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Obsesia perfekcionizmom – riziko dysmorfickej poruchy tela, bigorexie a ortorexie u študentov stredných škôl z regiónu Kysuce, Slovensko

Obsession with Perfection – Risk of Body Dysmorphic Disorder, Bigorexia and Orthorexia in High School Students from Kysuce Region, Slovakia

Branislav Kolena, Michaela Kuljovská, Jozef Kahan

Abstract

Adolescents are a critically endangered group regarding initiation into harmful behaviors. A standardized questionnaire was used for monitoring body image disorder (BID), composed of symptoms of body dysmorphic disorder (BDD), bigorexia, and orthorexia in high school students (Slovakia, n = 131). Correlation between the risk score of BDD (Cronbach's alpha (∝) = 0.844; r = 0.29, p = 0.001)) and bigorexia (∝ = 0.874; r = 0.29, p = 0.001), and between bigorexia and orthorexia (∝ = 0.737; r = 0.34, p = 0.001) were observed. 51.14% of adolescents fell into the intermediate risk; a statistically significantly higher risk score of bigorexia for females was observed. A tailored preventive strategy in schools to support mental health and well-being and involve students, teachers, and parents to educate them about these disorders is crucial. Developing mental health support tools, promoting balanced nutrition and body positivity, and engaging parents in recognizing early signs are essential.

Keywords: Body image disorders. Adolescence. Mental health. Risk factor. Life style.

Introduction

In today's image-driven society, the relentless pursuit of physical perfection has led to a dramatic rise in body image disorders. From body dysmorphic disorder and bigorexia to orthorexia, countless individuals are caught in a dangerous cycle of distorted self-perception and unhealthy behavior patterns.

Body image consists of two primary components: body percept, which refers to the internal visual representation of one's body shape and size, and body concept, which denotes the degree of satisfaction with one's body.

Alterations in these components can result in various conditions, including overestimating body dimensions, negative affect and cognitions toward the body, and behaviors such as body avoidance and body checking (Brytek-Matera et al. 2018). Body image is an individual's perception, cognition, and emotional response to their physical appearance. It encompasses the internal representation of one's body, including reflection in the mirror, and is influenced by social constructs shaped by cultural and societal norms. This construct is developed through the internalization of body ideals, predominantly transmitted via media, familial interactions, and peer influences (Jiotsa et al., 2021).

Over the past 30 years, the media have increasingly exposed individuals to ideals of thinness from a young age, establishing these ideals as new reference standards. Young women, particularly sensitive to these thinness ideals, often equate them with beauty and success. Consequently, etiological models that incorporate environmental factors regard social pressure concerning physical appearance as a significant determinant in the development of eating disorders (EDs) (Anschutz et al., 2008; Blowers et al., 2003; Laure et al., 2005; Stice & Shaw, 2002). Body dysmorphic disorder (BDD) typically emerges during adolescence, impacting approximately 2% of teenagers (Krebs et al., 2025; Veale et al., 2016). It is linked with significant impairment, psychiatric co-occurring conditions, and a heightened risk of suicide (Krebs et al., 2022, 2025). Orthorexia nervosa (ON) is an eating disorder characterized by an obsessive fixation on consuming healthy food.10 Key features of ON involve avoiding unhealthy food, emphasizing food quality, classifying food into "safe and harmful" categories, and experiencing adverse effects on overall quality of life (Malmborg et al., 2017). Demographic groups particularly vulnerable to developing ON-related disorders include women, adolescents, individuals involved in sports, medical students, healthcare workers, and dietitians (Dalmaz & Yurtdaş, 2018; Duran et al., 2020). Numerous studies have also noted a shift in the perception of the ideal body, with an increasing emphasis on lean body mass. The popularity of bodybuilding has surged, driven by the desire for a lean and muscular physique. Concurrently, muscle dysmorphia (also known as bigorexia), categorized as a body dysmorphic disorder, has emerged, particularly among young adult males (Blomeley et al., 2018) and individuals involved in bodybuilding (Bo et al., 2014; Suffolk et al., 2013). Reports are indicating that males are increasingly inclined towards gaining weight and developing muscle mass. This trend may be attributed to changes in cultural norms, evident in the prominence of lean and muscular physiques among celebrities in movies, magazines, and television (White et al., 2019; Santarnecchi & Dèttore, 2012) as well as at social media.

