthermore, anxiety is connected with both perfectionism and disordered eating (Egan et al., 2013), and is also related to online health information seeking (Eastin & Guinsler, 2006; Watson et al., 2011). This could lead to the assumption that mentioned constructs have anxiety as a background mechanism, which could induce correlation between the two. In recent time online behavior has been attracting scientific attention in general, but also in the area of psychopathology. Therefore, answering some of the previous questions could lead to better understanding of patients' behavior while using the Internet, as well as suggestions of potential modifications of online surrounding connected with eating disturbances.

Problems and hypotheses

In line with the aim of this study, following problems and hypothesis have been appointed:

Problem 1: To determine if topics that include food, diet, exercise, body appearance and eating disorders could differentiate women at risk and non-risk for eating disorder?

Hypothesis 1: The frequency of online searching for all mentioned topics will significantly predict group categorization of risk and non-risk women – those who score 2 or higher and those who score less than 2 on SCOFF screener.

Problem 2: To examine the differences in frequency of online searching topics (food, diets, exercise, body appearance and eating disorders) between those who indicated the presence of specific risk behaviors symptomatic for developing an eating disorder and those who did not.

Hypothesis 2: Since there are no research available related to this problem, we approach it in an exploratory way.

Problem 3: To examine the possibility of prediction of online searching topics related to eating disorders (food, diets, exercise, body appearance and eating disorders) using adaptive and maladaptive perfectionism.

Hypothesis 3: Three perfectionism subscales – Standards, Order and Discrepancy, will be significant predictors of frequency of searching topics related to eating concerns.

Method

Participants

The sample in this research consisted of 228 women from 17 to 66 years of age (*M*=30.5; *SD*=9.43, *Appendix 1*). Participants were mostly recruited on social media and various forums related to food, dieting, and exercise. Furthermore, sample structure according to the educational level, employment status, and partnership status is shown in Table 1. Most of the participants have a high-school degree, while only a slightly lower percentage of them have a Master's degree. More than half of the participants are currently employed and one-third of them are students. Most of the subjects report being in a relationship, as well as being married.

Table 1
Percentages of subjects according to the educational level, employment
and partnership status (*N*=228)

		% of subjects
Educational level	High-school	32.5
	Bachelors	23.3
	College	8.8
	Masters	29.4
	PhD/Specialization	6.1
Employment status	Employed	51.8
	Unemployed	13.2
	Retired	1.3
	College students	32
	High-school students	1.8
Partnership status	In relationship	35.1
	Married	33.3
	Single	28.1
	Divorced	3.5

Participants also provided answers on questions regarding dieting behavior, former and current eating disorder diagnosis (Table 2). More than one third of subjects reported being on a diet while participating in this research. Majority of participants didn't suffer from eating disorder in the past and report not having current eating disorder diagnosis. Among reported diagnosis, binge eating disorder appears to be more common than anorexia and bulimia, as expected.

Table 2
Percentages of subjects in each category of the variables: current dieting, former eating disorder diagnosis and current eating disorder diagnosis (*N*=228)

		% of subjects
Dieting	Yes	36.8
	No	62.7
Former eating disorder diagnosis	None	87.3
	Anorexia	2.2
	Bulimia	3.9
	BED	5.7
Current eating disorder diagnosis	None	92.5
	Anorexia	0.4
	Bulimia	0.3
	BED	5.3

Legend: BED – Binge Eating Disorder

Measures

 SCOFF questionnaire (Sick, Control, One stone, Fat, Food; Morgan, Reid, & Lacey, 1999) is used for selection of individuals with higher risk for development of an eating disorder. This questionnaire has been translated from English into Croatian language (Mestrovic, 2014). SCOFF consists of five questions with yes/no answers (see Table 4, p.p. 15). Questions are related to baseline symptoms of eating disorder, such as compensational behavior, feeling of losing control, sudden weight-loss, distorted body image and food preoccupation. Name "SCOFF" is an acronym for key areas covered by each question – *Sick*, *Control*, *One stone*, *Fat,* and *Food*. If the answer to at least two questions is positive, it is likely that person has an eating disorder (Botella, Sepúlveda, Huang, & Gambara, 2013). This questionnaire by itself cannot serve for diagnostic purposes due to the possibility of falsely classifying someone as eating disorder positive, but it is simple and very efficient in recognizing people with eating disorder symptomatology (Botella et al., 2013). Cronbach's alpha coefficient of internal consistency has shown to be from $\alpha = .47$ to $\alpha = .66$ in previous research (Lichtenstein, Hemmingsen, & Støving, 2017; Richter, Strauss, Braehler, Adametz,

& Berger, 2017; Wan Wahida, Lai, & Abdul Hadi, 2017). In this study, exploratory factor analysis yielded a one factor solution which explained 41% of variance. Cronbach's alpha was .63.

Almost Perfect Scale-Revised (*APS-R*; Slaney, Rice, Mobley, Trippi, & Ashby, 2001) is an instrument measuring perfectionism with 23 items on the 7-point Likert scale. APS-R is a questionnaire consisting of three factors: *High Standards, Order* and, *Discrepancy. High Standards* (7 items) represent need for achievement (e.g. *I expect the best from myself*), *Order* (4 items) need for orderliness (e.g. *Neatness is important to me*), and *Discrepancy* (12 items) measures difference between expected standards and real achievements (e.g. *I often feel frustrated because I can't meet my goals*). *High Standards* and *Order* are indicators of adaptive perfectionism, while *Discrepancy* measures maladaptive perfectionism. Internal consistency of the subscales measured as Cronbach's alpha ranged from .73 to .93 (Nakano, 2009; Chan, 2011; Slaney, Rice, & Ashby, 2002). In this research, exploratory factor analysis yielded a three factor solution which explained 34.4, 19.3, and 10.8% of variance. Cronbach's alpha for subscales were .84, .88 and .94.

Check-list of topics related to eating disorders was designed to assess how frequent do participants search terms related to the following topics on the Internet: *food, diet, exercise, body appearance* and *eating disorder*. There were four answering options: *never, rarely, sometimes* and *often*. Each of the five items was accompanied with a question: "Please, write down some of the terms related to this topic that you search online". Participants could write down terms on a blank line. The frequency of searching each topic are combined into a total result, since exploratory factor analysis yielded a one factor solution which explained 50%. Cronbach's alpha was .75. This new variable indicates how often one uses the Internet for searching topics related to eating concerns and weight-loss methods. However, the frequency of searching each topic can be used alone for some analyses. In this study, both total score and score for each topic has been used.

