



Healthy eating or anxious dietary control? Orthorexia, body mass anxiety, and diet-relevant health profiles in older adults

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Abstract

Introduction and Objective. Orthorexia nervosa (OrNe) is poorly understood in older adults, in whom dietary control may reflect either adaptive disease management or anxiety-driven restriction. The aim of the study is to examine somatic profiles, psychological predictors, and psychosocial consequences of OrNe in adults aged 60 years or older.

Materials and Method. A cross-sectional study included 360 adults aged 60–89 years, classified into four disease profiles: no diet-related disease, metabolic/cardiovascular, strict dietary control, and weight loss/cachexia. Orthorexia, body mass anxiety, health anxiety, nutritional status, depression, well-being, dietary restraint, and psychosocial consequences were assessed. Group comparisons, Spearman correlations, and hierarchical linear regressions were performed.

Results. The metabolic/cardiovascular profile showed the highest negative orthorexia, dietary restraint, and fear of weight gain, whereas the weight-loss/cachexia profile showed the lowest nutritional status and the greatest fear of weight loss. In the final TOS-Ne model, self-imposed diet, number of supplements, fear of weight gain, health anxiety, dietary restraint, and lower well-being were independent predictors; medically recommended diet, BMI, and depressive symptoms were not. The final psychosocial-consequence model explained 42.8% of variance, with negative orthorexia, health anxiety, and fear of weight loss as independent predictors.

Conclusions. In older adults, pathological orthorexia appears more closely related to health and weight-change anxiety than to objective BMI or depression. Screening should distinguish medically indicated dietary adherence from self-imposed restriction and should consider supplement use, nutritional risk, and psychosocial functioning.

Key words

aged, health anxiety, dietary supplements, chronic disease, orthorexia nervosa, psychosocial functioning, dietary restraint

INTRODUCTION

Eating disorders are undergoing a systematic evolution; with orthorexia, a psychopathological phenomenon, being increasingly observed as a clinically conceptualized obsession with healthy eating [1]. Orthorexia is characterized by a pursuit of dietary purity and an excessive preoccupation with the perceived health-promoting properties of food [1]. Although this condition is not yet formally codified in current diagnostic classifications, such as the DSM-5 or ICD-11, an international expert panel reached a formal medical consensus recognizing orthorexia as ‘a distinct clinical entity capable of causing severe physical emaciation, profound emotional distress, and significant psychosocial impairment’ [1].

Orthorexia, etymologically derived from Greek, pertains to the notion of ‘correct’ or ‘proper’ alignment of nutrition. However, its pathological manifestation involves a rigid over-focus on the consumption of foods deemed ‘healthy’.

A pivotal milestone in the epistemological evolution of this construct was the delineation of its two-dimensional nature, distinguishing healthy orthorexia (HeOr) from orthorexia nervosa (OrNe). Empirical analyses indicate that when controlling for OrNe, higher levels of HeOr are either unrelated or negatively associated with various indices of psychological distress and psychopathology. Conversely, OrNe correlates positively with psychological distress, restrictive eating patterns, obsessive-compulsive symptoms, and maladaptive perfectionism – a pattern of covariance that remains robust even when partialling out the variance of HeOr [2].

Distinct from a rational, adaptive concern for dietary quality, OrNe is characterized by an obsessive preoccupation with healthy eating that progressively loses its utility and evades volitional control. Consequently, dietary behaviours originally initiated to optimize health often precipitate a cascade of adverse outcomes spanning both somatic degradation and psychosocial dysfunction. Recent reviews and instrument-development research underscore that highly restrictive dietary control may be accompanied by malnutrition, social impairment, and diminished quality of life [3, 4].

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In the somatic domain, rigorous dietary restrictions yield not only systemic emaciation but also severe medical complications, including osteopenia, anaemia, endocrine disruptions, life-threatening fluid and electrolyte imbalances (e.g., hyponatraemia), and adverse cardiovascular events [3]. This clinical picture may be compounded by compulsive physical activity, which recent evidence identifies as an important correlate of orthorexia [3]. Furthermore, individuals presenting with elevated orthorectic tendencies exhibit significantly higher rates of objective metabolic symptoms – such as chronic fatigue and subjective energy depletion – alongside vasovagal symptoms, including generalized weakness and syncope proneness [5]. Notably, recent data from representative cohorts indicate that the severity of orthorectic behaviours directly drives the utilization of high-risk weight-control methods, including prolonged fasting and laxative abuse [6].

The psychological and interpersonal toll of OrNe is equally profound. A review of the extant literature reveals that it is characterized by chronic anxiety, reduced cognitive flexibility, intense guilt, and self-loathing following perceived dietary transgressions [3]. OrNe has been shown to be a robust, independent predictor of global psychological distress, manifesting as elevated stress, anxiety, and depressive symptomatology [7]. Empirical evidence also identifies severe emotion regulation deficits in these patients, specifically an intolerance of negative affective states and compromised impulse control [8]. Ultimately, these maladaptive, anxiety-driven eating patterns culminate in profound social alienation, erosion of relationships, and marked impairment in both intra- and interpersonal functioning [9].

However, the current body of literature on orthorexia is heavily constrained by an age-related selection bias. The vast majority of studies have relied on purposive sampling of adolescents and undergraduate students, severely limiting the generalizability of these findings across the lifespan. Across numerous empirical designs, the mean age of participants clusters tightly within late adolescence and emerging adulthood, typically between 19 and 21 years [5]. In several protocols, undergraduate status and an age below 26 years served as formal inclusion criteria [5]. Consequently, orthorexia has predominantly been conceptualized as a phenomenon associated with younger populations, leaving its manifestation, prevalence, and determinants in the later stages of life relatively underexplored. This pervasive focus on cohorts in the second and third decades of life has precluded the extrapolation of empirical data to geriatric populations [10]. Furthermore, this methodological trend has reinforced the widespread assumption in mainstream literature that orthorectic behaviours are a uniquely youth phenomenon [10–12], creating substantial gaps in knowledge regarding the geriatric specificities of the condition [11]. This under-representation mirrors historical trends in the broader field of eating disorders, which were traditionally viewed as pathologies restricted to youth, thereby under-diagnosing and ignoring eating disturbances in older adults [12]. Thus, a critical deficit of empirical data persists regarding geriatric populations, despite the fact that health concerns become the central organizing principle of daily functioning during this life stage [10]. Late adulthood, frequently complicated by multimorbidity (including metabolic diseases and oncological conditions), presents a distinct clinical context. Here, dietary vigilance often stems

not from weight management or body image ideals, but from mandatory medical recommendations. As review papers note, eating disturbances in older individuals rarely centre on the drive for slimness; instead, they frequently serve as a psychological coping mechanism to manage severe stress, age-related role loss, social isolation, and an existential loss of control over progressive somatic frailty [13].

