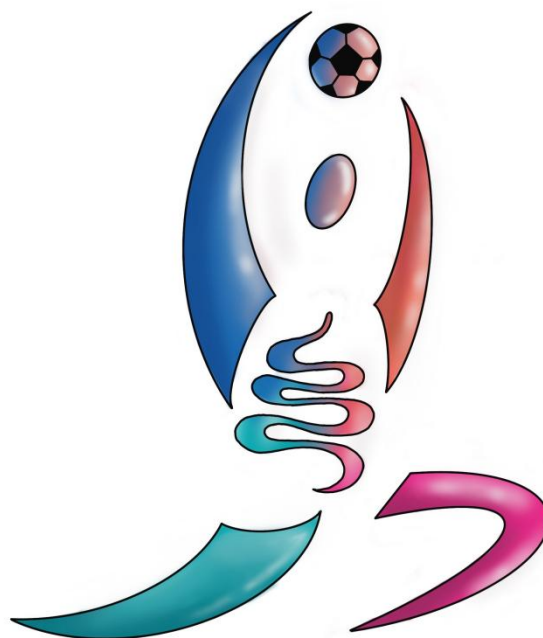




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SPORTS COMMUNITY AGAINST EATING DISORDERS

THE SURVEY REPORT



SCAED



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1. INTRODUCTION

1.1. THE IMPORTANCE OF PHYSICAL ACTIVITY AND DIET FOR HEALTH

Regular physical activity can maintain or improve health by reducing the risk of developing cardiovascular, metabolic, and neurovascular disorders, and strengthening the musculoskeletal system. It also prevents the formation of certain tumors, improves mood, expands lung capacity, and helps maintain body weight. Moreover, it appears to improve brain functions, particularly cognitive abilities that require attention, organization, and planning, to reduce symptoms of depression and anxiety, and to stimulate the abilities of the immune system¹. It is not necessary to become an athlete to have the benefits of physical activity, they can be derived from regular moderate physical activity².

One more important environmental factor that has a profound effect on many aspects of health and disease risk is diet. **Diet** affects multiple characteristics of human health and is, as a cause and a consequence, linked to chronic metabolic conditions such as obesity, type 2 diabetes, and cardiovascular disease³. Diet for physically active individuals, besides daily needs, must adequately satisfy all extra needs for energy, recovery, and hydration. Sports nutrition for active athletes must be concerned not only with the identification of their nutritional goals but also with the translation of these goals into an eating strategy that takes account of personal preferences, social and cultural issues, and a whole range of other factors. Therefore, the **nutrition of active individuals and/or athletes** should be professionally advised, monitored, and guided. In a search for adequate nutrition, athletes often rely on sources in the media, family, friends, and colleagues from the club, trainers, and staff in sports or fitness clubs. In a desire to achieve wanted sports performances, and body appearance, the search for quick and easily available solutions further complicates diet and diet behavior.

Adequate and regular physical activity and a healthy diet are important for any stage of life.

Adolescence is a period of 13 to 18 years of age, and a period of significant growth and physical development that includes body composition changes, metabolic and hormonal fluctuations, maturation of organ systems, and establishment of nutrient deposits, which all may affect future health⁴.

Of other health influence dimensions, regular physical activity during adolescence may help with social interaction and the development of self-identity and self-esteem, while diet influences the creation of an individual's lifelong relationship with food, which all are particularly important in terms of the connection between diet, exercise, and body image⁵. An adolescent who is also an athlete has unique nutritional requirements as a consequence of regular training and competition along with growth and development needs.

By adhering to appropriate training regimes and nutrition, developing young athlete has a good potential for performance achievements. However, in the search for an ideal diet that meets athletics needs, together with growth and development needs, and achievement of desired sports performances, it is possible for a young athlete to develop **disordered eating (DE)**. Regular habits of skipping meals, compulsive eating, compulsive exercise, and/or restrictive eating, and using a short-term restrictive diet can all advance into chronic energy or nutrient restraint, binge eating, active and passive dehydration, use of laxatives, diuretics, vomiting, and diet pills with or without excessive training⁶. In addition, the progress of **an eating disorder (ED)** may lead to a strong alteration in athlete performance, which also, at the same time, leads to undesired psychological and social effects⁶.

All abovementioned is highly important to prevent and manage ED properly and in time, which is critical for the young population's health and welfare. This is especially important since there is a higher risk for ED

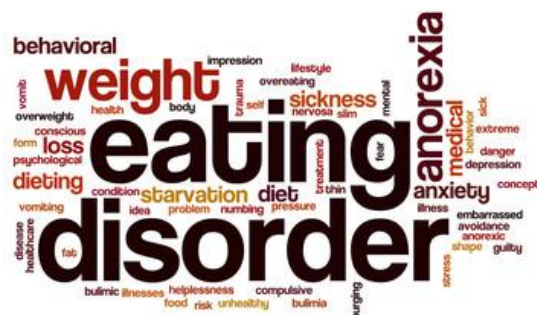


onset and prevalence among them compared to other age groups^{7,8}.

1.2. DISORDERED EATING AND EATING DISORDERS

Disordered eating (DE) as a potentially harmful or disruptive eating behavior may over time develop into an eating disorder (ED)⁹. **EDs are psychiatric diagnoses** made using the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)^{9,10}. The DSM-5 classification includes specified eating and feeding disorders; anorexia nervosa, bulimia nervosa, and binge-eating disorder, other specified feeding or

eating disorder that includes atypical anorexia nervosa, bulimia nervosa of low frequency and/or limited duration, a binge-eating disorder of low frequency and/or limited duration, purging disorder, and night eating syndrome. The remaining category is unspecified feeding or eating disorder which includes avoidant/restrictive food intake disorder, pica, and rumination disorder.



1.3. EATING DISORDERS AMONG ATHLETES

Among athletes, **the prevalence of ED among athletes** varies widely as a consequence of the difference among studied athlete populations (sports, ages, levels of competitiveness, gender, survey instrument, etc.). Among adult athletes, the ED prevalence has doubled from 3.5% in 2006 to 7.8% in 2018¹¹. The ED risk is predominantly more represented among female athletes (45%) than among males (19%)¹².

Currently, there is a limited amount of data available on research among adolescent athletes, which is important since the development of an eating disorder or disordered eating often arises during the transition from childhood to adulthood^{9,13}. Recent German research found the prevalence of clinical eating pathology at 5.5% among elite 13 to 18 years' adolescent athletes¹⁴.

1.4. THE PROJECT AIM

For all the above-mentioned and described motives important for sports society, and because of insufficient data among adolescent athletes, the main aim of this study was to determine the prevalence of eating disorders among young non-professional athletes in six European countries; Bulgaria, Croatia, Greece, Italy, North Macedonia, and Poland. Other aims were to examine possible eating disorders risk behaviors among athletes and to compare them with noticed eating disorders risk behaviors by their parents and by

their trainers, and to assess participants' existing eating disorders knowledge. All survey results will serve for designing workshops and manuals about eating disorders for athletes, families, and trainers. The survey was conducted within **the Erasmus + project Sports Community Against Eating Disorders (SCAED)** funded by the EUROPEAN EDUCATION AND CULTURE EXECUTIVE AGENCY (EACEA) – Erasmus+, EU Solidarity Corps (Project No. 101048829).





2. MATERIALS AND METHODS

2.1. PARTICIPANTS, SURVEY RECRUITMENT AND METHODS

In this cross-sectional survey in **six European countries (Bulgaria, Croatia, Greece, Italy, North Macedonia, and Poland) participated non-professional athletes of age 12 to 25 years, their trainers, and athletes' parents.** Trainers of sports clubs were contacted and presented the aim of this research. They contacted athletes and their parents for involvement in the survey.

Trainers, athletes, and their parents were invited to complete an anonymous online survey examining their attitudes, knowledge, and behavior toward diet and eating disorders, socio-demographic data (age, body weight, height, sports training type, and time spent per week), and lifestyle habits.

Each group of participants had their **questionnaire.** Athletes' questionnaires had questions regarding their athletic participation, and questions about behaviors, attitudes, and opinions related to their nutrition, body weight, and body shape.

Trainers' questionnaires had questions about their training data (number of years working as a trainer, sports coaching), previous nutrition education, and knowledge and behaviors regarding eating disorders.

Parents' questionnaires had the same questions about attitudes and opinions related to nutrition and eating disorders behaviors noticed at and relating to their athletic child. Sports trained by athletes or coached by trainers, or sports of athletes noted by their parents were categorized into weight-sensitive and less weight-sensitive sports which are grouped into eight sports classes^{15,16}. The questionnaire for athletes, their trainers, and parents was applied as an online form because an online form screening can reach large numbers of participants¹⁷, easy access to large and geographically distributed populations, and provide earlier access to interventions¹⁸⁻²⁰. The research was conducted from October to December 2022.

2.2. ETHICAL APPROVAL

By completing the questionnaire, participants (athletes, their parents, and trainers) gave their informed consent for scientific use, which was explained at the beginning of the online form. The

applied forms had no personal data, such as names, dates of birth, or e-mail addresses, and they were not mandatory to complete the questionnaire.

2.3. SURVEY INSTRUMENTS

2.3.1. THE EATING DISORDER EXAMINATION FOR ADOLESCENTS (EDE-A) QUESTIONNAIRE AND EATING DISORDERS SCREEN FOR ATHLETES (EDSA)

For assessing potential eating disorders among adolescent athletes, **The Eating Disorder Examination for Adolescents (EDE-A)** questionnaire was used. It is an adapted version of the Eating Disorder Examination Questionnaire (EDE-Q)²¹. The EDE-Q is a 28-item self-reported questionnaire that is modified from the semi-structured interview Eating Disorder Examination (EDE) and designed to assess the range and severity of sorts associated with a diagnosis of eating disorder using 4 subscales: Restraint, Eating Concern, Shape Concern, and Weight Concern. Responders are scoring questions on a 0–6 scale for either: (a) the number of days in the previous 28; or (b) "Not at all" to "Markedly." All scores of subscales are summed to form a global score. The EDE-A questionnaire focuses on the past 14 days and comprises 36 questions, and it rates the same four subscales and yields a global score as the EDE-Q. Higher scores of subscales and a global score represent more problematic eating behaviors and attitudes. To facilitate the detection of individuals who are at potential risk for developing an ED, the use of a reliable cut-off for global scores is important. The cut-off point for an EDE-Q global score higher than 2.94

showed to be of clinical significance for the detection of probable ED risk^{22,23}, and this cut-off point was used in this research. Identification of a clinically significant eating disorder in at-risk populations, such as athletes and recreationists, represents a significant challenge despite the observed increased prevalence. Eating disorder assessment measures intended for the general population showed suboptimal psychometric properties when applied among athletes²⁴. This is actually expected because athletes' motivations and norms related to nutrition, exercise, and body image differ from those of the general population^{25,26}, which then has a consequent impact on interpretation and response patterns.

The EDE-A questionnaire is relatively extensive and may limit the ease of dissemination as a screening tool. Existing tools for screening eating disorders among athletes are mostly intended for the female population and are relatively extensive, therefore this research also used a validated **Eating Disorders Screen for Athletes (EDSA)**, a brief eating disorders screening tool for use in athletes, both male and female²⁷. The intention was to use a brief questionnaire in order to assess its suitability as a screening tool for



the incidence of ED among athletes. The EDSA comprises six questions; two

related to weight/shape concerns, and four related to the importance of weight, weight concerns, binge eating-related concerns, and dietary restraint. Responses are noted on a 5-point Likert-type frequency scale with response options of 1 (never), 2 (rarely), 3 (sometimes), 4 (often), and 5 (always). The overall score represents average responses across the 6 items. A clinically meaningful cut-off score for the

2.3.2. THE PRESSURE FROM TRAINERS

The possible influence on developing an eating disorder is pressure from trainers expressed, for example, with comments about the athlete's body weight and shape, the requirements for a specific weight to compete in a particular category, regular weighting, the perception that low weight is associated with performance advantages, or use of a training or competition uniform that may reveal bodily imperfections²⁸. Athletes' experiences with **weight-related psychological pressure from a trainer and teammates** were assessed with 8 questions ("I talk about food and diet with my teammates."; "It makes me nervous that my trainer controls my weight."; "I

2.3.3. WEIGHT CONTROL BEHAVIOR

The athletes were asked whether they had to **lose weight** for their sports performances. If they had, they noted who they asked for help (trainer, sports dietitian, sports doctor, teammate, and family, self-helped). They also were asked who they would ask for help if they

2.3.4. DIETARY HABITS

Appropriate dietary intake can influence and improve athletes' health and sports performance. It is a direct result of eating behavior which can be influenced by many factors related to eating disorders. A **dietary intake** is a result of eating patterns described by food choices, and the frequency of meals and snacks intake which are all associated with individual dietary habits. This survey focused on the frequency intake of food and drinks, organized into food groups as follows: cereals and products; poultry and products; meat and products; fish; milk and products; oils and fats; fruits; nuts; legumes; vegetables; fast food meals; salty snacks; confectionery; non-alcoholic drinks; alcoholic drinks; coffee; sports drinks; and energy drinks. All participants noted listed food and drink that they consumed during the past week. They noted consumed food and drink frequency intake as a selection between "never", "once a week", "2-3 times per week", "4-5 times per week", "6 times per week", "once a day", or "few times a day". Each listed food or drink had a specified medium portion, so each participant noted their average intake of the listed food and drink as a selection of "less than medium", "medium", or "more than medium".