Sociodemographic data.- Participants responded to questions regarding their age, educational level, employment status and partnership status. Also, participants were asked about their frequency of Internet usage in general and specifically for searching information

12

about diseases, symptoms, and topics related to food, exercise, etc. At the end of a survey, participants answered questions about their height, weight, current dieting behavior, former eating disorder diagnosis and current eating disorder diagnosis.

Cyberchondria Severity Scale (*CSS*; McElroy & Shevlin, 2014) was also used during data collection, but it is not a part of this research design.

Procedure

Data collection was conducted online, using the website *SurveyMonkey,* in February and March of 2018. Invitation to participate in research was send via social media (e.g. *Healthy food recipes*, *UN diet*, etc.) aiming at women older than 16 years of age, who live in Croatia. Participants were asked to share the survey link and to invite their friends to participate as well. On the beginning of survey, general instructions were written, including the name and the e-mail address of researcher. Instructions included a description of the purpose of the study, formulated as the *examination of relationship between using the Internet and various behaviors related to health and food*. The anonymity of the participants was guaranteed, as well as the possibility to terminate participation at any moment. First, subjects had to fulfill sociodemographic data. Then, an elimination question was presented, *Have you ever used the Internet as a source of information about diet programs, exercise and body appearance?* on which they had to answer positively in order to continue with participation. After that, CSS questionnaire and online searching topics questions were presented to the subjects, followed by APS scale and SCOFF screener. In the end, the participants had to answer questions about height, weight, dieting and eating disorder diagnosis. The duration of participation was estimated to be around 15 minutes. After the data were collected, analyses showed that completion rate, among those who entered the survey, was around 76 %.

Results

Descriptive statistics

The descriptive statistics of the main variables in this study are presented in Table 3. Using reported measures of weight and height, variable BMI (*Body Mass Index*) was calculated for each participant and also shown in the table below. The distribution of all variables is statistically different from normal ($p<.001$). These distributions are mostly positively asymmetric, except for the distribution of Standard and Order subscales, which are more negatively asymmetric. Average BMI score was 23.34, which indicates that participants are normal weighted, moving towards higher boundary of that category (25). In case of SCOFF result, the frequency of subjects at each class decreases with total result increasing. The cut-off score for SCOFF is 2, which means that participants who scored 2 or higher are considered at risk for an eating disorder. SCOFF results indicate that 43.4 % of participants score 2 or higher, which means they are at increased risk for developing an eating disorder.

Table 3

Descriptive statistics for the variables SCOFF, APS-R subscales of perfectionism (Standards, Order and Discrepancy), check-list of topics related to eating disorders total score and BMI (Body Mass Index; *N*=228)

	range	*M*	*SD*	*K-S*	skewness	kurtosis
SCOFF	0-5	1.43	1.39	.199[***]	.68	-.49
Perfectionism						
Standards	13-49	37.43	6.67	.089[***]	-.67	.39
Discrepancy	12-84	40.72	16.64	.108[***]	.601	-.509
Order	6-28	21.40	4.89	.132[***]	-.765	-.04
Check-list of topics related to eating behavior	5-20	10.92	3.75	.102[***]	.29	-.65
BMI	15.57-42.58	23.34	4.25	.106[***]	1.36	2.71

Legend: *K-S* – Kolmogorov-Smirnov test; [***]*p*<.001

Participants provided their answers on check-list about online searching for eating disorder-related topics. Percentages of frequencies of searching these topics are presented in Table 4, where it can be observed how often women search for each topic online. Eating disorders are most rarely searched topic comparing to other topics, whereas exercise is the most common area that participants searched online.

Table 4
Percentages of answers on each topic in online search check-list (*N*=228)

topics	% of answers			
	never	*rarely*	*sometimes*	*often*
Food	29.8	20.2	23.2	26.8
Diets	36.0	21.5	17.1	25.4
Exercise	18.4	25.0	26.8	29.8
Body appearance	36.8	28.9	20.2	14.0
Eating disorders	77.2	14.5	6.1	2.2

Discriminant analysis

Discriminant analysis on five items of searching topics check-list has been conducted in order to differentiate between two groups of participants (Table 5). The Box's M was statistically significant (p<.05), but the analysis with a separate-groups covariance matrix showed the same group classification results. The analysis resulted in one discriminant function, whose value is statistically different for risk and non-risk women, Wilks' Lambda = .833, χ^2 (5, *N* = 228) = 40.81, *p* < .001. However, Wilks' Lambda parameter suggests that groups, after all, do not differ a lot since its value is close to 1. Group centroid of risk women is .509 and of non-risk women -.390, meaning that risk women score higher on discriminant function. Discriminant function correctly classified 71.3% of the non-risk group and 67.7% of risk group. Overall, 69.7% of original group members were classified correctly using discriminant function. Since originally there was a chance of 56.6% for correct group classification, using the discriminant function these chances for correct prediction increased by 13.1%.

Table 5
Contribution of topics searched online to differentiation of risk ($N = 99$) and non-risk
($N = 129$) participants determined by discriminant analysis

	Wilks' Lambda	*F*	*Coefficient*	*Correlation*
Food	.866	26.678***	.573	.877
Diet	.908	26.821***	.219	.713
Exercise	.938	9.186**	.050	.576
Body appearance	.925	11.309***	.324	.636
Eating disorders	.963	11.701***	.243	.438

Legend: **$p < .01$; ***$p < .001$; *Coefficient* – standardized saturation of discriminant function; *Correlation* – correlation coefficients between each discriminant variable and discriminant function.

Moreover, *F* ratio for each discriminant variable is statistically significant, which indicates that two groups can be distinguished by each of the topics searched online (food, diet, exercise, body and eating disorders; Table 5). The value of all coefficients and correlations are positive, meaning that higher score on each variable indicates higher score on the function. Both the coefficient and the correlation were the highest for searching about food. This topic predicts group classification better than other topics (diet, exercise, body appearance, and eating disorders). According to differences between coefficients and correlations in Table 5, it can be concluded that searching about diets, exercise and eating disorders explain similar proportion of variance as searching about food. In contrary, searching about body appearance predicts group classification well, and somewhat more independently than previously mentioned topics.

Analysis of SCOFF items

Following results answer the second problem in this study. SCOFF questionnaire consists of five items that describe eating disorder symptoms (Table 6), which differ in their severity. Because of that, the frequencies of searching each topic were compared between

participants who answered *Yes* and those who answered *No* on each SCOFF item using a mixed design analysis of variance. Frequency of searching each topic was defined as dependent variable. Also, answer on each SCOFF item was defined as between-subjects factor while the topics were defined as within-subjects variables (Table 7).

Table 6
Percentages of Yes and No answers to each of SCOFF questions (*N*=228).

