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Original Article

Comparative analysis of the mental state of athletes for risk-taking in team sports

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Abstract:
The purpose of the research is to create a factor structure of risk readiness in team sports athletes, as well as a comparison of key parameters across the three samples: football, handball, and volleyball. Subjects' mental states of preparation for risk-sports relationships are studied and generalized using semantic parameters. **Research methods:** retrospective analysis, generalization, and substantiation of the state of the researched problem; purposeful research with the use of observation protocol forms; valid and reliable questionnaires with standard forms for respondents; ANOVA factor analysis to reduce the proportionality of factors; reliability coefficients: α-Cronbach homogeneity index, Spearman correlation coefficient (r_s) and Student's t-test. **Results.** The differences between football (GF), handball (GG), and volleyball (GV) samples were determined by a comparative analysis. On the scales "EC" ($t = 2.034$; $p < .05$) and "BC" ($t = 2.934$; $p <. 05$), the differences between the GG and GV samples were significant. According to research, athletes' qualifications and emotional intelligence were important factors in their readiness to take risks. The structure of risk readiness of athletes in team sports was created by factor analysis of ANOVA, which resulted in the creation of a correlation matrix of connections. Athletes in team sports had a risk-taking structure that combines four key components (72.58 %). It was found that the key was F2 "Conative readiness to take risks" (10.54 %), which is positively correlated with F1 "Emotional readiness to take risks" ($r_s = .123$; $p \leq .01$), F3 "Resulting readiness to take risks" ($r_s = .204$; $p \leq .01$), and F4 "Cognitive readiness to take risks" ($r_s = .141$; $p \leq .01$). **Conclusions.** It is generalized that the learned knowledge has scientific value and that it is practical to apply it in tactical training of athletes in team sports who can significantly impact the outcome of a match.
Key words: emotionality, mental health, risk-taking, risk-sports relationships, playing sports, achievement motivation.

Introduction

In recent decades, the study of the mental state of risk-taking in sports has not only remained relevant but has also gotten a lot of attention and novel interpretations. The relevance of studying risky activities is determined by the rapid alterations of social transformation. The effects of such alterations are significant in many aspects of society because they influence a person's thoughts, attitudes, behavior, and adaption. Risk-taking, on the other hand, has a large adaptive resource. This quickens the transition to the assimilation phase of adaptation by reducing the time spent in the accommodation phase. Obviously, this decreases the athlete's time, emotional, and volitional resources for successful adaptation to altering risk-sports relationships.

The phenomena of "risk" can be interpreted from both good and negative perspectives, according to V. Zubkov (2003). Positive understanding involves "risk as a higher cause", which is essential for society's development and humanity's progress. Negative understanding includes irresponsible risk, which poses a threat to humanity (Zubkov, 2003). Social risk is the most common type of risk, and it refers to the existence of all social institutions. Sports risk is one of its varieties. Sports risk arises from sports activities that are marked by indicators of likelihood, alternatives, contradictions, dangers, and uncertainties (Turyanitsya, 2021). A. Algin (1989) notes that, firstly, the subject of risk-sports relations is the life and health of participants in professional activities, their sports reputation, and property interests; secondly, the object is directly professional sports activities; thirdly, the main (mandatory) subjects of risk-sports relations include professional athletes, and the secondary – other persons: coaches, judges, medical staff, organizers, etc. Relationships between risk and sports can occur during training, competition, and the post-competition period (Algin, 1989). The study's authors focused on the readiness to take risks right before a sports match. The psychological phenomena of proclivity to risk as an athlete's personality attribute is characterized by a desire for danger, a predisposition to prefer risky situations, and the emotional benefit of risky actions, all of which are accompanied by a deep and persistent need