EDSA questionnaire was 3.33²⁷ and was used in this research to indicate a high risk for an eating disorder.

The results of the EDE-A and the EDSA questionnaires have to be **interpreted with caution** because they represent screening tools rather than diagnostic criteria for eating disorders. Consequently, in the context of this survey, those two validated screening tools are used as standardized self-reported questionnaires and their values are interpreted as measurements of potential individual risk for ED among athletes.

compare myself to my teammates regarding body weight."; "It bothers me when my trainer asks me to weigh often."; "It bothers me when my trainer talks about my weight."; "I feel uncomfortable when my trainer and teammates talk about my weight and body shape."; "I don't feel good when my teammates talk about my body."; "I feel good if I weigh less than my teammates.") in binary answers (yes or no). A score of 1 is given for "no" to the first question, and for "yes" to the last seven questions. The pressure score ranged from 0 to 8, where a score ≥ 5 indicates high pressure from trainers and teammates.

have to regulate their weight (loss/gain); a trainer, sports dietitian, sports doctor, teammate, family, self-help by changing their diet or exercise or by using a product such as laxatives/diuretics/meal replacements.

Since this survey involved participants from six European countries, due to socio-cultural differences, it would be problematic to evaluate diet adherence to country-specific diet recommendations. Therefore, this survey aimed to assess participants' diet **adherence to the EAT-Lancet guidelines for healthy and sustainable diets**. Recently proposed EAT-Lancet diet as a global reference diet, representing the current evidence base for a healthy and environmentally sustainable diet²⁹, consists of food components for which defined target intake levels and reference ranges are suggested. The EAT-Lancet index includes the 14 food components, with a possible range of 0–3 points for each component, which detailed scoring is described elsewhere³⁰. A score of 0 points indicates low adherence to the target for the food component in the EAT-Lancet diet and 3 points indicate high adherence. The total possible score of the EAT-Lancet index can range from 0 (no adherence) to 42 points (perfect adherence, resulting from 14×3 points). A score of 14 was considered as low adherence to the EAT-Lancet diet, a score from 15 to 27 as moderate adherence, and a score ≥ 28 as high adherence.



2.3.5. KNOWLEDGE ABOUT EATING DISORDERS

The athletes were asked to evaluate the level of their **knowledge** (not informed; only heard; somewhat know; well informed) about **eating disorders**

2.4. PARENTS

Athletes' parents fulfilled their questionnaire which contained questions about their **socio-demographic variables** (age, gender, place of living, educational level, employment status, average income), **self-reported anthropometric variables** (body weight and height), and **lifestyle habits** (physical activity habits, hours of sleep, smoking, diet). They were asked about their **knowledge level of eating disorders** (Anorexia Nervosa, Bulimia Nervosa, Restrictive or uncontrolled eating, Bigorexia, Orthorexia Nervosa). Parents were asked about their **child's sports habits** and answered the same questions that are contained **in the EDSA questionnaire** but if they were noticed in their child.



2.6. STATISTICAL ANALYSIS

The statistical analyses were carried out using Statistica 12.7 for Windows (Statsoft Inc, Tulsa, OK, USA). The results are expressed as absolute numbers (N) and percentages (%) for categorical data and mean values with their SD for continuous data. All gathered data from the survey were first tested for normality of distribution with the Kolmogorov-Smirnov test. To compare the mean differences between survey groups, a Kruskal-Wallis or t-test test was used, whereas the chi-square test was used to compare the categorical frequencies. Statistical significance was set at $P < 0.05$.

(Anorexia Nervosa, Bulimia Nervosa, Restrictive or uncontrolled eating, Bigorexia, Orthorexia Nervosa).

2.5. TRAINERS

Trainers fulfilled their questionnaire which had questions about **socio-demographic variables** (age, gender, educational level, employment status, training habits, sports trained), and **lifestyle habits** (physical activity habits, hours of sleep, diet). They were asked about **their athletes' habits** regarding body weight and shape concern/emotions, food obsession, overeating, going to the bathroom right after a meal, uncontrolled eating/exercise, and using laxatives/diuretics/weight loss/muscle gain products. They were also asked about their **knowledge level of eating disorders** (Anorexia Nervosa, Bulimia Nervosa, Restrictive or uncontrolled eating, Bigorexia, Orthorexia Nervosa), and to note, if they know, **at least 3 symptoms** of Anorexia Nervosa, Bulimia Nervosa, and uncontrolled eating. They were also asked about their **behavior** when they notice symptoms of ED in their athlete, and when athletes have or had diagnosed the ED.





3. RESULTS AND DISCUSSION

3.1. ATHLETES

In this survey participated **462 non-professional athletes of age from 12 to 25 years** (18.49 ± 5.50 years) (Table 1). They mostly participated from Croatia (46.5%, $p < 0.001$), followed by Bulgaria (11.7%), Poland (11.3%), North Macedonia (11.0%), Italy (10.8%), and Greece (8.7%). The youngest athletes were from Poland (16 years) and the oldest were from Bulgaria (24 years; $p < 0.001$). On average, most of the athletes had nutrition status within a **normal weight** (75.1%, $p < 0.001$), but there were more of those with underweight (12.8%) than overweight and obesity (10.6% and 1.5%, respectively). Athletes were mostly engaged in **more than 10 hours per week of training** for their sport (36.8%, $p < 0.001$), mostly in Poland and Bulgaria (Table 1). Regarding the sport that surveyed athletes train, mostly they train a sport which is classified as **less weight-sensitive ball sports** (61.7%, $p < 0.001$) such as football, volleyball, mostly from Poland and Croatia.

3.1.1. WEIGHT CONTROL BEHAVIOR

Table 2 presents results regarding weight control behavior. **A third** of all surveyed athletes (32.3%, $p < 0.001$) had **regulated their body weight** to achieve desired sports performance, mostly from North Macedonia (60.8%), possibly because that the most of athletes from North Macedonia trained a weight-sensitive weight class sports such as karate (32.6%). A fifth of surveyed athletes stated that experienced negative consequences of regulating their weight (21.2%, $p < 0.001$), mostly from North Macedonia (43.1%, $p < 0.001$), and least from Greece (7.5%). Still, half of the surveyed athletes stated that they never had to lose weight (50.6%, $p < 0.001$), significantly the most from Bulgaria (79.6%, $p < 0.001$). Those athletes who were losing weight, **mostly helped themselves** (32.7%; $p < 0.001$), the most from Poland and Greece (40.4%, and 52.5%, respectively). On average, athletes asked for help from their **friends and family** (6.5%), more than asking

3.1.2. EATING DISORDERS RISK FACTORS AMONG ATHLETES

In Table 3 are factors that can influence risk behavior toward eating disorders. There was no significant difference ($p = 0.197$) among surveyed athletes regarding having 3 or more injuries in the past season or having to finish a season earlier, which may influence their weight. Still, this was reported by Italian athletes the most (24.0%), and the least was by Croatian (10.2%) and Greek (10.0%). Most of all athletes stated that they **don't worry about getting their weight in of season or when they are on sick leave** (64.7%, $p < 0.001$). Among those who stated to worry, most of them worry a few times a week (13.9%), most from North Macedonia (25.5%) and Italy (26.0%), while Bulgarian athletes worry mostly a few times a day about that (16.7%). **Constant worrying** about gaining weight declared North Macedonian athletes (23.5%) followed

Regarding weight-sensitive sports, athletes trained mostly weight-sensitive endurance sports (13.2%) such as swimming, mostly from Croatia, followed by weight-sensitive weight-class sports (9.3%) such as karate, and judo, mostly from Croatia and North Macedonia. A weight-sensitive aesthetic sport such as gymnastics trained 4.3% of athletes, while weight-sensitive power sports such as athletics trained 8.2% of surveyed athletes mostly from Croatia, Bulgaria, and Italy. Since diet has a significant role in athletes' life, their diet quality was evaluated with EAT-Lancet the Planetary Health Diet Index. On average, most of the athletes had **a diet that moderately adhered to the EAT-Lancet Index** (88.1%), and 11% of those with a diet that highly adhered to it (Table 1). Significantly the highest diet quality had Greek athletes and the lowest Italian (28.64 and 22.16, $p < 0.001$, respectively).

nutritionists (4.8%) or a trainer (5.4%). Italian, North Macedonian, and Croatian athletes will ask for help more from nutritionists and trainers than Bulgarian and Greek athletes, which will the most ask for help from their trainers and help themselves by changing their diet if they ever need to lose weight. Croatian athletes mostly will ask their parents (68.1%) and change their training (66.0%), while Polish athletes will choose to help themselves by using laxatives/diuretics/dieting products (26.7%). North Macedonian athletes will ask nutritionists (16.8%) and sports doctors the most (17.2%), which is similar to Bulgarian athletes, but most will ask experienced teammates (13.1%). Greek athletes will ask their trainer the most (52.5%), while statistically more Croatian (50.0%) and Italian (41.7%, $p = 0.011$) athletes stated that not wish to answer this, followed by being unsure about this issue (44.4% and 25.9%, respectively).

by Croatian (10.2%). Other athletes constantly stated to worry constantly in similar proportions. Although more than half of the athletes were satisfied with their current weight (55.4%, $p < 0.001$), Greek and Bulgarian athletes were the most unsatisfied. Croatian and North Macedonian athletes more than others stated they **need to lose more weight**, 5kg and more. Others the most stated that they need to lose weight from 0.5 to 5kg. A third of athletes stated that was told to lose weight by someone who is not a health professional (27.7%, $p < 0.001$), and this was the most told among more than half of North Macedonian athletes (56.9%). **A third** of athletes were **currently following a specific diet plan** for achieving the best weight for their performance (33.5%), and those data were similar in athletes from all countries ($p = 0.351$).



TABLE 3. EATING DISORDER RISK FACTORS AMONG ATHLETES (N=462)

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
3 or more injuries or finish a season earlier due to injury															
Yes	22	10.2	12	24.0	6	11.5	7	13.7	7	13.0	4	10.0	58	12.6	0.197
Worry getting weight in the off-season or when on sick leave															
No	137	63.7	27	54.0	45	86.5	20	39.2	40	74.1	30	75.0	299	64.7	
Yes, few time in a week	30	14.0	13	26.0	3	5.8	13	25.5	2	3.7	3	7.5	64	13.9	<0.001
Yes, few time in a day	26	12.1	7	14.0	1	1.9	6	11.8	9	16.7	4	10.0	53	11.5	
Yes, constantly	22	10.2	3	6.0	3	5.8	12	23.5	3	5.6	3	7.5	46	10.0	
Satisfied with current body weight															
Yes	140	65.1	21	42.0	35	67.3	35	68.6	16	29.6	9	22.5	256	55.4	<0.001
How much do you think you need to lose weight to be at your best performance weight?															
None	111	51.6	22	44.0	34	65.4	26	51.0	46	85.2	17	42.5	256	55.4	
0.5 to 2 kg	38	17.7	10	20.0	5	9.6	9	17.6	1	1.9	19	47.5	82	17.7	0.001
2 to 5 kg	31	14.4	12	24	10	19.2	6	11.8	2	3.7	3	7.5	64	13.9	
5 to 7 kg	16	7.4	5	10.0	1	1.9	6	11.8	1	1.9	1	2.5	30	6.5	
more than 7kg	19	8.8	1	2.0	2	3.8	4	7.8	4	7.4	0	0.0	30	6.5	
Currently follow a specific diet plan to achieve your best performance weight															
Yes	82	38.1	12	24.0	18	34.6	14	27.5	16	29.6	13	32.5	155	33.5	0.351
Not a health professional told to lose weight															
Yes	62	28.8	15	30.0	9	17.3	29	56.9	4	7.4	9	22.5	128	27.7	<0.001

3.1.3. THE PREVALENCE OF EATING DISORDER AMONG ATHLETES

For the purpose of assessment of the prevalence of the risk of eating disorders among athletes, two questionnaires were applied. First was a 36-item Eating Disorder questionnaire for Adolescents (EDE-A) relating to four risk behaviors (food restraint, eating concern, shape concern, and weight concern) for the last 14 days (Table 4). The second questionnaire was a 6-item eating Disorders Screen for Athletes (EDSA) (Table 5). **The prevalence of the risk for eating disorders assessed by EDE-A was 10.4%**, significantly **the highest among Croatian and North Macedonian athletes** (14.9% and 13.7%, respectively, $p < 0.001$) followed by Italian (6.0%) and Polish athletes (5.8%), and the least by Bulgarian (3.7%) and Greek athletes (2.5%) (Table 4). Athletes scored on the shape and weight concern questions the highest by Croatian, Greek, and North Macedonian athletes ($p < 0.001$), while Polish and Bulgarian athletes scored the highest on food restraint questions ($p = 0.001$) (Table 4). The highest global EDE-A score had North Macedonian athletes, and the lowest Bulgarian athletes ($p < 0.001$). The number of athletes **at risk for eating disorders assessed by a brief EDSA questionnaire** was twice higher, with a total of **92 athletes**, showing **an ED prevalence of 19.9%** (Table 5).