Questions	Answers in %	
	Yes	No
Do you make yourself sick because you feel uncomfortably full?	10.5	89.5
Do you worry that you have lost control over how much you eat?	42.5	57.5
Have you recently lost more than one stone in a 3 month period?	20.2	79.8
Do you believe yourself to be fat when others say you are too thin?	31.6	68.4
Would you say that food dominates your life?	37.7	62.3

It can be observed that within-subjects F ratio is significant (*p*<.001) for each SCOFF item, which means that the frequencies of searching topics are different for each symptoms of eating disorder. According to the pairwise comparisons, searching about eating disorders was the least searched area in every symptom, while other topics show very little or no difference in frequency of searching. Furthermore, between-subjects F ratios indicate that participants who answered positively to each SCOFF question, searched more frequently topics related to eating disorders. Finally, when observing the interaction F ratios in the Table 7, it is noticeable that only *One stone* and *Food* item in SCOFF show significant interaction (*p*<.001). These interaction effects indicate that searching about food and diets differentiates between participants who answered *Yes* and *No* on mentioned questions in a greater way than searching about other topics. Whereas in other SCOFF items exercise was the most searched topic in both groups (those who answered *Yes* and those who answered *No*), in One stone question the frequencies of searching about food and diet were the highest.

Likewise, those who answered *Yes* in *Food* question searched about food more than about other topics, while searching about diet and exercise had approximately the same frequency.

Table 7

Results of mixed design analyses of variance with SCOFF items as between-subjects factor and topics as within-subjects variables (*N*=228).

SCOFF items	Within-subjects F (df)	Between-subjects F (df)	Interaction F (df)
Sick	24.24^{***} (4, 904)	11.26^{**} (1, 226)	1.22 (4, 904)
Control	86.67^{***} (4, 904)	18.20^{***} (1, 226)	0.70 (4, 904)
One stone	80.38^{***} (4, 904)	28.12^{***} (1, 226)	9.30^{***} (4, 904)
Fat	78.91^{***} (4, 904)	12.87^{***} (1, 226)	0.77 (4, 904)
Food	87.77^{***} (4, 904)	39.94^{***} (1, 226)	5.61^{***} (4, 904)

Legend: $^{**}p<.01$; $^{***}p<.001$; F – F ratio; df – degrees of freedom

Correlation

Pearson's correlation coefficients are calculated between the main variables. Correlation matrix presented in Table 8 provides an insight into connections between variables, which could be used in the interpretation of regression analysis demonstrated later in this section.

Table 8
Pearson's correlation coefficients for variables: SCOFF, check-list and APS-R factors
(Standards, Discrepancy and Order) ($N = 228$)

	SCOFF	check-list of topics	Standards	Discrepancy	Order
SCOFF	—				
Check-list of topics	.456[***]	—			
Standards	-.092	-.116	—		
Discrepancy	.339[**]	.174[**]	.176[**]	—	
Order	-.009	-.012	.241[***]	-.097	—

Legend: [**]$p<.01$; [***]$p<.001$

Table 8 shows that, regarding perfectionism, only subscale Discrepancy is correlated both with SCOFF and searching topics. Women who score higher on maladaptive perfectionism subscale will more likely have symptoms of an eating disorder and will more frequently search for topics related to eating concerns. Also, SCOFF score is positively connected with the check-list result. This implies that women who are at risk for development of an eating disorder more often search topics related to eating on the Internet. These findings are in accordance with the hypotheses of this study.

Hierarchical regression analysis

In order to find out what variables can significantly predict the frequency of online searching topics, hierarchical regression analysis was conducted. The assumption of multicollinearity absence is confirmed (*VIF* < 10; *Tolerance* > 0.1). Total score on check-list is used as the criterion variable, with predictor variables entered in three steps (Table 9). In the first step, age is included as a predictor and significantly predicts ($p<.01$) online searching frequency. The facets of perfectionism are introduced as predictors in the next step. Only the subscale Discrepancy has a statistically significant beta-ponder ($p<.01$). Finally, in the third step, the SCOFF score was introduced as the predictor was significant

($p<.001$). It can be noticed that beta-ponder of Discrepancy became insignificant after SCOFF result was added as predictor, whereas age remained as a significant predictor ($p<.05$). This change in beta-ponders could indicate potential mediation. These results could indicate Discrepancy is not contributing alone to the explanation of the check-list score, rather that they are connected through SCOFF result, which explains the significant amount of variance in criterion variable.

Table 9
Results of hierarchical regression analysis with check-list of topics result as the criterion ($N=228$)

	Step 1 β	Step 2 β	Step 3 β
Age	.196**	.197**	.153*
Standards		-.116	-.055
Discrepancy		.223**	.065
Order		.036	.009
SCOFF			.415***
R	.196	.301	.487
R^2	.038	.090	.237
ΔR^2		.052	.146
ΔF	8.887**	4.192**	41.99***

Legend: *$p<.05$; **$p<.01$; ***$p<.001$

In order to test the potential mediating effect of SCOFF result, PROCESS macro for SPSS (Hayes, 2012) was used. Results are shown in Table 10. Total, direct and indirect effects were tested. Total effect accounts for overall prediction of criterion with two variables – Discrepancy and SCOFF score. This effect is shown to be significant ($p<.01$). Furthermore, this effect can be decompensated into direct and indirect effect. Direct effect stands for connection between predictor (Discrepancy) and criterion (SCOFF result) without any mediator. In this case, the direct effect is not significant ($p>.05$), meaning that

20

Discrepancy does not predict check-list score alone. On the other hand, the confidence interval of indirect effect does not include absolute zero, which indicates that this effect is statistically significant with 95% level of confidence. Therefore, SCOFF score, as a mediator, is connected with both Discrepancy and frequency of online searching.

Table 10
Results of the analysis using SCOFF result as a mediator between Discrepancy and total score on check-list of topics searched online related to eating disorders
(*N*=228)

	coefficient	*t-values*	*Bootstrap 95% CI*
Total effect	.039	2.66[**]	
Direct effect	.005	.351	
Indirect effect	.034		[.021; .049]

Legend: [**]*p*<.01

Discussion

In eating disorder research, scientists became interested in websites that promote various weight-loss methods and encourage disordered eating. Many studies have been conducted in order to examine effects of these websites on one's psychological well-being and to raise awareness about the potential damage that exposure to such websites might have on individuals with higher risk for developing an eating disorder (Branley & Covey, 2017; Rodgers et al., 2016; Talbot, 2010). However, little is known about the online searching behavior of those struggling with eating concerns. To our knowledge, this study is the first to investigate the differences in Internet searching behavior between women who show risk for eating disorder and those who do not. Topics that people with eating issues usually search for on the Internet are related to weight-loss methods. These areas were covered by five terms that were investigated in this research: food, diets, exercise, body appearance and eating disorders.

