



ORIGINAL ARTICLES. SPORT

Specificity of decision-making in junior athletes with signs of mixed anxiety-depressive disorder

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Abstract

Background and purpose

The aim is to study psychological content features of decision-making in junior athletes with signs of mixed anxiety-depressive disorder (MADD).

Material and methods

The research participants were students of sports schools for children and youth located in Ukraine's regional centres. The survey involved junior athletes aged 15 to 19 who attended schools and regularly trained, with a total of n = 112 individuals representing teams U-15, U-17, and U-19. They had participated in and won sports competitions of different levels. The research employed valid and reliable psychodiagnostic tools tested across numerous sports samples.

Results

MADD signs were diagnosed in n = 21 (18.75%) respondents in the total sample. Two petal diagrams visualising the decision-making profiles of juniors with and without MADD signs were created. The combined matrix of correlations between decision-making parameters and mixed anxiety-depressive disorder demonstrated completely different trajectories of significant correlations and loadings of the key studied parameters. The productive coping strategy "vigilance" (three correlations) and the unproductive coping strategy "avoidance" (two correlations) were found to be the most dependent decision-making parameters, which are excessively sensitive to the signs of anxiety and depressiveness. The inverse correlations with the productive coping strategy "vigilance" demonstrated the critical importance of vigilance for junior athletes. No significant difference was found in the studied groups for the grouping variable "gender differentiation". For the grouping variable "mixed anxiety-depressive disorder", superiority of athletes with MADD signs was found in the non-productive coping strategy "avoidance".

Conclusions

It was substantiated that mixed anxiety-depressive disorder signs can alternate, become more pronounced, and cause considerable discomfort, which is occasionally accompanied by body aches and gastrointestinal problems, which reduces the quality of life and is transformed into the coping strategy of decision avoidance. The study proposes measures for operationalising negative manifestations of anxiety caused by the dominant "avoidance" strategy by means of the diagnostic and corrective program for overcoming anxiety. It was recommended that the established scientific facts and significant differences should be integrated into professional training for teachers-coaches at sports schools for children and youth.

Key words: anxiety, depressiveness, stress, mental state, mental health, vigilance, avoidance



Анотація

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Обґрунтування і мета

Метою є дослідження психологічних змістових особливостей ухвалення рішень юними атлетами з ознаками тривожно-депресивного розладу (ТДР).

Матеріал і методи

Учасниками дослідження є вихованці дитячо-юнацьких спортивних шкіл, які розташовані в обласних центрах України. У опитуванні добровільно взяли участь юні спортсмени віком від 15 до 19 років, які навчалися і системно тренувалися, загальною кількістю $n = 112$ атлетів, що представляли команди U-15, U-17, U-19, були учасниками і переможцями різного рівня спортивних форумів. Застосовано валідний і надійний психодіагностичний інструментарій, який пройшов апробацію на численних спортивних вибірках.

Результати

Ідентифіковано ознаки ТДР у $n = 21$ (18.75%) досліджуваного загальної вибіркової сукупності. Побудовано дві пелюсткові діаграми профілів ухвалення рішень юніорів з ознаками і без ознак ТДР. Подано об'єднану кореляційну матрицю зв'язків параметрів ухвалення рішення з тривожністю та депресивністю, які продемонстрували абсолютно відмінну траєкторію достовірних зв'язків й навантажень ключових досліджуваних параметрів. Найбільш залежними параметрами ухвалення рішень є продуктивний копінг "пильність" (три зв'язки) і непродуктивний копінг "уникання" (два зв'язки), який є надмірно чутливими до проявів тривожності і депресивності. Обернені зв'язки з продуктивним копінгом "пильність" продемонстрували надмірну важливість сформованої властивості "пильність" у юних атлетів. За групуючою змінною "Статеве диференціювання" достовірних відмінностей у досліджуваних групах не зафіксовано. За групуючою змінною "Тривожно-депресивний розлад" встановлено перевагу атлетів з ознаками ТДР за непродуктивним копінгом "уникання".

Висновки

Обґрунтовано, що ознаки тривожно-депресивного розладу можуть чергуватися, набувати вираженості, викликати значний дискомфорт, який почасти супроводжується тілесними больовими відчуттями, проблемами кишково-шлункового тракту, що позначається на зниженні якості життя і трансформується у копінг-стратегію уникання ухвалення рішення. Запропоновано заходи операціоналізації негативних проявів тривоги, зумовлених домінуючою стратегією "уникання", засобами програми діагностично-корекційного подолання тривоги. Рекомендовано з'ясовані наукові факти та достовірні відмінності інтегрувати у професійну підготовку тренерів-викладачів дитячо-юнацьких спортивних шкіл.

Ключові слова: тривожність, депресивність, стрес, психічний стан, психічне здоров'я, пильність, уникання

Аннотация

Игорь Попович, Анастасия Курова, Наталья Шевченко, Елена Чаркина, Алуа Есмаханова, Лариса Гапоненко, Анжелика Колли-Шамне, Максим Каграманян, Игорь Гоян. Особенности принятия решений юными атлетами с признаками тревожно-депрессивного расстройства

Обоснование и цель

Целью является исследование психологических содержательных особенностей принятия решений молодыми атлетами с признаками тревожно-депрессивного расстройства (ТДР).