Significantly **the highest risk prevalence** was among **Polish athletes** (30.8%, $p = 0.003$) and the lowest among Bulgarian (3.7%) and Greek (7.5%), while Italian, North Macedonian, and Croatian athletes had similar values (24.0%, 23.5%, and 21.9%, respectively) showing almost a quarter or a fifth of athletes to be at possible risk for eating disorders (Table 5). The highest EDSA score had Polish athletes and the lowest Bulgarian athletes ($p < 0.001$), while athletes from other countries had similar scores (Table 5). Athletes **highest scored weight, shape, or body composition affecting feeling about them**, but with no difference among countries, the least was Greece ($p = 0.270$). Worrying that weight, shape, or body composition will change if not exercising was the second item highly scored, but with no difference ($p = 0.077$). The highest prevalence of those who want to be leaner even if others think differently was significantly the most among Croatian and Polish athletes (10.7% and 13.5%, $p = 0.011$). Food avoidance (19.2%) and dissatisfaction with weight, shape, or body composition were scored the highest by Polish athletes (11.5%) who stated significantly the highest proportion of being diagnosed with ED (15.4%, $p < 0.001$), and Bulgaria the lowest (0.0%).

TABLE 4. EATING DISORDER QUESTIONNAIRE FOR ADOLESCENTS (EDE-A) RESULTS AMONG ATHLETES (N=462)

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	mean	SD	mean	SD	mean	SD	mean	SD	mean	SD	mean	SD	mean	SD	
Restraint score	0.83	1.37	0.70	0.98	0.96	1.24	1.26	1.02	0.73	1.00	0.95	0.34	0.84	1.25	<0.001
Eating concern score	0.61	1.07	0.53	0.64	0.49	1.06	0.78	0.96	0.28	0.81	1.40	0.43	0.64	0.98	<0.001
Shape concern score	1.27	1.62	0.99	1.08	0.88	1.15	1.68	1.38	0.63	0.84	1.23	0.78	1.16	1.38	<0.001
Weight concern score	1.06	1.47	1.04	1.04	0.74	1.03	1.60	1.41	0.42	0.83	1.26	0.62	1.02	1.29	<0.001
Global EDE-A score	0.94	1.28	0.82	0.80	0.77	1.02	1.33	1.20	0.44	0.82	1.21	0.53	0.92	1.12	<0.001
At risk for eating disorder (N (%))	32	14.9	3	6.0	3	5.8	7	13.7	2	3.7	1	2.5	48	10.4	<0.001



TABLE 5. EATING DISORDERS SCREEN FOR ATHLETES (EDSA) RESULTS AMONG ATHLETES (N=462)

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Being diagnosed with any type of eating disorder															
Yes	2	0.9	4	8.0	8	15.4	1	2.0	0	0.0	3	7.5	18	3.9	<0.001
Eating Disorders Screen for Athletes (EDSA) score (mean (SD))	2.35	1.05	2.60	1.07	2.89	1.16	2.61	1.0	1.94	0.70	2.44	0.36	2.43	1.00	<0.001
At risk for eating disorder	47	21.9	12	24.0	16	30.8	12	23.5	2	3.7	3	7.5	92	19.9	0.003
Weight, shape, or body composition affects feeling about yourself															
always	23	10.7	3	6.0	8	15.4	7	13.7	4	7.4	1	2.5	46	10.0	0.270
Dissatisfied with weight, shape, or body composition															
always	18	8.4	1	2.0	6	11.5	3	5.9	1	1.9	0	0.0	29	6.3	0.073
Worried that weight, shape, or body composition will change if you cannot exercise															
always	24	11.2	5	10.0	5	9.6	7	13.7	1	1.9	0	0.0	42	9.1	0.077
Wanting to be leaner even if others may think he/she is already lean															
always	23	10.7	1	2.0	7	13.5	2	3.9	1	1.9	0	0.0	34	7.4	0.011
Worried about losing control over eating because of how it may affect his/her weight, shape, or body composition															
always	12	5.6	3	6.0	3	5.8	3	5.9	1	1.9	0	0.0	22	4.8	0.585
Trying to avoid certain foods to influence weight, shape, or body composition															

3.1.4. WEIGHT-RELATED PSYCHOLOGICAL PRESSURE FROM A TRAINER AND TEAMMATES

Pressure from trainers and teammates regarding body weight and/or shape can possibly influence on developing an eating disorder in an athlete. Athletes evaluated the comments and behavior of trainers and teammates regarding diet, weight, and shape which results are shown in Table 6. Bulgarian athletes significantly lowest talk about diet with their teammates, North Macedonian the highest (14.8% and 70.6%, $p<0.001$). North Macedonian and Italian athletes are significantly most nervous about their trainer controlling their weight (19.6% and 22.0%, respectively $p<0.001$), Polish and Bulgarian athletes the least (0.0% and 1.9%, respectively), and similar was about bothering them when a trainer asks to weight often ($p<0.001$). Polish and North Macedonian athletes compare themselves with teammates regarding body weight the most (46.2% and 31.4%, $p<0.001$), and Polish and Greek athletes the most feel good if weighing less than their teammates (34.6% and 32.5%, respectively, $p=0.004$), Italian and Bulgarian the least (12.0% and 13.0%, respectively).

When the trainer talks about the athlete's weight, this most affects North Macedonian athletes (35.3%, $p<0.001$), and Bulgarian the least (3.7%). A third of Italian (32.0%) and Greek (30.0%), a quarter of Croatian (22.3%), and North Macedonian athletes (23.5%) feel uncomfortable when a trainer and teammates talk about their body weight and shape, and significantly the lowest Bulgarian (5.6%) and Polish athletes (9.6%, $p<0.001$). Half of the Croatian athletes (51.6%) are not feeling good when their teammates talk about their weight, also a third of Greek (35.0%), a quarter of Italian (26.0%), Polish (25.0%), and North Macedonian athletes (27.5%), while Bulgarian significantly the least (5.6%, $p<0.001$). **The perceived pressure** regarding comments and behavior from trainers and teammates regarding athlete's body weight and shape significantly was **the highest among North Macedonian and Italian athletes** (21.6% and 18.0%, respectively, $p<0.001$), and the least among Bulgarian athletes (1.9%).

TABLE 6. PERCEIVED PRESSURE AND CONCERNS ABOUT TEAM COLLEAGUES'/TRAINER COMMENTS REGARDING DIET, WEIGHT AND SHAPE

All yes	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Talk about diet with team colleagues.	93	43.3	15	30.0	26	50.0	36	70.6	8	14.8	7	17.5	185	40.0	<0.001
Nervous that the trainer controls our weight.	13	6.0	11	22.0	0	0.0	10	19.6	1	1.9	2	5.0	37	8.0	<0.001
Comparing with team colleagues regarding body weight.	61	28.4	11	22.0	24	46.2	16	31.4	6	11.1	5	12.5	123	26.6	0.002
Bothering when a trainer asks to weigh often.	20	9.3	8	16.0	1	1.9	13	25.5	1	1.9	4	10.0	47	10.2	<0.001
Affected when a trainer talks about body weight.	41	19.1	11	22.0	5	9.6	18	35.3	2	3.7	3	7.5	80	17.3	<0.001
Uncomfortable when the trainer and team colleagues talk about weight and body shape.	48	22.3	16	32.0	5	9.6	12	23.5	3	5.6	12	30.0	96	20.8	0.003
Not feeling good when team colleagues talk about his/hers body.	111	51.6	13	26.0	13	25.0	14	27.5	3	5.6	14	35.0	168	36.4	<0.001
Feeling good if weighing less than team colleagues.	68	31.6	6	12.0	18	34.6	13	25.5	7	13.0	13	32.5	125	27.1	0.004
Perceived pressure from a trainer/team colleagues	25	11.6	9	18.0	4	7.7	11	21.6	1	1.9	1	2.5	51	11.0	<0.001



3.1.5. ATHLETES AT POTENTIAL RISK FOR EATING DISORDERS ASSESSED WITH EDE-A AND EDSA QUESTIONNAIRES

Tables 7 and 8 are showing selected characteristics of those athletes that are at possible risk for eating disorders assessed with the EDE-A questionnaire (Table 7) and with the EDSA questionnaire (Table 8). **Among 48 (10.4%) athletes** that were at potential risk for eating disorders assessed with the EDE-A questionnaire **females were significantly more present** (77.1%; $p=0.002$), except for Poland and Greece where all those athletes were males (Table 7). There wasn't a significant difference regarding nutritional status, most of them were **normal weight** (70.8%, $p=0.960$), there were 6.3% of underweight athletes, all from Croatia, and 22.9% of overweight athletes were from Croatia and North Macedonia. Regarding the sports trained, there also wasn't a significant difference, almost two-thirds of them played **less weight-sensitive ball sports** such as volleyball, handball, tennis, softball, and football (66.7%, $p=0.995$). Concerning country representation, all of them were from Italy, Poland, and Greece, and half of them were from Bulgaria. In Croatia and North Macedonia, besides the abovementioned sports class, other main sports class was weight-sensitive aesthetics such as figure skating, dancing, and gymnastics (12.5% and 14.3%, respectively), weight-sensitive power sports such as athletics, triathlon (9.4% and 14.3%, respectively). At possible risk were also the athletes that played weight-sensitive weight-class sports such as combat sports, in at Croatia 9.4% and in Bulgaria at 50.0%.

Eating behaviors of athletes with a possible risk didn't differ significantly, 83.3% had a **diet that moderately adhered to the EAT-Lancet diet**, where 2.1% had low adherence (1 from Croatia), and 14.6% had a diet that highly adhered, 5 from Croatia and 2 from North Macedonia.

Almost half of the athletes had perceived pressure from a trainer/teammates (47.9%, $p<0.001$), the most were in Croatia (56.3%) and North Macedonia (57.1%), and a third in Poland (33.3%). Italian, Greek, and Bulgarian athletes didn't note a perceived pressure (all 0.0%). There were **78.7%** of those athletes with a possible risk for ED assessed with **the EDSA questionnaire** ($p<0.001$). All those who were at possible risk for ED assessed with both questionnaires were Polish athletes (100.0%). High coincidence also had Croatia (84.4%) and North Macedonia (71.4%), then Bulgaria (50.0%), Italy (33.3%), and Greece with no coincidence (0.0%).

Among 92 (19.9%) athletes that were at possible risk for eating disorders assessed with the EDSA questionnaire (Table 8) half of them were from Croatia (N=47), 16 were from Poland, 12 each from Italy, and Poland, 3 from Greece, and 2 from Bulgaria. Most of all athletes had **normal weight** (72.8%), there were 6.5% of underweight, and 3.3% of those with obesity, the most were Croatian athletes. Around half of the athletes played **less weight-sensitive ball sports** (63.0%, $p=0.176$), the most from Poland, Greece, and North Macedonia. Other prevalent sports were weight-sensitive endurance (10.9%), power (8.7%), and weight-class sports (7.6%). Athletes' diet on average mostly moderately adhered to the EAT-Lancet diet (83.7%, $p=0.950$), whereas North Macedonian athletes had the highest prevalence of those whose diet highly adhered to (25.0%). **A third** (29.3%, $p<0.001$) of athletes confirmed a **perceived pressure from a trainer and teammates**, the most in Croatia (40.4%), then North Macedonia and Greece (both 33.3%), Poland (12.5%), Italy (8.3%) and Bulgaria the least (0.0%). **Two-fifth** of this subgroup of athletes were also at possible risk for ED assessed with **the EDE-A questionnaire** (40.2%, $p<0.001$), the most in Croatia (57.4%), then North Macedonia, Poland, and Bulgaria. In Italy wasn't any coincidence between these two questionnaires.