Importantly, the perception of body weight shifts significantly within the geriatric cohort. While emerging adults are primarily driven by a fear of weight gain, older individuals – particularly those at risk for cachexia – often experience a substantial fear of involuntary weight loss [14]. Precipitous weight loss in older adults is strongly tied to malnutrition, sarcopenia, and heightened mortality; hence, as highlighted by systematic reviews, rigorous dietary restrictions implemented under the guise of ‘healthy eating’ pose a significant clinical risk in this group [12]. Despite these risks, the psychological drivers of anxiety-mediated dietary control are routinely overlooked in psychogeriatric practice. One of the few available studies in older Chinese adults [10] suggested that orthorexia might serve a protective function associated with higher well-being. However, that study relied on a unidimensional instrument that lacked the methodological capacity to differentiate adaptive, preventive dietary care from anxiety-driven dysfunction.

OBJECTIVE

The aim of the study is to address the empirical discrepancies and comprehensively evaluate orthorectic behaviours in individuals aged 60 and older, while accounting for distinct diet-relevant health profiles. By utilizing the two-dimensional model of orthorexia (Teruel Orthorexia Scale – TOS), the study also aimed to determine the relative impact of health anxiety, weight-change anxiety (encompassing both fear of weight gain and fear of weight loss), and objective nutritional status on pathological forms of dietary control in older adults. Furthermore, by evaluating the intra- and interpersonal costs of these behaviours via the newly developed Intra- and Interpersonal Effects Scale of Orthorexia (IIESO), the study additionally aims to elucidate the extent to which orthorexia in late adulthood functions as a rational component of preventive health, or transforms into a maladaptive, anxiety-driven self-regulatory strategy.

MATERIALS AND METHOD

Study design, sampling, and participants. A cross-sectional observational study was conducted in Poland between January and June 2026, using a non-probability convenience sample. Participants were recruited during meetings held at Universities of the Third Age, community-based interest groups, residential care facilities, and activities organized specifically for older adults. Participants were not hospital inpatients and were required to be in a clinically stable general physical and mental condition that enabled participation. The study focused on orthorexic eating behaviours, body mass-related anxiety, health anxiety, nutritional status, depressive symptoms, well-being, dietary restrictions, supplement use, and the clinical context of diet-relevant chronic diseases.

Table 1. Characteristics of the study sample

Characteristic	Value
Number of participants, n	360
Age, years	M = 72.26, SD = 6.46, range 60–89
Age group	60–69: 120 (33.3); 70–79: 195 (54.2); 80+: 45 (12.5)
Gender	Female: 221 (61.4); Male: 139 (38.6)
Education	Primary/vocational: 100 (27.8); Secondary: 159 (44.2); Higher: 101 (28.1)
Living status	Alone: 110 (30.6); With partner: 179 (49.7); With family/caregiver: 71 (19.7)
Place of residence	Rural area: 69 (19.2); urban locality <100,000 inhabitants: 108 (30.0); city with at least 100,000 inhabitants: 183 (50.8)
BMI, kg/m ²	M = 27.65, SD = 4.77
BMI category	Underweight: 10 (2.8); Normal weight: 93 (25.8); Overweight: 153 (42.5); Obesity: 104 (28.9)
Diet-relevant health profile	No diet-relevant chronic disease: 85 (23.6); Metabolic/cardiovascular: 145 (40.3); Strict dietary control: 65 (18.1); Weight loss/cachexia: 65 (18.1)
Medically recommended diet	180 (50.0)
Self-imposed diet	71 (19.7)
Unintentional weight loss in previous 6 months	48 (13.3)
Regular supplement use	No supplements: 82 (22.8); 1–2 supplements: 186 (51.7); 3+ supplements: 92 (25.6)

Data were collected anonymously using a paper-and-pencil questionnaire battery completed in person in the presence of research assistants. The battery comprised an original 13-item socio-demographic, anthropometric, and clinical section, together with the standardized measures and study-specific items. The original section included five socio-demographic items (age, gender, education, living status, and place of residence), two anthropometric items (body weight and height), and six clinical and dietary items (main diet-relevant chronic disease, disease duration, medically recommended diet, self-imposed diet, regular supplement use, and unintentional weight loss during the previous six months). Open numerical fields, categorical response options, and yes/no questions were used, as appropriate to each variable. BMI was calculated from the reported body weight and height, and the diet-relevant health profile derived from the reported main disease. No personally identifying information was collected. The assistants explained the instructions and clarified individual items when necessary to facilitate comprehension and correct completion. Questionnaires were checked for completeness at the time of collection.

The inclusion criteria were age of at least 60 years, residence in Poland, provision of informed consent, clinically stable general health, and the ability to establish effective verbal contact, understand the study instructions, and complete the questionnaire independently or with clarification provided by a research assistant. The exclusion criteria were current hospitalization, an acute medical or psychiatric condition preventing participation, a diagnosis of dementia or other cognitive impairment affecting the ability to provide informed consent or understand the questionnaire, inability to establish effective verbal contact, and refusal to participate.

Participants were classified into four diet-relevant health profiles: (1) no chronic disease with a direct or substantial influence on dietary behaviour; (2) metabolic or cardiovascular diseases, in which diet and body weight are commonly framed as risk-control targets; (3) diseases requiring strict dietary control, such as conditions in which dietary adherence is a core element of clinical management; and (4) diseases associated with weight loss, cachexia, or clinically meaningful bodily deterioration. This classification

was used to distinguish different clinical meanings of food control in later life.

The final sample consisted of 360 participants with complete data for all variables included in the analyses. Participants were aged 60–89 years (M = 72.26, SD = 6.46); 221 participants were women (61.4%) and 139 were men (38.6%). Most participants were aged 70–79 years (54.2%), followed by 60–69 years (33.3%), and 80 years or older (12.5%). Mean BMI was 27.65 kg/m² (SD = 4.77). Overweight was observed in 153 participants (42.5%) and obesity in 104 participants (28.9%).