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for it. This can be seen in the continuum - from "risk insensitivity (dullness)" to "risk sensitivity" (low/high degree of risk); from subject risk "risk blindness" to "risk insight" (low/high-risk recognition). Some athletes, by their actions and behavior, are able to increase the riskiness of the current situation, and sometimes are able to create it even in neutral situations (Sannikova, 2003). In addition, scientists discovered that the demand for intense sensations is genetically determined and is one of the DRD4 gene's subvariants (Zuckerman et al., 1964). This gene enhances impulsivity, hyperactivity, and the desire for thrills. It's worth noting that experts regard this attribute to be a social realization mechanism (Kuzikova et al., 2020). The work of the social realization mechanism in the context of risk-sports relationships is quickly progressing. Furthermore, in sports, the mechanisms of social desirability and social approbation lead to the development of dangerous activities and the exhibition of risky actions by athletes. Sometimes such actions are adventurous. The motivations for seeking thrills, on the other hand, are hedonistic. Acute feelings can create a strong sense of satisfaction in some people under particular circumstances. The sensation of pleasure produces a simulated release of emotional stress. This system works well and is closely linked to people's passion for extreme sports (Zuckerman et al., 1964). It has been found that risk is a pleasure for many athletes. Sports risk can elicit an emotional response that leads to a unique type of physical recovery. This form of physical recovery is a life on the verge of danger (Ilyin, 2012). Individual typological characteristics, temperament, motives, and generally stable personality traits all influence risk decisions, according to E. Ilyin (2012). The ability to make independent judgments and display responsibility in challenging conditions is a strong-willed attribute of an athlete. Determination comes to the fore in risk-sports relations. As a result, extreme sports are frequently selected by individuals who want to "increase the adrenaline in the blood", which can be accomplished by putting themselves in a dangerous scenario. Such athletes aim to get the most out of their activities, reject self-control, and are less concerned with long-term objectives. The risk is considered by such athletes as a perceived probable danger (Ilyin, 2012). Emotionality has been found to be the component that determines the shape of riskiness. Emotionality was produced under the influence of both biological (constitution, qualities of the nervous system) and social (growth in the course of life) factors, according to personal and activity approaches. Emotionality influences the range and boundaries of an individual's personal reactions to the environment, as evidenced by individual activity styles, as well as the structure and qualitative and quantitative combination of many personality traits (Bykova, 2012). The authors proposed that emotionality is one of the determinants of an athlete's inclination to risk based on individual-typological features. Emotionality is also a crucial psychological aspect of an athlete's temperament. Emotionality is a type of personality difference that belongs to the nervous system's typological features (Nebylitsyn, 1973). Meanwhile, a study discovered that focusing on the physiological aspects of individual differences in riskiness is ineffective (Sannikova, 2003). That is why we emphasize the need of selecting a collection of individual psychological characteristics that influence the structure of an athlete's predisposition to risk and reflect the psychological determinants of risk-sports relationships.

Hypothesis. The authors suggest that the experimental study of variables risk aversion and factor structure of athletes' risk-taking in team sports will help establish important scientific facts that should be operationalized in the tactical training of athletes in team sports.

The purpose of the experimental study is to build a factor structure of athletes' risk-taking in team sports, as well as a comparison of key parameters between the three samples: football, handball, and volleyball.

Material and methods

Methodology. The original considerations on the propensity to risk in people with different types of emotions served as the methodological basis for the research of athletes' mental state of risk-taking in team sports (Sannikova & Bykova, 2008). Propensity to risk is a stable integral attribute of the individual, integrating formal-dynamic and qualitative levels of components. Qualitative components reflect the psychological essence of the studied phenomenon in representatives of risk-sports relations: 1) affective-volitional component – the desire for risk, saturation, the strength of emotional experiences associated with risk; 2) information and cognitive component – the presence of statements, opinions, judgments related to risk; 3) behavioral component – demonstration of risk-taking in the form of emotional expression through gestures, facial expressions, pantomime and through risky actions; 4) control and regulatory component – manifestations of mental activity aimed at self-control and self-regulation (Bykova, 2012; Sannikova & Sannikov, 2018). The emotionality of athletes will undoubtedly impact and determine the semantic characteristics of the subjects' risk-sports relationships. The analysis of emotional qualities such as excitability, stability, intensity, and duration in the measuring of risk appetite will disclose the true contours of respondents' self-regulatory capacity in team sports and analyze their ability to regulate events on the playground. In the tactical training of teams, establishing the relationship between emotionality and risk-taking will be critical. Well-structured psychological training of a sports team at a training camp can be a latent resource that will contribute to the success of the team during the tournament, in particular in principled matches.