TABLE 7. ATHLETES' CHARACTERISTICS THAT WERE AT POTENTIAL RISK FOR EATING DISORDERS ASSESSED WITH EDE-A (N=48)

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Total	32	100.0	3	100.0	3	100.0	7	100.0	2	100.0	1	100.0	48	100.0	<0.001	
Male	3	9.4	1	33.3	3	100.0	3	42.9	0	0.0	1	100.0	11	22.9	0.002	
Female	29	90.6	2	66.7	0	0.0	4	57.1	2	100.0	0	0.0	37	77.1		
Nutritional status	underweight	3	9.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	6.3	0.960
	normal weight	20	62.5	3	100.0	3	100.0	5	71.4	2	100.0	1	100.0	34	70.8	
	overweight	9	28.1	0	0.0	0	0.0	2	28.6	0	0.0	0	0.0	11	22.9	
	obese	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
	less weight-sensitive ball sports	19	59.4	3	100.0	3	100.0	5	71.4	1	50.0	1	100.0	32	66.7	
less weight-sensitive technical	1	3.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	2.1	0.995	
less weight-sensitive high mass	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0		
weight-sensitive aesthetic	4	12.5	0	0.0	0	0.0	1	14.3	0	0.0	0	0.0	5	10.4		
weight-sensitive endurance	3	9.4	0	0.0	0	0.0	1	14.3	0	0.0	0	0.0	4	8.3		
weight-sensitive power	2	6.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	4.2		
weight-sensitive weight class	3	9.4	0	0.0	0	0.0	0	0.0	1	50.0	0	0.0	4	8.3		
The Planetary Health Diet Index	low adherence	1	3.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	2.1	0.937
	moderate adherence	26	81.3	3	100.0	3	100.0	5	71.4	2	100.0	1	100.0	40	83.3	
	high adherence	5	15.6	0	0.0	0	0.0	2	28.6	0	0.0	0	0.0	7	14.6	
Perceived pressure from a trainer/teammates	18	56.3	0	0.0	1	33.3	4	57.1	0	0.0	0	0.0	23	47.9	<0.001	
At possible risk assessed with EDSA	27	84.4	1	33.3	3	100.0	5	71.4	1	50.0	0	0.0	37	78.7	<0.001	



TABLE 8. ATHLETES' CHARACTERISTICS THAT WERE AT POTENTIAL RISK FOR EATING DISORDERS ASSESSED WITH EDSA (N=92)

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Total	47	100.0	12	100.0	16	100.0	12	100.0	2	100.0	3	7.5	92	100.0	<0.001	
Male	7	14.9	3	25.0	13	81.3	4	33.3	0	0.0	1	2.5	28	30.4	<0.001	
Female	40	85.1	9	75.0	3	18.8	8	66.7	2	100.0	2	5.0	64	69.6	<0.001	
Nutritional status	underweight	5	10.6	0	0.0	1	6.3	0	0.0	0	0.0	0	0.0	6	6.5	0.697
	normal weight	30	63.8	10	83.3	14	87.5	8	66.7	2	100.0	3	100.0	67	72.8	
	overweight	10	21.3	1	8.3	1	6.3	4	33.3	0	0.0	0	0.0	16	17.4	
	obese	2	4.3	1	8.3	0	0.0	0	0.0	0	0.0	0	0.0	3	3.3	
Sport class	less weight-sensitive ball sports	23	48.9	5	41.7	16	100.0	10	83.3	1	50.0	3	100.0	58	63.0	0.176
	less weight-sensitive technical	3	6.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	3.3	
	less weight-sensitive high mass	1	2.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.1	
	weight-sensitive aesthetic	3	6.4	1	8.3	0	0.0	1	8.3	0	0.0	0	0.0	5	5.4	
	weight-sensitive endurance	7	14.9	2	16.7	0	0.0	1	8.3	0	0.0	0	0.0	10	10.9	
	weight-sensitive power	4	8.5	4	33.3	0	0.0	0	0.0	0	0.0	0	0.0	8	8.7	
The Planetary Health Diet Index	weight-sensitive weight class	6	12.8	0	0.0	0	0.0	0	0.0	1	50.0	0	0.0	7	7.6	0.950
	low adherence	1	2.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.1	
	moderate adherence	38	80.9	10	83.3	15	93.8	9	75.0	2	100.0	3	100.0	77	83.7	
	high adherence	8	17.0	2	16.7	1	6.3	3	25.0	0	0.0	0	0.0	14	15.2	
Perceived pressure from a trainer/teamates	19	40.4	1	8.3	2	12.5	4	33.3	0	0.0	1	33.3	27	29.3	<0.001	
At risk assessed with EDE-A	27	57.4	0	0.0	3	18.8	5	41.7	1	50.0	1	33.3	37	40.2	<0.001	

3.1.6. EATING DISORDERS KNOWLEDGE AMONG ATHLETES

Athletes rated their knowledge regarding eating disorders from not knowing to know well about it (Table 9). **North Macedonian and Croatian athletes knew more** than other subgroups about Anorexia Nervosa (35.3% and 34.4%, respectively; $p < 0.001$) and Bulimia Nervosa (25.5% and 30.2%, respectively; $p < 0.001$), Greek and Bulgarian about overeating (30.2% and 24.1%, respectively; $p < 0.001$), and about Orthorexia Nervosa (10.0% and 13.3%, respectively; $p < 0.001$), Croatian and Polish athletes about avoidant/restrictive eating (20.9% and 19.2%, respectively; $p < 0.001$), and Polish and Bulgarian athletes about Bigorexia Nervosa (13.5% and 11.1%, respectively; $p < 0.001$). Italian athletes stated answers in the least number to know well all mentioned eating disorders.

Concerning the abovementioned results about knowledge of eating disorders among athletes, they were asked to choose the most preferred way to receive education and information about eating disorders. The results are presented in table 10. Athletes from all countries chose **a webpage/blog as the most preferred way** (33.6%, $p < 0.001$). Croatian, Greek, and Bulgarian athletes also note webinars and workshops in a high proportion, while Italian, Polish, Greek and North Macedonian athletes noted printed manuals in a high proportion. Consulting with experts as an option noted only Italian athletes (14.5%), and 4.5% of Croatian athletes noted "Other" as an option to receive education and information about ED.

TABLE 9. ATHLETES' KNOWLEDGE ABOUT EATING DISORDERS (N=462)

Knowledge	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Anorexia Nervosa															
don't know	31	14.4	20	40.0	6	11.5	5	9.8	1	1.9	4	10.0	67	14.5	<0.001
heard/somewhat know	110	51.2	28	56.0	38	73.1	28	54.9	40	74.1	29	72.5	273	59.1	
know well	74	34.4	2	4.0	8	15.4	18	35.3	13	24.1	7	17.5	122	26.4	
Bulimia Nervosa															
don't know	46	21.4	18	36.0	16	30.8	9	17.6	2	3.7	4	10.0	95	20.6	<0.001
heard/somewhat know	104	48.4	30	60.0	30	57.7	29	56.9	44	81.5	35	87.5	272	58.9	
know well	65	30.2	2	4.0	6	11.5	13	25.5	8	14.8	1	2.5	95	20.6	
Binge eating/Overeating															
don't know	25	11.6	20	40.0	8	15.4	10	19.6	1	1.9	10	25.0	74	16.0	<0.001
heard/somewhat know	125	58.1	29	58.0	34	65.4	29	56.9	40	74.1	27	67.5	284	61.5	
know well	65	30.2	1	2.0	10	19.2	12	23.5	13	24.1	3	7.5	104	22.5	
Avoidant/Restrictive eating															
don't know	58	27.0	24	48.0	4	7.7	10	19.6	0	0.0	8	20.0	104	22.5	<0.001
heard/somewhat know	112	52.1	25	50.0	38	73.1	32	62.7	44	81.5	31	77.5	282	61.0	
know well	45	20.9	1	2.0	10	19.2	9	17.6	10	18.5	1	2.5	76	16.5	
Bigorexia Nervosa															
don't know	131	60.9	27	54.0	21	40.4	17	33.3	4	7.4	11	27.5	211	45.7	<0.001
heard/somewhat know	65	30.2	21	42.0	27	51.9	29	56.9	44	81.5	26	65.0	212	45.9	
know well	19	8.8	2	4.0	7	13.5	5	9.8	6	11.1	3	7.5	42	9.1	
Orthorexia Nervosa															
don't know	149	69.3	27	54.0	30	57.7	19	37.3	3	5.6	17	42.5	245	53.0	<0.001
heard/somewhat know	46	21.4	22	44.0	19	36.5	29	56.9	44	81.5	19	47.5	179	38.7	
know well	20	9.3	1	2.0	3	5.8	3	5.9	7	13.0	4	10.0	38	8.2	

TABLE 10. ATHLETES' PREFERRED WAY TO RECEIVE EDUCATION AND INFORMATION ABOUT EATING DISORDERS (N=462)

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Webpage/blogs	101	26.6	29	46.8	23	44.2	35	37.6	30	50.8	12	30.0	230	33.6	<0.001
Webinars	141	37.2	4	6.5	6	11.5	18	19.4	24	40.7	11	27.5	204	29.8	
Consulting with experts	0	0.0	9	14.5	0	0.0	0	0.0	0	0.0	0	0.0	9	1.3	
Workshops	82	21.6	9	14.5	12	23.1	22	23.7	4	6.8	1	2.5	130	19.0	
Printed manual	38	10.0	11	17.7	11	21.2	18	19.4	1	1.7	16	40.0	95	13.9	
Other	17	4.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	17	2.5	



3.2. ATHLETES' PARENTS

The average age of surveyed **519 athletes' parents** was 43 years (Table 11). Almost half of all parents were from Croatia (45.9%), followed by Poland (13.9%), Bulgaria (11.8%), North Macedonia (10.6%), Italy (9.6%), and Greece (8.3%). On average, almost all of the parents were married (79.6%), with no significant differences between countries. The majority of parents had a nutritional status within **normal body weight** (BMI 24.52 kg/m²). Bulgaria (14.8%) and Croatia (10.1%) stand out with those being malnourished. With overweight and obesity, North Macedonia (41.8%) and Croatia (40.3%) stand out ($p < 0.001$). Most of the parents were **nonsmokers** (62.6%, $p < 0.001$). North Macedonia had the largest number of smokers (58.2%, $p < 0.001$). Almost half of the parents stated their physical activity habits that were scored as **moderate physical activity** (48.6%). Most of those with low physical activity were among Croatian parents (31.5%), and most of those with high physical activity were among Polish parents (45.8%, $p < 0.001$). A third of parents stated that they completed **high school** (37.0%), and a third a **Graduate** (34.5%).

On average, a high proportion was **employed** (86.1%, $p < 0.001$), mostly in Croatia (93.3%), and the lowest was in Italy and Greece, where parents also worked honorary, more than others. Two-thirds of parents (61.8%) had **income around the country's average**. Italian parents were the most with income below the country average (18%, $p < 0.001$), and Greek parents were the most with income higher than the country average. The majority of parents stated that they live in an **urban area** (71.1%, $p < 0.001$), except for Polish and Greek parents (83.3%) who lived mostly in a rural area. On average, **the diet** of all parents **moderately adhered to the EAT-Lancet index** (85.5%; $p < 0.001$), whereas most of those with a diet that highly adhered to The EAT-Lancet Index were Italian parents (38.0%). Parents listed the sports that their children trained in. Most parents had children training sports classified as **less weight-sensitive ball sports** (59.7%, $p < 0.001$), all from Poland and Greece (both 100.0%). Croatian and Italian parents had the most children training in weight-sensitive endurance sports (32.8% and 12.0%, respectively, $p < 0.001$), and North Macedonian parents' children training in weight-sensitive weight-class sports (32.7%, $p < 0.001$).