No returned questionnaires were excluded because of missing data. Because probability sampling was not used, the study sample should not be regarded as representative of the entire population of older adults in Poland. Nevertheless, recruitment across different community and residential settings enabled the inclusion of older adults with diverse socio-demographic and clinical characteristics. Regarding socio-demographic background, 100 participants (27.8%) had primary or vocational education, 159 (44.2%) had secondary education, and 101 (28.1%) had higher education. A total of 110 participants (30.6%) lived alone, 179 (49.7%) lived with a partner, and 71 (19.7%) lived with family members or a caregiver. Place of residence was classified as rural area (n = 69, 19.2%), urban locality with fewer than 100,000 inhabitants (n = 108, 30.0%), or city with at least 100,000 inhabitants (n = 183, 50.8%).

The study sample was predominantly female, with most participants aged 70–79 years. Secondary education was the most common educational level, and nearly half of the participants lived with a partner. Most participants lived in urban areas, with cities of at least 100,000 inhabitants representing the largest place-of-residence category. Overweight was the most frequent BMI category, and the metabolic/cardiovascular profile was the largest diet-relevant health profile. Half of the participants followed a medically recommended diet, whereas self-imposed diets were less common. Most participants reported using at least one dietary supplement, while unintentional weight loss during the previous six months was reported by a minority. Detailed characteristics of the study sample are presented in Table 1.

The study was approved by the Bioethics Committee at the Medical University of Lublin (Consent No. KE-0254/223/2019; approval date: 27 June 2019). Participation was voluntary, and all participants provided informed consent. The study procedure was conducted in accordance with the Declaration of Helsinki.

MEASURES

Socio-demographic, anthropometric, and clinical variables. The socio-demographic section included age, gender, education, living status, and place of residence. Place of residence was classified as rural area, urban locality with fewer than 100,000 inhabitants, or city with at least 100,000 inhabitants. Anthropometric status was described using body mass index (BMI, kg/m²) and BMI categories. Clinical variables included the main diet-relevant disease, disease duration, health-profile category, medically recommended diet, self-imposed diet, regular supplement use, and unintentional weight loss during the previous six months.

Orthorexic eating behaviours. Orthorexic eating behaviours were assessed using the Polish version of the Teruel Orthorexia Scale (TOS), which is based on the bi-dimensional conceptualization of orthorexia proposed by Barrada and Roncero [2] and validated among Polish adults by Styk et al. [15]. The TOS distinguishes healthy orthorexia (TOS-He), understood as non-pathological interest in healthy eating, from negative/pathological orthorexia (TOS-Ne), which reflects maladaptive preoccupation with healthy eating. Higher scores indicate stronger endorsement of the respective dimension. The Polish validation study reported high internal consistency for TOS-He (Cronbach $\alpha = 0.87$) and TOS-Ne (Cronbach $\alpha = 0.82$) [15]. In the present sample of older adults, reliability was lower for TOS-He (Cronbach $\alpha = 0.610$) and acceptable for TOS-Ne (Cronbach $\alpha = 0.715$). Therefore, findings involving TOS-He were interpreted with caution, whereas TOS-Ne was treated as the primary orthorexia-related outcome.

Intra- and interpersonal effects of orthorexia. Consequences of orthorexic behaviours were assessed using the Intra- and Interpersonal Effects Scale of Orthorexia (IIESO), developed to identify the psychological and social consequences of orthorexic tendencies [9]. The instrument includes intra- and interpersonal content, reflecting internal psychological burden and the impact of orthorexic behaviours on social or relational functioning. In the present study, IIESO was analysed as an overall score and was used as the primary indicator of orthorexia-related consequences. The intra- and interpersonal dimensions were described as part of the instrument structure, but were not treated as separate outcomes in the main analyses, in order to maintain a parsimonious analytical model and avoid unnecessary multiplication of endpoints. The original validation study reported high reliability for the overall scale (Cronbach $\alpha = 0.91$) [9]. In the present sample, internal consistency was good for the intrapersonal dimension (Cronbach $\alpha = 0.812$) and acceptable, although lower, for the interpersonal dimension (Cronbach $\alpha = 0.696$).

Body mass anxiety. Body mass-related anxiety was assessed using the Body Mass Anxiety Scale (BMAS-20), which distinguishes anxiety about gaining fat/weight (BMAS-AGF) from anxiety about losing weight (BMAS-ALW) [14]. This distinction is particularly relevant in older adults, for whom weight change may be interpreted not only in aesthetic or weight-control terms but also in relation to illness, frailty, metabolic risk, or nutritional deterioration. In the original Polish validation study, internal consistency was very high for both BMAS-AGF (Cronbach $\alpha = 0.964$) and BMAS-ALW (Cronbach $\alpha = 0.935$), with $\alpha = 0.916$ for the total scale [14]. In the present sample, internal consistency remained excellent for BMAS-AGF (Cronbach $\alpha = 0.907$) and BMAS-ALW (Cronbach $\alpha = 0.893$).

Health anxiety and illness-related meaning of weight loss. Health anxiety was assessed with an index reflecting the tendency to worry about health and illness, conceptually consistent with the health-anxiety construct assessed in recent orthorexia research using the Short Health Anxiety Inventory [16]. Higher scores indicated greater health-related anxiety. In addition, participants rated the extent to which weight loss was interpreted as a sign of illness, frailty, or bodily deterioration; higher scores indicated a stronger illness-related interpretation of weight loss.

Nutritional status, depression, well-being, and dietary restriction. Nutritional status was assessed using the Mini Nutritional Assessment – Short Form (MNA-SF), a widely used screening tool for detecting malnutrition and risk of malnutrition in older adults [17]. Depressive symptoms were assessed using the 15-item Geriatric Depression Scale (GDS-15), a short screening instrument developed for older populations [18]. Subjective psychological well-being was assessed using the WHO-5 Well-Being Index, a brief and widely used measure of positive well-being [19].

Dietary restriction was assessed using the Dietary Restraint subscale of the My Eating Habits Questionnaire (Polish original: *Kwestionariusz Zachowań Związanych z Jedzeniem – KZZJ*), a Polish questionnaire measuring eating-related behaviours, including habitual overeating, emotional overeating, and dietary restriction [20]. The original validation study reported high internal consistency for the overall questionnaire (Cronbach $\alpha = 0.89$) [20]. In the present study, only the Dietary Restraint score was used in the analyses as an indicator of restrictive eating behaviour.

Statistical analysis. Statistical analyses were performed to describe the study sample, evaluate bi-variate associations between orthorexia-related outcomes and psychological/clinical variables, compare groups defined by health profile and place of residence, and identify independent predictors of negative orthorexia and orthorexia-related consequences. All analyses were conducted using a two-tailed significance level of $\alpha = 0.05$.