Материалы и методы

Участниками исследования являются воспитанники детско-юношеских спортивных школ, расположенных в областных центрах Украины. В опросе добровольно приняли участие юные спортсмены в возрасте от 15 до 19 лет, обучавшиеся и системно тренировавшиеся, общим количеством $n = 112$ атлетов, представлявших команды U-15, U-17, U-19, были участниками и победителями разного уровня спортивных форумов. Применен валидный и надежный психодиагностический инструментарий, прошедший апробацию на многочисленных спортивных выборках.

Результаты

Идентифицированы признаки ТДР у $n = 21$ (18.75%) исследуемого общей выборочной совокупности. Построены две лепестковые диаграммы профилей принятия решений юниоров с признаками и без признаков ТДР. Представлена объединенная корреляционная матрица связей параметров принятия решения с тревожностью и депрессивностью, которые продемонстрировали совершенно отличную траекторию достоверных связей и нагрузок ключевых исследуемых параметров. Наиболее зависимыми параметрами принятия решений являются продуктивный копинг "бдительность" (три связи) и непродуктивный копинг "избегания" (две связи), который чрезмерно чувствителен к проявлениям тревожности и депрессивности. Обратные связи с продуктивным копингом "бдительность" продемонстрировали чрезмерную важность сложившегося свойства "бдительности" у юных атлетов. За группирующей переменной "половое дифференцирование" достоверных различий в исследуемых группах не зафиксировано. По группирующей переменной "тревно-депрессивное расстройство" установлено преимущество атлетов с признаками ТДР по непродуктивному копингу "избегание".

Выводы

Обосновано, что признаки тревожно-депрессивного расстройства могут чередоваться, приобретать выраженность, вызвать значительный дискомфорт, который отчасти сопровождается телесными болевыми ощущениями, проблемами желудочно-кишечного тракта, что сказывается на снижении качества жизни и трансформируется в копинг-стратегию избегания принятия решения. Предложены меры операціоналізації негативних проявлених тривоги, обумовлених домінуючою стратегією "избегания", средствами программы диагностическо-коррекционного преодоления тревожности. Рекомендовано установленные научные факты и достоверные отличия интегрировать в профессиональную подготовку тренеров-преподавателей детско-юношеских спортивных школ.

Ключевые слова: тревожность, депрессивность, стресс, психическое состояние, психическое здоровье, бдительность, избегание



Introductions

Anxiety and depressiveness are two mental states that have affected our society under conditions of sociogenic challenges, pandemics, military conflicts, and climate disasters. It is noteworthy that these challenges catalyse the rapid increase in anxiety and depressiveness among people of any age. These two mental states commonly go hand in hand. When experiencing anxiety, the individual focuses on the future and exhibits restlessness or fear. In contrast, when experiencing depression, the individual focuses on the past, which can be due to different real or imaginary losses. The combination of these two states is referred to as mixed anxiety-depressive disorder (MADD). The World Health Organisation data indicate that over 300 million people all over the world suffer from mixed anxiety-depressive disorder [1]. Psychophysiological patterns in adolescents, which are accompanied by psychological changes and developmental contradictions, do not always contribute to stabilising anxiety and depressiveness. On the contrary, pursuing education, developing worldviews, and starting a family can cause anxiety, worries, restlessness, irritation, and concentration problems, which often require comprehensive psychotherapy or medication.

Mixed anxiety-depressive disorder poses a serious danger to junior athletes focused on sports self-realisation. If timely assistance is not provided at the initial stage of this disorder, its consequences may end up in self-harm or suicide [2; 3; 4]. A retrospective analysis of sports studies allowed for focusing on three MADD stages [5; 6]. The first stage is characterised by heightened sensitivity, irritation, and moderate anxiety, which causes sudden fatigue and insomnia with time. Unfortunately, the first stage is not paid due attention in a whirlpool of competitive or training activities. It is generally believed that sports load and moderate physical activity enable athletes to cope with stressful situations, regulating the stress hormone, cortisol. This may conceal the symptoms of increasing anxiety and depression at the initial stage. A lack of due attention to it causes the accelerated onset of the second stage. The second stage of MADD is psychosomatic. Painful sensations, which begin with untypical muscle pain, sexual dysfunction, dizziness, and an increased heart rate, can cause pain in the chest and abdomen. At this stage, the athlete gradually experiences dominant anxiety. At the third stage, the individual is subjected

to the consequences of the preceding two stages. A progressive increase in anxiety instantly leads to low self-esteem, indifference, and apathy. The individual loses the value and meaning of daily actions under the current conditions. The third stage results in the destabilisation of psycho-emotional readiness for sports activities. The study of content features and symptoms allows for identifying the following MADD signs in junior athletes: panic disorder, phobic anxiety disorders, mixed anxiety-depressive disorder, generalised anxiety disorder, posttraumatic stress disorder, complex posttraumatic stress disorder, and depression. We must admit that developing junior athletes' emotional intelligence is an important factor in preventing and fighting MADD. The study by N. Tavrovetska [7] demonstrates that junior sports are associated with riskiness, which partly borders on adventurism. Other studies indicate that extreme conditions require more attention to the safety of young people's professional activity [8; 9], which can cause fatigue and burnout [10].