TABLE 11. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF ATHLETES' PARENTS (N=519) (*MEAN (SD))

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Men	64	26.9	15	30.0	25	34.7	23	41.8	32	52.5	2	4.7	161	31.0	
Women	174	73.1	35	70.0	47	65.3	32	58.2	29	47.5	41	95.3	358	69.0	0.002
Total	238	45.9	50	9.6	72	13.9	55	10.6	61	11.8	43	8.3	519	100.0	<0.001
Age (years)*	43.54	5.60	47.96	8.03	40.06	4.72	39.65	5.44	36.75	8.56	44.02	6.08	42.95	6.97	<0.001
Body weight (kg)*	72.50	16.13	67.52	0.80	77.73	19.60	76.62	15.58	68.66	14.7	74.48	5.74	72.72	16.12	0.0112
body height (m)*	1.71	0.08	1.69	0.08	1.75	0.19	1.75	0.1	1.72	8.24	1.74	0.06	1.72	0.09	<0.001
Body mass index (kg/m²)*	24.73	6.48	23.44	2.55	24.81	2.35	24.8	3.25	23.11	3.53	24.48	0.45	24.52	5.00	0.236
Underweight	24	10.1	0	0.0	1	1.4	1	1.8	9	14.8	1	2.3	36	6.9	
Normal weight	118	49.6	37	74.0	39	54.2	29	52.7	27	44.3	31	72.1	281	54.1	<0.001
Overweight	50	21.0	12	24.0	25	34.7	23	41.8	25	41.0	10	23.3	145	27.9	
Obese	46	19.3	1	2.0	7	9.7	2	3.6	0	0.0	1	2.3	57	11.0	
Smoker	67	28.2	13	26.0	10	13.9	32	58.2	6	9.8	9	20.9	137	26.4	
Nonsmoker	152	63.9	30	60.0	56	77.8	16	29.1	47	77.0	24	55.8	325	62.6	<0.001
Former smoker	19	8.0	7	14.0	6	8.3	7	12.7	8	13.1	10	23.3	57	11.0	
Low physical activity	75	31.5	11	22.0	16	22.2	9	16.4	13	21.3	3	7.0	127	24.5	
Moderate physical activity	114	47.9	22	44.0	23	31.9	38	69.1	25	41.0	30	69.8	252	48.6	<0.001
High physical activity	49	20.6	17	34.0	33	45.8	8	14.5	22	36.1	10	23.3	139	26.8	
Married	194	81.3	34	68.0	58	80.6	45	81.8	48	78.7	37	86.0	416	80.2	
Living with partner	17	7.1	9	18.0	1	1.4	1	1.8	7	11.5	3	7.0	38	7.3	
Widowed	3	1.3	1	2.0	2	2.8	0	0.0	1	1.6	1	2.3	8	1.5	<0.001
Single parent	21	8.8	0	0.0	4	5.6	1	1.8	4	6.6	1	2.3	31	6.0	
Preferred not to answer	3	1.3	6	12.0	7	9.7	8	14.5	1	1.6	1	2.3	26	5.0	
Elementary school	0	0.0	2	4.0	0	0.0	2	3.6	0	0.0	0	0.0	4	0.8	
High school	86	36.1	29	58.0	20	27.8	32	58.2	2	3.3	23	53.5	192	37.0	
Undergraduate	45	18.9	7	14.0	9	12.5	18	32.7	10	16.4	20	46.5	109	21.0	<0.001
Graduate	83	34.9	10	20.0	41	56.9	3	5.5	42	68.9	0	0.0	179	34.5	
Postgraduate	24	10.1	2	4.0	2	2.8	1	1.8	7	11.5	0	0.0	36	6.9	
Employed	222	93.3	40	80.0	61	84.7	50	90.9	54	88.5	20	46.5	447	86.1	
Unemployed	3	1.3	3	6.0	5	6.9	4	7.3	5	8.2	3	7.0	23	4.4	<0.001
Honorary work	8	3.4	6	12.0	5	6.9	1	1.8	1	1.6	20	46.5	41	7.9	
Pension	5	2.1	1	2.0	1	1.4	0	0.0	1	1.6	0	0.0	8	1.5	
Income below country average	30	12.6	9	18.0	5	6.9	4	7.3	1	1.6	1	2.3	50	9.6	
Income around average	144	60.5	35	70.0	42	58.3	34	61.8	44	72.1	22	51.2	321	61.8	<0.001
Income higher than average	64	26.9	6	12.0	25	34.7	17	30.9	16	26.2	20	46.5	148	28.5	
Living in urban area	223	93.7	38	76.0	12	16.7	47	85.5	47	77.0	2	4.7	369	71.1	<0.001
Living in rural area	15	6.3	12	24.0	60	83.3	8	14.5	14	23.0	41	95.3	150	28.9	
EAT-Lancet index*	24.61	3.04	26.76	4.16	24.13	3.18	22.63	3.09	23.4	2.1	21.33	1.24	24	3.3	<0.001
Low adherence	1	0.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	
Moderate adherence	202	84.9	31	62.0	59	81.9	52	94.5	60	98.4	40	93.0	444	85.5	<0.001
High adherence	35	14.7	19	38.0	13	18.1	3	5.5	1	1.6	3	7.0	74	14.3	
Their child's sports class															
less weight-sensitive ball sports	74	31.1	43	86.0	72	100.0	32	58.2	46	75.4	43	100.0	310	59.7	<0.001
less weight-sensitive technical	5	2.1	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0.0	5	1.0	<0.001
less weight-sensitive high mass	0	0.0	0	0.0	0	0.0	0	0.0	1	1.6	0.0	0.0	1	0.2	<0.001
weight-sensitive aesthetic	48	20.2	1	2.0	0	0.0	0	0.0	3	4.9	0.0	0.0	52	10.0	<0.001
weight-sensitive endurance	78	32.8	6	12.0	0	0.0	5	9.1	5	8.2	0.0	0.0	94	18.1	<0.001
weight-sensitive power	18	7.6	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0.0	18	3.5	<0.001
weight-sensitive weight class	15	6.3	0	0.0	0	0.0	18	32.7	6	9.8	0.0	0.0	39	7.5	<0.001



3.2.1. PARENTS' OPINIONS ABOUT WEIGHT CONTROL BEHAVIOR AMONG THEIR ATHLETE CHILD

Weight control behaviors among athletes noticed and rated by their parents are presented in Table 12. The largest proportion of parents (93.4%, $p=0.012$) stated that their child **did not have 3 or more injuries in the last training season or ended the last season early due to injury**. Polish (13.9%) and North Macedonian parents (12.7%) reported in the highest proportions that their child had injuries. Parents' perception of their child's concern about gaining weight in the off-season or when he/she can't train due to injury showed that **73.0% of parents think that their child does not worry** about it. Greek (18.6%), Croatian (15.5%), and North Macedonian (12.7%) parents stated the highest that their child

worries, and Bulgarian parents stated that only 26.2% of them think that their children do not worry about it, and more than half do not know if their child does worry (59.0%). A large proportion of parents (69.7%, $p<0.001$) believed that **their child does not need to lose weight** for being at his/her best performance weight. North Macedonia stands out, where only half of the parents have such an opinion, and 40% think that their child needs to lose 0.5 to 5 kg to be at his/her best performance weight. **Croatian and Greek parents** stated more than other parents that **their child should lose from 2 to more than 7 kg** for their best athletic performance.

TABLE 12. PARENTS' OPINION REGARDING WEIGHT CONTROL BEHAVIOR NOTICED AMONG THEIR ATHLETE CHILDREN (N=519)

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Did your child have 3 or more injuries in the last training season OR ended the last season early due to injury?															
yes	11	4.6	4	8.0	10	13.9	7	12.7	1	1.6	1	2.3	34	6.6	0.012
Does your child worry about gaining weight in the off-season or when he can't train due to injury?															
yes	37	15.5	7	14.0	6	8.3	7	12.7	9	14.8	8	18.6	74	14.3	<0.001
no	194	81.5	41	82.0	61	84.7	44	80.0	16	26.2	23	53.5	379	73.0	
don't know	7	2.9	2	4.0	4	5.6	4	7.3	36	59.0	12	27.9	65	12.5	
Is your child currently following a special diet plan for achieving desirable weight?															
yes	42	17.6	6	12.0	14	19.4	10	18.2	11	18.0	11	25.6	94	18.1	<0.001
no	187	78.6	42	84.0	57	79.2	44	80.0	14	23.0	13	30.2	357	68.8	
don't know	9	3.8	2	4.0	1	1.4	1	1.8	36	59.0	19	44.2	68	13.1	
Has your child been told by someone who is not a healthcare professional that he/she needs to lose weight?															
yes	32	13.4	16	32.0	7	9.7	14	25.5	7	11.5	9	20.9	85	16.4	<0.001
no	196	82.4	31	62.0	58	80.6	35	63.6	18	29.5	24	55.8	362	69.7	
don't know	10	4.2	3	6.0	7	9.7	6	10.9	36	59.0	10	23.3	72	13.9	
How much do you think your child needs to lose weight to be at his/hers best performance weight?															
none	183	76.9	33	66.0	58	80.6	30	54.5	52	85.2	19	44.2	375	72.3	<0.001
0.5 to 2 kg	20	8.4	5	10.0	5	6.9	15	27.3	5	8.2	1	2.3	51	9.8	
2 to 5 kg	15	6.3	7	14.0	5	6.9	7	12.7	1	1.6	20	46.5	55	10.6	
5 to 7 kg	9	3.8	0	0.0	0	0.0	2	3.6	0	0.0	2	4.7	13	2.5	
more than 7kg	8	3.4	0	0.0	2	2.8	0	0.0	0	0.0	0	0.0	10	1.9	
don't know	3	1.3	5	10.0	2	2.8	1	1.8	3	4.9	1	2.3	15	2.9	

3.2.2. EATING DISORDERS SCREEN FOR ATHLETES (EDSA) EVALUATED BY PARENTS FOR THEIR ATHLETES

The results of the eating disorders screen for athletes (EDSA) questionnaire evaluated by the parents are in Table 13. In the total group of parents, **98.7%** stated that **their child is not being diagnosed with any type of eating disorder** ($p<0.001$), but 8.0% of Italian parents reported a child being diagnosed with ED, followed by Greek (2.3%), Polish (1.4%) and Croatian parents (0.4%). According to the EDSA questionnaire results, **7.3% of parents** described **their child as being at risk for an eating disorder**. Most of them are among parents from **Poland** (18.1%) and Italy (14.0%, $p<0.001$). The highest proportion of parents had noted as "always" (2.3%, $p=0.246$) for **child's weight, shape, or body composition affects their feeling about themselves**, the most Bulgarian parents (6.6%) and the least North Macedonian (0.0%).

Italian parents noted in **the highest proportion** (4.0%, $p=0.125$) than other parents as "always" for their child is dissatisfied with weight, shape, or body composition. Within this questionnaire, even better results were for questions related to the concern that weight, shape, or body composition will change if a child cannot exercise, wanting to be leaner even if others may think he/she is already lean, and worried about losing control over eating because of how it may affect his/her weight shape or body composition were noticed. Still, Italian parents stated "always" to those questions in the highest proportions than other parents. Polish parents stand out only for questions about their child' trying to avoid certain foods to influence weight, shape, or body composition, where 4.2% of parents stated that their child constantly tries to do so ($p=0.088$).



TABLE 13. EATING DISORDERS SCREEN FOR ATHLETES (EDSA) EVALUATED BY PARENTS (N=519) FOR THEIR ATHLETIC CHILD

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Being diagnosed with any type of eating disorder															
yes	1	0.4	4	8.0	1	1.4	0	0.0	0	0.0	1.0	2.3	7	1.3	<0.001
Eating Disorders Screen for Athletes (EDSA)															
score*	1.57	0.72	1.92	0.77	2.29	1.00	2.13	0.72	2.27	0.4	2.81	0.18	1.87	0.81	<0.001
At risk for eating disorder	10	4.2	7	14.0	13	18.1	4	7.3	3	4.9	1	2.3	38	7.3	<0.001
Weight, shape, or body composition affects feeling about yourself															
always	4	1.7	1	2.0	2	2.8	0	0.0	4	6.6	1	2.3	12	2.3	0.246
Dissatisfied with weight, shape, or body composition															
always	2	0.8	2	4.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0.8	0.125
Worried that weight, shape, or body composition will change if you cannot exercise															
always	4	1.7	1	2.0	0	0.0	0	0.0	0	0.0	0	0.0	5	1.0	0.536
Wanting to be leaner even if others may think he/she is already lean															
always	4	1.7	1	2.0	0	0.0	0	0.0	0	0.0	0	0.0	5	1.0	0.536
Worried about losing control over eating because of how it may affect his/her weight, shape, or body composition															
always	2	0.8	1	2.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.6	0.641
Trying to avoid certain foods to influence weight, shape, or body composition															
always	2	0.8	2	4.0	3	4.2	0	0.0	0	0.0	0	0.0	7	1.3	0.088

3.2.3. EATING DISORDERS RISK BEHAVIORS NOTICED BY PARENTS AT THEIR CHILD

Parents noted if they noticed eating disorders risk behaviors in their athlete child which results are in Table 14. The **same questions were asked their child** and also trainers. In order to detect this problem as soon as possible, it is important that the surroundings notice the existence of risk factors in the child as soon as possible. Such changes can be noticed in everyday life, but parents should be the first to notice. In the questionnaire were listed the ED risk factors were and checked how sensitized parents were to notice them. In the entire group of parents, **7.3%** of them noticed that **their child had significant weight loss, gain, or fluctuations**. Most of them were among parents from **Poland** and the least among Croats (13.9% and 4.2% respectively, $p=0.087$). **Polish** (20.8%) and **Greek** (20.9%) **parents**, together with **Bulgarian** (19.7%, $p<0.001$) also stand out in the question of whether the **child has changed his/her eating habits**, which Croatian parents noticed in the lowest proportion (11.8%). **Greek parents** more of the others noticed their **child being obsessed with food** (7.0%, $p<0.001$), and Bulgarian the least. A small number of parents stated that their child has a negative attitude towards his/her body image (7.0%), with Italian parents the most, and Bulgarian the least of them (14.0% and 0.0%, respectively, $p<0.001$). **Polish parents** noticed more than other groups of parents that their athlete **child likes to eat alone or hide eating habits from others** (8.3%, $p<0.001$), and Bulgarian parents the least (0.0%). **Italian parents** noted that more than others that their **child had a traumatic experience with a certain type of food** (8.0%) which Polish (2.8%) and Greek (2.3%) parents noticed the least ($p<0.001$). Most parents who noticed that their **child has little interest in eating were Croats** (10.9%), and the least among Polish parents (1.4%; $p<0.001$). A third of **Italian parents** (30.0%, $p<0.001$) noticed that their **child is emotional** when talking about weight or body shape, and a quarter of them (24.0%, $p<0.001$) also noticed their

child is worried about gaining weight, where Croats noticed that the least (13.0%).

