

Compensatory phase of fatigue among football players in the organization of motivational structure

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Abstract:

This study empirically investigated the relationship between motivational factors and the compensatory phase of fatigue in football players. **Methods:** Valid and reliable psychodiagnostic tools were used, and the Pearson correlation coefficient determined statistically significant relationships. **Results:** The results of the research on the correlation between the dominant purposes (personal meanings) of sports activities and self-assessment indicators of athletes' compensatory phase indicate that as emotional satisfaction, physical self-expression, social and emotional, and socio-moral motives increase – along with achievement of success, preparation for professional activity, and focus on satisfying sports-cognitive needs – the indicators of the compensatory phase in football players also increase. These indicators include well-being, activity, mood, performance, willingness to perform sports tasks, and confidence in their abilities. These same indicators of the compensatory phase of athletes improve with the increase in the indicators of the respondents' motivational structure (internal, cognitive, competitive motives, self-respect motive, imbuing personal significance to activity results, the level of task difficulty, the manifestation of volitional effort, the assessment of the level of achieved results, self-potential assessment, the planned level of effort, the expected level of activity results, the consistency of results, initiative). Athletes with predominant motives of avoidance and changing current activities, on the contrary, exhibit negative manifestations of their psychophysiological state. Emotional changes, decrease of general activity, violation of the "sleep-wakefulness" cycle, and somato-vegetative disorders are observed in football players with low indicators of dominant purposes (personal meanings) of sports activities. High indicators of dominant purposes (personal meanings) of sports activities suggest that these football players exhibit insignificant manifestations of monotony, over-saturation, stress, and fatigue, which corresponds to their high performance. It has been established that athletes with high motivation for success rarely experience fatigue and somato-vegetative disorders, and are less prone to emotional changes, over-saturation, and stress. Highly motivated football players are distinguished by their performance in sports activities, strong willingness to perform sports tasks, confidence in their abilities, and good mood. **Discussion and conclusions.** Football players with a pronounced motive of avoidance and a motive of changing current activity have poor well-being and mood, low levels of activity, work performance, confidence in their abilities, and willingness to perform sports tasks. Based on empirical results, it has been found that athletes with high indicators of dominant purposes of sports activities are characterized by significantly lower levels of professional maladaptation.

Keywords: fatigue, mental state, motivation, leadership, work performance, monotony, distress.

Introduction

Football is a sport characterized by a dynamic and unpredictable environment. During a football match, an athlete must be able to anticipate and react to rapidly changing situations (such as the positions of teammates and opponents) to make the best decision. However, such prolonged and intense activity leads to player fatigue, which worsens technical and physical performance during football games, the athlete's executive function, and the ability to maintain focus on what is important during task execution. Fatigue, as a particular type of functional state, temporarily arises due to overload and leads to decreased efficiency (Popovych, et al., 2022c).

The research of fatigue in football players is a key aspect for achieving high sports results, maintaining health, and ensuring a long-term sports career. Research on fatigue in athletes, particularly football players, is extremely important for several reasons. Fatigue significantly affects physical performance and cognitive functions of athletes. Studying and controlling fatigue allows optimizing the training process, ensuring high

efficiency and minimizing the risks of overtraining. Fatigue increases the probability of injuries due to decreased reaction time and movement coordination. Monitoring fatigue helps to make timely adjustments to training, reducing the risk of injuries. Proper understanding of fatigue helps to create individual recovery plans that include appropriate rest and recovery methods, facilitating a faster and more effective return to optimal form (Plokhikh et al., 2024; Shcherbak et al., 2023).

Fatigue can have a negative impact on the psycho-emotional state of athletes, manifesting as stress, decreased motivation, and depressive states. Timely detection and correction of fatigue help maintain the psychological health of football players (Galan et al., 2017). Studying and correction of fatigue makes it possible to develop training programs aimed at gradually increasing athletes' endurance without risking their health (Galan et al., 2021; Tavrovetska et al., 2023).

Signs of fatigue in athletes vary depending on their level of adaptation to loads, basic physical training, neuropsychic tension, and motivation. In the early stages, fatigue may be imperceptible and have a compensatory nature. Compensated fatigue arises due to compensatory mechanisms of a volitional nature, which stimulate task performance. High motivation can reduce the subjective feeling of fatigue. Motivated individuals can mobilize additional internal resources to overcome fatigue (Prokhorenko et al., 2023). This may include improved concentration, increased energy levels, and reduced negative emotional reactions, allowing them to continue performing tasks with less discomfort (Popovych et al., 2023f).

Hypothesis. With the growth of motivational aspects among football players aimed at successfully performing their sports activities, the psychological parameters of fatigue decrease.

Purpose is to empirically investigate and theoretically substantiate the influence of motivation on compensatory phase of fatigue in football players.

Methods

Methodology. In the process of our research, we used leading conceptual research, including: 1) modeling motivation using target competition in mental fatigue research; motivation as a means to counteract the effects of mental fatigue (Herlambang et al., 2021); 2) the relationship between mental fatigue and motivation in cancer patients (Jong et al., 2005); 3) the impact of mental fatigue on brain activity in cyclists (Proost et al., 2024); 4) stress factors for mental health in high-performance sports (Lundqvist et al., 2024; Popovych et al., 2023b); 5) the influence of coaching behavior and achievement motivation in athletes (Halian et al., 2023a; 2023b; Soyer et al., 2014); 6) mental fatigue after endurance training in professional football players (Ferreira et al., 2023); 7) psycho-physiological patterns of juniors' competitive activity (Cretu et al., 2021; Kozina et al., 2019; Marques et al., 2011); 8) publications outlining the current social transformations were also taken into consideration (Kobets et al., 2021; Zavatska et al., 2023); 9) dominant advantage of a value-meaning component in extreme situations (Halian, 2023; Kariyev et al., 2024; Zinchenko et al., 2023).