Junior athletes' anxiety is a burden that has a complex effect on cognitive, emotional, and behavioural spheres. The cross-sectional study by D. Celik and M. Haney [11], conducted on student athletes and focused on internet addiction, found that this phenomenon is a source of depressiveness and anxiety among young people. It was substantiated that psychophysiological [12], pedagogical, and biomedical aspects [13; 14] in training and competitive activities can facilitate preventive strategies, reducing trauma and injuries among athletes. Excessively high levels of anxiety and depressiveness negatively affect the athlete's mental state. Juniors' weak psychological preparation and low level of psychological culture partly internalise anxiety and depression. The research by F. Lebrun et al. [15] draws valid conclusions that preventive consultations, timely psychological assistance, and social support are important methods for coping with clinical depression. Notably, a retrospective analysis of empirical studies has shown the absence of scientific works examining differences in the manifestations of anxiety-depressive disorder, in particular in the dimensions of anxiety and depressiveness in athletes of different sports.

The signs of mixed anxiety-depressive disorder in junior athletes are considered a dominant negative mental state in sports activities, which



combines the symptoms of anxiety manifested as continuous agitation, panic, trembling, an increased heart rate, excessive sweating, and chronic insomnia that affect attentional control. The signs of mixed anxiety-depressive disorder also include depression symptoms, which manifest as continuous sadness, a loss of interest in learning and training activities, a reduced desire to win in competitions, chronic fatigue, sudden changes in appetite, negative thoughts, frustration, and even suicidal ideation. All these signs of anxiety and depression can alternate, become more pronounced, and cause considerable discomfort, which is occasionally accompanied by body aches and gastrointestinal problems that result in a lower quality of life. Research into the specificity of decision-making in junior athletes with the signs

of mixed anxiety-depressive disorder is aimed at establishing important scientific facts and revealing latent resources of junior athletes' psycho-emotional potentials.

Hypothesis. Mixed anxiety-depressive disorder will affect the values of decision-making parameters; no significant difference will be found in decision-making parameters for the grouping variable "gender differentiation"; significant differences will be identified in decision-making parameters for the grouping variable "mixed anxiety-depressive disorder".

Aim. To study psychological content features of decision-making among junior athletes with the signs of mixed anxiety-depressive disorder.

Material and methods

Methodological Basis

The empirical study into the specificity of decision-making among junior athletes with the signs of mixed anxiety-depressive disorder includes systemic and activity-based approaches, the concepts of stress [16] as a natural response to any **unexpected or considerable physical, emotional, and psychological challenges or threats, the tenets of research into** mixed anxiety-depressive disorder [6], and the concepts of the psychological system of decision-making [17; 18].

Participants

The research involved junior athletes aged 15 to 19 ($M = 18.01$; $SD = \pm 3.12$), with a total of $n = 112$ athletes. Gender parity was maintained, i. e. male athletes ($n = 56$; 50.00%) and female athletes ($n = 56$; 50.00%). All participants attended sports schools for children and youth (SSCY), located in the following Ukrainian cities: Kyiv, Lviv, Ivano-Frankivsk, and Odesa. Educational and training processes were organized offline. Respondents stayed in Ukraine, regularly trained and studied. Among the research participants were representatives of team and individual sports: weightlifting, sambo, boxing, track and field, football, handball, volleyball, basketball, rugby, and futsal. We randomly created a sample of young athletes of different sports, since there are no studies stating differences in the manifestations of

anxiety-depressive disorder and in the dimensions of anxiety and depressiveness in athletes of different sports. Participants represented junior teams U-15, U-17, and U-19. The research participants included winners of regional, all-Ukrainian, and world competitions. A considerable portion of athletes had been awarded I, II, III adult sports qualifications, as well as the qualifications of Candidates for Master of Sports (CMS) and Masters of Sports (MS).

Ethics approval

This research was conducted in accordance with the principles of the Declaration of Helsinki. Respondents provided personal written consent to participate in the study, after which they received access to the questionnaires. For participants under 18 years of age, written informed consent was obtained from their parents or legal guardians.

Organization of Research

To collect empirical data, SSCYs were randomly selected from the general population. Empirical data were gathered remotely via Google Forms. After receiving informed consent to participate in the survey, each respondent was sent four questionnaire forms. The empirical study was subjected to a lengthy approval process at the administrations of sports schools where junior athletes trained. Moreover, the research subject was approved by the Departments and Scientific-



Methodological Councils of the Universities associated with the research organisers. The researchers received permission to observe junior athletes' learning and training processes. Statistical reliability was recorded at medium and high levels employing Cronbach's alpha (α), which indicates the quality of empirical data collection. Awareness, confidentiality, and voluntariness allowed for achieving these indicators. When conducting research, the organisers were guided by the principles of the Helsinki Declaration.