All mentioned disorders pose a threat to the developing organism, impacting its physiological and psychological aspects. The absence of critical thinking, media pressure, the impact of influencers and social networks, and peer bullying represent significant dangers for this particularly vulnerable group, which may result in lasting damage to their physical and mental health.

This study focuses on monitoring the symptoms of body image disorders, consisting form the aforementioned disorders in the population of high school students in Slovakia.

Methods

The symptoms of body dysmorphic disorder, orthorexia, and bigorexia were monitored among secondary school students (n = 131, average age 17.5±1.24 years), where the group of girls prevailed (72.52%). All respondents come from the Kysuce region (northwestern Slovakia). For data collection, a modified electronic standardized questionnaire was used. The questionnaire was distributed to students via the Edupage application, and participation was voluntary. To analyze Body Image disorders (BID), the questionnaire comprised closed-ended questions, including 7 items for assessing body dysmorphic disorder symptoms (BDD) (Dufresne et al., 2001), 10 items for orthorexia (O) derived from the Bratman Orthorexia Test (Bratman & Knight, 2000), and 19 items for evaluating bigorexia (B) from the MASS bigorexia test (Mayville et al., 2002). Completion of the questionnaire by minors required informed consent from their legal representatives, and the study was approved by the school administration.

Quantitative data analysis was conducted as follows: each question was assigned a maximum score of 1, and responses were scored on a Likert scale. The total score for each participant was calculated as the sum of scores across all questions (1-36). Participants were then categorized into tertiles based on their total score to determine the degree of risk for developing the observed pathologies, with tertile distribution as follows: high risk (≤ 0.33), medium risk (0.34 - 0.67), and low risk (≥ 0.68).

The normality of the data was assessed using the Shapiro-Wilk test. To assess the internal consistency of the questionnaire, Cronbach's alpha was calculated, as a measure of scale reliability or internal consistency, indicating how closely related a set of items is as a group. It ranges from 0 to 1, with higher values indicating greater reliability. A Cronbach's alpha value above 0.7 is generally considered acceptable, suggesting that the items measure the same underlying construct. The alpha coefficient for each subscale of the questionnaire was computed to ensure the reliability of the measurements used in this study. Spearman's correlation was used to analyze the association between respondents' age and risk score values, as well as between risk scores of body dysmorphic disease, orthorexia, and bigorexia. The Mann-Whitney test was applied to examine differences in risk score values based on respondents' sex, while the Kruskal-Wallis test was used to verify differences according to type of school (Secondary Vocational School of Education – SVSE; Secondary school with a focus on general education – SSGE; Technical Secondary

School – TSS). Statistical significance was set at $p \leq 0.05$, and data analysis was performed using Jamovi software (The Jamovi project, 2021; version 2.2). The Ethics Committee approved the study.

Results

The survey monitoring for symptoms of BID (composed of symptoms of body dysmorphic disorder, orthorexia, and bigorexia) in the population of high school students in the Kysuce region involved 131 participants, with an average age of 17.5±1.24 years. Among them, 72.52% (n = 95) were girls with an average age of 17.5±1.19 years, and 27.48% (n = 36) were boys, with an average age of 17±1.38 years. Participants from three types of schools took part in the survey; information on the representation of individual schools and their basic characteristics is provided in Table 1.