One of the ED risk factors that most often only a parent can notice is **going to the toilet immediately after eating**. Almost a **third of parents from North Macedonia** noticed this, more than others, where Bulgarian parents haven't noticed at all (29.1% and 0.0%, respectively, $p<0.001$). **Exercising at an excessive quantity than usual** training can be a possible risk factor for weight control which **Bulgarian parents** noticed among their athlete children most of all group of parents (9.8%, $p=0.291$), and North Macedonian parents the least of others (1.8%). **Italian and Greek parents** more than the other parents noticed that their **child uses laxatives or diuretics** (both $p<0.001$), Bulgarian parents the least (0.0% both, $p<0.001$). The use of **muscle gain supplements** is noticed the most by **Polish parents** (16.7%, $p<0.001$), and the least by Bulgarian parents (1.6%).

Parents were asked to note their **most trusted choice for seeking help** if their child is having signs of an eating disorder which results are in Table 15. The largest number of parents would first seek help from a **family doctor** (45.7%, $p<0.001$), Greek (69.8%) and North Macedonian the most (60.0%), the least Italian parents (10.0%). In second place took psychologists (17.2%), and right after him are sports dietitians (11.0%) and sports doctors (11.0%). Polish parents had at them the greatest trust in seeking help (26.4%, and 22.2%, respectively). Sports doctor was the most trusted by Bulgarian parents (52.5%) and the least by Croatian parents (2.1%). Asking for help from their trainer was noted the most by parents from Poland (19.4%) and the least by North Macedonian parents (1.8%). "Friends and family" first will ask by Italian parents the most and the least Bulgarian parents (1.6%). Parents also noted "other" for seeking help, in similar proportions, with exception of Bulgarian parents who didn't note this (0.0%).



TABLE 14. EATING DISORDERS RISK BEHAVIORS NOTICED BY PARENTS (N=519) AT THEIR ATHLETIC CHILD

Noticing their child...	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
have significant weight loss, gain, or fluctuations	10	4.2	3	6.0	10	13.9	5	9.1	5	8.2	5	11.6	38	7.3	0.087
changed eating habits	28	11.8	7	14.0	15	20.8	8	14.5	12	19.7	9	20.9	79	15.2	<0.001
is obsessed with food	15	6.3	3	6.0	3	4.2	2	3.6	2	3.3	3	7.0	28	5.4	<0.001
has a negative attitude towards his/her body image	16	6.7	7	14.0	6	8.3	5	9.1	0	0.0	3	7.0	37	7.1	<0.001
likes to eat alone or hide eating habits from others	13	5.5	3	6.0	6	8.3	1	1.8	0	0.0	0	0.0	23	4.4	<0.001
had a traumatic experience with a certain type of food	15	6.3	4	8.0	2	2.8	2	3.6	2	3.3	1	2.3	26	5.0	<0.001
has little interest in eating	26	10.9	3	6.0	1	1.4	1	1.8	3	4.9	2	4.7	36	6.9	<0.001
is emotional when talking about weight or body shape	25	10.5	15	30.0	9	12.5	2	3.6	5	8.2	1	2.3	57	11.0	<0.001
is worried about gaining weight	31	13.0	12	24.0	10	13.9	8	14.5	10	16.4	6	14.0	77	14.8	<0.001
usually goes straight to the toilet after eating	14	5.9	5	10.0	1	1.4	16	29.1	0	0.0	2	4.7	38	7.3	<0.001
is exercising excessively	9	3.8	4	8.0	5	6.9	1	1.8	6	9.8	3	7.0	28	5.4	0.291
eats an unusually large amount of food for the circumstances	17	7.1	2	4.0	4	5.6	2	3.6	2	3.3	1	2.3	28	5.4	<0.001
uses laxatives	5	2.1	2	4.0	1	1.4	0	0.0	0	0.0	2	4.7	10	1.9	<0.001
uses diuretics	5	2.1	2	4.0	0	0.0	0	0.0	0	0.0	1	2.3	8	1.5	<0.001
uses muscle gain supplements	12	5.0	3	6.0	12	16.7	3	5.5	1	1.6	1	2.3	32	6.2	<0.001

TABLE 15. PARENTS' CHOICE FOR SEEKING HELP FOR THEIR CHILD IF HAVING SIGNS OF AN EATING DISORDER (N=519)

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
family doctor	128	53.8	5	10.0	32	44.4	33	60.0	9	14.8	30	69.8	237	45.7	<0.001
psychologist	45	18.9	8	16.0	19	26.4	2	3.6	8	13.1	1	2.3	83	16.0	
sports dietitian	23	9.7	2	4.0	16	22.2	4	7.3	9	14.8	3	7.0	57	11.0	
sports doctor	5	2.1	4	8.0	2	2.8	10	18.2	32	52.5	4	9.3	57	11.0	
trainer	17	7.1	3	6.0	14	19.4	1	1.8	2	3.3	1	2.3	38	7.3	
family/friends	15	6.3	27	54.0	5	6.9	3	5.5	1	1.6	3	7.0	54	10.4	
other	5	2.1	1	2.0	2	2.8	1	1.8	0	0.0	1	2.3	10	1.9	

3.2.4. EATING DISORDERS KNOWLEDGE AMONG ATHLETES PARENTS

Parents were asked to rate their knowledge about eating disorders from “don’t know” to “know well” about the particular eating disorders (Table 16). All groups of parents, on average the most, noted **“somewhat know or just heard” about listed eating disorders**. Bulgarian parents stand out for knowing well more than others about Anorexia Nervosa, Bulimia Nervosa, Restrictive eating, and Binge eating/Overeating (70.5%, 70.5%, and 65.6%, respectively, all $p<0.001$), and for not knowing about Bigorexia Nervosa and Orthorexia Nervosa (both 0.0%, $p<0.001$). After **Bulgarian parents, Croatian and North Macedonian parents** were next **most for knowing well about listed eating disorders**, followed

by Italian and Greek parents, while Polish parents noted to know well the least about listed ED than other groups of parents.

Parents were asked to choose their **preferred way to receive education and information about eating disorders** (Table 17). Half of the parents (50.9%, $p<0.001$) answered they prefer **webpages or blogs**, Bulgarian and Croatian parents the most, while the rest chose education through webinars (15.5%), printed manuals (17.2%), and workshops (15.4%). Only a third of Poles (31.3%) and Greeks (30.2%) prefer education using printed manuals, which preferred consulting with experts (2.3%). Only Croatian noted “Other” in a difference to others (1.9%).

TABLE 16. PARENTS' KNOWLEDGE ABOUT EATING DISORDERS (N=519)

Knowledge	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Anorexia Nervosa															
don't know	1	0.4	3	6.0	6	8.3	2	3.6	1	1.6	3	7.0	16	3.1	<0.001
heard/somewhat know	128	53.8	39	78.0	57	79.2	31	56.4	17	27.9	33	76.7	305	58.8	
know well	109	45.8	8	16.0	9	12.5	22	40.0	43	70.5	7	16.3	198	38.2	
Bulimia Nervosa															
don't know	4	1.7	6	12.0	2	2.8	2	3.6	3	4.9	2	4.7	19	3.7	<0.001
heard/somewhat know	126	52.9	37	74.0	63	87.5	36	65.5	15	24.6	30	69.8	307	59.2	
know well	108	45.4	7	14.0	7	9.7	17	30.9	43	70.5	11	25.6	193	37.2	
Overeating															
don't know	2	0.8	8	16.0	7	9.7	1	1.8	5	8.2	5	11.6	28	5.4	<0.001
heard/somewhat know	131	55.0	40	80.0	59	81.9	37	67.3	16	26.2	31	72.1	314	60.5	
know well	105	44.1	2	4.0	6	8.3	17	30.9	40	65.6	7	16.3	177	34.1	
Restrictive eating															
don't know	15	6.3	13	26.0	4	5.6	3	5.5	6	9.8	5	11.6	46	8.9	<0.001
heard/somewhat know	144	60.5	33	66.0	62	86.1	37	67.3	11	18.0	37	86.0	324	62.4	
know well	79	33.2	4	8.0	6	8.3	15	27.3	44	72.1	1	2.3	149	28.7	
Bigorexia Nervosa															
don't know	82	34.5	27	54.0	28	38.9	4	7.3	10	16.4	11	25.6	162	31.2	<0.001
heard/somewhat know	114	47.9	21	42.0	42	58.3	35	63.6	51	83.6	27	62.8	290	55.9	
know well	42	17.6	2	4.0	2	2.8	16	29.1	0	0.0	5	11.6	67	12.9	
Orthorexia Nervosa															
don't know	103	43.3	26	52.0	32	44.4	6	10.9	11	18.0	17	39.5	195	37.6	<0.001
heard/somewhat know	97	40.8	22	44.0	38	52.8	28	50.9	50	82.0	23	53.5	258	49.7	
know well	38	16.0	2	4.0	2	2.8	21	38.2	0	0.0	3	7.0	66	12.7	



TABLE 17. PARENTS' PREFERRED WAY TO RECEIVE EDUCATION AND INFORMATION ABOUT EATING DISORDERS (N=519)

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Webpage/blogs	178	54.9	28	45.9	34	41.0	48	51.1	59	56.7	14	32.6	361	50.9	<0.001
Webinars	43	13.3	13	21.3	11	13.3	28	29.8	14	13.5	1	2.3	110	15.5	
Consulting with experts	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	2.3	1	0.1	
Workshops	46	14.2	13	21.3	12	14.5	8	8.5	16	15.4	14	32.6	109	15.4	
Printed manual	51	15.7	7	11.5	26	31.3	10	10.6	15	14.4	13	30.2	122	17.2	
Other	6	1.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	6	0.8	

3.3. TRAINERS

In this cross-sectional survey participated **284 trainers**. The most trainers were from Croatia (39.4%, $p<0.001$), the least from Poland (4.6%), a fifth from Bulgaria (20.1%) and Italy (17.6%), 12.3% from Greece and 10.9% from North Macedonia (Table 18). A third of trainers were women (33.1%) and this distribution was the same in all countries ($p=0.326$). Their average age was 39 years, older trainers were from Poland ($p=0.003$), and the youngest was from North Macedonia. On average, more than **half of them worked as trainers for more than 10 years**, the most Bulgarian trainers (75.4%, <0.001). Working less than 10 years were the most trainers from Poland (84.6%). **A third of all trainers stated that they finished faculty for kinesiology or physiology**, and this distribution was almost equal in all countries. Most of the trainers with higher education levels were from Bulgaria ($p<0.001$). Italian and North Macedonian trainers mostly had their physical activity habits evaluated as moderate (74.0% and 58.1%, respectively, $p<0.001$), while trainers from other countries were more highly-active, except for Greek trainers who were distributed equally. On average, and in the same distribution in all countries, **most of the trainers trained less weight-sensitive sports** such as football, volleyball, handball, tennis, etc. (64.8%, $p<0.001$), and the least trainers stated to train less weight-sensitive

high-mass sports such as skiing or hokey (2.5%). **Trainers' diet quality on average moderately adhered to the EAT-Lancet Diet** (89.1%), where a seventh of Croatian and Greek (both 14.3%), Italian (16.0%), and Polish trainers (15.4%, $p<0.001$) had a diet that highly adhered to EAT-Lancet diet. **Croatian (62.2%) and Bulgarian (93.0%) trainers were the most educated in sports nutrition**, and the least were Polish trainers (7.7%, $p<0.001$). Bulgarian trainers highly stated to use learned in their clubs (94.7%, $p<0.001$), around half of the trainers were from other countries, and Greek trainers the least (8.6%). **Two-thirds of trainers** stated that they were **educated about eating disorders**, Bulgarian trainers the most (94.7%, $p<0.001$), and Greek the least (28.6%). Croatian (59.2%) and Bulgarian (100.0%) trainers more than others noted to be familiar with eating disorders ($p<0.001$). **Almost all trainers** agreed that **trainers should be educated in sports nutrition**, Croatian trainers the most (100.0%, $p<0.001$), and the least Polish trainers (76.9%). On average, **78.2%** stated that they **need education on eating disorders**, the highest Bulgarian (93.0%) and the least Greek trainers (45.7%, $p<0.001$). **Two-thirds of all trainers** also stated to **need education on ED for their athletes**, Bulgarian the most (94.7%), and Italian the least (44.0%).