Procedures and Instruments

The psychological content parameters of decision-making were examined along two dimensions – manifestations of personal behavioural patterns and the intensity of behavioural traits in the decision-making process. The psychodiagnostic tool "Methods for Identifying Personal Factors in Decision-Making" (PFDM-25), developed by T. Kornilova and tested on a Ukrainian sample by I. Petrovska [19], was employed to study two parameters: rationality (R) and risk readiness (RR). Respondents answered twenty-five statements, using a three-point bipolar scale with the following answer options: "+1" – the statement characterises you, "0" – the statement partly characterises you, and "-1" – the statement does not characterise you. Points on the scales were awarded only for positive answers. The maximum score on the scale "rationality" was 12, and the maximum score on the scale "risk readiness" was 13. Statistical reliability for the "PFDM-25" [19] was found to be at a high level (0.945), as indicated by Cronbach's alpha (α).

The "Melbourne Decision Making Questionnaire" (MDMQ) [20] was employed to assess four traits, which were viewed as productive and non-productive coping strategies in the decision-making process. Vigilance (V) was considered a productive coping strategy. Non-productive coping strategies included avoidance (AD), procrastination (PR) and hypervigilance (HV). The version of the questionnaire adapted for a Ukrainian sample contained twenty-two statements [19]. Respondents answered statements using a three-point direct Likert scale, where "1" – not true for me; "2" – sometimes true for me, and "3" – true for me. The measuring range on the scale for the parameters was as follows: vigilance – from 6 to 18 points; avoidance – from 6 to 18 points; procrastination – from 5 to 15 points;

and hypervigilance – from 5 to 15 points. Statistical reliability for the MDMQ [20] was found to be at a high level (.886), as indicated by Cronbach's alpha (α). The signs of mixed anxiety-depressive disorder were identified using two one-scale methodologies, which allowed for measuring the intensity of anxiety – the "Personality Scale of Manifest Anxiety" (PSMA) by J. Taylor [21], and the intensity of depressiveness – the "Self-rating depression scale" (STDS) developed by W. Zung [22]. The adapted versions of the methodologies tested on a Ukrainian sample [23] were employed. The scale "anxiety" (A) of the methodology "PSMA" [21] was used to identify emotional responses, internal tension, agitation, and fear focused on the future, which are commonly associated with those things and events that have not happened yet and, as experience shows, may not happen in reality, being only images in respondents' imagination.

The methodology consisted of a hundred statements and required a positive or negative answer. Statistical reliability for the "PSMA" [21] was found to be at a high level (0.956), as indicated by Cronbach's alpha (α). The scale "depressiveness" (D) of the methodology "STDS" [22] was employed to measure the intensity of the psycho-complex manifesting in low mood and concentration, mental slowness, and psychological and motor retardation. The methodology consisted of twenty statements and a unipolar four-point Likert scale. Above-average values of anxiety and depressiveness were considered to be signs of mixed anxiety-depressive disorder. Statistical reliability for the "STDS" [22] was found to be at a medium level (0.844), as indicated by Cronbach's alpha (α).

Statistical analysis

The main statistical operations were performed utilising "IBM SPSS Statistics", version 29.0.0.0 (241). The computer programs "Jamovi" version 2.7.2 and "MS Excel" were employed additionally. Standard statistical tests and coefficients were used to identify descriptive frequency characteristics, test the data for normality, establish correlations, and find significant differences. Significant values at $p \leq 0.050$, $p \leq 0.010$, and $p < 0.001$ were analysed in the research.

Results

The methodology “PSMA” [21] was employed to measure the intensity of respondents’ anxiety. The methodology “STDS” [22] was applied to measure the intensity of respondents’ depressiveness. The data were scored on a scale from 0 to 80 points. Table 1 presents the empirical distribution of points regarding the intensity of the studied phenomena.

The proposed differentiation into intensity levels allowed for dividing respondents into two groups. Group 1 comprised respondents with the signs of mixed anxiety-depressive disorder ($n = 21$; 18.75%). Group 2 consisted of respondents without signs of mixed anxiety-depressive disorder ($n = 91$; 81.25%). Notably, respondents were diagnosed with MADD provided that they had one of the two anxiety levels (severe or panicky) and one of the three depressiveness levels (mild / moderate / severe). Given a high level of one of the studied parameters and a low or normal level of another parameter, MADD was not diagnosed. However, we must admit that these states are quite sensitive. The distribution of respondents with MADD signs ($n = 21$; 18.75%) is an evident cause for concern, as this percentage is high for athletes. Attention should be paid to the content, which seems optimistic, since a considerable portion of MADD cases were recorded on the borderline between severe anxiety and mild depressiveness. Table 2 presents the parameters of descriptive frequency characteristics and the results of testing the data for normality in the group of respondents with MADD signs (Group 1).

Moderate parameters of rationality and risk readiness were recorded employing the methodology “PFDM-25” [19]. Applying the methodology “MDMQ” [20], the highest values were observed in avoidance ($M = 14.29$; $SD = \pm 2.95$), which is viewed as a non-productive coping strategy. Since the values greater than one were recorded in the parameters of asymmetry and excess, and the parameters of the Kolmogorov-Smirnov Test (λ) and the Shapiro-Wilk Test (W) also exceeded significant values, no normal distribution was identified across the data in Group 1. Table 3 presents the descriptive frequency characteristics and parameters, indicating a normal distribution for the group of respondents without MADD signs (Group 2).