Around 43 % of women in this study are considered at risk for an eating disorder according to SCOFF screener. Previous research demonstrated lower rate of those at higher risk for an eating disorder development, to be precise: 9.3 % (Garcia et al., 2010), 10 % (Richter, Strauss, Braehler, Adametz, & Berger, 2017), 15 % (Sanchez-armass et al., 2016), 28 % (Lichtenstein, Hemmingsen, & Støving, 2017), etc. Prevalence of risk individuals is much higher than in general population. Research by Mcbride et al. (2013) emphasizes that, as a screening tool, SCOFF is prone to overestimation of eating disorder risk. However, this proportion of women with higher eating disorder risk could also be explained by self-selection of participants, since those who are more willing to participate in a study are presumably more interested in the topic. Percentage of women who are dieting is 36.6 %, which could explain why so many participants are considered at risk according to SCOFF. Previous research also show that dieting behavior can lead to an eating disorder (Liechty & Lee, 2013). It is possible that, while following certain diet program and restriction, these women could have increased food focus and preoccupations, which some findings also indicated (Jones & Rogers, 2003; McElroy et al., 2016). Furthermore, one of the questions in SCOFF relates to weight-loss, which is expected for those who are dieting. Duncan, Ziobrowski, and Nicol (2017) have also reported this finding in case of bulimia and binge eating disorder. Knowing that anorexia diagnosis requires low BMI and in our study BMI tends to be higher, participants in this study are probably more prone to development of bulimia and binge eating disorder. In that case, we might conclude that focus of participants potentially affected by these disorders is mainly centered around food, when comparing them with non-risk participants.

Women with a higher risk of developing eating disorder more frequently search eating disorder-related topics on the Internet, including food, diets, exercise, body appearance and eating disorders. These findings confirm the first hypothesis defined in this study. Discriminant analysis showed that searching topics related to food differentiates between two groups somewhat more than searching other topics. Women who show an increased risk for eating disorders seem to have eating concerns. This seems intuitive since

the focus of eating disorder patient is mainly centered around feeding process, including the amount, nutritive value and quality of food (Racine, 2018).

After analyzing differences in frequency of online searching five topics for each aspect of disordered eating behavior, it can be concluded that searching about topics is more common behavior among participants who answered positively on each SCOFF question. Nevertheless, searching about food and diets differentiates participants who lost six kilos in the last three months even more than searching for other topics. Similarly, participants who report food domination in their life can be distinguished from those who do not in a greater way by the frequency of searching about food and diets. It appears that these two topics differentiate women with mentioned symptoms from those who do not experience them better than other topics.

After the participants estimated how frequently they use the Internet for searching each topic, they could also write down some of the terms they most often seek online. Some terms appeared more frequently than others. For instance, when searching about food, participants often use terms such as "proteins", "carbohydrates", "calories", as well as names of some fruits. It appears that these women are mostly concerned about nutritional value of food they consume, possibly to achieve weight-loss. When being asked about diet topics they search online, terms like "intermitted fastening", "ketogenic diet" and "paleo diet" were reported most often. In terms of exercise topic searching, participants most often used terms "cardio", "HIT", "yoga", but also some specific body parts exercises. Women in this study also search terms related to body appearance, such as "fitness", "plus-size", "abs" and "biceps". Eating disorder topic was most rarely searched among these participants, but those who reported seeking for some terms, often used words like "anorexia", "bulimia" and "pro-ana". It can be observed that participants in this research mainly search for terms connected with weight-loss options on the Internet.

In addition, these results shed a light on food online searching as being the primary indicator of differences between risk and non-risk women. Many studies (Branley & Covey, 2017; Mulveen & Hepworth, 2006; Rodgers et al., 2016; Talbot, 2010) have been conducted in order to investigate the impact of pro-eating disorder websites. In terms of online

23

searching, results of this study demonstrate that seeking information about food is the crucial behavior that indicates eating disorder risk, more than searching for eating disorder symptoms and diagnosis. This opens a new question – how can we control what someone searches on the Internet in order to help them? Shutting down pro-eating disorder websites is attainable, but will that make a big difference for those with higher eating disorder risk? It appears that it would be more beneficial to control the websites that contain information about macronutrients and calories in general since that is what risk women search more frequently than non-risk women. Such websites should include information about potential risks of following a certain diet or changing food choice in general. However, the issue of making a positive impact with this information still has to be explored.

Hierarchical regression analysis showed that maladaptive perfectionism, and not other forms of perfectionism, successfully predicts result on check-list of searched-for eating disorder related topics. Age was used as sociodemographic measure, and hierarchical regression showed that it is also a significant predictor of searching eating disorder-related topics online. This indicates searching about topics related to eating concerns is more common behavior for women who are older. All in all, the third hypothesis in this study is partially confirmed. Those participants who are prone to maladaptive perfectionism more often searched mentioned topics on the Internet. Maladaptive perfectionism was shown to correlate positively with problematic internet use in previous research also (Lehmann & Konstam, 2011).

However, when result on SCOFF screener is included in a final step of hierarchical regression analysis, the contribution of Discrepancy becomes insignificant. Mediation test indicates that eating disorder symptoms represent a mediator between Discrepancy and online searching about eating related topics. Therefore, Discrepancy itself is not connected directly with online searching because eating disorder symptoms explain this relationship more appropriately. The possible explanation is that those women who are higher in maladaptive perfectionism will experience some disordered eating symptoms, which is in accordance with the previously established maladaptive perfectionism is positively connected with eating disorder symptoms (Boone, Soenens, Braet, & Goossens, 2010).

Those symptoms might induce more frequent searching for topics related to eating disorders on the Internet. Bardone-Cone et al. (2007) also indicate that, if desired outcomes are unmet, increase in negative affect and aversive self-awareness might occur. That consequently could lead to binge eating as a way of escape (Bardone-Cone et al., 2007). Also, some findings indicate that worry about imperfection is, among other types of perfectionism, the most significant predictor of disordered eating (Czepiel, 2018). Therefore, it is possible that maladaptive perfectionism leads to increased negative affect, which could induce eating disorder symptoms, and consequently online searching for information related to eating concerns and weight-loss methods.

Limitations and recommendations for future research

This study has several limitations. First, the sample of women on which the data was collected is not representative. Although these women vary by age, educational level, etc., many of them were recruited from social media groups that include food and dieting topics. As expected, women with these interests were more likely to participate in this study due to their high motivation for this area. Along with this, it is possible that those who withdrew from the study at some point, are those who may have some personal issues related to this topic and find it too exhausting and revealing to participate all the way. Furthermore, this research was conducted online, which means that researchers don't have an insight into subjects involved or in participation process.