TABLE 18. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF TRAINERS (N=284) *(MEAN \pm SD)

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Men	70	71.4	33	66.0	10	76.9	19	61.3	32	56.1	26	74.3	190	66.9	0.326	
Women	28	28.6	17	34.0	3	23.1	12	38.7	25	43.9	9	25.7	94	33.1		
Total	98	34.5	50	17.6	13	4.6	31	10.9	57	20.1	35	12.3	284	100.0	<0.001	
Age (years)*	41.26	10.63	36.74	9.61	43.38	10.90	35.97	13.40	37.11	7.00	36.41	10.94	38.86	10.46	0.003	
Time working as a trainer	< 10 years	40	40.8	31	62.0	11	84.6	22	71.0	14	24.6	13	37.1	131	46.1	<0.001
> 10 years	58	59.2	19	38.0	2	15.4	9	29.0	43	75.4	22	62.9	153	53.9		
Trainer	62	63.3	30	60	11	84.6	26	83.9	54	94.7	28	80.0	211	74.3	<0.001	
Kinesiologist	36	36.7	20	40	2	15.4	5	16.1	3	5.3	7	20.0	73	25.7		
Elementary school	0	0.0	2	4.0	0	0.0	0	0.0	0	0.0	1	2.9	3	1.1	<0.001	
High school	27	27.6	16	32.0	0	0.0	7	22.6	0	0.0	1	2.9	51	18.0		
Undergraduate	22	22.4	17	34.0	0	0.0	21	67.7	7	12.3	24	68.6	91	32.0		
Graduate	44	44.9	15	30.0	12	92.3	3	9.7	19	33.3	7	20.0	100	35.2		
Postgraduate	5	5.1	0	0.0	1	7.7	0	0.0	31	54.4	2	5.7	39	13.7		
Low physical activity	11	11.2	3	6.0	1	7.7	1	3.2	4	7.0	3	8.6	23	8.1	<0.001	
Moderate physical activity	20	20.4	37	74.0	5	38.5	18	58.1	12	21.1	16	45.7	108	38.0		
High physical activity	67	68.4	10	20.0	7	53.8	12	38.7	41	71.9	16	45.7	153	53.9		
Sports class trained																
less weight-sensitive ball sports	43	43.9	35	70.0	13	100.0	14	45.2	46	80.7	33	94.3	184	64.8	<0.001	
less weight-sensitive technical	6	6.1	3	6.0	0	0.0	0	0.0	2	3.5	0	0.0	11	3.9		
less weight-sensitive high mass	6	6.1	1	2.0	0	0.0	0	0.0	0	0.0	0	0.0	7	2.5		
weight-sensitive aesthetic	17	17.3	1	2.0	0	0.0	0	0.0	0	0.0	1	2.9	19	6.7		
weight-sensitive endurance	10	10.2	3	6.0	0	0.0	1	3.2	0	0.0	1	2.9	15	5.3		
weight-sensitive power	4	4.1	1	2.0	0	0.0	1	3.2	3	5.3	0	0.0	9	3.2		
weight-sensitive weight class	10	10.2	3	6.0	0	0.0	14	45.2	5	8.8	0	0.0	32	11.3		
Not specified	2	2.0	3	6.0	0	0.0	1	3.2	1	1.8	0	0.0	7	2.5		
EAT-Lancet index*	24.37	2.89	24.84	3.17	22.92	3.50	22.83	3.03	26.29	1.64	24.97	1.96	24.62	2.95		<0.001
low adherence to EAT index	0	0.0	0	0.0	0	0.0	1	3.2	0	0.0	0	0.0	1	0.4		<0.001
moderate adherence	84	85.7	42	84.0	11	84.6	30	96.8	56	98.2	30	85.7	253	89.1		
high adherence	14	14.3	8	16.0	2	15.4	0	0.0	1	1.8	5	14.3	30	10.6		
Educated in sports nutrition	61	62.2	20	40.0	1	7.7	13	41.9	53	93.0	4	11.4	152	53.5	<0.001	
Using learned in their sports club	53	54.1	16	32.0	6	46.2	13	41.9	54	94.7	3	8.6	145	51.1	<0.001	
Educated about eating disorders	58	59.2	33	66.0	10	76.9	22	71.0	54	94.7	10	28.6	187	65.8	<0.001	
Familiar with eating disorders	76	77.6	27	54.0	8	61.5	16	51.6	57	100.0	12	34.3	196	69.0	<0.001	
Trainers should be educated about eating disorders	98	100.0	44	88.0	10	76.9	27	87.1	55	96.5	16	45.7	250	88.0	<0.001	
Need education about eating disorders	87	88.8	33	66.0	8	61.5	25	80.6	53	93.0	16	45.7	222	78.2	<0.001	
Need education about eating disorders for their athletes	77	78.6	22	44.0	9	69.2	23	74.2	54	94.7	18	51.4	203	71.5	<0.001	



3.3.1. TRAINERS' OPINIONS, BEHAVIORS AND OBSERVATIONS REGARDING EATING DISORDERS

Trainers were asked to note their opinions and behaviors regarding eating disorders which results are presented in Table 19. **Two-thirds** of them, on average stated **sports dietitians as the most trusted source of information about sports nutrition and eating disorders** (70.8%, $p < 0.001$). The least rated as trusted were colleague trainers and sports literature by the most of trainers. Bulgarian trainers highly stated that they ever trained an athlete with eating disorders (91.2%), Croatian significantly the least (2.0%, $p < 0.001$), in contrast to coaches from other countries, a third of whom stated that they had coached an athlete with an eating disorder. Trainers noted what they will do first if they noticed symptoms of an eating disorder in their athlete. **Trainers from Croatia, Italy, Greece, Poland, and North Macedonia will first tell a family** ($p < 0.001$), then send to the family doctor, sports doctor, and sports dietitian, Croatian also to a psychologist (32.7%). Bulgarian trainers firstly will send an athlete to a sports dietitian (91.2%), then to a sports doctor (21.1%), and to a psychologist (15.8%), but not to a family doctor (0.0%). North Macedonian and Croatian trainers choose to withdraw an athlete from training (9.7% and 8.8%), while Polish trainers will not

do that (0.0%). Interestingly, 4.1% of Croatian trainers stated that they will do nothing if they noticed symptoms of an eating disorder in their athlete.

Significantly the highest proportion of **Bulgarian trainers had an athlete with 3 or more injuries in the last training season or ended the last season early due to injury** (89.5%, $p < 0.001$), Croatian trainers the least (16.3%) (Table 19). Croatian and Italian trainers less stated to have **an athlete who is worried about gaining weight in the off-season or when he can't train due to injury** (40.8% and 34.0%, respectively, $p < 0.001$), but **Polish** (69.2%) and **Bulgarian trainers** stated the highest of all to have such an athlete (96.5%). These two groups of trainers (69.2% and 96.5%, respectively, $p < 0.001$) also stated the highest to have **an athlete who is currently following a special diet plan** for achieving desirable weight, Italian trainers the least (22.0%). Similar was for results of having an athlete whose been told by someone who is not a healthcare professional that he/she needs to lose weight, Polish and Bulgarian trainers significantly the highest (61.5% and 96.5%, respectively, $p < 0.001$), and Italian and Greek trainers the least (38.0% and 40.0%).

TABLE 19. TRAINERS' OPINIONS, BEHAVIORS, AND PERCEPTIONS REGARDING EATING DISORDERS (N=284)

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Most trusted for information about sports nutrition, eating disorders															
colleague trainer	2	2.0	4	8.0	0	0.0	0	0.0	0	0.0	1	2.9	7	2.5	
sports dietitian	77	78.6	25	50.0	9	69.2	18	58.1	50	87.7	22	62.9	201	70.8	
sports doctor	5	5.1	17	34.0	3	23.1	10	32.3	4	7.0	10	28.6	49	17.3	<0.001
literature	14	14.3	2	4.0	1	7.7	2	6.5	3	5.3	2	5.7	24	8.5	
family	37	37.8	1	2.0	0	0.0	1	3.2	0	0.0	0	0.0	39	13.7	
Ever trained an athlete with eating disorder	2	2.0	17	34.0	4	30.8	11	35.5	52	91.2	2	5.7	88	31.0	<0.001
If noticing symptoms of an eating disorder in their athlete, what do they first															
Send to a family doctor	34	34.7	14	28.0	0	0.0	0	0.0	0	0.0	7	20.0	55	19.4	
Send to sports dietitian	28	28.6	3	6.0	3	23.1	12	38.7	52	91.2	13	37.1	111	39.1	
Send to psychologist	32	32.7	5	10.0	1	7.7	6	19.4	9	15.8	6	17.1	59	20.8	
Tell a family	70	71.4	31	62.0	6	46.2	10	32.3	8	14.0	21	60.0	146	51.4	<0.001
Send to a sports doctor	0	0.0	14	28.0	3	23.1	13	41.9	12	21.1	11	31.4	53	18.7	
Give professional literature to read	2	2.0	3	6.0	0	0.0	3	9.7	6	10.5	2	5.7	16	5.6	
Withdraw an athlete from training	8	8.2	1	2.0	0	0.0	3	9.7	1	1.8	1	2.9	14	4.9	
Nothing	4	4.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	1.4	
Having an athlete with 3 or more injuries in the last training season OR ended the last season early due to injury															
Yes	16	16.3	16	32.0	7	53.8	10	32.3	51	89.5	23	65.7	123	43.3	<0.001
Having an athlete who is worried about gaining weight in the off-season or when he can't train due to injury															
Yes	40	40.8	17	34.0	9	69.2	17	54.8	55	96.5	19	54.3	157	55.3	
No	57	58.2	33	66.0	4	30.8	13	41.9	2	3.5	16	45.7	125	44.0	<0.001
Don't know	1	1.0	0	0.0	0	0.0	1	3.2	0	0.0	0	0.0	2	0.7	
Having an athlete who is currently following a special diet plan for achieving desirable weight															
Yes	36	36.7	11	22.0	9	69.2	19	61.3	55	96.5	18	51.4	148	52.1	
No	60	61.2	39	78.0	4	30.8	11	35.5	2	3.5	16	45.7	132	46.5	<0.001
Don't know	2	2.0	0	0.0	0	0.0	1	3.2	0	0.0	1	2.9	4	1.4	
Having an athlete whose been told by someone who is not a healthcare professional that he/she needs to lose weight															
Yes	42	42.9	19	38.0	8	61.5	14	45.2	55	96.5	14	40.0	152	53.5	
No	56	57.1	31	62.0	5	38.5	16	51.6	2	3.5	20	57.1	130	45.8	<0.001
Don't know	0	0.0	0	0.0	0	0.0	1	3.2	0	0.0	1	2.9	2	0.7	



Trainers indicated noticed eating disorder risk behavior among their athletes (Table 20). **In highly significant proportion and differently to trainers from other countries, Bulgarian trainers** stated that they noticed that **one of their athletes had significant** weight loss, gain, or fluctuations (91.2%), changed eating habits (93.0%), is obsessed with food (84.2%), has a negative attitude towards his/her body image (86.0%), likes to eat alone or hiding eating habits from others (84.2%), had a traumatic experience with a certain type of food has little interest in eating (82.5%), exercising excessively (89.5%), eats an unusually large amount of food for the circumstances (86.0%), and uses laxatives (84.2%), diuretics (86.0%), and muscle gain supplements (89.5%) (all $p < 0.001$). Significant weight loss at one of their athletes noticed less than a fifth of trainers from other countries. A third to a quarter of them noticed an athlete changing eating habits. Less than a fifth of them noticed an obsession with food, eating alone or hiding from

others and having a traumatic experience with certain types of food, and having little interest in eating. North Macedonian trainers noted the highest notice that one of their athletes is emotional when talking about weight or body shape (29.0%, $p = 0.006$), is worried about gaining weight (48.4%, $p = 0.148$), and the one that usually goes straight to the toilet after eating (12.9%, $p = 0.406$). A third of North Macedonian trainers noticed an athlete who exercised excessively (35.5%). Greek, North Macedonian, and Croatian trainers in similar proportions noticed an athlete that eats an unusually large amount of food for the circumstances (17.1%, 16.1%, and 14.3%, respectively). Italian trainers most than others, besides Bulgarian trainers, noticed that one of their athletes uses laxatives (4.0%) and diuretics (4.0%). The use of muscle gain supplements was noticed in a third of North Macedonian (32.3%), a quarter of Polish (23.1%), and a fifth of Greek (20.0%) and Croatian trainers (17.3%).