Moderate parameters of rationality and risk readiness, similar to those in the other subsample, were

observed in Group 2, employing the methodology “PFDM-25” [19]. The methodology “MDMQ” [20] revealed the highest values in two traits: vigilance ($M = 12.37$; $SD = \pm 5.11$), which is viewed as a productive coping strategy, and avoidance ($M = 14.29$; $SD = \pm 2.95$), which is considered to be a non-productive coping strategy. Though the size of Group 2 ($n = 91$) is large, the parameters of asymmetry and excess also demonstrated values greater than one, and the parameters of the Kolmogorov-Smirnov Test (λ) and the Shapiro-Wilk Test (W) considerably exceeded significant values; therefore, no normal distribution was identified in Group 2. This provides grounds for the legitimate use of nonparametric statistical tests. Figure 1 presents the petal diagrams of junior athletes’ decision-making profiles.

Visualising the profiles with different MADD parameters possesses cognitive value. Figure 1 (a) illustrates the decision-making profile of athletes with MADD signs. The contour of decision-making (scarlet line) outlines the area indicating a junior athlete’s operational readiness to make decisions. Creating individual profiles is considered effective for selecting playmakers or key players in team sports. Comparing the cross-sections of individual profiles can indicate the dynamics of the studied phenomenon. Figure 1 (b) illustrates the decision-making profile of athletes without MADD signs. The contour of decision-making (blue line) outlines the area indicating a junior athlete’s operational readiness to make decisions. This profile should also be used for each athlete individually. The principles of creating profiles are similar.

As no normal distribution was identified, Spearman’s correlation coefficient (r_s) was used to establish the strongest correlations between the parameters of anxiety and depressiveness and the respondents’ decision-making parameters. Correlations were established between the studied parameters of the subsample with MADD signs (Group 1) and those of the subsample without MADD signs (Group 2). Table 4 presents the results of correlation analysis.

The studied groups were found to have different pictures of correlations. Group 1 had one inverse correlation between “vigilance” and “depressiveness” ($r_s = -0.454$; $p = 0.039$). Group 2 had three direct correlations: between “avoidance” and “anxiety” ($r_s = 0.262$; $p = 0.012$), between “procrastination”

and “anxiety” ($r_s = 0.255$; $p = 0.015$), and between “avoidance” and “depressiveness” ($r_s = 0.255$; $p = 0.015$), and three inverse correlations: between “vigilance” and “anxiety” ($r_s = -0.253$; $p = 0.016$), between “risk readiness” and “depressiveness” ($r_s = -0.271$; $p = 0.009$), and between “vigilance” and “depressiveness” ($r_s = -0.219$; $p = 0.037$). The inverse correlation between “risk readiness” and “depressiveness” ($r_s = -0.271$; $p = 0.009$) was found to be the strongest. “Vigilance”, with three significant correlations, was the most loaded decision-making parameter, followed by “avoidance”, with two correlations. Table 5 presents the results of comparing decision-making parameters, based on the grouping variable “Gender differentiation”, between the subsample of females, Group A ($n = 56$; 50.00%), and the subsample of males, Group B

($n = 56$; 50.00%). The groups were compared using the nonparametric Mann-Whitney U-test for two independent samples and the Wilcoxon W-test and the Kolmogorov-Smirnov λ -test for recording the related parameters.

The results of the comparison show no significant differences between male and female junior athletes in decision-making parameters. Table 6 presents the results of the comparison based on the grouping variable “Mixed anxiety-depressive disorder” between two subsamples, Group 1 ($n = 21$; 18.75%) and Group 2 ($n = 91$; 81.25%). The groups were compared using the nonparametric Mann-Whitney U-test for two independent samples and the Wilcoxon W-test and the Kolmogorov-Smirnov λ -test for recording the related parameters.

Table 1

The distribution of points and the intensity of respondents’ anxiety and depressiveness ($n = 112$)

Scale	Points	Level	Characteristic	Number	
				n	%
Anxiety (A)	0.00 – 20.00	mild	no MADD signs	3	2.68
	21.00 – 48.00	moderate	no MADD signs	57	50.89
	49.00 – 69.00	severe	MADD signs	51	45.54
	70.00 – 80.00	panicky	MADD signs	1	0.89
Depressiveness (D)	20.00 – 49.00	normal	no MADD signs	85	75.89
	50.00 – 59.00	mild	MADD signs	25	22.32
	60.00 – 69.00	moderate	MADD signs	2	1.79
	70.00 – 80.00	severe	MADD signs	0	0.00

Note: n – the number of respondents; % – the percentage of respondents; MADD – mixed anxiety-depressive disorder. Source: Own research.