Descriptive statistics were calculated for all variables. Continuous variables were summarized using means and standard deviations, as well as medians and ranges where relevant. Categorical variables were summarized as frequencies and percentages. The distribution of continuous variables was assessed using visual inspection, skewness and kurtosis, and the Shapiro-Wilk test. Because several key variables showed non-normal distributions, Spearman rank

Table 2. Descriptive statistics and Spearman correlations with TOS-Ne and IIESO

Variable	M ± SD	Me	Range	ρ with TOS-Ne	p _{FDR}	ρ with IIESO	p _{FDR}
TOS-He	29.07 ± 4.00	29.00	17–43	0.023	0.659	0.123	0.023
TOS-Ne	16.38 ± 4.08	16.00	7–27	—	—	0.530	<0.001
IIESO	55.94 ± 8.76	56.00	34–77	0.530	<0.001	—	—
BMAS-AGF	29.10 ± 10.33	28.00	11–64	0.294	<0.001	0.187	<0.001
BMAS-ALW	23.58 ± 8.88	22.00	10–53	0.149	0.007	0.309	<0.001
Health anxiety	20.31 ± 7.03	20.00	0–38	0.249	<0.001	0.378	<0.001
Weight-loss illness meaning	2.42 ± 0.73	2.40	1–5	0.125	0.021	0.187	<0.001
MNA-SF	11.18 ± 1.67	11.00	6–14	-0.112	0.036	-0.141	0.011
GDS-15	5.25 ± 2.63	5.00	0–14	0.127	0.020	0.199	<0.001
WHO-5	13.04 ± 4.30	13.00	0–24	-0.231	<0.001	-0.174	0.002
Dietary restraint	4.79 ± 1.61	5.00	1–9	0.338	<0.001	0.258	<0.001
BMI	27.65 ± 4.77	27.55	17.50–43.00	0.118	0.028	0.137	0.012
No. of supplements	1.67 ± 1.49	1.00	0–8	0.169	0.002	0.168	0.002

TOS-He – Teruel Orthorexia Scale-Healthy Orthorexia; **TOS-Ne** – Teruel Orthorexia Scale-Negative Orthorexia; **IIESO** – Intra- and Interpersonal Effects Scale of Orthorexia; **BMAS-AGF** – anxiety about gaining fat/weight; **BMAS-ALW** – anxiety about losing weight; **MNA-SF** – Mini Nutritional Assessment-Short Form; **GDS-15** – 15-item Geriatric Depression Scale; **WHO-5** – WHO-Five Well-Being Index. FDR-adjusted p values are reported for correlations. Place of residence did not significantly differentiate any of the analysed continuous study variables (all Kruskal-Wallis $p > 0.05$); therefore, detailed results of these comparisons are not presented

correlation coefficients were selected for bi-variate analyses involving ordinal or non-normally distributed variables.

Internal consistency coefficients for the main multi-item instruments were reported descriptively in the Measures section together with the psychometric information from the original validation studies. Reliability coefficients were not treated as separate empirical outcomes and were not presented in a separate results table.

Group differences between the four diet-relevant health profiles were examined using the Kruskal-Wallis test for continuous or ordinal outcomes and chi-square tests for categorical outcomes. When an omnibus test was significant, *post hoc* pairwise comparisons were conducted using Dunn's test or pairwise Mann-Whitney U tests, with correction for multiple comparisons. Differences in continuous study variables across the three place-of-residence categories were also examined using the Kruskal-Wallis H test. To control the false discovery rate in families of related tests, the Benjamini-Hochberg procedure was applied where appropriate [21]. Effect sizes for group comparisons were reported using η^2 based on the H statistic for Kruskal-Wallis tests and Cramer V for chi-square tests.

The primary bi-variate analyses examined associations between TOS-He, TOS-Ne, IIESO score, BMAS-AGF, BMAS-ALW, health anxiety, illness-related meaning of weight loss, MNA-SF, GDS-15, WHO-5, BMI, dietary restriction, and number of supplements. These analyses were intended to determine whether negative orthorexia and orthorexia-related consequences were more strongly associated with anxiety, restrictive dietary behaviour, supplement use, and poorer well-being than with socio-demographic variables alone.

Hierarchical linear regression models were performed for two main outcomes: TOS-Ne and IIESO score. For TOS-Ne, predictors were entered in three blocks: (1) age, gender, and BMI; (2) diet-relevant health profile, medically recommended diet, self-imposed diet, and number of supplements; and (3) BMAS-AGF, BMAS-ALW, health anxiety, dietary restriction, depressive symptoms, and well-being. For IIESO score, the first three blocks were the same, and TOS-Ne was added as a final block to test whether negative orthorexia explained

additional variance in orthorexia-related consequences beyond anxiety, diet, supplement use, and clinical context.

Regression assumptions were evaluated using residual plots, normality of residuals, homoscedasticity, leverage values, and multicollinearity diagnostics. Variance inflation factors below 5 were considered acceptable. Standardized regression coefficients, unstandardized coefficients, 95% confidence intervals, p-values, R^2 , adjusted R^2 , and change in R^2 between hierarchical blocks were reported.

Statistical analyses were performed in R (R Foundation for Statistical Computing, Vienna, Austria).

RESULTS

Descriptive statistics and bi-variate associations. The descriptive statistics for the principal study variables are presented in Table 2. The mean score for healthy orthorexia (TOS-He) was 29.07 (SD = 4.00), whereas the mean score for negative orthorexia (TOS-Ne) was 16.38 (SD = 4.08). The mean IIESO score was 55.94 (SD = 8.76).

Negative orthorexia was moderately associated with orthorexia-related consequences and showed positive associations with dietary restraint, fear of weight gain, health anxiety, the number of supplements used, BMI, fear of weight loss, depressive symptoms, and the tendency to interpret weight loss as a sign of illness. It was negatively associated with nutritional status and well-being. In contrast, healthy orthorexia showed only a weak association with orthorexia-related consequences and was not meaningfully associated with the anxiety-related variables.

The strongest bi-variate correlate of IIESO was TOS-Ne. In addition, higher orthorexia-related consequences were associated with greater health anxiety, fear of weight loss, dietary restraint, depressive symptoms, fear of weight gain, and interpretation of weight loss as illness, as well as with lower nutritional status and lower well-being.