Table 1: Baseline characteristics of cohorts

Type of school	**n (%)**	**age±SD**	**Males n; %; age ±SD**	**Females n; %; age ±SD**
SVSE	61 (46.56%)	18±0.85	1; 1.64% 18±0.0	60; 98.36% 18±0.85
SSGE	49 (37.4%)	17±1.31	14; 28.58% 17.5 ±1,2	35; 71.42% 17±1.32
TSS	21 (16.04%)	17±1.55	21; 100% 17±1.55	-
All	131 (100%)	17.5±1.24	36; 27.48% 17±1.38	95; 72.52% 17.5±1.19

Notes: SVSE - Secondary Vocational School of Education, SSGE - Secondary school with a focus on general education, TSS - Technical Secondary School, SD – Standard deviation

To assess the internal consistency of the questionnaire, Cronbach's alpha was calculated for four different subscales: Body Dysmorphic Disorder ($\propto = 0.844$), Orthorexia ($\propto = 0.737$), Bigorexia ($\propto = 0.874$), and Body Image Disorder ($\propto = 0.524$). A Cronbach's alpha value above 0.7 is generally considered acceptable, suggesting that the items measure the same underlying construct. These results of testing Cronbach's alpha suggest that the subscales for BDD, orthorexia, and bigorexia have acceptable to good reliability, while the BID subscale may need revision or additional items to improve its internal consistency.

Correlations between the risk score of BDD and orthorexia ($r = 0.29$, $p \leq 0.001$) and bigorexia ($r = 0.29$, $p \leq 0.001$), as well as between bigorexia and orthorexia ($r = 0.34$, $p \leq 0.001$) were observed in the whole cohort. We do not observe a correlation between the age of respondents and risk of BID ($r = 0.08$, $p = 0.36$), as well as BDD ($r = 0.09$, $p = 0.33$), orthorexia ($r = -0.01$, $p = 0.96$) and bigorexia ($r = 0.1$, $p = 0.27$). According to the Kruskal-Wallis test, we do not observe an association between the type of school and risk of BID, BDD, orthorexia, and bigorexia (Table 2).

Table 2: Comparison of risk scores based on school type

	χ^2	df	p	ε^2
Risk score	2.93	4	0.569	0.0225
	SVSE-SSGE		0.937	
	SVSE-TSS		0.719	
	SSGE-TSS		0.904	

Notes: SVSE - Secondary Vocational School of Education, SSGE - Secondary school with a focus on general education, TSS - Technical Secondary School