Table 2

Descriptive frequency characteristics and data on a normal distribution in Group 1 ($n = 21$)

Scale	M	Me	SD	Normal distribution ^a			
				A	E	K-Sb (p) ^b	Sh-W (p)
“PFDM-25” [19]							
R (scores)	5.05	5.00	±1.20	0.662	-1.168	< 0.001	< 0.001
RR (scores)	4.05	5.00	±1.77	-0.079	-1.929	0.006	< 0.001
“MDMQ” [20]							



V (scores)	10.57	<i>13.00</i>	±5.25	-.704	-1.182	0.006	0.002
AD (scores)	14.29	<i>14.00</i>	±2.95	-.451	-0.899	0.200 ^e	0.077
PR (scores)	8.86	<i>9.00</i>	±1.68	-.240	-1.261	0.006	0.031
HV (scores)	5.86	<i>6.00</i>	±0.91	-.135	-0.959	0.018	0.007
"PSMA" [21]							
A (scores)	55.14	<i>53.00</i>	±5.51	1.261	1.902	0.092	0.013
"STDS" [22]							
D (scores)	53.24	<i>52.00</i>	±3.16	1.103	0.820	0.048	0.006

Note: ^a – no normal distribution; ^b – Lilliefors significance correction; ^e – the lower bound of true significance; p – the level of significance; M – the mean; Me – the median (given *in italics*); SD – the squared deviation; A – asymmetry; E – excess; K-Sb – the Kolmogorov-Smirnov Test (λ); Sh-W – the Shapiro-Wilk Test (W); R – rationality; RR – risk readiness; V – vigilance; AD – avoidance; PR – procrastination; HV – hypervigilance; A – anxiety; D – depressiveness.

Source: Own research.

Table 3

Descriptive frequency characteristics and data on a normal distribution in Group 2 (n = 91)

Scale	M	Me	SD	Normal distribution ^a			
				A	E	K-Sb (p) ^b	Sh-W (p)
“PFDM-25” [19]							
R (scores)	5.05	4.00	±2.05	2.309	4.760	<0.001	<0.001
RR (scores)	4.93	5.00	±1.94	-0.136	-0.186	<0.001	<0.001
“MDMQ” [20]							
V (scores)	12.37	14.00	±5.11	-0.986	-0.283	<0.001	<0.001
AD (scores)	12.56	13.00	±3.14	-0.095	-0.724	0.045	0.050
PR (scores)	8.13	8.00	±2.11	-0.420	-0.761	<0.001	<0.001
HV (scores)	5.63	6.00	±1.06	-0.854	0.735	<0.001	<0.001
“PSMA” [21]							
A (scores)	45.63	46.00	±9.52	-0.518	1778	0.014	<0.001
“STDS” [22]							
D (scores)	39.99	40.00	±6.76	0.166	-0.455	0.106	0.359

Note: ^a – no normal distribution; ^b – Lilliefors significance correction; p – the level of significance; M – the mean; Me – the median (given *in italics*); SD – the squared deviation; A – asymmetry; E – excess; K-Sb – the Kolmogorov-Smirnov Test (λ); Sh-W – the Shapiro-Wilk Test (W); R – rationality; RR – risk readiness; V – vigilance; AD – avoidance; PR – procrastination; HV – hypervigilance; A – anxiety; D – depressiveness.

Source: Own research.

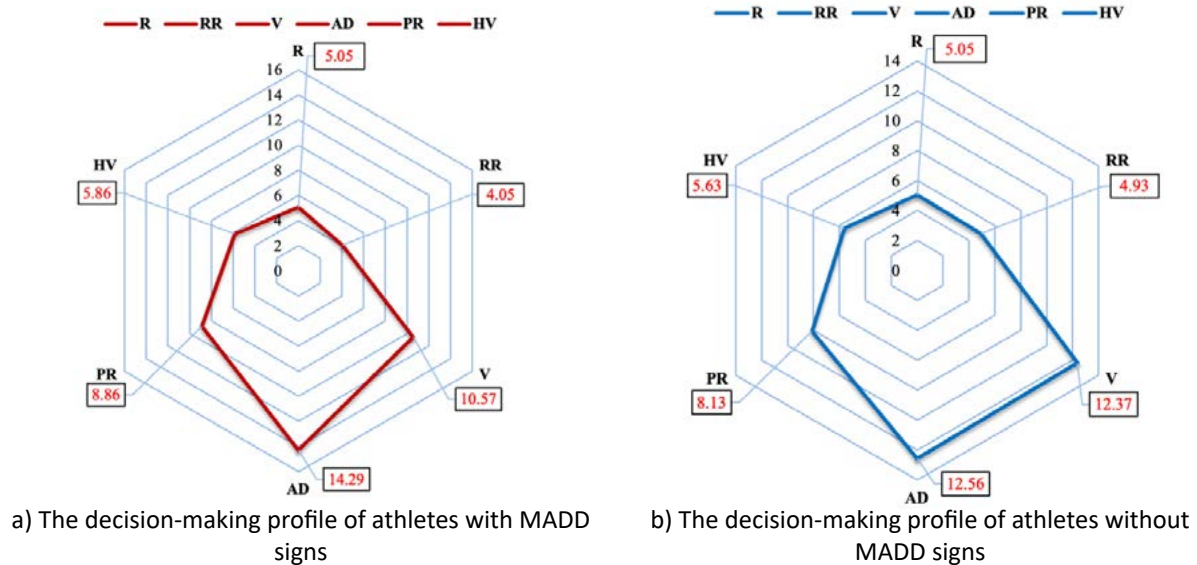


Figure 1. Petal diagrams of respondents' decision-making profiles

Note: contour of the decision-making profile of athletes with MADD signs; contour of the decision-making profile of athletes without MADD signs; R – rationality (scores); RR – risk readiness (scores); V – vigilance (scores); AD – avoidance (scores); PR – procrastination (scores); HV – hypervigilance (scores).