Psychodiagnostic methods that have been validated and proven to be effective in studies of athlete risk and vitality (Kuzikova et al., 2020; Popovych et al., 2021a), personality self-regulation (Blynova et al., 2019; 2022; Halian, 2019; Klenina, 2019; Popovych et al., 2019a; 2020a; 2022a), meaningful life orientations (Blynova &

Kruglov, 2019; Popovych et al., 2021b; 2021g), mental health (Popovych et al., 2021d; 2022b), the effects of information technology (Kobets et al., 2021a; 2021b) and social media on athletes activity (Hudimova, 2021; Hudimova et al., 2021). The methodology of modern research of the maximum physical and psycho-emotional (Cheban et al., 2020a; 2020b; Nosov et al., 2020a; 2021a; Plokhikh, 2021), and extreme load of the respondents (Mamenko et al., 2022; Nosov et al., 2020b; 2021b; Zinchenko et al., 2020; 2021; 2022a; 2022b) is analyzed. Research on tactical and psychological training of football (Kozina et al., 2019; Marques et al., 2011; Popovych et al., 2020c; 2021f; Strykalenko et al., 2021), handball (Popovych et al., 2020b; 2021c) and volleyball (Ntozis et al., 2021) teams receives special attention. The logic of experimental study of athletes' readiness to accept risks was built using outlined methodological provisions and analyzed theoretical, empirical, and experimental studies.

Participants. The football sample in the experimental study included teams from the second league, group B (Ukrainian championship), and clubs that competed in regional championships (Kherson region championship, Ukraine). There were 108 participants, all of them were males between the ages of 16 and 35 years (M=22.1). The handball team was made up of players from the "Dnipryanka" handball club's main, backup, and youth teams (Super League of the Championship of Ukraine). The participants (n = 38) were females between the ages of 14 and 27 years (M=19.9). Volleyball teams from regional competitions made up the third sample (Kherson region championship, Ukraine). The participants (n = 36) were males, ranging in age from 16 to 42 years (M=27.1). The study's participants were informed in advance, and their participation was voluntary, ensuring that the answers were honest and that no random empirical data was used.

Organization of research. The experimental study's observational stage took place in January and lasted until September 2021. During this time, empirical data was also collected, and a large number of observations were organized and conducted. Risk-sports indicators were determined ahead of time and recorded in the observation protocols. Only the athletes who went to the sports ground had their data recorded. The study's organizers followed ethical guidelines and kept the identities of the participants private. The administration of sporting clubs gave its approval to all empirical contacts.

Procedures and instruments. The "Test-questionnaire of qualitative components of propensity to risk" was used to determine the propensity to risk ("TQCPR") (Sannikova & Bykova 2008). The test questionnaire contains forty questions and four measurement scales: emotional component (EC), cognitive component (CC), behavioral component (BC), control and regulatory component (CRC), and an integrated scale that reflects composite risk assessment (CRA). Composite risk assessment (CRA) is the arithmetic mean of the three components EC+CC+BC/3. A four-point scale was used with the following responses: "certainly yes", "probably yes", "probably no", and "absolutely no". The α-Cronbach homogeneity index was α_{TQCPR}=.811.