Some constraints come from questionnaires used in this study. For eating disorder identification SCOFF screener was used. SCOFF consist of only five questions measuring symptoms of eating disorder, which helps in classification of those with low and high risk for development of this condition. Therefore, risk and non-risk groups were created based on total score, even though these groups may not differ. Only one number in total score can distinguish two groups, which are then presented as two completely different populations across the research. Mcbride et al. (2013) suggest using classes of participants according to eating disorder symptoms in order to avoid common dichotomous view about healthy and

affected population. In addition, some research (Sanchez-armass et al., 2016; Mond et al., 2008) emphasize SCOFF's brevity, but also warn about the possibility of false-positively classified cases. Also, a measure of BMI was used in this study as a controlling variable. However, Engen, Mathisen, and Sundgot-Borgen, (2017) suggest that BMI is not a good measure of physical appearance since unhealthy fat mass can be disguised by a "healthy" BMI.

According to the literature, this is the first study that examines the relationship between eating disorder symptoms and topics searched on the Internet. This study should encourage further interest in this area of research because many questions arose. For example, what impact does Internet searching have on eating disorder development and how can it be used to enhance treatment? The Internet represents a safe place where people can open their minds and feel protected by doing so. That is why more attention should be devoted to investigating online searching behavior, especially among young people in whose everyday life Internet presents an extremely important factor. Since food, diets, exercise, body appearance and eating disorders are topics more frequently searched online by women with higher risk for disordered eating, information on the Internet should be presented correctly and with caution. There are some websites that promote various types of dieting and some "magical" food that helps in accelerating the weight-loss process. Therefore, women should be educated about nutrition in order to be more critical about these sources of information, because that could make a great impact on one's eating behavior. People, in general, should improve their health information literacy in order to prevent potential concerns that might arouse from reading health-related information on non-expert-based websites. Finally, more research regarding online searching behavior among those with a higher risk for developing eating disorder should be conducted to understand, and perhaps explain these complex processes that are behind disordered eating.

Future research should examine in what situations people with a risk of developing an eating disorder use the Internet for seeking food information. Perhaps online searching for weight-loss methods occurs after one experiences some symptoms of disordered eating. This assumption could be tested in future studies. Also, check-list of topics related to eating

disorders could be expanded with more items to create a wider range of results, which could lead to a better distinction of online searching frequency. For instance, topic related to food could be expanded into items "calories", "proteins", etc. Also, answering option could be defined as the frequency of searching topics, so that participants could provide information about the exact frequency of seeking each term. For example, the frequency could be estimated as a number of searches in the past two weeks or so. In that case, researchers could avoid different perceptions of what, e.g., "often" actually stands for since its meaning is prone to subjective interpretation.

Furthermore, the longitudinal approach would be of great importance since it could lead to better understanding of interactions between online searching behavior and eating disorder symptoms. The question remains – do eating disorder symptoms cause increased online searching for weight-loss methods, or, do information found on the Internet induce negative affect and anxiety, which leads to eating concerns and indirectly to disordered eating? Future research should be designed to answer these questions because obtained answers would lead to better interventions in terms of helping eating disorder affected individuals and preventing diagnosis evolvement of ones at risk.

Conclusion

The objective of this study was to examine which topics that women usually search on the Internet can distinguish those at risk from those without risk for developing an eating disorder. The aim was also to determine what aspect of perfectionism can predict the frequency of online searching for eating disorder-related topics.

Results showed that women with risk and those without risk for developing eating disorder can be distinguished by frequency of online searching about food, diets, exercise, body appearance and eating disorders. Women with a risk of eating disorder development more often seek information on the Internet related to food, diets, exercise, body appearance and eating disorders. Although every one of these five topics successfully differentiates between two groups, searching about food terms stands out the most. Therefore, risk and non-risk women can be differentiated the best when comparing them in online searching about food.

Maladaptive perfectionism appears to predict the frequency of online searching better than other subscale of perfectionism measure. The higher the result on maladaptive perfectionism measure, the more often will participants search online information about food, diets, exercise, body appearance and eating disorders. However, this relationship is completely mediated by the severity of eating disorder symptoms. Therefore, women more prone to maladaptive perfectionism will more likely experience disordered eating symptoms, which might increase online searching for eating disorders related topics.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Amianto, F., Ottone, L., Abbate Daga, G., & Fassino, S. (2015). Binge-eating disorder diagnosis and treatment: A recap in front of DSM-5. *BMC Psychiatry*, *15*(1). https://doi.org/10.1186/s12888-015-0445-6

Bardone-Cone, A. M., Wonderlich, S. A., Frost, R. O., Bulik, C. M., Mitchell, J. E., Uppala, S., & Simonich, H. (2007). Perfectionism and eating disorders: Current status and future directions. *Clinical Psychology Review*, *27*(3), 384–405. https://doi.org/10.1016/j.cpr.2006.12.005

Bell, H. S., Donovan, C. L., & Ramme, R. (2016). Is athletic really ideal? An examination of the mediating role of body dissatisfaction in predicting disordered eating and compulsive exercise. *Eating Behaviors*, *21*, 24–29. https://doi.org/10.1016/j.eatbeh.2015.12.012

Blashill, A. J. (2011). Gender roles, eating pathology, and body dissatisfaction in men: A meta-analysis. *Body Image*, *8*(1), 1–11. https://doi.org/10.1016/j.bodyim.2010.09.002

Blodgett Salafia, E. H., Schaefer, M. K., & Haugen, E. C. (2014). Connections Between Marital Conflict and Adolescent Girls' Disordered Eating: Parent-Adolescent Relationship Quality as a Mediator. *Journal of Child and Family Studies*, *23*(6), 1128–1138. https://doi.org/10.1007/s10826-013-9771-9

Botella, J., Sepúlveda, A. R., Huang, H., & Gambara, H. (2013). A Meta-Analysis of the Diagnostic Accuracy of the SCOFF. *The Spanish Journal of Psychology*, *16*, E92. https://doi.org/10.1017/sjp.2013.92

Branley, D. B., & Covey, J. (2017). Pro-ana versus pro-recovery: A content analytic comparison of social media users' communication about eating disorders on Twitter and Tumblr. *Frontiers in Psychology*, *8*(AUG), 1–8. https://doi.org/10.3389/fpsyg.2017.01356

Brown, A. J., Parman, K. M., Rudat, D. A., & Craighead, L. W. (2012). Disordered eating, perfectionism, and food rules. *Eating Behaviors*, *13*(4), 347–353. https://doi.org/10.1016/j.eatbeh.2012.05.011

Castillo, M., Feinstein, R., Tsang, J., & Fisher, M. (2015). An assessment of basic nutrition knowledge of adolescents with eating disorders and their parents. *International journal of adolescent medicine and health, 27(1)*, 11-17. https://doi.org/10.1515/ijamh-2013-0340

Chan, D. W. (2011). Perfectionism among Chinese gifted and nongifted students in Hong Kong: The use of the revised almost perfect scale. *Journal for the Education of the Gifted*, *34*(1), 68–98. https://doi.org/10.1177/016235321003400104

Chelsey, E. B., Alberts, J. D., Klein, J. D., & Kreipe, R. E. (2003). Pro or con? Anorexia nervosa and the internet. *Journal of Adolescent Health*, *32*(2), 123–124. https://doi.org/10.1016/S1054-139X(02)00615-8

Csipke, E., & Horne, O. (2007). Pro-Eating Disorder websites Pro-Eating Disorder websites. *Eating Disorders*, *15*(3), 196–206. https://doi.org/10.1002/erv

Czepiel, D. (2018). Does worry about imperfection predict disordered eating (Master's thesis).