The scientific focus is on: 1) the need to maintain the psychological safety of athletes (Blynova et al., 2022; Nosov et al., 2021); 2) the impact of emotions and emotional states on athletes (Chebykin et al., 2024; Khraban, & Silko, 2022; Kuzikova et al., 2023); 3) the mental states (Loch, et al., 2021; Popovych, et al., 2023a; 2023d; Pshenychna et al., 2019); 4) personal determinants of athletes' mental states (Popovych, et al., 2022d); 5) motivational orientation of football players (Krasnik et al., 2024; Popovych, et al., 2022a; 2022c; 2023e).

Participants and organization of research. The empirical research involved 37 football players (age: $Me = 26.00$; $min = 21.00$; $max = 37.00$). The empirical research was conducted on the basis of the SCPS (Sumy, Ukraine) in June 2024 among both teams of police officers from the city of Sumy.

Procedures, instruments and limitations of research. The choice of methods was implemented according to the subject field. To achieve the goal and determine the necessary parameters, we selected a number of standardized methods aimed at determining the motivational orientation and fatigue of football players. The following psychodiagnostic methods were used: Professional maladjustment assessment test by M. Dmitrieva (2003); method of scaled self-assessment of psychophysiological state by O. Kokun (2012); questionnaire "Differentiated evaluation of work capacity" (Leonova, 1984); "Motives for sports activities" (Shaboltas, 2004); "Assessment of the level of aspirations" (Herbachevskyi, 1990); "Motivation for success" (Ehlers, 2002).

To study the peculiarities of the compensatory phase of athletes, the test for assessing professional maladaptation by M. Dmitrieva (2003) was used. Among the main diagnostic signs highlighted by the author are: deterioration of well-being (emotional changes, peculiarities of individual mental processes, decrease of general activity, fatigue); somato-vegetative disorders; and violation of the "sleep-wakefulness" cycle.

The study of the compensatory phase was carried out using the method of scaled self-assessment of psychophysiological state by O. Kokun (2012), which allowed diagnosing not only the parameters of "traditional" states such as well-being, activity, and mood, but also other indicators that characterize the specific psychophysiological state of the athlete.

Questionnaire "Differentiated evaluation of work capacity" by O. Leonova (1984) was used for the individual diagnosis of the subject's state. The assessment of mental states such as monotony, over-saturation, stress, and fatigue was carried out based on four degrees of symptom severity.

To study the dominant purposes (personal meanings) of sports activities among football players, the “Motives for sports activities” by A. Shaboltas (2004) was used. This method is designed to identify ten motive categories: Emotional satisfaction (ES), Social self-expression (SSE), Physical self-expression (PE), Social and emotional motive (SM), Social and moral motive (SM), Achievement of success (AS), Sports-cognitive motive (SC), Rational-willed motive (RW), Preparation for professional activity (PPA), Civic-patriotic motive (CP).

An original diagnostic tool that enabled the identification of the level of aspirations among football players was the “Assessment of the level of aspirations” by V. Herbachevskyi (1990). This methodology is used for diagnosing components of the motivational structure of the personality, including: Internal motive, Cognitive Motive, Avoidance Motive, Competitive Motive, Motive of Changing Current Activity, Self-Respect Motive, Imbuing Personal Significance to Activity Results, Level of task’s difficulty, Manifestation of volitional effort, Assessment of Level of Achieved Results, Self-Potential Assessment, Planned Level of Effort, The expected level of activity results, Consistency of Results, Initiative.

The motivational orientation of athletes towards achieving success was diagnosed using the “Motivation for success” by T. Ehlers (2002).

The survey of participants was conducted using Google Forms. E-mails containing an explanation of the study’s purpose and a link to the online Google Forms service, which included all the psychodiagnostic methods, were sent to the respondents who had previously consented to participate. The research was based on the ethical principles of confidentiality and anonymity.

In psychodiagnostics of fatigue, there are several limitations and specific features that are important to consider for accurate and reliable detection of a person’s fatigue state. Fatigue is often measured using questionnaires and surveys based on self-assessment. This can lead to subjective and not always accurate assessments, as people perceive and describe their fatigue differently. The level of fatigue can vary depending on the time of day, availability of rest and sleep, current workloads, and stresses. This necessitates multiple measurements of fatigue over different periods for greater objectivity. People may react differently to the same physical and psychological stress. This requires considering individual characteristics in the diagnosis of fatigue. Fatigue has both physical and psychological components. It is often difficult to separate the influence of these factors and determine which one plays a leading role. These features and limitations demand a comprehensive approach in the psychodiagnostics of fatigue, which includes both subjective and objective assessment methods, as well as consideration of individual differences.

Another limiting factor is that a convenient sample was used in the research, which does not adequately represent all football players (amateurs, professional players, etc.). Thus, a more representative and diversified sample is needed to compare our results.

Statistical Analysis. In the process of mathematical processing of the obtained data, computer programs “SPSS v. 23.00.00.01” and “MS Office Excel 2016” were used. The Pearson correlation coefficient was used to test the significance of the relationships between motivation and fatigue.

Results

The empirical stage of the research is aimed at determining the relationship between motivation and fatigue in the compensation phase. Let’s consider the results of the correlation study of the dominant purposes (personal meanings) of sports activities and the indicators of self-assessment of the compensatory phase of athletes (Tabl. 1).