The emotional properties of team sports athletes were determined by the psychodiagnostic method "Emotionality Characteristic" ("EC") (Ilyin, 2000). The method entails thirty-two statements and four scales, three of which are basic and one of which is derivative. Basic scales reflect the levels of formation of the following basic properties of athletes' emotionality: intensity (EI), duration (ED), and excitability (EE). The derivative Stability Scale (ES) reflects the integral property of emotionality. Emotional stability is a combination of intensity and duration of emotions of athletes: EI + ED. This component reflects respondents' emotional response and is crucial in the study of athletes' risk-taking mental states. The parameters of internal consistency α-Cronbach were fixed at the level of α_{EC}=.876. Two scales of psychodiagnostic methodology "Level of subjective control" ("LSC") (Bazhin et al., 1984) were used: internality in the area of achievements (IAA) and internality in the area of sports relations (IASR). The use of the outlined scales allowed to obtain measurements that showed the semantic relationships of subjective control in risk-sports relations. Since only two scales were used, the homogeneity parameter α-Cronbach was determined only on the basis of two scales α_{LSC}=.902.

The method "Motivation to succeed" ("MS") was used (Elers, 2002). The method contains forty questions and has one scale – the level of motivation to succeed (LMS). The homogeneity parameter α-Cronbach was α_{MS}=.843. The α-Cronbach homogeneity parameters of the respondents' answers ranged from medium (.811) to high (.902) level, which indicates the reliability of the obtained empirical data.

Statistical analysis. Empirical data processing was implemented by the standard software package "SPSS" version 21. ANOVA factor analysis was used to reduce the proportionality of mental readiness factors. The homogeneity index α-Cronbach, Spearman correlation coefficient (rs), and Student's t-test were used as reliability coefficients. The differences between the three samples: football, handball, and volleyball were shown using a Student's t-test. A correlation matrix of connections was created using Spearman's correlation analysis (rs). Significant levels of statistical reliability were $p \leq .05$ and $p \leq .01$. The experiment's repeatability and environmental validity were ensured through the use of frequency descriptive characteristics.

Results

The results of the experimental study of risk readiness of athletes in team sports were emphasized using descriptive frequency characteristics. The arithmetic mean (M) and standard deviation (SD) of the measures on psychodiagnostic scales are shown in Table 1: "TQCPR" (Sannikova & Bykova 2008), "EC" (Ilyin, 2000), "LSC" (Bazhin et al., 1984) and "MS" (Elers, 2002).

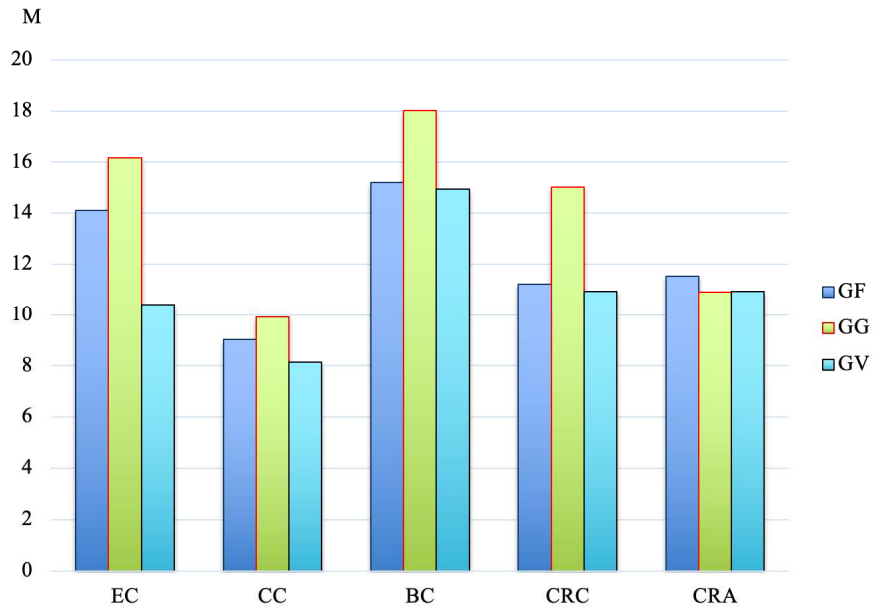
Table 1. Descriptive frequency characteristics on the scales of psychodiagnostic methods (n=182)