TABLE 20. EATING DISORDERS RISK BEHAVIORS NOTICED BY TRAINERS AMONG THEIR ATHLETES (N=284)

Noticing one of their athlete...	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
had significant weight loss, gain, or fluctuations	22	22.4	6	12.0	3	23.1	6	19.4	52	91.2	4	11.4	93	32.7	<0.001
changed eating habits	31	31.6	11	22.0	4	30.8	8	25.8	53	93.0	5	14.3	112	39.4	<0.001
is obsessed with food	18	18.4	9	18.0	0	0.0	5	16.1	48	84.2	0	0.0	80	28.2	<0.001
has a negative attitude towards his/her body image	29	29.6	12	24.0	2	15.4	7	22.6	49	86.0	7	20.0	106	37.3	<0.001
likes to eat alone or hide eating habits from others	15	15.3	5	10.0	0	0.0	2	6.5	48	84.2	1	2.9	71	25.0	<0.001
had a traumatic experience with a certain type of food	12	12.2	3	6.0	0	0.0	3	9.7	49	86.0	0	0.0	67	23.6	<0.001
has little interest in eating	17	17.3	10	20.0	0	0.0	6	19.4	47	82.5	1	2.9	81	28.5	<0.001
is emotional when talking about weight or body shape	15	15.3	13	26.0	1	7.7	9	29.0	7	12.3	3	8.6	48	16.9	0.006
worried about gaining weight	28	28.6	13	26.0	5	38.5	15	48.4	12	21.1	11	31.4	84	29.6	0.148
usually goes straight to the toilet after eating	5	5.1	2	4.0	1	7.7	4	12.9	6	10.5	1	2.9	19	6.7	0.406
exercising excessively	9	9.2	3	6.0	0	0.0	11	35.5	51	89.5	6	17.1	80	28.2	<0.001
eats an unusually large amount of food for the circumstances	14	14.3	1	2.0	0	0.0	5	16.1	49	86.0	6	17.1	75	26.4	<0.001
uses laxatives	1	1.0	2	4.0	0	0.0	0	0.0	48	84.2	0	0.0	51	18.0	<0.001
uses diuretics	1	1.0	2	4.0	0	0.0	0	0.0	49	86.0	0	0.0	52	18.3	<0.001
uses muscle gain supplements	17	17.3	4	8.0	3	23.1	10	32.3	51	89.5	7	20.0	92	32.4	<0.001

3.3.2. TRAINERS KNOWLEDGE ABOUT EATING DISORDERS

Bulgarian trainers more than other trainers stated to **know well** about Anorexia Nervosa (93.0%), Bulimia Nervosa (93.0%), Binge eating/overeating (91.2%), avoidant/restrictive eating (91.2%), and Bigorexia Nervosa (86.0%) (all $p < 0.001$), next knowledgeable were trainers from North Macedonia (Table 21). **The least** proportion to state well knowledge about those eating disorders had **trainers from Italy and Poland. Most of the trainers** stated that about that eating disorders **only heard or somewhat know** about it. Orthorexia Nervosa disorder most of the trainers know nothing, or only heard or somewhat know (52.6%), Bulgarian trainers the most (87.8%). Polish trainers stated to know nothing about it the most of all (69.2%), and trainers from North Macedonia the most to know it well (16.1%, $p < 0.001$). Trainers were asked to note if they know, **at least three symptoms of Anorexia Nervosa, Bulimia Nervosa, Binge eating, and avoidant/restrictive eating**. On average, only **a fifth of all trainers noted correct answers** (21.5%, $p < 0.001$), **Polish trainers** (69.2%) **know in the highest proportion**, then Croatian (26.5%), North Macedonian (19.4%), Greek

(17.1%), Italian (16.0%), and Bulgarian trainers as the least of all (10.5%).

Regarding the abovementioned results about trainers' knowledge of eating disorders, they were asked to choose **the most preferred way to receive education and information about eating disorders**. The results are presented in Table 22. Trainers from all countries the most chose to **consult with experts and workshops** as the most preferred way (22.3% and 32.1%, respectively, $p < 0.001$). Italian trainers noted webinars in a high proportion (24.6%), and North Macedonian trainers a printed manual as well (18.3%). Webpage/blog as an option was noted in proportion from 9.9% by Bulgarian trainers to 15.9% by North Macedonian trainers. Also, similar to the athletes, 4.4% of Croatian trainers noted "Other" as an option to receive education and information about ED.



TABLE 21. TRAINERS' KNOWLEDGE ABOUT EATING DISORDERS (N=284)

Knowledge	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Anorexia Nervosa															
don't know	10	10.2	5	10.0	0	0.0	6	19.4	0	0.0	2	5.7	23	8.1	<0.001
heard/somewhat know	69	70.4	41	82.0	13	100.0	17	54.8	4	7.0	29	82.9	173	60.9	
know well	19	19.4	4	8.0	0	0.0	8	25.8	53	93.0	4	11.4	88	31.0	
Bulimia Nervosa															
don't know	14	14.3	6	12.0	0	0.0	8	25.8	0	0.0	3	8.6	31	10.9	<0.001
heard/somewhat know	69	70.4	41	82.0	13	100.0	14	45.2	4	7.0	27	77.1	168	59.2	
know well	15	15.3	3	6.0	0	0.0	9	29.0	53	93.0	5	14.3	85	29.9	
Binge eating/Overeating															
don't know	10	10.2	6	12.0	1	7.7	9	29.0	0	0.0	6	17.1	32	11.3	<0.001
heard/somewhat know	73	74.5	41	82.0	12	92.3	16	51.6	5	8.8	25	71.4	172	60.6	
know well	15	15.3	3	6.0	0	0.0	6	19.4	52	91.2	4	11.4	80	28.2	
Avoidant/Restrictive eating															
don't know	22	22.4	14	28.0	0	0.0	10	32.3	0	0.0	10	28.6	56	19.7	<0.001
heard/somewhat know	65	66.3	33	66.0	13	100.0	15	48.4	5	8.8	22	62.9	153	53.9	
know well	11	11.2	3	6.0	0	0.0	6	19.4	52	91.2	3	8.6	75	26.4	
Bigorexia Nervosa															
don't know	46	46.9	22	44.0	6	46.2	13	41.9	3	5.3	11	31.4	101	35.6	<0.001
heard/somewhat know	46	46.9	27	54.0	7	53.8	13	41.9	5	8.8	21	60.0	119	41.9	
know well	6	6.1	1	2.0	0	0.0	5	16.1	49	86.0	2	5.7	63	22.2	
Orthorexia Nervosa															
don't know	52	53.1	23	46.0	9	69.2	14	45.2	3	5.3	14	40.0	115	40.5	<0.001
heard/somewhat know	40	40.8	25	50.0	4	30.8	12	38.7	50	87.7	20	57.1	151	53.2	
know well	6	6.1	2	4.0	0	0.0	5	16.1	4	7.0	1	2.9	18	6.3	
Adequate knowledge about eating disorders	26	26.5	8	16.0	9	69.2	6	19.4	6	10.5	6	17.1	61	21.5	<0.001

TABLE 22. TRAINERS' PREFERRED WAY TO RECEIVE EDUCATION AND INFORMATION ABOUT EATING DISORDERS (N=249)

	Croatia		Italy		Poland		North Macedonia		Bulgaria		Greece		Total		p-value
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Webpage/blogs	27	14.8	8	11.6	1	7.7	13	15.9	7	9.2	4	11.4	60	13.1	<0.001
Webinars	37	20.2	17	24.6	1	7.7	14	17.1	4	5.3	6	17.1	79	17.2	
Consulting with experts	40	21.9	19	27.5	4	30.8	21	25.6	10	13.2	8	22.9	102	22.3	
Workshops	40	21.9	16	23.2	7	53.8	19	23.2	52	68.4	13	37.1	147	32.1	
Printed manual	31	16.9	9	13.0	0	0.0	15	18.3	3	3.9	4	11.4	62	13.5	
Other	8	4.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	8	1.7	



4. CONCLUSIONS

THE SCAED PROJECT HIGHLIGHTS

- every tenth (10.4%) of non-professional athletes of age from 12 to 25 years were found to be at possible risk for eating disorders (EDE-A), the most among Croatian and North Macedonian athletes, and every fifth (19.9%) (EDSA), the most among Polish and Italian athletes
- the highest prevalence for ED at less weight-sensitive ball sports
- matching results between the EDE-A and the EDSA questionnaires higher than 80%
- the highest score was for a concern that the body's weight, shape, or composition affects feeling about themselves
- almost every twelve athletes were perceiving pressure from trainers and/or teammates
- most athletes' parents believed that their child doesn't worry about their weight
- parents evaluated their child as being at risk for possible ED more than actually being at risk
- about a quarter to a third of trainers noticed eating disorders risk behavior in one of their athletes
- half of the trainers knew to describe at least three symptoms of ED
- athletes, parents, and trainers need education about eating disorders
- athletes and their parents choose a website/blog as the most preferred way to receive information about eating disorders, trainers choose consultations with experts and workshops

4.1. ATHLETES

A survey conducted in six European countries revealed that every tenth (10.4%) of non-professional athletes of age from 12 to 25 years is at possible risk for eating disorders assessed with a 36-item Eating Disorder questionnaire for Adolescents (EDE-A), and every fifth (19.9%) when assessed with 6-item eating Disorders Screen for Athletes (EDSA). The highest possible risk for ED was among Croatian and North Macedonian athletes when assessed with EDE-A, and significantly the highest for Polish and Italian athletes when assessed with EDSA, while it was the lowest among Bulgarian and Greek athletes. Matching results on risk prevalence assessed with those screening tools was more than 80%, showing that the short EDSA questionnaire is a good and easy-to-use screening tool for athletes. Although in this survey participated most athletes trained less weight-sensitive ball sports, in which the prevalence of those at possible risk for ED was the highest, a significant prevalence was also shown in those athletes who trained in weight-sensitive sports such as aesthetic, endurance, power, and weight class sports.

A third of athletes ever regulated their weight to achieve desired sports performance and are a third currently followed a specific dietary plan for achieving a desired body weight, and fifth experienced negative consequences of regulating weight, especially North Macedonian athletes who more than others constantly worried about getting weight during a training break. Those who regulated their weight mostly helped themselves, but if they have to regulate their weight, they will mostly ask for help sports dietitian and their trainer rather than asking experienced teammates or family.

Among screened risks for the development of eating disorders, the concern that the body's weight, shape, or composition affects feeling about them was the most scored, followed by concern that weight, shape, or body composition will be altered by non-exercising. Croatian and Polish athletes had the highest prevalence of those who want to be slimmer even though others think otherwise.

Almost every twelve athletes were perceiving pressure from trainers and/or teammates due to their



trainer controlling weight, especially the North Macedonian and Italian athletes. In addition to the anxiety, they, and Croats also, described a feeling of

embarrassment when trainers and teammates talked about their body weight and shape.

4.2. PARENTS

Most of the athletes' parents believed that their child doesn't worry about gaining weight if not training and not knowing if they are following a specific diet for achieving a desired sports performance. Parents evaluated their child for being at possible risk for ED (7.3%) more than reporting for actually being diagnosed for an ED (1.3%), especially Polish and Italian parents who more than others described their child as "always" dissatisfied with the weight, shape, or

composition of the body. Polish parents more often than others noticed their child significantly lost, gained, or fluctuated in weight, while others noticed more a stronger change in eating habits, reduced desire for food, and emotionality when talking about food. Almost a third of North Macedonian parents noticed their child goes to the toilet immediately after a meal, while Italian parents more than others noticed their child uses laxatives or diuretics.

4.3. TRAINERS

About a quarter to a third of trainers significantly noticed eating disorders risk behavior in one of their athletes such as weight fluctuation, changed eating habits, obsession with food, negative attitude towards their own body image including emotionality when talking about weight and shape, exercising excessively, overeating, or hiding eating habits from others.

If trainers notice symptoms of an eating disorder in their athlete, they will first tell the family, then send to the family doctor, sports doctor, and sports dietitian, and Croatian trainers will also seek the help of psychologists.

Still, two-thirds of them see sports dietitians as the most reliable source of information about sports nutrition and eating disorders, and fellow trainers and sports literature as the least trusted.

This survey revealed that athletes, parents, and trainers need education about eating disorders. Most of them somewhat knew or heard about the most known eating disorders such as Anorexia Nervosa and Bulimia Nervosa, and not knowing about lesser-known ED forms such as Orthorexia Nervosa and Bigorexia Nervosa. Only half of the trainers knew to describe at least three symptoms of ED, which is interesting because two-thirds of all trainers stated that they were educated about eating disorders.

4.4. PROJECT SPORTS COMMUNITY AGAINST EATING DISORDERS FUTURE ACTIONS

This survey revealed important information about possible risks for ED among European athletes, their risk behaviors, and also those noticed by their parents and trainers. Presented survey findings are in line with previous studies conducted with adult athletes and illustrate that, even at a recreational level, competitive, sport-related pressures are associated with athletes' eating and weight control behavior and symptoms of

eating disorders. Obtained data represents a basis for the design of a manual for managing eating disorders among athletes, and all participants also noted their preferred way to receive information about eating disorders. Athletes from all countries and half of the parents chose a website/blog, parents also chose webinars and manuals, while trainers mostly chose consultations with experts and workshops.



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