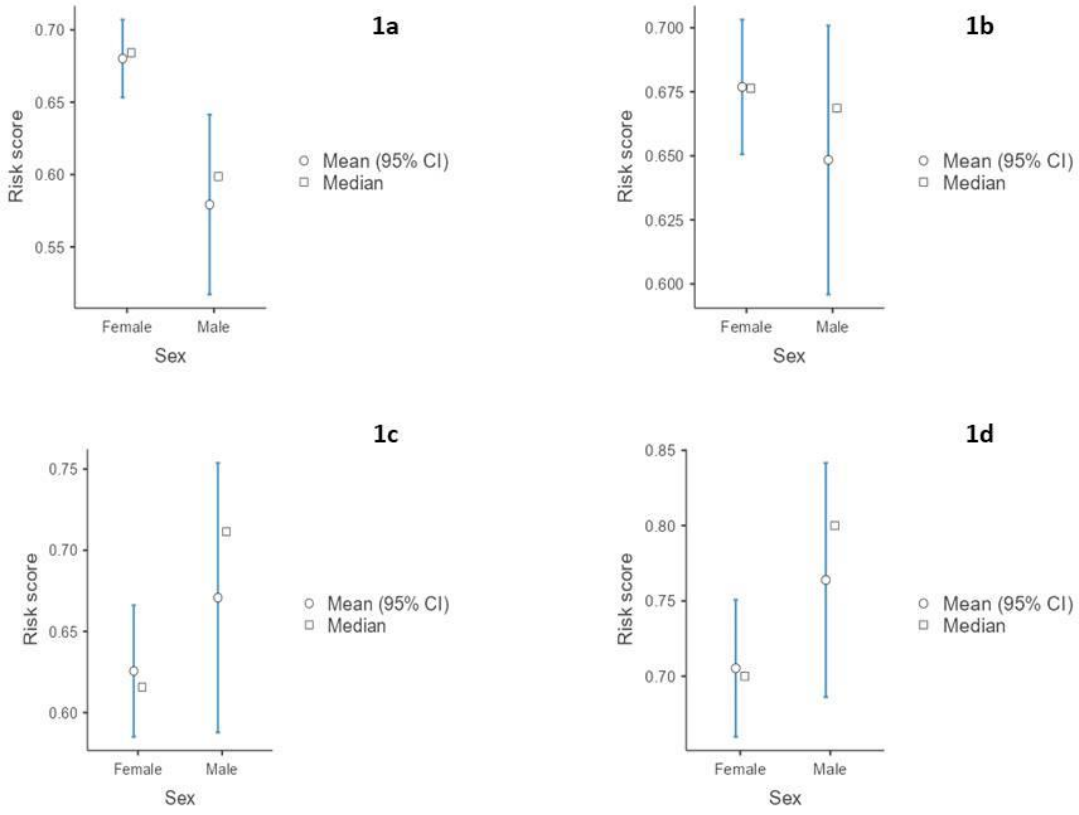
According to Table 3, we observed a statistically significantly higher risk score in bigorexia for females (Figure 1a), and a higher risk of BID, which was not statistically significant (Figure 1b). Although male respondents achieved a marginally higher average risk score in BDD (Figure 1c) and orthorexia (Figure 1d) than females, the differences were not statistically significant ($p \geq 0.05$).

Table 3: Sex-dependent risk of Body Dysmorphic Disorder, orthorexia, bigorexia, and Body Image Disorder

	All	Cornbach´s α	♂ (mean± D)	♀ (mean±SD)	p
BDD	0.639±0.218	0.844	0.671±0.254	0.626±0.202	0.150
Orthorexia	0.701±0.246	0.737	0.764±0.238	0.705±0.226	0.087
Bigorexia	0.648±0.156	0.874	0.579±0.032	0.680±0.014	**0.005**
BID	0.671±0.146	0.524	0.648±0.161	0.677±0.130	0.529

Notes: BDD – Body Dysmorphic Disorder; BID – Body Image Disorder

Figure 1: Sex-dependent risk of bigorexia (1a), body image disorder (1b), body dysmorphic disorder (1c), and orthorexia (1d)



Upon examining the tercile distribution of the risk score for items monitoring symptoms of BID (body dysmorphic disorder, orthorexia, bigorexia), we observed that over half of the respondents (51.14%, n = 67) fell into the intermediate risk category. In comparison, two respondents (1.53%, n = 2) were classified as having a high risk of developing these conditions. For 47.33% of respondents (n = 62), irrespective of sex, the risk of these disorders was either absent or negligible.

When considering the sex of respondents, we found that less than half of females (49.47%, n = 47) and males (41.67%, n = 15) could be categorized as being at low risk. In contrast, the majority of females (50.53%, n = 48) and 52.78% of males (n = 19) exhibited symptoms warranting preventive intervention from educators and parents to mitigate the onset of these disorders through education. For two male respondents (5.55%, n = 2) displaying symptoms indicating a high risk of developing the analyzed disorders, professional intervention in mental health, healthy lifestyle promotion, and youth outreach is warranted.

Discussion

Body image disorder encompasses a range of conditions affecting one's perception of the body, including body dysmorphic disorder, anorexia nervosa, and muscle dysmorphia. The concept of body image involves perceptions, beliefs, and representations of one's body within the self (Snaith, 1992). These disorders can arise from sociocultural pressures, neurological factors, and psychiatric conditions, leading to distortions in body perception and self-awareness (Berlucchi & Aglioti, 2006; Shontz, 1974).