Scale	M	SD
"TQCPR"		
Emotional component (EC)	14.56	2.98
Cognitive component (CC)	9.12	2.03
Behavioral component (BC)	16.45	3.12
Control and regulatory component (CRC)	12.82	2.43
Composite risk assessment (CRA)	10.37	2.22
"EC"		
Emotional Intensity (EI)	5.01	1.12
Emotional Duration (ED)	3.29	.81
Emotional Excitability (EE)	3.56	.84
Emotional Stability (ES)	4.15	.97
"LSC"		
Internality in the Area of Achievements (IAA)	49.12	7.11
Internality in the Area of Sport Relations (IASR)	32.01	4.92
"MS"		
Level of motivation to succeed (LMS)	17.19	3.69

Note: M – arithmetic mean; SD – mean-square deviation.

When we compared the results of the test "TQCPR" in terms of arithmetic mean (M=9.12-16.45) and standard deviation (SD=2.02-3.12) to data from other empirical studies (Bykova, 2012), we found that there were some differences in indicators, but they were minor and fell within the test's recommended norms (Sannikova & Bykova 2008). Descriptive frequency characteristics for psychodiagnostic instruments "EC" and "MS" also did not differ significantly from the proposed standards (Elers, 2002; Ilyin, 2000). According to the IAA (M = 49.12) and IASR (M = 32.01) scales of the LSC psychodiagnostic method, significant differences were recorded compared to the average norms (Bazhin et al., 1984) and in empirical studies using this method (Popovych & Blynova, 2019a).

Figure I graphically depicts the dynamics of the arithmetic mean (M) semantic parameters of propensity to risk ("TQCPR") (Sannikova & Bykova 2008) of athletes in football (GF), handball (GG), and volleyball (GV) samples.



Note: EC – Emotional component; CC – Cognitive component; BC – Behavioral component; CRC – Control and regulatory component; CRA – Composite risk assessment; GF – Football sample; GG – Handball sample; GV – Volleyball sample.

Figure I. Dynamics of parameters of arithmetic mean in football (GF), handball (GG), and volleyball (GV) samples

Table 2 presents the statistical differences of the arithmetic mean of the Student's t-test between football (GF), handball (GG), and volleyball (GV) samples.

Table 2. Statistical differences of arithmetic mean parameters according to the method "TQCPR"

Scale	Criterion	GF & GG	GF & GV	GG & GV
Emotional component (EC)	tSt	-.896; p<.2281	.234; p<.3291	2.034*; p<.0375
Cognitive component (CC)	tSt	-.127; p<.5637	.327; p<.1637	1.411; p<.1094
Behavioral component (BC)	tSt	-.776; p<.2079	.334; p<.3691	2.934*; p<.0275
Control and regulatory component (CRC)	tSt	-.120; p<.5602	.227; p<.1939	.921; p<.1894
Composite risk assessment (CRA)	tSt	.209; p<.2637	.330; p<.1687	1.310; p<.1134

Note: GF – football sample; GG – handball sample; GV – volleyball sample; tSt – Student's criterion; * – α<.05; ** – α<.01.

Comparative analysis revealed significant differences between samples GG and GV on the scales "EC" (t = 2.034; p <.05) and "BC" (t = 2.934; p <.05). The handball sample of the "Dnipryanka" handball team (Ukrainian Super League) was evidently highly qualified, and gender distinction (GG – female handball players; GV – male volleyball players) was probably equally essential. GF, the football sample, was likewise male, however, there were no significant differences on any of the scales in the pair GF and GG. We supposed that an athlete's qualifications, namely emotional intelligence, determine their readiness to take risks. This hypothesis will need to be tested in a separate, specially designed research. The just-stated assumption is outside the scope of the present research.

The indicators of linear correlation of "TQCPR" risk propensity and the parameters that impact it are provided in accordance with the logic of the experimental study. A correlation matrix of connections between the analyzed content parameters is shown in Table 3.