Darcy, A. M., & Lin, I. H.-J. (2012). Are We Asking the Right Questions? A Review of Assessment of Males With Eating Disorders. *Eating Disorders*, *20*(5), 416–426. https://doi.org/10.1080/10640266.2012.715521

Donini, L. M., Marsili, D., Graziani, M. P., Imbriale, M., & Cannella, C. (2004). Orthorexia nervosa: A preliminary study with a proposal for diagnosis and an attempt to measure the dimension of the phenomenon. *Eating and Weight Disorders*, *9*(2), 151–157. https://doi.org/10.1007/BF03325060

Dunn, T. M., & Bratman, S. (2016). On orthorexia nervosa: A review of the literature and proposed diagnostic criteria. *Eating Behaviors*, *21*, 11–17. https://doi.org/10.1016/j.eatbeh.2015.12.006

Eastin, M. S., & Guinsler, N. M. (2006). Worried and Wired: Effects of Health Anxiety on Information-Seeking and Health Care Utilization Behaviors. *CyberPsychology & Behavior*, *9*(4), 494–498. https://doi.org/10.1089/cpb.2006.9.494

Egan, S. J., Watson, H. J., Kane, R. T., McEvoy, P., Fursland, A., & Nathan, P. R. (2013). Anxiety as a mediator between perfectionism and eating disorders. *Cognitive Therapy and Research*, *37*(5), 905–913. https://doi.org/10.1007/s10608-012-9516-x

Engen, K. M., Mathisen, T. F., & Sundgot-Borgen, J. (2017). Is Unhealthy Fat Mass Disguised By A Healthy Bmi In Females With Eating Disorders?: 1723 Board# 4 June 1 1. *Medicine & Science in Sports & Exercise, 49*(5S), 485.

Farstad, S. M., McGeown, L. M., & von Ranson, K. M. (2016). Eating disorders and personality, 2004-2016: A systematic review and meta-analysis. *Clinical Psychology Review*, *46*, 91–105. https://doi.org/10.1016/j.cpr.2016.04.005

Garcia, F. D., Grigioni, S., Chelali, S., Meyrignac, G., Thibaut, F., & Dechelotte, P. (2010). Validation of the French version of SCOFF questionnaire for screening of eating disorders among adults. *The World Journal of Biological Psychiatry*, *11*(7), 888–893. https://doi.org/10.3109/15622975.2010.483251

Haas, S. M., Irr, M. E., Jennings, N. A., & Wagner, L. M. (2011). Communicating thin: A grounded model of online negative enabling support groups in the pro-anorexia movement. *New Media and Society*, *13*(1), 40–57. https://doi.org/10.1177/1461444810363910

Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling [White paper]. http://www.afhayes.com/public/process2012.pdf

Holtkamp, K., Hebebrand, J., & Herpertz-Dahlmann, B. (2004). The contribution of anxiety and food restriction on physical activity levels in acute anorexia nervosa. *International Journal of Eating Disorders*, *36*(2), 163–171. https://doi.org/10.1002/eat.20035

Jones, N., and Rogers, P. J. (2003). Preoccupation, food, and failure: an investiga- tion of cognitive performance deficits in dieters. *International Journal of Eating Disorders. 33*, 185–192. doi: 10.1002/eat.10124

Keel, P. K., & Forney, K. J. (2013). Psychosocial risk factors for eating disorders. *International Journal of Eating Disorders*, *46*(5), 433–439. https://doi.org/10.1002/eat.22094

Koch-Weser, S., Bradshaw, Y. S., Gualtieri, L., & Gallagher, S. S. (2010). The internet as a health information source: Findings from the 2007 Health Information National Trends Survey and implications for health communication. *Journal of Health Communication*, *15*(SUPPL. 3), 279–293. https://doi.org/10.1080/10810730.2010.522700

Lehmann, I. S., & Konstam, V. (2011). Growing up perfect - Perfectionism, problematic Internet use, and career indecision in emerging adults. *Journal of Counseling and Development*, *89*(2), 155–162.

Lewis, S., Thomas, S. L., Blood, R. W., Castle, D., Hyde, J., & Komesaroff, P. A. (2011). "I'm searching for solutions": Why are obese individuals turning to the Internet for help and support with "being fat"? *Health Expectations*, *14*(4), 339–350. https://doi.org/10.1111/j.1369-7625.2010.00644.x

Lichtenstein, M. B., Hemmingsen, S. D., & Støving, R. K. (2017). Identification of eating disorder symptoms in Danish adolescents with the SCOFF questionnaire. *Nordic Journal of Psychiatry*, *71*(5), 340–347. https://doi.org/10.1080/08039488.2017.1300322

Liechty, J. M., & Lee, M. (2013). Longitudinal Predictors of Dieting and Disordered Eating Among Young Adults in the U . S . https://doi.org/10.1002/eat.22174

Lindvall Dahlgren, C., Wisting, L., & Rø, Ø. (2017). Feeding and eating disorders in the DSM-5 era: A systematic review of prevalence rates in non-clinical male and female samples. *Journal of Eating Disorders*, *5*(1), 1–10. https://doi.org/10.1186/s40337-017-0186-7

Lo, A., & Abbott, M. J. (2013). Review of the theoretical, empirical, and clinical status of

adaptive and maladaptive perfectionism. *Behaviour Change*, *30*(2), 96–116. https://doi.org/10.1017/bec.2013.9

Magallares, A. (2016). Drive for thinness and pursuit of muscularity: The role of gender ideologies. *Universitas Psychologica*, *15*(2), 353–360. https://doi.org/10.11144/Javeriana.upsy15-2.dtpm