Table 1. Correlations between indicators of dominant purposes (personal meanings) of sports activities and self-assessment of compensatory phase

Parameters	Self-assessment of psychophysiological state						
	WB	A	M	P	IS	WPT	COA
Emotional satisfaction	.790**	.853**	.841**	.892**	.873**	.849**	.864**
Social self-expression	.660	.688	.670	.634	.643**	.677	.668
Physical self-expression	.846**	.827**	.803**	.862**	.872**	.831**	.856**
Social and emotional	.836	.860**	.890**	.849**	.922**	.900**	.895**
Social and moral	.780**	.798**	.840**	.856**	.842**	.858**	.845**
Achievement of success	.806**	.866**	.877**	.881**	.873**	.885**	.880**
Sports-cognitive	.712**	.619	.640	.673	.629	.620	.603
Rational-willed	.622	.616	.641	.635	.641	.686	.687
Preparation for professional activity	.837**	.858**	.856**	.860**	.866**	.876**	.847**
Civic-patriotic	.611	.618	.624	.606	.653	.657	.661

Note: WB – well-being; A – activity; M – mood; P – performance; IS – interest in sports; WPT – willingness to perform tasks; COA – confidence in one’s abilities; ** – statistical significance of $p \leq .010$ (marked in bold).

The presented data allow us to state that all parameters of athletes' self-assessment of their compensatory phase have a strong correlation with motivation parameters, except for the motives of social self-affirmation, sports-cognitive, rational-volitional, and civic-patriotic motives, which show a noticeable relationship. Thus, athletes with strong indicators of motivation (desire reflecting the joy of movement and physical effort; desire for physical development and character building; desire for sports events due to their high emotionality, informal communication, and social and emotional liberation; desire for the success of one's team, which requires training and good contact with partners and the coach; desire to achieve success and improve personal sports results; desire to engage in sports to prepare for the requirements of the chosen professional activity) have high indicators of self-esteem of the compensatory phase of athletes (well-being; activity; mood; performance; interest in sports; willingness to perform tasks; confidence in one's abilities).

Tabl. 2 presents the results of the correlation analysis of the data obtained from the "Assessment of the level of aspirations" by V. Herbachevskyi (1990) and method of scaled self-assessment of psychophysiological state by O. Kokun (2012). The results of the correlation analysis indicate a strong relationship between the components of athletes' motivational structure and the indicators of their psychophysiological state. Among the established correlations, only two are characterized by a negative regularity. In particular, football players with a pronounced avoidance motive, that is, those with a negative motivational trait (fear of showing poor results), have poor well-being and mood, low levels of activity, performance, confidence in their abilities, and willingness to engage in sports activities.

Table 2. Correlations between components of the motivational structure and self-assessment of psychophysiological state

Parameters	Self-assessment of psychophysiological state						
	WB	A	M	P	IS	WPT	COA
Internal motive	.729**	.800**	.843**	.833**	.807**	.840**	.827**
Cognitive Motive	.719**	.748**	.806**	.817**	.814**	.818**	.822**
Avoidance Motive	-.813**	-.815**	-.862**	-.825**	-.836**	-.860**	-.840**
Competitive Motive	.776**	.788**	.819**	.880**	.823**	.839**	.796**
Motive of Changing Current Activity	-.791**	-.852**	-.842**	-.817**	-.821**	-.823**	-.812**
Self-Respect Motive	.764**	.849**	.807**	.789**	.838**	.835**	.826**
Imbuing Personal Significance to Activity Results	.829**	.781**	.775**	.812**	.811**	.786**	.814**
Level of task's difficulty	.754**	.789**	.778**	.886**	.839**	.817**	.824**
Manifestation of volitional effort	.769**	.857**	.865**	.871**	.863**	.863**	.847**
Assessment of Level of Achieved Results	.689**	.802**	.821**	.784**	.751**	.833**	.763**
Self-Potential Assessment	.709**	.751**	.733**	.818**	.771**	.770**	.783**
Planned Level of Effort	.764**	.799**	.783**	.852**	.851**	.828**	.826**
The expected level of activity results	.782**	.817**	.827**	.829**	.808**	.859**	.807**
Consistency of Results	.758**	.864**	.828**	.863**	.823**	.860**	.832**
Initiative	.721**	.824**	.834**	.803**	.742**	.809**	.809**

Note: WB – well-being; A – activity; M – mood; P – performance; IS – interest in sports; WPT – willingness to perform tasks; COA – confidence in one's abilities; ** – statistical significance of $p \leq .010$ (marked in bold).

There is also a strong negative correlation between the motive of changing current activities, indicating a pronounced tendency for the athlete to stop current activities, and all indicators of the psychophysiological state. Therefore, football players experiencing fatigue are significantly more likely to seek changes in their activity or even wish to leave it. Conversely, the subjects who do not exhibit pronounced indicators of fatigue are characterized by enthusiasm for the activity process, imbuing personal significance to activity results, high levels of aspiration, willingness to perform tasks and mobilize to achieve set goals, a clear confidence in their abilities in achieving planned objectives, and they demonstrate initiative and resourcefulness for this purpose. Therefore, we can conclude that more motivated athletes have lower levels of fatigue.

Tabl. 3 presents the results of the correlation analysis in the form of a correlation matrix of motivation parameters and professional maladjustment. The matrix reflects inverse relationships between the motives for engaging in sports and indicators of professional maladjustment in the context of fatigue among the studied football players. Thus, respondents who have high indicators of emotional satisfaction from sports activities, express themselves and assert themselves in the football game, strive for their team's success and personal improvement, are highly emotional, oriented towards are highly emotional, oriented towards learning technical and tactical skills, prepare for professional sports activities, and self-improve to maintain the club's prestige,

show significantly lower indicators of impaired well-being (emotional changes, decrease in general activity, feeling of fatigue), somatic vegetative disorders, violations of the “sleep-wakefulness” cycle. Therefore, motivated football players demonstrate higher levels of work capacity.