Table 3. Correlation matrix of connections of the studied content parameters

Scale	EC	CC	BC	CRC	CRA
EI	314**		209*		189*
ED		174*	149*		
EE	-289**			-169*	
ES	231*		189*		149*
IAA	-319**				-241*
IASR		-212*	-372**	-369**	-309**
LMS	-362**				-245*

Note: EC – Emotional component; CC – Cognitive component; BC – Behavioral component; CRC – Control and regulatory component; CRA – Composite risk assessment; EI – emotional intensity; ED – emotional duration; EE – emotional excitation; ES – emotional stability; IAA – internality in the area of achievements; IASR – internality in the area of sports relations; level of motivation to succeed (LMS); ** – p≤.01; * – p≤.05.

The emotional component of risk (EC) and composite risk assessment (CRA) had the most statistically significant correlation coefficients, resulting in five significant connections. At the same time, the most positive correlations were recorded in the "BC": "EI" (r_s=.209; p<.05); "ED" (r_s=.149; p<.05) and "ES" (r_s=.189; p<.05). We explain such connections by the fact that the practical component in the propensity to take risks is primary in the continuum of "action-thought-attitude". The pre-game attitude "act-win-win" is accompanied by incredible emotions, neuropsychological efforts (Cheban et al., 2020c).

Positive correlations between "EC" and "EI" (r_s=.314; p<.01), and "ES" (r_s=.231; p<.05) confirmed the view that emotions in readiness to take risks have stable and intense indicators. "CRA" with "EI" (r_s=.189; p<.05) and "ES" (r_s=.149; p<.05) had slightly lower positive values of the correlation. The pairs "IASR" with "BC" (r_s=.372; p<.01) and "CRC" (r_s=.369; p<.01) had the highest significant negative correlation values. The fact that respondents' subjective control or internality in the sphere of sports interactions had a prominent behavioral and control-regulatory tone, and was mostly influenced by tactics and foreplay for a sports match, explains these associations.

Furthermore, proportionality factors were minimized using ANOVA factor analysis in order to determine the prevalent mental states prior to the commencement of a sports competition. The selected set of twelve factors was reasonable and methodologically competent.

The most important aspects of the study of athletes' mental states of risk preparedness in team sports were reflected in factors. The principal component approach was used to determine the factor matrix of twelve variables. There have been four variables found with loads larger than one. The variable's total index of variance was 72.58 % (Table 4).

Table 4. Factor matrix of loads of athletes' mental state of risk-taking (n=182)

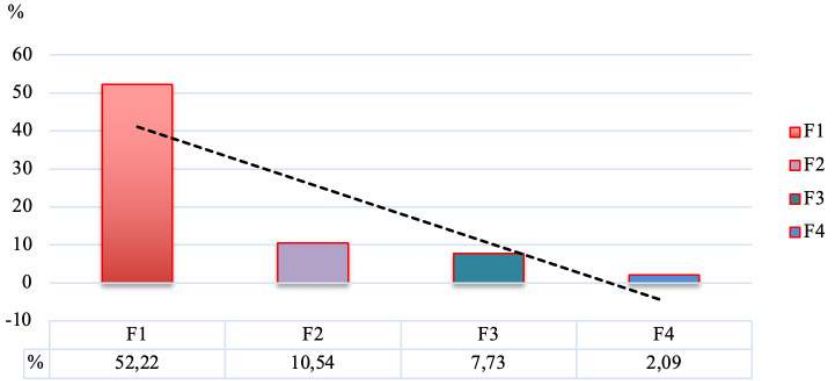
Factors	F1	F2	F3	F4
Emotional component (EC)	.934			
Cognitive component (CC)				.649
Behavioral component (BC)		.845		
Control and regulatory component (CRC)		.906		
Composite risk assessment (CRA)				-.507
Emotional Intensity (EI)	.678			
Emotional Duration (ED)	.609			
Emotional Excitability (EE)	.656			
Emotional Stability (ES)	.708			
Internality in the Area of Achievements (IAA)			.569	
Internality in the Area of Sport Relations (IASR)		.634		
Level of motivation to succeed (LMS)			.576	
Dispersion, %	52.22	10.54	7.73	2.09
∑ dispersion, %	52.22	62.76	70.49	72.58
Value	13.41	3.33	2.01	1.06