Mcbride, O., Mcmanus, S., Thompson, J., Palmer, R. L., & Brugha, T. (2013). Profiling disordered eating patterns and body mass index (BMI) in the English general population, 783–793. https://doi.org/10.1007/s00127-012-0613-7

McElroy, E., & Shevlin, M. (2013). The development and initial validation of the cyberchondria severity scale (CSS). *Journal of Anxiety Disorders*, *28*(2), 259–265. https://doi.org/10.1016/j.janxdis.2013.12.007

McElroy, S. L., Crow, S., Blom, T. J., Biernacka, J. M., Winham, S. J., Geske, J., … Frye, M. A. (2016). Prevalence and correlates of DSM-5 eating disorders in patients with bipolar disorder. *Journal of Affective Disorders*, *191*, 216–221. https://doi.org/10.1016/j.jad.2015.11.010

Meštrović, A. (2014). *Neki prediktori stavova prema anoreksiji (Some predictors of attitudes towards anorexia nervosa).* Unpublished Master Thesis. Zagreb: Department of Psychology at Faculty of Humanities and Social Sciences in Zagreb.

Mulveen, R., & Hepworth, J. (2006). An interpretative phenomenological analysis of participation in a pro-anorexia internet site and its relationship with disordered eating. *Journal of Health Psychology*, *11*(2), 283–296. https://doi.org/10.1177/1359105306061187

Nakano, K. (2009). Perfectionism, Self-Efficacy, and Depression: Preliminary Analysis of the Japanese Version of the Almost Perfect Scale–Revised. *Psychological Reports*, *104*(3), 896–898. https://doi.org/10.2466/PR0.104.3.896-908

Neumark-Sztainer, D., Wall, M., Larson, N. I., Eisenberg, M. E., & Loth, K. (2011). Dieting and disordered eating behaviors from adolescence to young adulthood: Findings from a 10-year longitudinal study. *Journal of the American Dietetic Association*, *111*(7), 1004–1011. https://doi.org/10.1016/j.jada.2011.04.012

Racine, S. E. (2018). Emotional ratings of high- and low-calorie food are differentially associated with cognitive restraint and dietary restriction. *Appetite*, *121*, 302–308. https://doi.org/10.1016/j.appet.2017.11.104

Richter, F., Strauss, B., Braehler, E., Adametz, L., & Berger, U. (2017). Screening disordered eating in a representative sample of the German population: Usefulness and psychometric properties of the German SCOFF questionnaire. *Eating Behaviors*, *25*, 81–88. https://doi.org/10.1016/j.eatbeh.2016.06.022

Rodgers, R. F., Skowron, S., & Chabrol, H. (2012). Disordered eating and group membership among members of a pro-anorexic online community. *European Eating Disorders Review*, *20*(1), 9–12. https://doi.org/10.1002/erv.1096

Rodgers, R. F., Lowy, A. S., Halperin, D. M., & Franko, D. L. (2016). A Meta-Analysis Examining the Influence of Pro-Eating Disorder Websites on Body Image and Eating Pathology. *European Eating Disorders Review*, *24*(1), 3–8. https://doi.org/10.1002/erv.2390

Rohde, P., Stice, E., & Marti, C. N. (2015). Development and predictive effects of eating disorder risk factors during adolescence: Implications for prevention efforts. *The International Journal of Eating Disorders*, *48*(2), 187–98. https://doi.org/10.1002/eat.22270

Sanchez-armass, O., Raffaelli, M., Cristina, F., Andrade, D., Wiley, A. R., Nacielli, A., … Aradillas-garcia, C. (2016). Validation of the SCOFF questionnaire for screening of eating disorders among Mexican university students. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, (February). https://doi.org/10.1007/s40519-016-0259-7

Sarwer, D. B., Magee, L., & Clark, V. (2003). Physical appearance and cosmetic medical treatments: physiological and socio-cultural influences. *Journal of Cosmetic Dermatology*, *2*(1), 29–39. https://doi.org/10.1111/j.1473-2130.2003.00003.x

Shapira, N. A., Goldsmith, T. D., Keck, P. E., Khosla, U. M., & McElroy, S. L. (2000). Psychiatric features of individuals with problematic internet use. *Journal of Affective Disorders*, *57*(1–3), 267–272. https://doi.org/10.1016/S0165-0327(99)00107-X

Sherry, S. B., Hewitt, P. L., Flett, G. L., Lee-Baggley, D. L., & Hall, P. A. (2007). Trait perfectionism and perfectionistic self-presentation in personality pathology. *Personality and Individual Differences*, *42*(3), 477–490. https://doi.org/10.1016/j.paid.2006.07.026

Slaney, R. B., Rice, K. G., & Ashby, J. S. (2002). A programmatic approach to measuring perfectionism: The Almost Perfect Scales. *Perfectionism: Theory, Research, and Treatment*, (2002), 63–88. https://doi.org/10.1037/10458-003

Slaney, R. B., Rice, K. G., Mobley, M., Trippi, J., & Ashby, J. S. (2001). The revised almost perfect scale. *Measurement and evaluation in counseling and development, 34(3),* 130.

Stice, E., Presnell, K., & Spangler, D. (2002). Risk factors for binge eating onset in adolescent girls: A 2-year prospective investigation. *Health Psychology*, *21*(2), 131–138. https://doi.org/10.1037//0278-6133.21.2.131

Story, M., Kaphingst, K. M., Robinson-O'Brien, R., & Glanz, K. (2008). Creating Healthy Food and Eating Environments: Policy and Environmental Approaches. *Annual Review of Public Health*, *29*(1), 253–272.

https://doi.org/10.1146/annurev.publhealth.29.020907.090926

Strother, E., Lemberg, R., Stanford, S. C., & Turberville, D. (2012). Eating Disorders in Men: Underdiagnosed, Undertreated, and Misunderstood. *Eating Disorders*, *20*(5), 346–355. https://doi.org/10.1080/10640266.2012.715512

Swami, V., Frederick, D. A., Aavik, T., Alcalay, L., Allik, J., Anderson, D., … Zivcic-Becirevic, I. (2010). The attractive female body weight and female body dissatisfaction in 26 countries across 10 world regions: Results of the international body project I. *Personality and Social Psychology Bulletin*, *36*(3), 309–325. https://doi.org/10.1177/0146167209359702

Talbot, T. S. (2010). The effects of viewing pro-eating disorder websites: a systematic review. *The West Indian Medical Journal*, *59*(6), 686–697. Retrieved from http://caribbean.scielo.org/pdf/wimj/v59n6/v59n6a16.pdf

Taranis, L. (2010). Compulsive exercise and eating disorder related pathology, *19*(3), 174–189.