Table 3. Correlations between indicators of dominant purposes (personal meanings) of sports activities and professional maladjustment

Parameters	EC	PIM	DGA	FF	VC	SVD
Emotional satisfaction	-.908**	-.654	-.846**	-.823**	-.823**	-.919**
Social self-expression	-.890**	-.632	-.752**	-.748**	-.759**	-.905**
Physical self-expression	-.880**	-.614	-.780**	-.708**	-.753**	-.935**
Social and emotional	-.877**	-.585	-.808**	-.707**	-.781**	-.881**
Social and moral	-.902**	-.599	-.750**	-.682	-.761**	-.896**
Achievement of success	-.925**	-.608	-.812**	-.759**	-.787**	-.893**
Sports-cognitive	-.883**	-.625	-.788**	-.706**	-.747**	-.886**
Rational-willed	-.892**	-.640	-.772**	-.733**	-.738**	-.863**
Preparation for professional activity	-.930**	-.559	-.765**	-.746**	-.784**	-.874**
Civic-patriotic	-.893**	-.591	-.811**	-.692	-.745**	-.909**

Note: EC – emotional changes; PIM – peculiarities of individual mental processes; DGA – decrease of general activity; FF – fatigue feeling; VC – violation of the “sleep-wakefulness” cycle; SVD – somatic vegetative disorders; ** – statistical significance of $p \leq .010$ (marked in bold).

Tabl. 4 demonstrates the presence of a negative functional relationship between the components of the motivational structure of football players’ personalities and the indicators of their professional maladjustment in terms of the fatigue state of the studied football players.

Table 4. Correlations between components of the motivational structure and indicators of professional maladjustment

Parameters	EC	PIM	DGA	FF	VC	SVD
Internal motive	-.817**	-.609	-.748**	-.697	-.728**	-.828**
Cognitive Motive	-.809**	-.599	-.670	-.670	-.678	-.781**
Avoidance Motive	.874**	.567	.722**	.749**	.721**	.830**
Competitive Motive	-.871**	-.600	-.827**	-.747**	-.729**	-.822**
Motive of Changing Current Activity	.818**	.502	.694	.681	.671	.848**
Self-Respect Motive	-.816**	-.588	-.731**	-.656	-.691	-.853**
Imbuing Personal Significance to Activity Results	-.862**	-.524	-.745**	-.735**	-.781**	-.805**
Level of task’s difficulty	.632	.598	.670	.710**	.667	.706**
Manifestation of volitional effort	-.841**	-.625	-.814**	-.765**	-.730**	-.825**
Assessment of Level of Achieved Results	-.813**	-.523	-.718**	-.701**	-.721**	-.738**
Self-Potential Assessment	-.862**	-.636	-.763**	-.724**	-.794**	-.826**
Planned Level of Effort	-.873**	-.560	-.761**	-.719**	-.771**	-.854**
The expected level of activity results	-.838**	-.585	-.733**	-.731**	-.663	-.819**
Consistency of Results	-.862**	-.540	-.805**	-.676	-.690	-.805**
Initiative	-.874**	-.536	-.798**	-.750**	-.744**	-.826**

Note: EC – emotional changes; PIM – peculiarities of individual mental processes; DGA – decrease of general activity; FF – fatigue feeling; VC – violation of the “sleep-wakefulness” cycle; SVD – somatic vegetative disorders; ** – statistical significance of $p \leq .010$ (marked in bold).

The established inverse correlation indicates that the studied football players, who had pronounced internal motives within their motivational structure directly related to the activity process, show significantly lower indicators of emotional changes ($r = -.817**$), significantly less often experience a decrease in general activity ($r = -.748**$), as well as a violation of the “sleep-wakefulness” cycle ($r = -.728**$) and somatovegetative disorders ($r = -.828**$). A negative bivariate relationship was determined between the cognitive motive and emotional changes ($r = .809**$) and somatovegetative disorders ($r = .781**$). Thus, respondents who show an interest in the results of sports activities significantly less often experience emotional changes and somatoform disorders.

The correlation coefficients presented in Tabl. 4 show that football players with a strong avoidance motive related to the to the evaluation of their performance significantly more often experience deteriorated well-being ($r = .874**$; $r = .722**$; $r = .749**$), somatovegetative disorders ($r = .830**$), and violation of the “sleep-wakefulness” cycle ($r = .721**$).

With the increased significance of the competitive motive among the components of the motivational structure of football players’ personalities, there are reductions in emotional changes, somatovegetative

disorders, and feelings of fatigue, and an increase in general activity, as indicated by significant negative correlations. A high positive correlation coefficient was determined between the motive of changing current activities and emotional changes ($r = 0.818^{**}$) and somatovegetative disorders ($r = 0.848^{**}$).

As we can see, players with pronounced self-esteem, which manifests in sports activities through a high level of aspirations, are not prone to emotional changes ($r = -.816^{**}$), decreased general activity ($r = -.731^{**}$), and somatovegetative disorders ($r = -.853^{**}$). Imbuing personal significance to activity results significantly reduces the probability of emotional changes ($r = -.862^{**}$), decreased activity ($r = -.745^{**}$), feelings of fatigue ($r = -.735^{**}$), violation of the “sleep-wakefulness” cycle ($r = -.781^{**}$), and somatovegetative disorders ($r = -.805^{**}$) in football players.