F1 "Emotional readiness to take risks" of team sports athletes united only positively loaded scales: EC (.934), EI (.678), ED (.609), EE (.656), ES (.708). F1 reflected the affective-volitional component in readiness for risk. Probably, emotional intelligence played not the last value in this integration. This factor of mental state was the largest and covered the variance (52.22%) and was one of the important risk factors in the structure. All factors reflected the emotional properties and emotional parameters of the competitive activities of respondents.

F2 "Conative readiness to take risks" reflected the dependence of risk-sports relationships on significant positively loaded scales that were related to the behavioral component: BC (.845), CRC (.906), and IASR (.634). The behavioral core of this mental state, obviously, proved the operation of the "action-thought-attitude" continuum, which led to the designation "conative readiness to take risks". F2 demonstrated the importance of the control-regulatory and internalized position of the subject of risk-sports relations. This factor covered 10.54% of the variance and had a significant impact on the willingness of athletes to take risks.

F3 "Resulting readiness to take risks" of respondents reflected the dependence of risk-sports relations on two positively loaded parameters: IAA (.569) and LMS (.576). Of course, the result in a sports match is the competition's main goal. Note that this may not always be a victory, sometimes a defeat, with a minimum difference of goals scored/conceded (football, handball), may give preference to one of the teams in the standings or in a pair cup match. Researchers agreed that the two parameters selected (IAA; LMS) were somewhat duplicated. At the same time, the obtained measurement of these parameters was a confirmation of the reliability of the obtained empirical data. F3 covered the variance (7.73%) and was also no less important in the resulting structure of athletes' readiness to take risks. F4 "Cognitive readiness to take risks" of athletes showed the dependence of risk-sports relations on one positively loaded CRC scale (.649) and one negatively loaded CRA scale (-.507). Awareness, enlightenment, and cognitive component in risk-taking brought pragmatism and moderation. The negatively loaded scale of composite risk assessment indicated that the effectiveness and attitudes of respondents were opposite in the current mental state. F4 had the lowest variance (2.09%) and was final in the obtained factor structure of athletes' risk-taking in team sports.

All other factors had a load that was the variance of the variables less than .969. Thus, four factors (72.69%) were obtained, and they formed the factor structure of risk readiness of team sports athletes in risk-sports relations (Fig. II).



Note: ----- – trend line; F1 – "Emotional readiness to take risks"; F2 – "Conative readiness to take risks"; F3 – "The resulting readiness to take risks"; F4 – "Cognitive readiness to take risks".

Figure II. Factor structure of risk readiness of team sports athletes

Table 5 presents the correlation matrix for establishing relationships among the elements revealed in the propensity to risk factor structure of team sports athletes.

Table 5. Correlation matrix of factor loads of athletes' risk-taking (n=182)

Factors	F1	F2	F3	F4
F1	1.000	.132**	.119**	-.097*
F2	.132**	1.000	.232**	.057
F3	.119**	.232**	1.000	-.045
F4	-.097*	.057	-.045	1.000

Note: ** – p≤.01; * – p≤.05.

Analysis of the interdependence of factors that formed the factor structure of athletes' risk-taking showed that the most significant was the ratio of F2 and F3 (.232; p≤.01). F1 and F2 recorded the largest number of significant correlations: there were three in F1: positive with F2 (.132; p≤.01), F3 (.119; p≤.01), and negative with F4 (-.097; p ≤.05). There were two positive correlations in F2. We state that in the structure of risk readiness in team sports athletes, emotional readiness to accept risks was the most significant. As a result, in the factor structure, factors F1 and F2 were the most dependent.