Table 4

Results of correlation analysis across the studied subsamples

Scale	Spearman's coefficient	Anxiety (A)		Depressiveness (D)	
		Group 1	Group 2	Group 1	Group 2
Rationality (R) (conditional unit)	r_s	0.259	0.084	-0.163	-0.111
	p	0.256	0.426	0.481	0.297
Risk readiness (RR) (conditional unit)	r_s	-0.347	-0.153	0.005	-0.271**
	p	0.123	0.148	0.983	0.009
Vigilance (V) (conditional unit)	r_s	0.256	-0.253*	-0.454*	-0.219*
	p	0.263	0.016	0.039	0.037
Avoidance (AD) (conditional unit)	r_s	0.156	0.262*	0.134	0.255*
	p	0.501	0.012	0.562	0.015
Procrastination (PR) (conditional unit)	r_s	0.009	0.255*	0.067	0.129
	p	0.968	0.015	0.772	0.225
Hypervigilance (HV) (conditional unit)	r_s	-0.009	-0.024	-0.008	-0.016
	p	0.970	0.825	0.971	0.879

Note: Group 1 – a subsample of male junior athletes; Group 2 – a subsample of female junior athletes; * – correlation at $p \leq 0.050$ and ** – correlation at $p \leq 0.010$.

Source: Own research.

Table 5

Results of comparative analysis based on the grouping variable “Gender differentiation” between the subsamples of junior athletes, Group A and Group B

Statistical parameter	R (conditional unit)	RR (conditional unit)	V (conditional unit)	AD (conditional unit)	PR (conditional unit)	HV (conditional unit)
Mann-Whitney U-test	1426.00	1551.50	1549.50	1381.00	1270.50	1424.00
Wilcoxon W-test	3022.00	3147.50	3145.50	2977.00	2866.50	3020.00
Kolmogorov-Smirnov λ -test	-0.940	-0.100	-0.108	-1.093	-1.756	-0.883
p	0.347	0.921	0.914	0.274	0.079	0.377

Note: p – level of significance; R – rationality; RR – risk readiness; V – vigilance; AD – avoidance; PR – procrastination; HV – hypervigilance.

Source: Own research.

Table 6

Results of comparison of decision-making parameters, based on the grouping variable “Mixed anxiety-depressive disorder”, between two subsamples, Group 1 and Group 2

Statistical parameter	R (conditional unit)	RR (conditional unit)	V (conditional unit)	AD (conditional unit)	PR (conditional unit)	HV (conditional unit)
Mann-Whitney U-test	809.00	746.50	721.50	655.50*	786.50	869.00
Wilcoxon W-test	4995.00	977.50	952.50	4841.50	4972.50	5055.00
Kolmogorov-Smirnov λ -test	-1.243	-1.619	-1.758	-2.247	-1.278	-0.680
p	0.214	0.105	0.079	0.025	0.201	0.497

Note: p – level of significance; R – rationality; RR – risk readiness; V – vigilance; AD – avoidance; PR – procrastination; HV – hypervigilance; * – correlation at $p \leq 0.050$; ** – correlation at $p \leq 0.010$; and *** – correlation at $p < 0.001$.

Source: Own research.

One significant difference was found in the parameter “avoidance” ($U = 655.50$; $p = 0.025$). Obviously, avoidance as a trait that can be internalised into a non-productive coping strategy under adverse conditions is the most important strategy in junior athletes’ decision-making. When avoiding the situation, junior athletes deprive themselves of the

opportunity to influence it and achieve the desired (winning) outcomes; therefore, the competitive situation is resolved under the influence of external factors. Thus, this strategy is not very effective and does not enable athletes to achieve winning outcomes.

Discussion

Junior athletes’ decision-making in a competitive situation is viewed as a complex process of the analytical work in the social field, which involves predicting the opponents’ actions, considering the athletes’ competencies and

preparedness, and selecting optimal strategies. The operationalisation of competitive and mental activities requires well-developed sensory and perceptual skills such as promptness, accuracy, strategic and operational thinking, concentration,



attention stability, anticipation, and reflection to achieve winning outcomes. The model of the expected image of winning outcomes should be supported by real components. Junior athletes can automate a number of patterns in conditions that simulate extreme competitive situations. Such training sessions should combine physical, tactical, and psychological preparation and the development of skills to overcome competitive obstacles.

In the context of our research, the findings of the study by V. Plokhikh and D. Koverdiuk [24] on the specificity of decision-making in students under moderate stress can be assigned a cognitive value. The authors found that students with high levels of neuroticism, depressiveness, emotional lability, and anxiety tend to use non-productive coping strategies as mental strain rises. This fact is confirmed in our study. Scientific literature shows that the individual's response to stressful situations is mainly associated with two states, anxiety and depression, with their combination ranging from 23.00 to 87.00% [2]. These facts align with our empirical results obtained in Group 1, consisting of respondents with the signs of mixed anxiety-depressive disorder ($n = 21$; 18.75%) (see Table 1). Since our study focuses on junior athletes, the obtained indicator is considered to be representative and relevant.