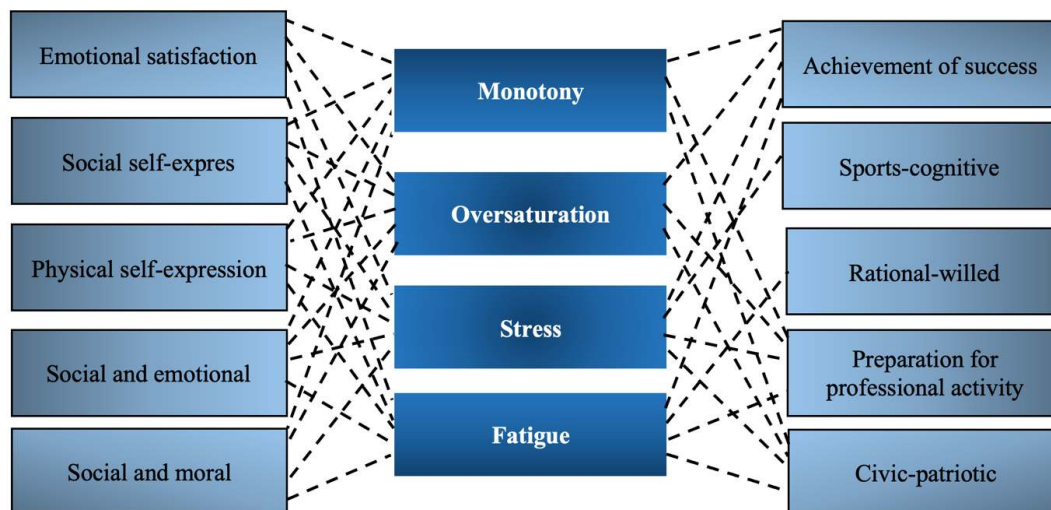
Depending on the level of task’s difficulty, indicators of professional maladjustment change. In particular, a high level of complexity of game of task’s difficulty is accompanied by a significant feeling of fatigue ($r = .710^{**}$), emotional changes ($r = -.802^{**}$), and somatovegetative disorders ($r = -.706^{**}$).

Key data for our research reveal a paradoxical relationship between the efforts exerted by the athlete and their level of performance. It is generally believed that when exerting maximum level of effort, fatigue increases and the ability to perform at the previous level is lost. However, despite fatigue, performance can be sufficiently effective due to willpower, the body’s reserve capabilities, and motivation. This is reflected in the inverse correlation between the intensity of volitional effort during sports activities and the indicators of professional maladjustment. The higher the athlete’s self-assessment of their capabilities on the field and their playing potential, the less frequently they experience deterioration in well-being, emotional, and somatovegetative disorders.

Bivariate negative correlations between the components of predictive assessments of athlete’s performance and indicators of professional maladjustment indicate that with an increase in the level of effort mobilization necessary to achieve the purpose of activity and the expected level of performance, there are significantly fewer occurrences of emotional changes, decreased feelings of fatigue, and somatovegetative disorders, violation of the “sleep-wakefulness” cycle, and an increase in general activity. This fact may indicate that predicted positive assessments of game results help athletes adapt to various manifestations of fatigue.

Significant negative correlations between the causal factors of sports activity and indicators of professional maladjustment indicate that an athlete’s understanding of their own capabilities in achieving purposes, as well as their initiative and ingenuity in solving tasks, significantly reduce the probability of emotional changes, somatovegetative disorders and increase the general activity of the athlete.

Fig. I presents the relationship between performance indicators (according to the questionnaire “Differentiated evaluation of work capacity” O. Leonova (1984)) and the “Motives for sports activities” by A. Shaboltas (2004).



Note: --- inverse correlations at $p \leq .010$.

Figure I. Correlations between indicators of differentiated assessment of performance and indicators of dominant purposes (personal meanings) of sports activities

In the process of sports activity, a state of monotony often occurs, negatively affecting the psyche and performance of a person. This tension is caused by the monotony of performed actions, the inability to switch attention, and the increased demands for its concentration. Under the influence of experiencing monotony, a person who does not know how to endure or eliminate this mental state becomes lethargic and indifferent to work. Analyzing the obtained data, it is worth noting that athletes, due to the regularity of their sports activities, have developed resilience to monotony. At the same time, it is necessary to emphasize that football is an

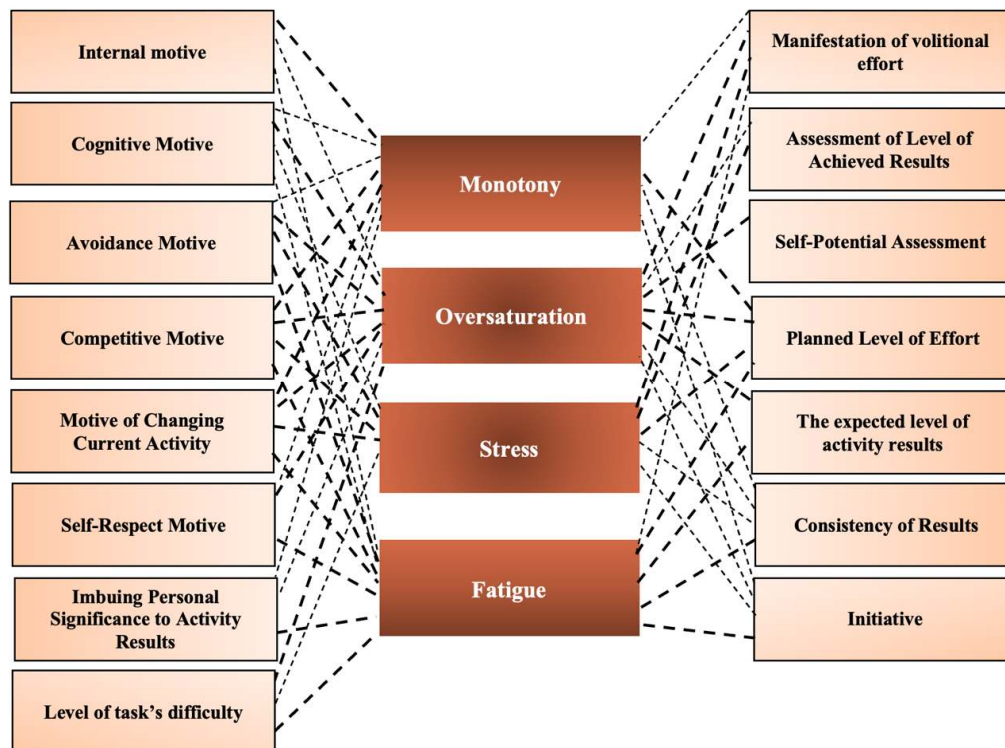
extreme, very dynamic, and tactically complex sport, and therefore the game does not involve an oversaturation of monotonous actions. Nevertheless, the results indicate a strong inverse relationship between monotony and almost all types of athlete motives, except for the sports-cognitive and rational-willed motives. Thus, the higher the level of an athlete's motivation (regardless of the dominant purposes in sports), the less likely the football player is to experience monotony.