Discussion

We have not found any experimental studies of athletes' mental states of risk-taking in team sports. However, they are of scientific interest to the research of scientists participating in our study. In their research of triumph at all costs, Y. Chen et al. (2019) investigated risky behavior and sports injuries in terms of sports safety and hygiene. It has been shown that a significant proportion of elite athletes' activities were of a production nature and were often received at home or in training. Researchers believe that athletes' awareness of potential risks, together with organizational, societal, and individual safety are crucial. It's worth noting that our cognitive component (CC) (Sannikova & Bykova 2008) and our established cognitive readiness to take risks are in sync with our understanding of risk-sports relationships. The dependence of safety, risk, and achievement motive in the structure of motivation of young athletes in the study of Ye. Blynova et al. (2020) was also identified and established. It was established that the motive for success was a factor that burdens F3 "Resulting readiness to take risks". Thus, the resulting component of a sports match was interdependent on the motive for success and safety/risk balance. In another study (Mason et al., 2021), professional and young hockey players were shown to have a dependence between gaming effect and individual aspects of neuromuscular performance at the risk of injury. In this study, injury risk increased as game tone and basic playing time, i. e. time spent on the playground, decreased. Reduced time on the sports field, unfortunately, does not lower the danger of risk-sports connections, but rather makes them more traumatic. This supports our findings that the behavioral (BC) and control-regulatory (CRC) components of F2 "Conative readiness to take risks" are crucial, with the mental state of conative readiness being one of the most important. The relationship between health technology and the protection of athletes from injury has gotten a lot of attention (Bahr & Holme, 2003; Staude & Radzyshevska, 2021).

The risk of injury in the team and individual youth sports has been investigated and shown to be different. The risk of injury in team sports is substantially higher than in individual sports (6.16 vs. 2.88 injuries per 1000 hours, correspondingly) (Theisen et al., 2012). It was discovered that in team sports, the desire to take risks was higher, and as a result, the chance of injury was higher, independent of the type of injury. Obviously, psychological impacts such as "we", "team spirit" and "synergy" improve athletes' motivation to win, resulting in a larger readiness to accept risks. Emotional intelligence and risk-taking proclivity were most probably connected. The established factor structure of risk-taking of athletes in team sports finds confirmation of the proposed methodology in the study of mental states of educational and professional (Popovych & Blynova, 2019b), tourism (Popovych et al., 2019b), and sports activities (Popovych et al., 2019b; 2021e).

We conclude that the findings allow for the operationalization of athletes' tactical training in team sports. The use of learned skills during tactical training and foreplay can have a significant impact on the outcome of a sports match.

Conclusions

1. The results of experimental research and theoretical substantiation of the interdependence of correlation matrix scales and construction of the factor structure of athletes' risk-taking in team sports should be used in tactical training of football, handball, volleyball, and other sports representatives.

2. Descriptive frequency characteristics of football (GF), handball (GG), and volleyball (GV) samples were given. Significant differences were found on the "EC" scales (t = 2.034; p <.05) and "BC" (t = 2.934; p <.05) between the GG and GV samples. Explanations and assumptions are made that the qualifications of athletes, emotional intelligence are decisive in the readiness to take risks.

3. Four key elements were integrated to create a factor structure of risk readiness in team sports athletes (72.58%). It was found that the key was F1 "Emotional readiness to take risks" (52.22%), which was positively

correlated with F2 "Conative readiness to take risks" (r_s=.132; p≤.01), F3 "Resulting readiness to take risks" (r_s=.119; p≤.01) and was negatively related to F4 "Cognitive readiness to take risks" (r_s=-.097; p≤.05).

4. The hypothesis was proven, and the experimental study's purpose was achieved. Scientific facts applied during tactical training and preparation can have a significant impact on the outcome of a sports match.

5. Aspects of scientific study that have come to the fore in the current research process, are significant, scientific innovation, and require empirical and theoretical clarification or refutation will be the future of scientific research.

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