Two petal diagrams of the decision-making profiles of juniors with MADD signs and without them (see Fig. 1) visualised changes in decision-making parameters. Noticeable differences were identified between respondents in both subsamples in their selection of the coping strategies "vigilance" and "avoidance". Both subsamples (Group 1 and Group 2) demonstrated almost the same level of rationality and risk readiness, whereas the values of the productive coping strategy "vigilance" in Group 2 (see Table 3) and those of the non-productive coping strategy "avoidance" in Group 1 (see Table 2) are significantly different. Cognitive value can also be assigned to the comparison of two correlation matrices (see Table 4). Significant superiority of Group 2, with six correlations (three direct correlations and three inverse correlations), was recorded over Group 1 with one inverse correlation. This indicates different loadings of the parameters in the studied subsamples. The specificity mentioned in the title of the article is supported by the empirical fact that severe depressiveness reduces respondents' readiness to take risks in competitive activities. Moreover, increased anxiety and depressiveness inversely correlate with

the only productive coping strategy – "vigilance". Obviously, in fierce contests, self-control, self-management, and self-motivation (components of well-developed emotional intelligence determine the selection of productive coping strategies. Due to vigilance, this choice ensures the achievement of winning outcomes. In junior athletes representing the subsample of respondents without MADD signs, "avoidance" and "procrastination" had a direct correlation with "anxiety" and "depressiveness". This indicates that non-productive coping strategies are not effective in achieving winning outcomes. However, it is assumed that there may be exceptions, which are important in a tournament bracket, rather than in a single competition.

The analysis of the empirical data obtained suggests that the comparison of decision-making parameters, based on the grouping variable "Gender differentiation", between the subsample of female athletes, Group A ($n = 56$; 50.00%), and the subsample of male athletes, Group B ($n = 56$; 50.00%), is disputable. The lack of significant differences suggests the need for verification with a larger sample, as no normal distribution was identified. This can be considered a research limitation; however, it does not question the validity of the empirical data obtained. Based on the grouping variable "Mixed anxiety-depressive disorder", the only superiority in the subsample of athletes with MADD signs (Group 1) was recorded in the non-productive coping strategy "avoidance". Obviously, the tendency for avoidance during the progression of MADD is so dominant that other productive or non-productive coping strategies, including rationality and risk readiness, fade into the background. We note that to prevent negative manifestations of anxiety at the physical level, caused by the dominant strategy of "avoidance", young athletes should master a diagnostic and corrective program for overcoming anxiety. The means of such a program include autotraining, mental gymnastics, art therapy, meditation, and relaxation.

A clear description of the manifestations of anxiety and depressiveness in difficult situations of competitive and training activities and the proposed algorithm of actions will allow young athletes to increase their psychological culture and competence. This will give them a competitive advantage over their peer opponents. The proposed measures allow transforming the manifestations of avoidance, anxiety, and depressiveness into the dominance of the "vigilance" strategy. In



summary, the methods of overcoming anxiety and manifestations of depressiveness require additional experimental examination, which outlines the focus of our further scientific research. Our study has only provided constructive recommendations based on

the confirmatory research strategy. Nevertheless, the obtained results provide grounds for stating that the aim was achieved and that the hypotheses were tested. The established patterns and superiorities can be assigned a cognitive value and scientific novelty.

Conclusions

1. It was substantiated that junior athletes' decision-making in competitive activities is a complex process of the analytical work in the social field of a competitive situation, which involves predicting the opponents' actions, considering the athletes' competencies and preparedness, and selecting optimal strategies.

2. It was explained that mixed anxiety-depressive disorder signs in junior athletes are viewed as a dominant negative mental state manifesting in sports activities that combines anxiety and depression symptoms. The research clarified the essence of mixed anxiety-depressive disorder signs, which can alternate, become pronounced, cause considerable discomfort, which is partly accompanied by body aches and gastrointestinal problems, which reduces the quality of life and is transformed into the coping strategy of avoidance in the decision-making process.

3. Mixed anxiety-depressive disorder signs were diagnosed in $n = 21$ (18.75%) junior athletes. Petal diagrams can be used to create juniors' decision-making profiles, which should be operationalised in athletes' learning and training activities. The combined correlation matrix of decision-making parameters demonstrated completely different trajectories of significant correlations. The productive coping

strategy "vigilance" (three correlations) and the non-productive strategy "avoidance" (two correlations), which are highly sensitive to manifestations of respondents' anxiety and depressiveness, were found to be the most dependent decision-making parameters. No significant difference was found for the grouping variable "Gender differentiation". Based on the grouping variable "Mixed Anxiety-Depressive Disorder", the only superiority of athletes with mixed anxiety-depressive disorder signs was identified in the non-productive coping strategy "avoidance".

4. The study proposes measures for operationalising negative manifestations of anxiety caused by the dominant "avoidance" strategy by means of the diagnostic and corrective program for overcoming anxiety. It summarises that the methods of overcoming anxiety and manifestations of depressiveness require additional experimental examination and outlines the focus of our further scientific research. It is recommended that the established scientific facts and significant differences should be integrated into professional training for teachers-coaches at sports schools for children and youth.

Conflict of interest

The authors declare that there is no conflict of interest in this study

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