Differences according to diet-relevant health profile. The diet-relevant health profile significantly differentiated most study variables (Tab. 3). The largest effects were observed

Table 3. Study variables according to diet-relevant health profile

Variable	No diet-related disease	Metabolic/cardio-vascular	Strict dietary control	Weight loss/cachexia	H	η^2H	p_{FDR}
TOS-He	27.29 ± 4.07	29.91 ± 3.89	29.37 ± 3.79	29.20 ± 3.70	21.65	0.052	<0.001
TOS-Ne	15.24 ± 4.24	17.35 ± 3.97	16.02 ± 3.62	16.05 ± 4.12	17.48	0.041	<0.001
IIESO	53.81 ± 8.95	57.51 ± 8.92	54.58 ± 8.44	56.58 ± 7.81	9.53	0.018	0.023
BMAS-AGF	26.24 ± 8.42	33.66 ± 10.60	27.29 ± 10.08	24.49 ± 8.25	45.90	0.120	<0.001
BMAS-ALW	21.88 ± 7.96	22.39 ± 8.43	20.95 ± 6.88	31.09 ± 8.99	51.17	0.135	<0.001
Health anxiety	19.71 ± 6.65	21.19 ± 6.70	17.69 ± 7.91	21.78 ± 6.66	13.11	0.028	0.005
Weight-loss illness meaning	2.29 ± 0.77	2.40 ± 0.69	2.16 ± 0.57	2.92 ± 0.68	40.29	0.105	<0.001
MNA-SF	11.71 ± 1.39	11.57 ± 1.48	11.46 ± 1.25	9.35 ± 1.58	79.27	0.214	<0.001
GDS-15	4.95 ± 2.68	5.22 ± 2.50	4.69 ± 2.85	6.25 ± 2.40	13.24	0.029	0.005
WHO-5	13.94 ± 4.09	12.90 ± 4.02	13.69 ± 4.61	11.54 ± 4.50	11.81	0.025	0.009
Dietary restraint	4.56 ± 1.64	5.23 ± 1.54	4.49 ± 1.73	4.42 ± 1.42	18.10	0.042	<0.001
BMI	26.14 ± 4.56	29.85 ± 4.61	27.40 ± 3.78	24.94 ± 4.09	58.60	0.156	<0.001
No. of supplements	1.00 ± 1.07	1.83 ± 1.68	1.78 ± 1.26	2.09 ± 1.48	27.91	0.070	<0.001

Note. Values are M ± SD. H – Kruskal-Wallis test statistic; η^2H – eta-squared effect size based on the Kruskal-Wallis statistic. FDR-adjusted p values are reported. The reference category labels were shortened for readability

for nutritional status, BMI, fear of weight loss, fear of weight gain, interpretation of weight loss as a sign of illness, and the number of supplements used. Smaller but statistically significant effects were also observed for healthy orthorexia, dietary restraint, negative orthorexia, depressive symptoms, health anxiety, well-being, and IIESO.

Participants with metabolic or cardiovascular diseases showed the highest levels of fear of weight gain, negative orthorexia, and dietary restraint. Participants with diseases associated with weight loss or cachexia showed the highest fear of weight loss, the strongest tendency to interpret weight loss as a sign of illness, and the lowest nutritional status. This pattern suggests that different chronic disease contexts are associated with qualitatively different forms of food- and body mass-related anxiety.

Diet type and supplementation. A medically recommended diet was associated with higher TOS-He scores ($M = 29.85$ vs. 28.28 , FDR-adjusted $p = 0.003$), greater dietary restraint ($M = 5.03$ vs. 4.56 , FDR-adjusted $p = 0.033$), and a higher number of supplements used ($M = 1.98$ vs. 1.37 , FDR-adjusted $p = 0.002$).

A self-imposed diet was associated primarily with higher TOS-Ne scores ($M = 17.72$ vs. 16.04 , FDR-adjusted $p = 0.035$). Other differences related to self-imposed diet did not remain statistically significant after FDR correction.

Supplement use also differentiated selected outcomes.

Participants using no supplements had lower TOS-He scores ($M = 27.16$) than those using 1–2 supplements ($M = 29.21$)

or at least 3 supplements ($M = 30.48$). Across supplement categories, the strongest effect was observed for TOS-He (TOS-He: $H = 28.86$, $\eta^2H = 0.075$, $p < 0.001$), while differences in TOS-Ne were weaker (TOS-Ne: $H = 5.30$, $\eta^2H = 0.009$, $p = 0.071$) and differences in IIESO were statistically significant but small (IIESO: $H = 13.02$, $\eta^2H = 0.031$, $p = 0.001$).

Multivariable regression models. Hierarchical regression analyses were performed to identify independent predictors of TOS-Ne and IIESO. For TOS-Ne, the block including socio-demographic variables explained little variance. Adding diet-relevant health profile, diet type and supplementation, improved the model, and the psychological block provided the largest increase in explained variance. In the final model, higher fear of weight gain, greater dietary restraint, more supplements used, higher health anxiety, self-imposed diet, and lower well-being, were independently associated with higher TOS-Ne scores.

For IIESO, the final model including TOS-Ne explained 42.8% of the variance, with TOS-Ne being the strongest independent predictor. Health anxiety and fear of weight loss also remained significant, indicating that orthorexia-related consequences in older adults were not explained only by negative orthorexia itself, but also by illness- and weight-loss-related anxiety.

Continuous predictors and outcomes were standardized before analysis; therefore coefficients for continuous predictors can be interpreted as standardized β coefficients. Coefficients for dichotomous predictors are partially standardized

Table 4. Hierarchical regression model fit for TOS-Ne and IIESO

Outcome	Block	Predictors added	R^2	Adj. R^2	ΔR^2	F	p
TOS-Ne	1	Socio-demographic variables	0.017	0.009	—	2.07	0.104
TOS-Ne	2	Disease, diet, supplementation	0.090	0.067	0.073	3.86	<0.001
TOS-Ne	3	Psychological variables	0.264	0.232	0.174	8.22	<0.001
IIESO	1	Socio-demographic variables	0.019	0.011	—	2.34	0.074
IIESO	2	Disease, diet, supplementation	0.075	0.051	0.056	3.15	0.001
IIESO	3	Psychological variables	0.304	0.273	0.229	10.00	<0.001
IIESO	4	TOS-Ne	0.428	0.401	0.124	16.02	<0.001

R^2 – coefficient of determination; Adj. R^2 – adjusted coefficient of determination; ΔR^2 – change in R^2 relative to the previous block

Table 5. Final regression models for TOS-Ne and IIESO

Outcome	Predictor	B / β	SE	t	p
TOS-Ne	Age	0.044	0.047	0.92	0.357
TOS-Ne	Male gender	0.082	0.098	0.83	0.407
TOS-Ne	BMI	-0.069	0.059	-1.18	0.240
TOS-Ne	Metabolic/cardiovascular disease	0.124	0.144	0.86	0.390
TOS-Ne	Disease requiring strict dietary control	0.121	0.172	0.71	0.481
TOS-Ne	Disease associated with weight loss/cachexia	-0.107	0.165	-0.65	0.515
TOS-Ne	Medically recommended diet	0.007	0.111	0.06	0.952
TOS-Ne	Self-imposed diet	0.263	0.120	2.19	0.029
TOS-Ne	No. of supplements	0.156	0.049	3.19	0.002
TOS-Ne	BMAS-AGF	0.216	0.059	3.63	<0.001
TOS-Ne	BMAS-ALW	0.099	0.053	1.86	0.063
TOS-Ne	Health anxiety	0.135	0.056	2.42	0.016
TOS-Ne	Dietary restraint	0.210	0.051	4.10	<0.001
TOS-Ne	GDS-15	-0.032	0.067	-0.49	0.626
TOS-Ne	WHO-5	-0.155	0.066	-2.35	0.019
IIESO	Age	0.025	0.042	0.60	0.548
IIESO	Male gender	0.113	0.087	1.30	0.196
IIESO	BMI	0.080	0.052	1.54	0.124
IIESO	Metabolic/cardiovascular disease	0.063	0.127	0.50	0.620
IIESO	Disease requiring strict dietary control	0.131	0.152	0.86	0.390
IIESO	Disease associated with weight loss/cachexia	-0.008	0.146	-0.05	0.958
IIESO	Medically recommended diet	-0.134	0.098	-1.36	0.175
IIESO	Self-imposed diet	0.151	0.107	1.42	0.158
IIESO	No. of supplements	0.078	0.044	1.78	0.076
IIESO	BMAS-AGF	0.009	0.054	0.17	0.862
IIESO	BMAS-ALW	0.202	0.047	4.28	<0.001
IIESO	Health anxiety	0.246	0.050	4.95	<0.001
IIESO	Dietary restraint	0.069	0.046	1.50	0.135
IIESO	GDS-15	0.104	0.059	1.77	0.077
IIESO	WHO-5	0.136	0.059	2.32	0.021
IIESO	TOS-Ne	0.411	0.048	8.62	<0.001

coefficients. The reference group for diet-relevant health profile was no disease substantially affecting diet.

An additional model for TOS-He explained less variance than the models for TOS-Ne and IIESO (final $R^2 = 0.168$, adjusted $R^2 = 0.132$). In the final model, TOS-He was independently associated with metabolic/cardiovascular disease ($B = 0.458$; $p = 0.003$), self-imposed diet ($B = 0.259$; $p = 0.043$), number of supplements used ($\beta = 0.193$; $p < 0.001$), and depressive symptoms ($\beta = 0.220$; $p = 0.002$). Given the lower internal consistency of the TOS-He subscale in the present sample, this finding should be interpreted cautiously.

DISCUSSION

Weight anxiety and the bifurcation of somatic profiles.

The principal finding of the study is that somatic conditions, defined by the diet-relevant health profile, create distinct clinical contexts that differentiate the psychological basis of anxiety about body-weight change and orthorexic behaviours in older adults. To date, pathological orthorexia and body-

related anxieties have been described mainly in younger groups, with emphasis placed on psychosocial and aesthetic factors [7, 22]. The obtained results, however, show that the mechanisms regulating diet in the geriatric population are more complex, and are determined to a considerable extent by the type of somatic disease and its associated anxieties.

In the comparative analyses (Tab. 3), patients with a metabolic or cardiovascular profile obtained the highest scores for pathological orthorexia (TOS-Ne), dietary restraint, and fear of weight gain. This phenomenon may be interpreted as an attempt to regain control over health in the face of the threat posed by cardiovascular or metabolic diseases. As Vaidyanathan et al. [13] indicate, disordered eating in older adults occurs in the context of chronic medical conditions and psychosocial role changes, and cannot be understood solely through aesthetic pressure. In the context of the findings of the current study, these behaviours may serve a compensatory function, helping to restore a sense of agency in response to deteriorating health. Because body weight and diet are regarded in clinical practice as components of the prevention and treatment of cardiovascular diseases, some older adults may follow the relevant recommendations with

excessive rigidity. Although the metabolic profile was no longer a direct predictor of orthorexia in the multivariable models (Tab. 5), the positive correlation between TOS-Ne and dietary restraint, together with the strong effect of fear of weight gain, indicates that pathological control of eating in this group is related mainly to medically conditioned anxiety about an increase in body weight.

By contrast, patients with diseases associated with weight loss or cachexia presented a different psychosomatic pattern from participants in the metabolic group. They were characterized by an extremely poor nutritional status, the highest level of fear of losing weight, and the interpretation of weight loss as a sign of progressive physical wasting. At the same time, they showed the lowest level of dietary restraint and no fear of weight gain. In this case, eating behaviours did not serve as weight control but counteracted a perceived threat to health and life.

As Mulchandani et al. [12] emphasize, eating disorders in older adults are associated with substantial morbidity and mortality. The fear of losing weight observed in patients with cachexia therefore reflects a genuine biological threat, because weight loss may be perceived as a sign of disease progression. This mechanism is illustrated by Herre et al. [23], who described the case of a 75-year-old patient in whom fear of illness led to extreme food exclusions under the guise of a 'healthy diet', resulting in life-threatening physical wasting. The findings of the current study empirically confirm this pattern in a larger sample of older adults with somatic diseases, and simultaneously provide key evidence from the multivariable models (Tab. 5). Although the cachexia profile itself is not a direct predictor of the severity of the negative consequences of orthorexia, fear of weight loss remains a strong independent predictor of the IIESO score, second in strength only to pathological orthorexia itself and general health anxiety. This demonstrates that the psychosocial costs and suffering experienced by an older person in the context of wasting diseases do not result directly from the medical diagnosis itself, but are generated by a psychological fear of weight loss, which in turn imposes an anxious and rigid control over food intake.

The findings obtained are inconsistent with those reported by He et al. [10] who found that orthorexic behaviours in older Chinese adults were adaptive and associated with greater well-being and a positive body image. Important methodological differences should, however, be emphasized. The uni-dimensional C-DOS instrument used in the above-mentioned study does not distinguish between a non-pathological interest in healthy eating and its dysfunctional forms. The current study used the bi-dimensional conceptualization of orthorexia (TOS), which makes it possible to separate healthy from pathological orthorexia. The findings showed that pathological orthorexia among Polish older adults with chronic diseases was associated with lower well-being, which remained its independent predictor. This discrepancy suggests that, under the burden of somatic disease, orthorexia in older adults loses its adaptive nature and becomes an anxiety-driven strategy for coping with bodily frailty. The differences may also stem from cultural specificity and different sampling methods, because the Chinese study included a general population of older adults, whereas the presented sample reflected the clinical context of people with chronic conditions.

Previous findings do not allow the nature of the relationship between age and orthorexia to be determined unequivocally; however, the available evidence indicates that pathological forms of this phenomenon occur less often in older than in younger people [7]. This may partly explain the moderate level of pathological orthorexia observed in the current study. At the same time, the regression models (Tab. 5) show that age alone is not a universal protective factor. When fear of weight gain or general health anxiety intensifies, the potentially protective effect of age may be weakened, and dietary control becomes a means of reducing experienced anxiety.

The autonomy paradox – self-imposed diet and supplement polypharmacy. Another important finding was the different role played by the source of dietary restriction in shaping pathological orthorexia among older adults. In the multivariable regression model (Tab. 5), adherence to a diet recommended for medical reasons was not associated with the severity of negative orthorexia. A different pattern was observed for diets introduced independently by patients, which proved to be a significant independent predictor of pathological orthorexia.

These findings shed new light on the control of eating behaviours in late adulthood. A physician-recommended diet is usually a rational response to health problems and promotes healthy orthorexia (TOS-He) without being linked to psychopathological mechanisms. By contrast, a self-imposed diet reflects different psychological processes and, among the older adults studied, was associated exclusively with increased indices of pathological orthorexia. Independently eliminating food groups may represent an attempt to cope with anxiety about illness or ageing. As Roncero et al. [24] indicate, pathological orthorexia is underpinned by cognitive distortions and beliefs concerning the need for strict control over eating (Need to Control). The findings of the current study suggest that, among older adults, these mechanisms may manifest as self-imposed diets serving the function of anxiety-driven self-treatment. This paradox is also reflected in the findings concerning supplementation. The number of preparations taken proved to be a significant independent predictor of pathological orthorexia (Tab. 5). An association between supplement use and orthorexic tendencies has previously been observed in a population of Polish adults [15]. The current findings, however, indicate that this mechanism assumes a negative form in older adults. In the context of multimorbidity and intensive pharmaceutical marketing, the use of numerous supplements may extend beyond rational concern for health and become a dysfunctional means of coping with anxiety about deteriorating health and the ageing process.

The resulting profile of predictors also provides important arguments in the debate concerning the nosological position of orthorexia. Although it was initially linked to obsessive-compulsive disorder (OCD) or regarded as a phenomenon typical of young people, current meta-analyses and large population studies indicate stronger associations with the eating-disorder (ED) spectrum [25]. The current findings extend this discussion to the population of older adults. The effects of fear of weight gain and dietary restraint on pathological orthorexia suggest that, even in late adulthood, it shares key mechanisms with classic eating disorders. As in younger people, dietary restrictions and body-weight-related anxieties may sustain maladaptive patterns of eating

behaviour, although in older age they are more strongly embedded in a health-related context.

Health anxiety and well-being as primary psychological drivers of negative orthorexia. Introducing the block of psychological variables into the hierarchical multiple regression model (Tab. 4) significantly increased the proportion of explained variance in pathological orthorexia. In the final model (Tab. 5), the strongest independent predictors of TOS-Ne were fear of weight gain, dietary restraint, general health anxiety, and reduced well-being. By contrast, body mass index and the severity of depressive symptoms were non-significant. These findings suggest that pathological control over dietary quality in older adults is related primarily to anxiety-related and cognitive factors, while objective physical parameters lose their predictive significance. The independent effect of dietary restraint alongside the non-significance of BMI is consistent with the findings of Plichta and Kowalkowska [6], who demonstrated that the risk of orthorexia is associated with rigorous weight control rather than the actual BMI value. The current study extends these findings to the population of older adults. Although most participants were overweight or obese, BMI status itself was not directly associated with orthorexia. The psychological representation of the body and anxiety about body-weight change were of key importance. This mechanism is further explained by the important role of health anxiety. Sanlier et al. [16] recently demonstrated direct associations between orthorexic tendencies, health anxiety, and eating-disorder-related impairment. In older adults, for whom the risk of health deterioration naturally increases, pathological orthorexia may function as a strategy for coping with anxiety. As Greville-Harris et al. [22] indicate, rigid dietary control often leads to chronic distress and guilt following even the slightest deviation from adopted rules. This cognitive trap is reflected in the negative effect of psychological well-being on the severity of pathological orthorexia, which is inconsistent with the findings of He et al. [10]. The demonstrated effect of reduced well-being indicates that pathological orthorexia retains its maladaptive nature in older adults burdened by chronic disease, and may perpetuate anxiety-driven eating patterns. This interpretation is supported by the data of Düdükçü et al. [11], who found that as many as 45.7% of the older adults studied, simultaneously experienced severe food-related obsessions and dysfunctional attitudes towards eating. The non-significance of depressive symptoms in the final regression model is also noteworthy. This suggests that pathological orthorexia in older adults is not simply a consequence of low mood or depression. As clinical reviews indicate [13], eating-behaviour disorders in later life are more often underpinned by the need to regain a sense of agency and control in the face of deteriorating health and the loss of previous social roles. In this context, dietary control may serve as a substitute for control over one's own life.

The findings suggest that pathological orthorexia in older adults constitutes a specific syndrome of symptoms associated with anxiety about health and somatic functioning. It may therefore require a distinct diagnostic and therapeutic approach focused on reducing health anxiety and strengthening cognitive flexibility.

Intra- and interpersonal consequences of orthorexic fixation and somatic anxiety. The final key area of the study

was the identification of factors determining the intra- and interpersonal consequences of orthorexic behaviours in older adults, assessed using the IIESO developed by Styk et al. [9]. The regression model showed a good fit to the data and explained 42.8% of the variance in the negative consequences of orthorexia. Pathological orthorexia proved to be the strongest predictor of psychosocial impairment. The use of the IIESO demonstrated that in the geriatric population, the pathological rather than the healthy dimension of orthorexia is responsible for deterioration in psychological and social functioning. Importantly, findings indicate that the personal and social costs experienced by older adults are not exclusively a consequence of orthorexic fixation. Even after controlling for the effect of TOS-Ne, general health anxiety and fear of weight loss remained significant predictors of negative consequences. This suggests that the suffering experienced by older adults, to a large extent, is associated with somatic anxiety and fear of losing weight.

Unlike in younger age groups, in which orthorexia-related problems often result from fear of weight gain and loss of physical attractiveness, neither BMI nor fear of weight gain was significant for the IIESO among older adults. This indicates that deterioration in psychosocial functioning in older age is more strongly associated with concerns about health and physical capacity than with concerns about appearance. Vaidyanathan et al. [13] emphasize that disordered eating in later life has important implications for physical morbidity and mortality and may be obscured by co-existing medical conditions. In this context, fear of losing weight may reflect older adults' deeper concerns about losing physical capacity and independence, and about the progressive ageing of the body. This mechanism may be further reinforced by environmental factors. Düdükçü et al. [11] indicate that older adults often experience a dual psychological burden resulting from the overlap of loneliness and health problems. Under such conditions, orthorexic behaviours may promote further restriction of social contact. Sharing meals, an important element in maintaining relationships in older age, may become a source of tension and anxiety concerning food quality or safety. Consequently, some older adults may avoid meals prepared by relatives, increasing the risk of conflict and social isolation reflected in the overall psychosocial-cost score measured with the IIESO.

An interesting finding was the positive association between subjective well-being and the severity of the consequences of orthorexia. The correlation analyses indicated a negative association between well-being and the consequences of orthorexia (Tab. 2), but the relationship reversed in the multivariable model. This phenomenon may reflect a suppression effect or suggest that some older adults perceive strict dietary control as a source of satisfaction, and concern for health. From this perspective, restricting social contact may be interpreted not as a loss, but as an accepted cost of pursuing health goals.

In summary, all the findings obtained provide important arguments in the discussion concerning the clinical significance of orthorexia. The data indicate its potentially maladaptive consequences for the functioning of older adults. In line with proposals put forward in international expert consensus statements and reviews [1, 3], the fact that the presented model explains nearly half of the variance in the IIESO and suggests that pathological orthorexia in older age may constitute an important clinical problem. These findings

emphasize the need to consider not only somatic aspects but also health anxiety and the social functioning of older adults when planning therapeutic interventions.

Limitations of the study and future directions. Despite the clearly applied and cognitive value of the study, it has several methodological limitations which should be taken into consideration when interpreting the findings. The most important is its cross-sectional design, which prevents unequivocal inference about causal relationships. Although the regression models indicate that somatic anxieties and dietary restraint are significantly associated with the severity and consequences of pathological orthorexia, the direction of these relationships requires confirmation in longitudinal studies of geriatric populations. The use of non-probability sampling and recruitment through selected community and residential settings also limited the generalizability of the findings to the entire population of older adults. In particular, recruitment through Universities of the Third Age and organized interest groups may have over-represented socially active and health-engaged older adults, whereas isolated or homebound individuals may display different health-seeking and dietary behaviours.

The reliability analyses of the instruments used also yielded findings that are important from a psychometric perspective. The internal consistency of the healthy-orthorexia subscale was relatively low (Cronbach's $\alpha = 0.610$), whereas it reached a satisfactory level for the pathological dimension (Cronbach's $\alpha = 0.715$). By comparison, in the Polish validation of the TOS conducted by Styk et al. [15], the TOS-He subscale was characterized by high reliability ($\alpha = 0.87$). The reduction in this coefficient among older adults may reflect the specific nature of late adulthood, in which attention to diet results not only from health preference, but also from the need to follow medical recommendations. In older adults, the same eating behaviour may reflect a personal preference for healthy eating, adherence to clinically required dietary guidance, or both; this overlap may reduce the coherence of the beliefs captured by the TOS-He items. Similar conclusions can be drawn from the lower reliability of the interpersonal IIESO subscale ($\alpha = 0.696$), indicating a need to develop psychometric instruments dedicated to geriatric populations.

A promising direction for future research is to consider the role of medical personnel and caregivers. Examining whether rigorous dietary recommendations may unintentionally reinforce anxiety-driven patterns of eating control in older adults could contribute to the development of more integrated and safer forms of psychogeriatric care.

CONCLUSIONS

Pathological orthorexia in older adults was associated more strongly with health anxiety, weight-change anxiety, dietary restraint, self-imposed dieting, supplement use, and lower well-being than with BMI, depressive symptoms, or a medically recommended diet. Diet-relevant health profiles were related to distinct patterns: the metabolic/cardiovascular profile was characterized by greater fear of weight gain and dietary restraint, whereas the weight-loss/cachexia profile was characterized by poorer nutritional status and greater fear of weight loss. Orthorexia-related psychosocial consequences were independently associated with pathological orthorexia,

health anxiety, and fear of weight loss. Assessment in primary and geriatric care should distinguish adaptive adherence to medical dietary recommendations from anxiety-driven self-imposed restriction and should include nutritional risk, supplement use, and psychosocial functioning.

Abbreviations

AGF – Anxiety about Gaining Fat/Weight.

ALW – Anxiety about Losing Weight.

BMI – Body Mass Index.

BMAS-20 – Body Mass Anxiety Scale.

BMAS-AGF – Body Mass Anxiety Scale – Anxiety about Gaining Fat/Weight subscale.

BMAS-ALW – Body Mass Anxiety Scale – Anxiety about Losing Weight subscale.

FDR – False Discovery Rate.

GDS-15 – 15-item Geriatric Depression Scale.

IIESO – Intra- and Interpersonal Effects Scale of Orthorexia.

In this study, IIESO was used as the overall score of orthorexia-related consequences.

KZZJ – My Eating Habits Questionnaire; abbreviation based on the Polish original title Kwestionariusz Zachowań Związanych z Jedzeniem.

KZZJ-DR – Dietary Restraint subscale of the My Eating Habits Questionnaire.

MNA-SF – Mini Nutritional Assessment – Short Form.

SD – Standard Deviation.

SE – Standard Error.

TOS – Teruel Orthorexia Scale.

TOS-He – Teruel Orthorexia Scale – Healthy Orthorexia subscale.

TOS-Ne – Teruel Orthorexia Scale – Negative Orthorexia subscale.

WHO-5 – WHO-Five Well-Being Index.

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