Based on the fact that resistance to monotony can be developed, we should have obtained rather high monotony scores considering the age of the respondents. However, the development of monotony resistance is influenced not only by physical training, but also by motivation. In particular, N. Fetiskin (1993) found that in younger athletes with up to five years of experience, the desire to achieve mastery creates an increased motivation, resulting in them training enthusiastically and noticing monotony only when they are excessively tired. Athletes with more experience, despite their high levels of training, have reduced motivation (a manifestation of mental or emotional "burnout"), and they start complaining about monotony long before fatigue sets in. A strong inverse relationship has been established between overtraining and the motivation of football players. Thus, with high athlete motivation, the level of overloading does not occur. This can be achieved through properly balanced training loads and positive changes in the training process: the inclusion of new exercises, methods, and purposes, which can maintain interest and motivation.

The relationship between motivation and stress in athletes is complex and can vary depending on many factors, such as the type of motivation, intensity of stress, individual characteristics of athletes, and training and competition conditions. Our findings indicate that high motivation in football players, regardless of their dominant purposes, leads to reduced stress levels. Thus, motivated athletes experience less stress because their motivation stems from the enjoyment of the activity itself. They enjoy the process of training and competition more, which reduces psychological pressure. Their motivation contributes to greater resilience to stress and better psychological well-being.

The high indicators of the inverse correlation between football players' fatigue and their motivation can be explained as follows: athletes who are highly motivated to achieve a certain goal are often able to maintain high performance for longer, even when physically or mentally tired. Thus, high motivation can reduce the subjective feeling of fatigue, and motivated athletes can mobilize additional internal resources to overcome fatigue. This can include improved concentration, increased energy levels and reduced negative emotional reactions.

The data presented in Fig. II, illustrate the relationship between performance indicators (according to the questionnaire "Differentiated evaluation of work capacity" O. Leonova (1984)) and components of the motivational structure of the personality of football players (according to the "Assessment of the level of aspirations" (Herbachevskiy, 1990)).



Note: — — — inverse correlations at $p \leq .010$; — — — — — inverse correlations at $p \leq .050$.

Figure II. Correlations between indicators of differentiated assessment of performance and self-assessment of psychophysiological state

According to the data in Fig. II, there is a strong positive correlation between avoidance motivation and performance indicators. This means that when a football player afraid to show a low result and its consequences, he significantly more often experiences fatigue, oversaturation, and find himself in a state of monotony and stress. Similar performance results were obtained concerning the correlation with the motive of changing current activities. Thus, the stronger the desire to stop sports activities, the more pronounced monotony, oversaturation, stress, and fatigue are in the athlete. The level of task's difficulty significantly affects fatigue, oversaturation, and stress in athletes, as evidenced by the strong positive correlation. Optimizing the training process by gradually increasing complexity, varying intensity, considering individual characteristics, and including recovery procedures helps maintain high performance and reduces the risk of overfatigue.

The competitive motive has an inverse correlation with all performance indicators. Thus, a strong competitive motive often stimulates the athlete to more intensive and purposeful training. Athletes with a high level of competitive motivation strive to improve their performance, which leads to an increase in their physical and mental readiness. Accordingly, these football players significantly less often experience fatigue, oversaturation, monotony, and stress.

Significant inverse correlations were found between internal motivation and performance indicators. Therefore, with the growth of internal motivation, as the desire to do sports, which comes from internal motivations (satisfaction with the process, interest in activities, the desire for self-improvement and the achievement of personal purposes), the probability of experiencing monotony, fatigue, oversaturation, and stress decreases.

Athletes with high internal motivation often experience less fatigue because their activities bring them pleasure and satisfaction. Internal motivation contributes to a positive emotional background, which reduces mental tension and fatigue. It helps athletes overcome difficulties and maintain high performance even under high physical loads. Such athletes are more resilient to stress and can cope with fatigue thanks to a positive attitude towards the training and competition process.

Strong significant inverse relationships were formed between the cognitive motive and performance indicators. The cognitive motive characterizes an individual as someone who shows interest in the results of activities. Interest in sports activities, as a positive emotional attitude towards sports, is accompanied by a desire to actively participate in training and competitions. It helps to avoid monotony. Athletes who feel interested in their training tend to experience less fatigue because their positive emotions and engagement help maintain high energy levels. Interest in the activity contributes to faster recovery after training due to the positive emotional background. Athletes who have an interest in training usually experience less stress because they because they consider exercise as a pleasant and exciting activity. Positive emotions associated with interest in sports help to reduce the level of anxiety and improve the general psychological well-being.

It is also worth noting that the higher the level of personal significance of activity results, the lower the level of negative performance indicators. Athletes for whom results have high personal significance usually suffer less from monotony, fatigue, and oversaturation because they are motivated and focused on achieving their purposes. However, if the personal significance of results is excessive, the monotony of the training process can only be temporarily compensated, after which emotional burnout may occur.

According to the obtained data, there is a significant inverse relationship between the indicators of "consistency of results", "assessment of level of achieved results" and performance indicators. The regularity of results represents the stability and predictability of sports achievements over a certain period of time. Consistent and predictable results can reduce fatigue because athletes have a clear idea of their capabilities and can plan training loads accordingly. The consistency of results can reduce stress levels because athletes feel confident in their abilities and don't experience excessive pressure. A positive assessment of achieved results can reduce fatigue because satisfaction from achieving purposes brings positive emotions and increases motivation. This indicator also contributes to reducing stress levels, as athletes feel confident in their abilities and satisfaction from their work.

Self-esteem and assessment of one's potential play a crucial role in mental state of athletes and have a significant impact on factors such as fatigue, stress, monotony and oversaturation. This is evidenced by the results of the correlation analysis, in particular, a strong inverse relationship between these indicators. High self-esteem and a positive assessment of one's potential can reduce fatigue, as athletes feel confident in their abilities and see meaning in their efforts. Conversely, low self-esteem and doubts about their abilities can increase fatigue, as athletes may experience greater physical and emotional stress in their efforts to prove their worth.

Volitional efforts and the level of effort mobilization necessary to achieve goals are key factors influencing the condition of athletes. This is proven by the results of correlation analysis. The planned level of effort mobilization helps to distribute resources more effectively, reducing the risk of excessive fatigue, monotony, oversaturation, and stress. When the level of mobilization matches the athlete's capabilities, all these indicators are minimal.

High expectations regarding performance results can lead to increased fatigue, as athletes will try to exert maximum effort to meet these expectations. However, our study found a significant inverse relationship between performance indicators and the expected level of activity results. This may indicate sufficiently realistic

expectations of the football players that match the athlete's capabilities, therefore their fatigue, monotony, oversaturation and stress are lower, as the workload is distributed more effectively.

Initiative plays an important role in managing fatigue, stress, monotony and oversaturation in athletes. Supporting initiative, balanced planning of workloads and rest, as well as psychological support are key factors in maintaining optimal condition and motivation for athletes. Initiative athletes are less prone to monotony. This can happen due to their active search for new ways to diversify training and improve their skills. Provided that initiative is accompanied by adequate rest and recovery planning, athletes successfully prevent oversaturation. According to our findings, as the level of initiative increases, fatigue and stress indicators decrease. Indeed, the initiative helps organize training and distribute efforts more effectively, reducing fatigue. However, high initiative can also increase fatigue since initiative-driven athletes often perform additional tasks and responsibilities, which increases their workload.

According to the results of the conducted research, with the increase in football players' initiative levels, a decrease in stress levels is observed. Initiative allows athletes to control their actions and achievements, which can reduce stress associated with uncertainty and passivity. At the same time, initiative-driven athletes may experience more stress due to increased responsibility and expectations (Popovych et al., 2021; 2023c). The constant drive to show initiative and achieve results can create additional tension. Therefore, this aspect of the research requires further study.

The motivation to achieve success significantly impacts the emotional changes in athletes. Maintaining a positive emotional background, managing stress and anxiety, as well as developing resistance to failure are key elements for achieving high results and maintaining the optimal psychological state of athletes. To study the relationship between motivational orientation toward success and indicators of professional maladjustment, the professional maladjustment assessment test by M. Dmitrieva (2003) and "Motivation for success" (Ehlers, 2002) were used.

In the course of correlation analysis, a negative relationship was established between motivation for success and fatigue ($r = -.862^{**}$ at $p \leq .010$) and "somato-vegetative disorders" ($r = -.869^{**}$ at $p \leq .010$). Therefore, a high motivation for success increases the level of energy and enthusiasm, which makes it easier to endure difficulties and physical fatigue. Motivated football players are more focused on achieving goals, which helps them ignore temporary inconveniences. If an athlete enjoys their sports activities, this in itself can reduce stress and fatigue levels. Satisfaction from achieving intermediate purposes maintains a high level of motivation and reduces the perception of fatigue. Motivated individuals often set clear and achievable purposes, which helps avoid burnout. Achieving small successes stimulates and gives strength for further actions. However, it is worth noting that excessive enthusiasm for work, if accompanied by neglect of rest and recovery, can lead to burnout and severe fatigue. It is important to maintain a balance between work and rest to achieve sustainable results. Therefore, for athletes to maintain a healthy level of motivation for success, it is crucial to pay attention to a balanced regime of training and rest, stress management, and ensuring support and resources.

A negative correlation was also found between motivation for success and the "emotional changes" indicator ($r = -.870^{**}$ at $p \leq .010$). Athletes motivated to achieve success often experience satisfaction and joy when reaching their purposes. This leads to positive emotional changes, such as improved mood and self-confidence. Gradual success strengthens the athletes' confidence in their abilities and potential, fostering a positive emotional background. However, it is essential to set realistic and achievable purposes that match the athlete's level of preparation and capabilities. This helps reduce stress levels and enhance self-confidence. Gradually increasing the difficulty of tasks and goals promotes steady growth in motivation and maintains a positive emotional state.

Using data obtained from the questionnaire "Differentiated evaluation of work capacity" O. Leonova (1984) and "Motivation for success" (Ehlers, 2002), a correlation analysis was carried out. According to the results, a strong inverse relationship was found between motivation for success and oversaturation ($r = -.859^{**}$ at $p \leq .010$), stress ($r = -.845^{**}$ at $p \leq .010$), and fatigue ($r = -.895^{**}$ at $p \leq .010$). Motivation for success is a powerful driver, helping athletes overcome difficulties with great enthusiasm. Motivated athletes often exhibit high stress resilience because they find meaning in their actions and strive to achieve their purposes.