This survey conducted among high school students in the Kysuce region (Slovakia) offers insights into the monitoring of the symptoms and factors associated with Body Image Disorders (BID), including body dysmorphic disorder (BDD) and bigorexia, in this study supplemented by symptoms of orthorexia. Participants were drawn from three types of schools, offering a diverse perspective on BID symptoms in this region. Here, we delve into the key findings and implications for preventive strategies in educational settings.

As mentioned by Bjornsson et al. (2010), BDD is a relatively common condition characterized by a distressing or impairing preoccupation with imagined or minor defects in appearance. Often considered part of the obsessive-compulsive spectrum due to its similarities with obsessive-compulsive disorder, BDD is crucial to recognize and treat appropriately. Given the obsessive and preoccupying nature of BDD, it could coexist with orthorexia or bigorexia as part of their excessive focus on appearance and perceived physical flaws. Our results suggest significant correlations between the risk scores of BDD and orthorexia, BDD and bigorexia, and orthorexia and bigorexia. These findings indicate a notable overlap among these disorders, suggesting that individuals at risk for one type of BID may be predisposed to others. Recognizing and treating these co-occurring disorders is important for comprehensive patient care.

BDD is characterized by an excessive focus on one or more perceived flaws or defects in physical appearance, which are either minor or nonexistent. It affects 1.7-2.4% of the general population, with a higher incidence in women (Jawad & Sjögren, 2017). Muscle dysmorphia can impact anyone, but it is more frequently observed in males than in females (Chung, 2001). While respondents' sex did not significantly influence the overall incidence of BID in our study, specific patterns emerged. Females exhibited a higher risk score for bigorexia compared to males. Males had marginally higher average risk scores for BDD and orthorexia than females, though these differences were not statistically significant ($p \geq 0.05$). These sex-specific trends highlight the need for tailored interventions that address the unique ways in which BID symptoms manifest in boys and girls.

As societal influences increasingly favor a more muscular physique, younger children are at a growing risk of developing body image disorders like muscle dysmorphia (Cohane & Pope, 2001). We do not observe sex-significant

differences supported over mentioned. The tercile distribution analysis revealed that over half of the respondents (51.14%) fell into the intermediate risk category for BID and a small fraction (1.53%) were classified as high risk. This underscores the need for targeted professional mental health interventions for these individuals.

Interestingly, the study found no significant correlation between the age of participants and the risk of developing BID, BDD, orthorexia, and bigorexia. This suggests that within the age range studied, other factors besides age may be more influential in the development of these disorders.

Conclusion

The findings underscore the critical role of preventive programs in schools, involving students, teachers, and parents to mitigate the onset of BID. Despite the insignificant influence of sex on the overall incidence, the significant impact of bigorexia on females and the notable presence of symptoms in male's warrant sex-sensitive approaches.

Preventive strategies should focus on enhancing students' and educators' understanding of BID symptoms. It is necessary to develop and incorporate mental health support tools (providing access to mental health resources and counseling), for encouraging balanced nutrition and body positivity, and engaging parents in recognizing and addressing early signs of BID. The observed sex-specific trends call for comprehensive, tailored preventive strategies to foster a supportive environment for mental health and well-being in schools.

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RNDr. Branislav Kolena, PhD.
Katedra zoológie a antropológie
Univerzita Konštantína Filozofa v Nitre, Fakulta prírodných vied a informatiky
Nábrežie mládeže 91, 949 01 Nitra
bkolena@ukf.sk

Mgr. Michaela Kuljovská
Základná škola
Mládežnícka 1343, 023 02 Krásno nad Kysucou
kuljovskamiska@gmail.com

Ing. Jozef Kahan, PhD.
Katedra didaktiky prírodných vied, psychológie a pedagogiky
Univerzita Komenského v Bratislave, Prírodovedecká fakulta
Mlynská dolina, Ilkovičova 6, 842 15 Bratislava 4
jozef.kahan@@uniba.sk