Tiggemann, M., Churches, O., Mitchell, L., & Brown, Z. (2018). Tweeting weight loss: A comparison of #thinspiration and #fitspiration communities on Twitter. *Body Image*, *25*, 133–138. https://doi.org/10.1016/j.bodyim.2018.03.002

Vervaet, M., Van Heeringen, C., & Audenaert, K. (2004). Personality-Related Characteristics in Restricting Versus Binging and Purging Eating Disordered Patients. *Comprehensive Psychiatry*, *45*(1), 37–43. https://doi.org/10.1016/j.comppsych.2003.09.008

Wan Wahida, W. M. Z., Lai, P. S. M., & Abdul Hadi, H. (2017). Validity and reliability of the english version of the sick, control, one stone, fat, food (SCOFF) in Malaysia. *Clinical Nutrition ESPEN*, *18*, 55–58. https://doi.org/10.1016/j.clnesp.2017.02.001

Watson, H. J., Raykos, B. C., Street, H., Fursland, A., & Nathan, P. R. (2011). Mediators between perfectionism and eating disorder psychopathology: Shape and weight overvaluation and conditional goal-setting. *International Journal of Eating Disorders*, *44*(2), 142–149. https://doi.org/10.1002/eat.20788

Weinstein, P. K. (2006). A review of weight loss programs delivered via the Internet. *The Journal of Cardiovascular Nursing*, *21*(4), 251–258. https://doi.org/00005082-200607000-00003 [pii]

Wilksch, S. M., Durbridge, M. R., & Wade, T. D. (2008). A preliminary controlled comparison of programs designed to reduce risk of eating disorders targeting perfectionism and media literacy. J*ournal of the American Academy of Child and Adolescent Psychiatry, 47*, 937–947

Wilson, J. L., Peebles, R., Hardy, K. K., & Litt, I. F. (2006). Surfing for Thinness: A Pilot Study of Pro-Eating Disorder Web Site Usage in Adolescents With Eating Disorders. *Pediatrics*, *118*(6), e1635–e1643. https://doi.org/10.1542/peds.2006-1133

Zipfel, S., Giel, K. E., Bulik, C. M., Hay, P., & Schmidt, U. (2015). Anorexia nervosa:
Aetiology, assessment, and treatment. *The Lancet Psychiatry*, *2*(12), 1099–1111.
https://doi.org/10.1016/S2215-0366(15)00356-9

Appendices

Appendix 1

Distribution of frequencies of age divided into six categories
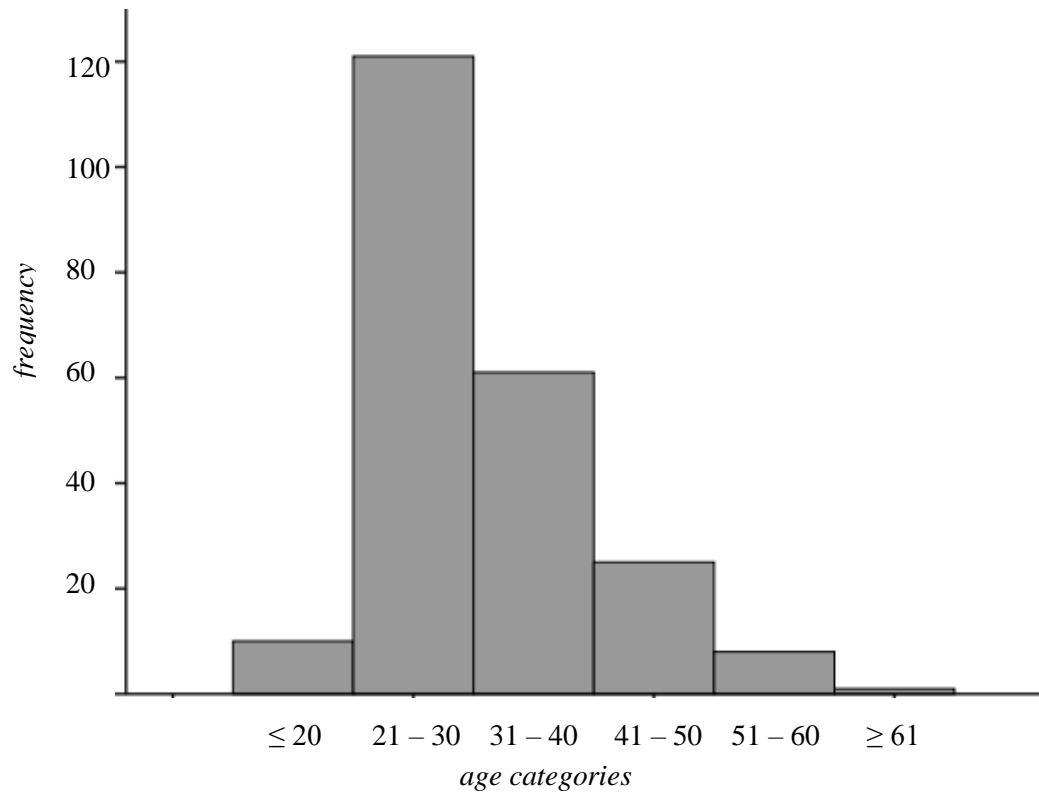
Check-list of topics related to eating disorders

Sljedećih nekoliko pitanja odnosi se na razne teme o kojima se može informirati putem interneta. Molimo Vas da procjenite koliko često ste u posljednih mjesec dana putem interneta pretraživali pojmove vezane uz:

1. Nutritivne vrijednosti hrane (npr. *kalorije, ugljikohidrati*):

   Nikad   *Rijetko*   *Ponekad*   *Često*

   Navedite neke primjere pojmova vezanih uz nutritivne vrijednosti hrane koje ste pretraživali putem interneta:

2. Informacije o dijetama (npr. *ketogena dijeta, paleo dijeta*):

   Nikad   *Rijetko*   *Ponekad*   *Često*

   Navedite neke primjere pojmova vezanih uz informacije o dijetama koje ste pretraživali putem interneta:

3. Informacije o vježbanju (npr. *cardio, sagorijevanje kalorija*):

   Nikad   *Rijetko*   *Ponekad*   *Često*

   Navedite neke primjere pojmova vezanih uz informacije o vježbanju koje ste pretraživali putem interneta:

4. Izgled tijela (npr. *trbušni mišići, plus-size modeli*):

   Nikad   *Rijetko*   *Ponekad*   *Često*

   Navedite neke primjere pojmova vezanih uz izgled tijela koje ste pretraživali putem interneta:

5. Poremećaje hranjenja (npr. *povraćanje, pro-ana*)

   Nikad   *Rijetko*   *Ponekad*   *Često*

   Navedite neke primjere pojmova vezanih uz poremećaje hranjenja koje ste pretraživali putem interneta: