УДК 159.922.7:616.89-008.441.42
DOI: https://doi.org/10.17721/BPSY.2025.2(22).13

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CAUSAL NETWORKS OF ADVERSE CHILDHOOD EXPERIENCE AND ORTHOREXIA NERVOSA

Background. *The problem of orthorexia nervosa is that it is becoming increasingly popular not only in Western society, but also in other countries around the world: India, Turkey, China, and many others. The psychological phenomenon and construct of orthorexia nervosa is still seeking its place among other eating disorders and beyond. Diagnostic criteria for orthorexia nervosa are still being developed, and attempts are being made to create psychometric tools for it. The objectives of this research is to study the psychogenic component of orthorexia nervosa from the perspective of negative childhood experiences (physical and emotional abuse) through the mediating prism of the influence of types of eating behavior (restrictive, emotion-driven, or external) and dysfunctional patterns.*

Methods. *The method of causal modeling with the construction of path diagrams of regression influences was used. The sample consisted of 467 respondents.*

Results. *The mechanisms of orthorexic eating behavior were demonstrated for groups of representatives of orthorexic modalities (diagnosed with orthorexia nervosa) and control groups (among which were representatives of those who practice fasting of any religious tradition, follow a therapeutic diet due to illness, use weight loss drugs, or do not follow any dietary restrictions at all).*

Conclusions. *This revealed that the development of orthorexia nervosa is largely determined by negative childhood experiences, which particularly influence the orthorexic modalities of exclusion and emphasis. Restrictive, emotion-driven, and external eating behaviors are associated with negative childhood experiences. Schema-regimes are powerful mediators that can either strengthen or weaken orthorexic tendencies. However, control groups have shown that orthorexic manifestations remain within normal limits if there is no traumatic childhood experience.*

Keywords: *orthorexia nervosa, causal modeling, adverse childhood experiences, eating behavior, eating disorder, schema-modes.*

Background

The problem of orthorexia nervosa is becoming increasingly widespread not only in the Western world, but also among other ethnic groups and cultures: India (Jain, & Sharma, 2021), Turkey (Aksoydan, & Camci, 2009), China (Zhou et al., 2020) and others. The strongest impetus for the spread of the idea of healthy eating and the search for various methods to achieve it is the growing internet trend of obsession with one's own health and appearance – the health and wellness syndrome. The most important scientific research in the field of orthorexia nervosa at present is the search for its place among other eating disorders, or its comorbidity with OCD, through the identification of construct components, the isolation of diagnostic criteria, and the creation of measurement tools (Cena et al., 2018). The etiology of orthorexia nervosa in our study is considered from the perspective of factors influencing adverse childhood experiences through the construction of causal models–this is the most in-depth attempt to date to design a study of the impact of adverse childhood experiences on the development of orthorexia nervosa, as previous studies in this area have had simpler designs (Galfano et al., 2021).

The purpose of this article is to attempt to investigate the psychogenic component of orthorexia nervosa from the perspective of adverse childhood experiences through the mediating effect of the influence of types of eating behavior (restrictive, emotional, or external) and dysfunctional schema-modes.

Methods

The study used psychodiagnostic methods: "Adverse Childhood Experiences Questionnaire (ACE)" adapted in ukrainian language (Vlasova et al., 2022); "Dutch Eating Behavior Questionnaire (DEBQ)" (Van Strien et al., 1986) and "Schema Mode Inventory" by J. Young (SMI) adapted in ukrainian language (Bolshakova, 2019).

The study sample consisted of n = 467 respondents, ukrainians randomly selected representatives of different age groups, professions, and hobbies. They were divided into subsamples according to dietary biases: in addition to the four types of orthorexic modalities (exclusion, emphasis, balancing, and periodization) (Kuchyna, 2024), there were six more control groups (practicing fasting; respondents following a therapeutic diet; taking weight loss drugs; eating without restrictions; eating intuitively; and those for whom none of the options offered in the questionnaire were suitable).

Research results and their discussion. At the very beginning of the work, the reliability of the questionnaires used in our sample was checked. The "Adverse Childhood Experiences Questionnaire (ACE)" adapted by Vlasova et al. (2022), according to the developers' statements, allows the following types of adverse childhood experiences to be measured: the ACE integral indicator, living in a dysfunctional family, destructive attitudes of those around them, involvement in early sexual activity, and social and emotional neglect. In our sample, only the integral indicator received a satisfactory Cronbach's α (.75) and McDonald's Ω (.74), which can only confirm the unidimensionality of the scale. Thus, it was decided to use a composite indicator for further procedures for describing and analyzing data, without dividing it into the above-mentioned additional scales. As a substitute for these procedures, an analysis will be carried out on individual, most effective items of the questionnaire.

Next, after checking reliability, distributions were assessed and descriptive statistics were calculated. Assessment of the distribution of the integral indicator of adverse childhood experiences using the Shapiro–Wilk criterion allowed us to reject the null hypothesis in favor of the alternative, since the distribution does not meet the criteria of normality ($p < .01$). Descriptive parameters of the

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integral scale: mean M = 6.86, mode Mo = 8, median Md = 7, standard deviation Sd = 3.68, standard error Se = .17, kurtosis Kr = -.4, and skewness Sk = -.05. The minimum value on the scale is 0, the maximum is 18. The highest frequency of responses falls between 6 and 10 points. There is a slight left-sided asymmetry towards lower values, indicating a tendency for the sample to balance in the range of lower characteristics measured by the questionnaire. Therefore, according to the reference values created by the developers of the ACE questionnaire, it was determined that the overall level of ACE can fall within the range of 0 to 9 points in the normal range and 10 to 22 points in the abnormal range. If a respondent scores 4 points or more, it is considered that they have long-term destructive health consequences.

Since it is not possible to use individual ACE scales in our study, except for the integral one, due to insufficiently reliable coefficients, in order to gain a deeper understanding of what is happening with the data, the frequency of responses to each item of the questionnaire and their average values were assessed. This made it possible to draw attention to those items that were most heavily weighted toward "yes" responses regarding negative childhood experiences. It turned out that in items 1, 2, 7, 13, 21, and 22, the average values were high and the frequency of "yes" responses was greater than "no," indicating a high degree of adverse childhood experiences. The items are as follows: 1. "Did any adults often insult, scold, or humiliate you during your childhood?" 2. "During your childhood, did any adults behave in such a way that you feared physical harm?"; 7. "During your childhood, did you often feel that you were not loved or cared for?"; 13. "Did you often feel that there was no one to protect you?"; 21. "During your childhood, did any adults often refuse to talk to you for several hours as a punishment?"; 22. "During your childhood, were you a victim of bullying or violence at school?" Elevated levels of adverse childhood experiences were found in relation to being insulted, quarreled with, or humiliated by an adult, fear of physical harm from an adult, feelings of indifference and lack of love, lack of protection, punishment in the form of silence for at least several hours, and bullying at school.

Subgroups by orthorexic modality type and control groups received the following average scores on the Childhood Adverse Experience Questionnaire, which are presented in Table 1.

Table 1

Average values in subsamples by orthorexic modality and control groups by adverse childhood experiences

Subgroups	n	M	Sd	Se
n_1 – exclusion modality (vegetarianism / veganism / raw food diet / Ayurvedic diet / gluten-free / sugar-free) (n = 50)	50	**10.12**	0.447	3.16
n_2 – modality of emphasis (keto diet / paleo diet / protein diet) (n = 52)	52	**9.29**	0.282	2.03
n_3 – balancing modality (proper nutrition: proteins-fats-carbohydrates) or specialized sports diet "weight gain" or "fat loss") (n = 40)	40	**6.53**	0.684	4.33
n_4 – modality of periodization (intermittent fasting / other fasting system) (n = 48)	48	**7.83**	0.262	1.81
n_5 – practice fasting (of any religious tradition: Christian, Vedic, Islamic, or other) (n = 37)	37	**8.03**	0.250	1.52
n_6 – follow a therapeutic diet (due to illness, allergies, or other reasons) (n = 46)	46	**4.78**	0.479	3.25
n_7 – take medications for weight loss (n = 40)	40	**6.33**	0.342	2.16
n_8 – eat without restrictions (n – 60)	60	**4.6**	0.498	3.86
n_9 – eat intuitively (n = 74)	74	**5.61**	0.468	4.03
n_{10} – none of the options are suitable (n = 22)	22	**5.86**	0.869	4.07

Table 1 shows that the highest average values, namely those that exceed the normative range in terms of the overall level of adverse childhood experiences and indicate an abnormally high level of adverse childhood experiences, were obtained by representatives of the orthorexic modality of exclusion (M = 10.12). The orthorexic modality of emphasis was also marked by an increased average score on the ACE (M = 9.29).

According to the average values of the responses of respondents from all 10 subsamples for orthorexic modality and control groups, for the questionnaire items highlighted above (Nos. 1, 2, 7, 13, 21, 22), it can be seen that the highest scores were obtained by the first four groups corresponding to orthorexic modalities (exclusion, emphasis, balancing, and periodization), The rest of the control groups, which included respondents who indicated that they do not follow any diets, use weight loss drugs, or fast for religious reasons, have lower average scores on the questions we selected from the ACE questionnaire.

Deepening the analysis of the data obtained, a visualization of the distribution of responses of all groups of orthorexic modalities and control groups (10 groups) was created in relation to their indicators for orthorexia nervosa and the composite ACE score. The visualization in Figure 1 shows the direction of the regression lines in each of the groups, which makes it possible to first assess the strength and direction of the regression dependencies between the studied phenomena and then conduct a more in-depth analysis.

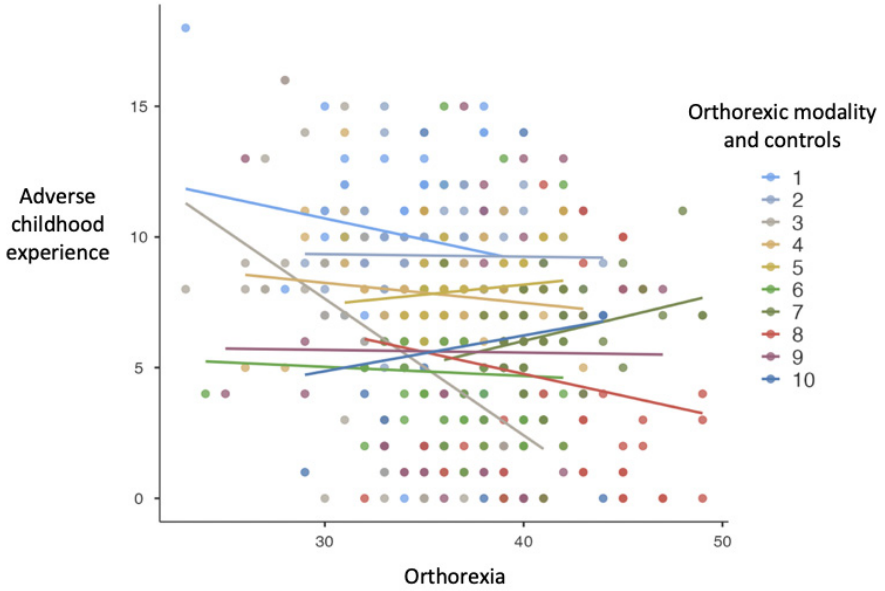


Fig. 1. Scatter plot with regression lines for all groups of orthorexic modalities, control groups, relative to ACE and ON

Next, to investigate deep regression effects, a comparison was made between groups of orthorexic modalities and control groups using confirmatory factor analysis, namely structural equation modeling (SEM) with mediation effects of interaction. Causal networks were also confirmed with an assessment of their conformity and quality indicators, and path diagrams were created showing the influence of adverse childhood experiences as a factor in the etiology of nervous orthorexia.

As additional independent variables, which also served as intermediate mediating effects of interaction, the results of respondents using the Dutch Eating Behavior Questionnaire (DEBQ) (S. Braet, T. Van Strim) and dysfunctional schema-modes according to J. Young's Schema-Mode Inventory (SMI) as adapted in ukrainian language by Bolshakova (2019). The indicators measured by these methods (DEBQ – restrictive eating behavior, emotional and external, and SMI – 18 schema-modes) allowed us to create additional space for searching for interaction effects.

Causal networks were constructed separately for each group. A number of exogenous variables were formed: the integral ACE scale, separate, previously justified questionnaire items, and restrictive eating behavior (according to DEBQ). Individual ACE items included: No. 1 (insults, quarrels, humiliation), No. 2 (fear of physical harm), No. 7 (feelings of dislike and indifference towards oneself), No. 13 (lack of a protector), No. 21 (silence as punishment), No. 22 (bullying and violence at school).

The quality assessment of the models in the form of incremental and absolute fit indices is given for each model separately. The "P" value for χ2 reflects the fit of the model to the data: if it is greater than .05, the model does not differ from the obtained data and, therefore, has a good fit, and vice versa.

The causal network with interaction effects for exclusion modality (vegetarianism, veganism, etc.) is shown in Figure 2. Quality indicators for the model: RMSEA = .08; SRMR = .04; CFI = .88; TLI = .7; χ2 (p) = .23. When interpreting the path diagram of the obtained model, it is worth first paying attention to the interaction in the triangle: ACE affects restrictive eating behavior (R2 = .43), and then restrictive eating behavior affects orthorexia nervosa (R2 = -.27), negative R2 indicates that the values on the orthorexia nervosa scale decrease, indicating its exacerbation, with an increase in restrictive eating behavior. When constructing a mediation equation for this triangle, the mediated effect of restrictive eating behavior is estimated at 48 % for all interactions ($p < .05$). In addition, increases in ACE scores also directly influence the exacerbation of orthorexia nervosa in the exclusion modality subsample. Also in this model, another negative regression is the influence of fear of physical harm on the increase in orthorexia nervosa (R2 = -.14).

Thus, from the causal network of adverse childhood experiences for orthorexic exclusion modality, it is clear that fear of physical harm is one of the strongest factors influencing the increase in orthorexic tendencies in this group. A strong mediating effect (48 %) is present between the influence of adverse childhood experiences on orthorexia nervosa in the form of restrictive eating behavior, indicating that in representatives of orthorexic modality of exclusion, adverse childhood experiences initially increase the tendency toward restrictive eating behavior, which then contributes to the exacerbation of orthorexia.

The causal network for the emphasis modality is shown in Figure 3. Model fit indices: RMSEA = .01; SRMR = .01; CFI = .99; TLI = .99; χ2 (p) = .81. In this case, the mediating effect goes from the predictor in the form of fear due to the absence of a protector, initially affecting attitudes toward food and, through it, orthorexia nervosa. The second path of interaction begins with the predictor in the form of bullying and violence at school, passing through emotion-driven eating behavior, and affecting nervous orthorexia. However, it should be noted that only in the group representing the orthorexic modality of emphasis do the ON values not decrease but increase, indicating its weakening.

The path diagram of structural equations in the form of a causal network for the balancing modality is presented in Figure 4. Model quality indices: RMSEA = .01; SRMR = .07; CFI = .8; TLI = .46; χ2 (p) = .07. The model shows that the mediating effect of interaction begins with a predictor in the form of an integral score for ACE, which first affects restrictive eating behavior, which then affects the strengthening of orthorexic tendencies in the balancing modality group. Fear of physical harm is one of the most powerful predictors of increased orthorexic tendencies in this group.

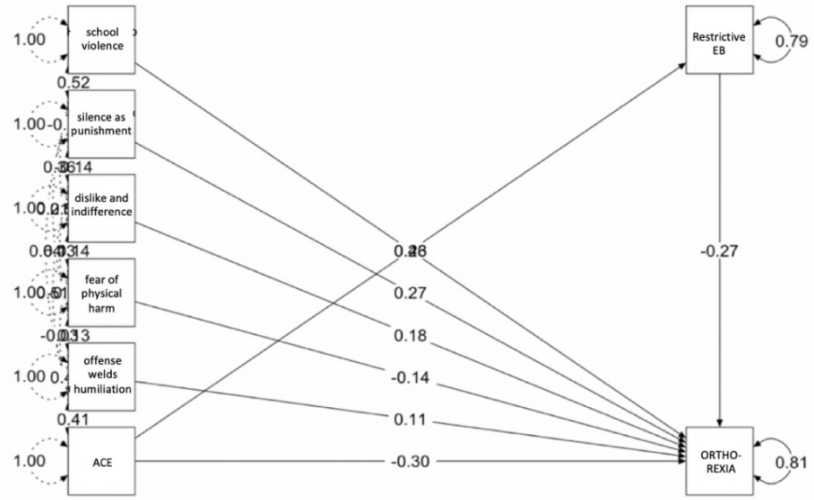


Fig. 2. Path diagram of the causal network of structural equations for adverse childhood experiences in the orthorexic modality group of exclusion

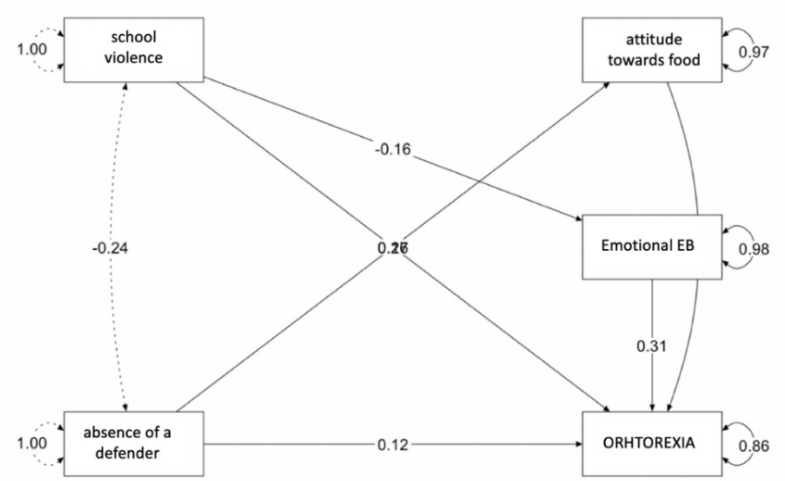


Fig. 3. Path diagram of the causal network of structural equations for adverse childhood experiences in the orthorexic modality of emphasis group

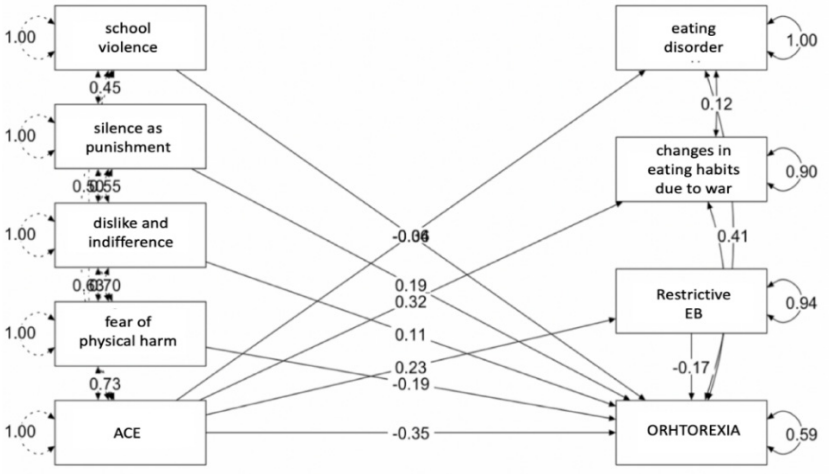


Fig. 4. Path diagram of the causal network of structural equations for negative childhood experiences in the orthorexic modality of balancing group

The causal network for orthorexic modality of periodization is presented in the form of a path diagram of structural equations in Figure 5. Model quality indices: RMSEA = .01; SRMR = .07; CFI = .98; TLI = .96; $\chi 2$ (p) = .42. It shows that there are two options for paths with mediating effects on the dependent variable in the form of orthorexia nervosa and three more direct regressions. The first interaction begins with a predictor in the form of negative childhood experiences, which influence external eating behavior (R2 = .37), which then influences the

intensification of orthorexic tendencies in the periodization modality group. The second interaction pathway runs through adverse childhood experiences, which influence attitudes toward food (as fuel, a means of maintaining beauty and health, a tool for purification, etc.), which then influence orthorexia. In addition, there are several direct influences: general adverse childhood experiences, insults and humiliation in childhood, and violence at school are three factors that influence the intensification of orthorexic tendencies.

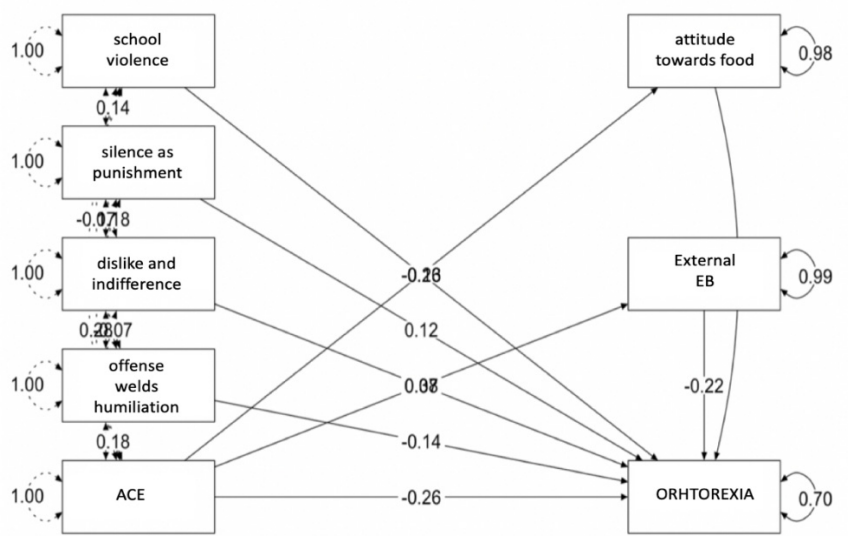


Fig. 5. Path diagram of the causal network of structural equations for adverse childhood experiences in the orthorexic modality of periodization group

The remaining groups, which were identified as controls for orthorexic modalities, were considered further. These included respondents who indicated that they practice fasting (of any religious tradition: Christian, Vedic, Islamic, or other), follow a therapeutic diet due to illness (allergies or other), prefer to take weight loss drugs, eat whatever they want without thinking about it, intuitively feel what to eat, and do not fit any of the proposed options. Their scores for orthorexia nervosa indicate the absence of this diagnosis, since M = 41.

Causal networks of path diagrams of structural equations of adverse childhood experiences were also constructed for the control groups. For example, the control group of respondents who indicated that they never follow any diets and do not think about what to eat is of particular interest. Their average score for adverse childhood experiences is one of the lowest, M = 4.6, indicating the absence of burdensome adverse childhood experiences and trauma. In terms of eating behavior, it was found that this group is dominated by the emotional type of eating behavior (M = 2.72), followed by the external type (M = 2.97). In terms of restrictive eating behavior, they scored (M = 2.01) below the average test norm determined by the questionnaire developers.

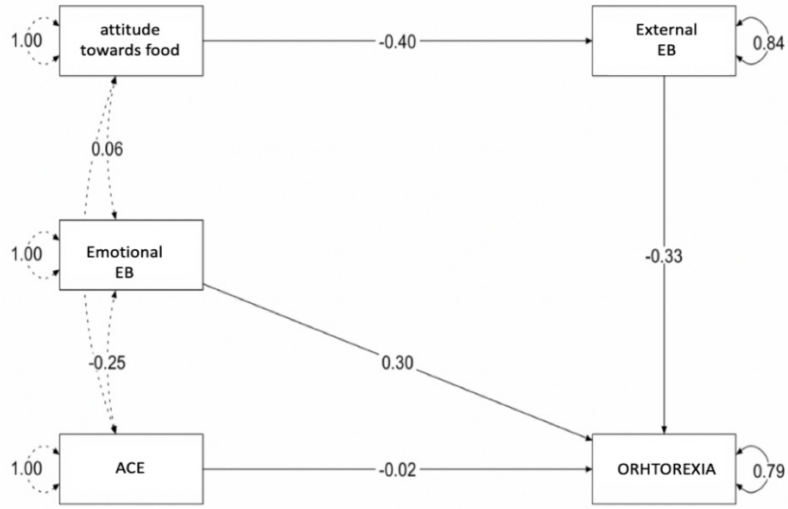


Fig. 6. Path diagram of the causal network of structural equations for adverse childhood experiences in the group without dietary restrictions

The causal network for the control group with respondents who do not follow diets and eat without thinking is shown in Figure 6. Model quality indices: RMSEA = .01; SRMR = .09; CFI = .84; TLI = .64; $\chi 2$ (p) = .06. First of all, the model shows that adverse childhood experiences do not affect the values of orthorexia, however, with regard to the factor of attitude towards food, it should be noted that it has a mediating effect on external

eating behavior in this group, which then affects the decrease in values for orthorexia nervosa (its presence). However, it is precisely the emotion-driven eating behavior in this group that influences the increase in scores for orthorexia, which means its weakening.

Path diagrams were also constructed for the rest of the control groups to assess the impact of adverse childhood experiences on orthorexia. The results of the analysis showed that in the group of respondents who prefer to take weight loss drugs, the main relationship between the impact of adverse childhood experiences on orthorexia nervosa is absent. In this case, their childhood experiences do not reinforce orthorexic tendencies. According to the average indicator of orthorexia, they do not have it, however, the presence of an influence can be noted.

A group of respondents who practice fasting (of any religious tradition: Christian, Vedic, Islamic, or other) was further studied. Their model also lacks the influence of adverse childhood experiences on the intensification of orthorexic eating behavior that we were looking for. In their case, only extreme eating behavior influences the intensification of orthorexic tendencies.

Respondents who follow a therapeutic diet due to illness (allergies or other) also do not have the influence of adverse childhood experiences on the intensification of orthorexic tendencies. It shows that only their emotional eating behavior influences the intensification of orthorexic tendencies, which are still within the normal range and do not require diagnosis.

The control group of respondents who determined that they intuitively feel what to eat did not show the effects we were looking for, neither adverse childhood experiences on orthorexia, nor the influence of food behavior type (emotional or external).

Based on the assumption that adverse childhood experiences influence the formation of schema-modes, they were added to the causal networks as a second intermediate variable–the mediating component of the interaction effect. For example, Figure 7 shows the causal network for the group of representatives of orthorexic exclusion modality. Model quality indices: RMSEA < .08; SRMR < .08; CFI > .95; TLI > .95; $\chi 2 > .05$.

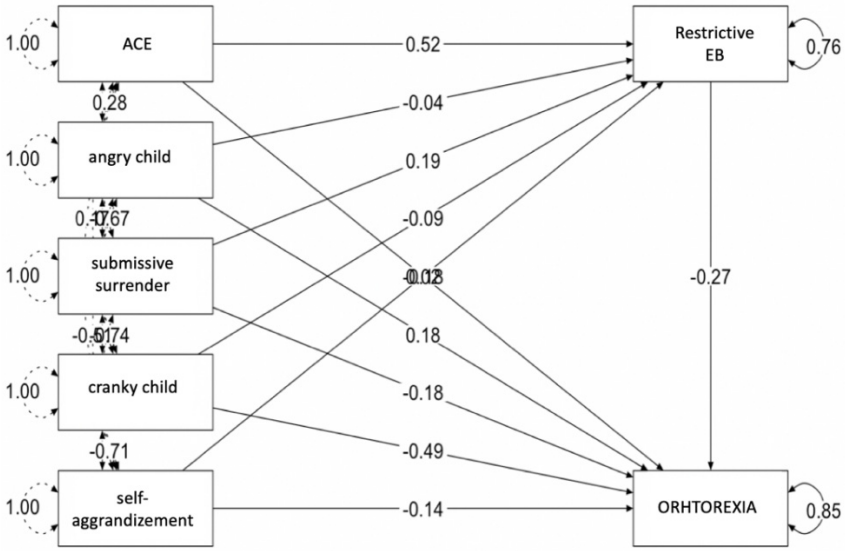


Fig. 7. Path diagram of the causal network of structural equations for adverse childhood experiences and mode patterns in the orthorexic modality of exclusion group

It reflects the regression effects of exogenous variables in the form of dysfunctional schema-modes (self-aggrandizement, angry child, angry child, and submissive surrender) and adverse childhood experiences as a direction towards orthorexia nervosa and through a mediating component in the form of restrictive eating behavior. The diagram shows that the direct effects of schema-modes in the group of representatives of the orthorexic modality of exclusion mainly reinforce orthorexic tendencies in the group, while the second path shows that schema-modes, initially influencing an increase in restrictive eating behavior, through it influence an increase in orthorexic tendencies in the group. It should be noted that in this same model, ACE does not directly affect nervous orthorexia, but it does have a strong (R2 = .52) indirect effect on ON through restrictive eating behavior.

The group of representatives of orthorexic modality of emphasis received the following causal network, presented in Figure 8. Model quality and fit indices: RMSEA < .08; SRMR < .08; CFI > .95; TLI > .95; $\chi 2 > .05$. The following exogenous predictors were included in the model: ACE and schema modes—undisciplined child, demanding parent, and attacking protector. The model shows that for representatives of orthorexic modality of emphasis, characterized by an increase in orthorexia nervosa through ACE, the influence of the demanding parent schema-mode is small (R2 = -.08) and the undisciplined child (R2 = -.11).

The orthorexic modality of balancing is characterized by the following patterns: an angry, impulsive, and undisciplined child, a punitive and demanding parent, and submissive capitulation. In the causal network, they acted as exogenous predictors, along with ACE and eating behavior. The model is presented in Figure 9. Model quality and fit indices: RMSEA < .08; SRMR < .08; CFI > .95; TLI > .95; $\chi 2 > .05$. It shows that: adverse childhood experiences predict an impulsive child schema-mode (R2 = .27), which in turn influences the intensification of orthorexia (R2 = -.25), ACE predicts an angry child schema-mode (R2 = .36), which intensifies orthorexia (R2 = -.16), ACE predicts an undisciplined child schema-mode (R2 = .3), which intensifies orthorexia (R2 = -.17). Only the demanding parent pattern is not associated with ACE, but independently influences the

intensification of orthorexia in the study group of representatives of the orthorexic balancing modality (R2 = -.16). The direct influence of ACE on orthorexia nervosa also remains (R2 = -.36).

The orthorexic modality of periodization with its inherent patterns: a vulnerable and impulsive child, a punitive father, and submissive surrender was further investigated, and its causal network is presented in Figure 10. Model quality and fit indices: RMSEA < .08; SRMR < .08; CFI > .95; TLI > .95; χ2 > .05. The model shows that for representatives of orthorexic modality, the schema-mode of submissive surrender (R2 = -.27), which is initially influenced by ACE (R2 = .43), works most strongly to reinforce orthorexic tendencies.

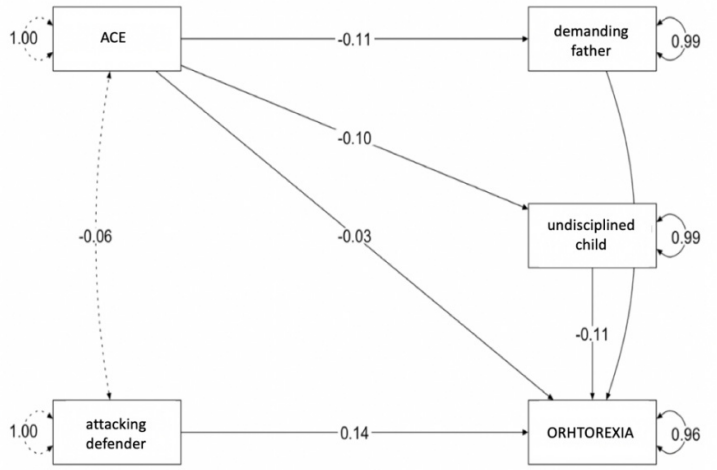


Fig. 8. Path diagram of the causal network of structural equations for adverse childhood experiences and mode patterns in the orthorexic modality of emphasis group

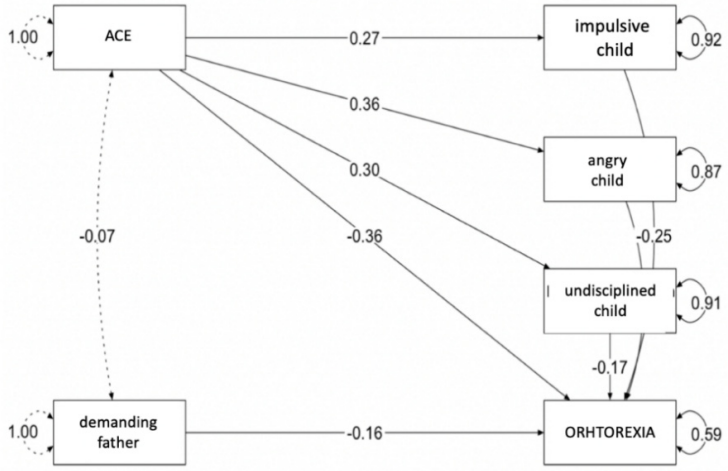


Fig. 9. Path diagram of the causal network of structural equations for adverse childhood experiences and mode patterns in the orthorexic modality of balancing group

The remaining groups, which served as control groups for this study, were studied further. For example, in the group of representatives without dietary restrictions (Fig. 11), it was found that all regimes fall within the range of moderate manifestation of the trait and are not exceeded–detached self-reassurance, happy child, and healthy adult. Quality and model fit indices: RMSEA < .08; SRMR < .08; CFI > .95; TLI > .95; χ2 > .05. The model shows that their level of ACE affects the decrease in values for the above-mentioned pattern-modes, but the pattern-modes, as a mediating variable, do not increase orthorexia nervosa in representatives of the group without dietary restrictions.

Other groups also do not have exceeded test norms for scheme-modes, all lie within the range of average manifestation of the trait. For example, when studying a group of practitioners of fasting (their characteristic schema modes: defender, attacker, and self-aggrandizer), it was found that an increase in ACE in them affects the exacerbation of the corresponding schema-modes, however, it increases orthorexic tendencies only in the self-aggrandizing schema mode (R2 = -.26), and not in the defender who attacks. Model quality and fit indices: RMSEA < .08; SRMR < .08; CFI > .95; TLI > .95; χ2 > .05.

Representatives of the group that follows a therapeutic diet due to illness have their own schema-modes: healthy adult and defender who distances himself. The causal network for members of the group who follow a therapeutic diet showed that if ACE increases, their healthy adult and distancing defender schema-modes will decrease. Schema-modes, as a mediating component of the structural model, further influence the increase in orthorexia scores in this group only in the case of the schema-mode of the distancing protector (R2 = -.39), but not the healthy adult (R2 = .41). In the same model, ACE does not directly influence the strengthening of orthorexic tendencies.

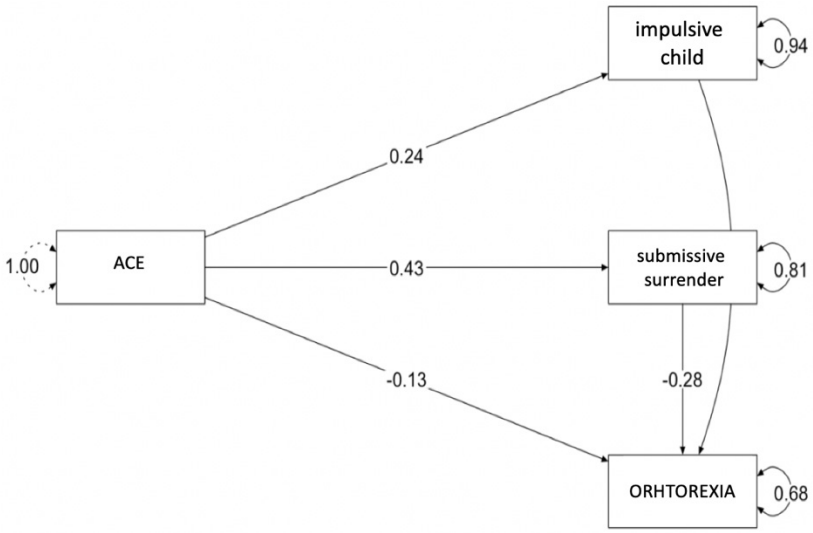


Fig. 10. Path diagram of the causal network of structural equations for adverse childhood experiences and mode patterns in the orthorexic modality of periodization group

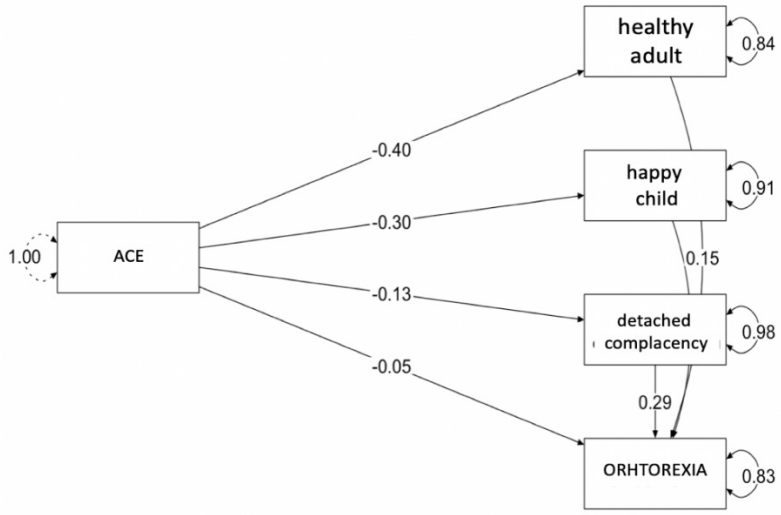


Fig. 11. Path diagram of the causal network of structural equations for adverse childhood experiences and mode patterns in the group without dietary restrictions

Representatives of the group who indicated that they use weight loss drugs have the following patterns: happy child and detached self-reassurance. Quality and model fit indices: RMSEA < .08; SRMR < .08; CFI > .95; TLI > .95; χ2 > .05. The causal network model for representatives of the group who use weight loss drugs shows that their patterns of detached self-reassurance (R2 = -.12) and happy child (R2 = -.17) contribute to the strengthening of orthorexic tendencies, while ACE, when increased, reinforces orthorexia (R2 = .36).

The subjects from the group who claimed to intuitively feel what to eat have the following schema-modes: submissive surrender, punishing parent, angry child. Model fit indices: RMSEA < .08; SRMR < .08; CFI > .95; TLI > .95; χ2 > .05. The causal network for representatives of the group of those who eat intuitively shows that the schema-modes of submissive surrender (R2 = -.28) and punishing father (R2 = -.18) reinforce orthorexic tendencies in them, while ACE does not affect NO. However, when ACE intensifies, the schema-modes also intensify.

The group of respondents who answered that none of the nine proposed dietary options suited them have characteristic patterns in the form of: punitive father, angry child, and self-aggrandizement. The causal network presented has the following quality and model fit indices: RMSEA < .08; SRMR < .08; CFI > .95; TLI > .95; χ2 > .05. The causal network shows that for members of the group who do not fit any of the proposed options regarding their type of nutrition, only the punitive father pattern influences the intensification of orthorexic behavior (R2 = -.11).

Summarizing the results of our study, it was established that the most significant manifestations of adverse childhood experiences (ACE) affecting the development of orthorexia nervosa (ON) are related to humiliation, insults, arguments with adults, feelings of lack of love and protection, fear of physical harm, punishment in the form of neglect, and school bullying. These factors create long-term consequences in the form of increased vulnerability to the formation of orthorexic tendencies. With regard to the modality of "exclusion," the highest levels of adverse childhood experiences were found. The main predictor in this group is fear of physical harm. Eating disorder acts indirectly here–it first intensifies restrictive eating behavior, which in turn contributes to the

exacerbation of ED. This indicates a pronounced tendency to develop pathological control over eating. In representatives of the emphasis modality, who also have elevated ACE indicators, two main pathways of influence were identified: fear and lack of a protector → altered attitude towards food → orthorexia; school bullying → emotion-driven eating behavior → orthorexia. In this group, unlike others, ON indicators do not decrease but remain consistently high, indicating a chronic persistence of the problem. Regarding the balancing modality, ACE affects orthorexia through a mediating effect: negative childhood experienses → restrictive eating behavior → increased ON. The decisive predictor is the fear of physical harm. The impulsive child and angry child schema-modes, which reinforce orthorexic tendencies, were also found to be significant. In the periodization modality, a complex system of interactions was observed for this group: ACE → external eating behavior → increased orthorexia; ACE → attitude towards food as a means of purification/health → orthorexia; direct influence of individual factors (insults, humiliation, bullying). The submissive surrender schema-mode has the strongest effect on the intensification of orthorexia. In the control groups: in those who practice fasting, follow a therapeutic diet, or take weight loss drugs, ACE has no direct effect on orthorexia. Orthorexic tendencies in these groups are largely due to specific eating behaviors (emotional or external), but remain within normal limits. Individuals who do not diet and eat intuitively showed the lowest levels of ACE, corresponding to the absence of pronounced orthorexic manifestations. Weight loss drugs and therapeutic diets are associated with emotional eating behavior, which may partially reinforce orthorexic tendencies. It has also been established that the role of eating patterns is a key mediator between ACE and ON. For example, vulnerable schema-modes (demanding parent, punitive parent, submissive surrender, undisciplined child) increase the tendency toward orthorexia. In control groups, more adaptive schema-modes (happy child, healthy adult) are observed, which reduce risks. Thus, the intensity and type of schema-modes determine the depth and nature of orthorexic tendencies.

When discussing the results of this study, it should be supplemented with a comparison with other global research on the impact of adverse childhood experiences on orthorexia nervosa. A systematic review (21 studies, 1990–2022) showed that adverse childhood experiences (emotional, physical, sexual abuse, and neglect) directly or indirectly predict the development of eating disorders but do not affect orthorexia nervosa. The authors emphasize the need for greater attention to NO, but it still requires clear diagnostic criteria and reliable psychometric tools (Örge, & Volkan, 2023).

However, in another study in 2024, ON was considered from the perspective of healthy orthorexia (HO) and orthorexia nervosa (NO), where cluster analysis revealed two types of profiles in the study sample. In this case, adverse childhood experiences (ACE) predicted tendencies toward orthorexia nervosa (NO), as opposed to healthy orthorexia (HO). In addition, the mediating role of alexithymia, avoidance, and fixation on appearance between ACE and ON was identified (Rzeszutek et al., 2024).

Another 2022 study by Arab scientists examined the role of maladaptive cognitive schemas in the development of eating disorders (bulimia). An indirect pathway was analyzed: schemas → difficulties in regulating emotions → dysfunctional eating patterns. The strongest predictor was the distrust schema (disengagement/rejection domain). Other schemas also influenced eating disorders through problems with emotional regulation. That is, emotional regulation disorders are a key mechanism linking maladaptive schemas to disordered eating behavior. Cognitively and emotionally vulnerable people tend to use eating disorders as a way to compensate for internal weakness (Gerges et al., 2022).

Discussion and conclusions

Thus, this article presented the results of a study on the impact of adverse childhood experiences on orthorexia nervosa. Causal models were constructed on different samples (with and without a diagnosis of orthorexia nervosa), which allowed us to identify the mechanisms of orthorexic eating behavior using schema-modes and types of eating behavior (restrictive, emotion-driven, and external). Summarizing the general conclusions, it can be noted that adverse childhood experiences are a significant predictor of the development of orthorexia nervosa, with a particular impact on the modalities of exclusion and emphasis. The main pathways of adverse childhood experiences are through restrictive, emotional, and external eating behaviors. Schema-modes act as strong mediators that either enhance or reduce orthorexic tendencies depending on their type. Control groups have shown that in the absence of traumatic childhood experiences, orthorexic manifestations remain within normal limits, even in the presence of dietary restrictions.

Prospects for further research in this area require a deeper analysis of the impact of various types of adverse childhood experiences on the development of orthorexia nervosa by studying the role of various mediators, such as eating behavior, cognitive patterns, difficulties with emotional regulation, and many others.

Sources of funding. This study did not receive any grant from a funding institution in the public, commercial, or non-commercial sectors.

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Отримано редакцією журналу / Received: 22.09.25
Прорецензовано / Revised: 02.11.25
Схвалено до друку / Accepted: 17.11.25

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КАУЗАЛЬНІ МЕРЕЖІ НЕГАТИВНОГО ДОСВІДУ ДИТИНСТВА ТА НЕРВОВОЇ ОРТОРЕКСІЇ

В с т у п . ***Проблема нервової орторексії на сьогодні набуває все більшої популярності не тільки у західному суспільстві, але і в інших країнах світу: Індії, Туреччині, Китаї та багатьох інших. Психологічний феномен та конструкт нервової орторексії досі шукає своє місце серед інших розладів харчової поведінки і не тільки. Досі формуються діагностичні критерії нервової орторексії та робляться спроби створення психометричного інструментарію для неї. Метою цієї статті є дослідження психогенної складової нервової орторексії із позиції негативного досвіду дитинства (фізичного та емоційного насилля) через медіаційну призму впливу типів харчової поведінки (обмежувальний, емоціогенний або екстернальний) та дифсункціональних схема-режимів.***

М е т о д и . ***Було використано метод каузального моделювання з побудовою шляхових діаграм регресійних впливів. Вибірка становила 467 респондентів.***

Р е з у л ь т а т и . ***Продемонстровано механізми реалізації орторексичної харчової поведінки для груп представників орторексичних модальностей (із діагнозом нервової орторексії) та груп контролю (серед яких були представники тих, хто практикує піст будь-якої релігійної традиції, дотримується лікувальної дієти через хворобу, використовує препарати для схуднення або взагалі не дотримується жодних обмежень у харчуванні.***

В и с н о в к и . ***Констатовано, що розвиток нервової орторексії значною мірою визначається негативним досвідом дитинства, який особливо впливає на орторексичні модальності виключення та акцентування. Обмежувальна, емоціогенна та екстернальна харчова поведінка пов'язана з негативним досвідом дитинства. Схема-режими є потужними посередниками, які можуть або посилити, або послабити орторексичні тенденції. Втім, контрольні групи продемонстрували, що орторексичні прояви залишаються в межах норми, якщо немає травматичного досвіду дитинства.***

К л ю ч о в і с л о в а : ***нервова орторексія, каузальне моделювання, негативний досвід дитинства, харчова поведінка, розлад харчової поведінки, схема-режими.***

Автор заявляє про відсутність конфлікту інтересів. Спонсори не брали участі в розробленні дослідження; у зборі, аналізі чи інтерпретації даних; у написанні рукопису; в рішенні про публікацію результатів.

The author declares no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses or interpretation of data; in the writing of the manuscript; in the decision to publish the results.