A strong correlation was found between all indicators of scaled self-assessment of psychophysiological state by O. Kokun's (2012) and motivation for success. High motivation is often accompanied by increased energy and enthusiasm. An athlete driven by purposes and ambitions may feel a surge of strength and a desire to act, which positively affects overall well-being ($r = .770^{**}$ at $p \leq .010$). Football players with high motivation for success significantly more frequently exhibit physical activity ($r = .851^{**}$ at $p \leq .010$). This may be related to their desire to maintain good physical condition, which helps them cope with workloads and achieve their purposes. Achieving set purposes and success bring feelings of satisfaction, pride, and joy. These positive emotions contribute to improving the overall emotional state and mood ($r = .847^{**}$ at $p \leq .010$).

High motivation for success in football players leads to increased productivity ($r = .805^{**}$ at $p \leq .010$). Athletes who strive for success aim to perform their tasks at the highest level. They pay more attention to details, strive for constant improvement and improvement of their skills, which positively affects the quality of their work. The relationship between motivation for success and the interest of football players is an important aspect

that influences the effectiveness and satisfaction of sports activities ($r = .819^{**}$ at $p \leq .010$). Motivation for success contributes to increasing the level of interest in training and competitive activities. When an athlete sets a clear goal and strives to achieve it, he becomes more involved in the process and exhibits more enthusiasm.

A strong correlation was also established between motivation for success and the desire to perform sports tasks ($r = .852^{**}$ at $p \leq .010$). Athletes with high motivation for success often demonstrate persistence and purposefulness in sports activities. They set specific purposes for themselves (e.g., improving personal records, winning competitions) and actively work towards achieving them. Football players motivated for success strive not only for physical development but also for the improvement of their mental and emotional qualities, which makes sports activities even more attractive.

During the correlation analysis, a strong direct relationship was established between motivation for success and self-confidence ($r = .847^{**}$ at $p \leq .010$). Motivation for success is often associated with setting and achieving specific purposes. Each achievement strengthens the football player's self-esteem and confidence in his abilities. The athlete begins to believe in his capabilities and becomes more confident in performing subsequent tasks. Motivation helps to overcome difficulties and obstacles, and the ability to cope with challenges and succeed in difficult conditions increases self-confidence.

Discussion

Modern experimental studies prove that understanding of the nature of motivation in athletes should be multifaceted. In particular, F. Rodrigues et al. (2023) emphasize the importance of considering various motivational factors to better understand the engagement of adolescent football players in sports. In the context of the discussion, attention should be drawn to a trend that was not monitored in our research, namely: the researchers have identified dynamic changes in the motivational sphere among adolescent football players during the competitive season. Internal motivation has significantly decreased, and consequently, players' satisfaction and interest in football significantly decreases by the end of the season. Although the dynamism of motives was not monitored within our study, nevertheless, there were no low indicators of the internal motivation of football players at the end of the playing season.

H. Lepschy et al. (2018) in their scientific research, identified factors that lead to success in football and performance indicators that significantly differentiate winners and losers. Among such variables, the authors singled out the following as significant: the number of goals, shots on target, ball possession, and passing accuracy/successful passes. Despite indicating the need to study psychological aspects of success, including player engagement, this was not realized. In our work, we emphasize that motivation for success, as a factor in reducing fatigue, stress, monotony, oversaturation and increasing work capacity that contributes to the successful performance of the sports task by players.

Recent research by H. Sigmundsson et al. (2022) has demonstrated that while an individual's motivational process is significantly influenced by factors such as the motivational climate, coaches, upbringing, teammates, and other social agents, the key factor in sports success is passion. They suggest that passion can set the direction for achievement. The authors argue that athletes who exhibit a high degree of passion put more effort into training and practice, as well as show greater resilience to difficulties. The advantage of the presented research is the comparison of elite football players with juniors; however, it is not clearly defined what place passion holds in the motivational structure.

Researchers who have investigated the issue of athlete motivation at an experimental level, particularly M. Ion et al. (2013), emphasize the significant role of motivational and affective factors in optimizing sports performance. Our research aligns with the authors' thesis about athlete motivation as a resource that enhances, activates, and awakens interest in sports activities. In their study, variables such as "avoidance of monotony", "emotional balance", "stress resistance", and "passion" were used, just as in our research. Similar to our study, the significant importance of internal motivation for the athlete's performance is emphasized, although it is noted that external motives need to undergo an autological transformation into internal ones.

Overall, our research aligns with the study by N. Weerakkody et al. (2013), which found that mental fatigue has a detrimental effect on the performance of specific skills in Australian football players (aerobic endurance and kicking accuracy) who need to maintain attention and concentration for extended periods before and during matches. Similar to our previous studies, a decrease in performance is observed. According to this research, this indicator can be compensatorily maintained through athletes' motivation. This could serve as an impetus for future longitudinal studies to explore the mechanisms of compensatory fatigue.

The decrease in performance and working capacity of track and field athletes during the increase in mental fatigue is also indicated by the results obtained by S. Russell et al. (2019). The researchers note that the negative impact of mental and physical fatigue is cumulative and does not manifest immediately. The progressive deterioration in the athlete's condition is especially noticeable in the psychomotor area and requires more thorough study throughout the competitive season.

Based on the analysis of contemporary research, in particular, M. Wirdnam et al. (2024), mental fatigue negatively impacts the physical and cognitive performance of ballet dancers and increases the risk of injuries. The main indicators of fatigue, as in our research, included mood, emotions, perception of effort, and

performance. Different from our results is the interesting fact that some dancers noted a positive effect of mental fatigue, suggesting it may reduce nervousness and enhance concentration during performances. Since we are talking about maintaining the efficiency of psychomotor functions, we assume this refers to the stage where fatigue is compensable. Unfortunately, the mechanisms of this positive effect were not explored by the authors.

Interesting results in the context of our study were obtained by T. Matsui et al. (2024): the researchers found that prolonged engagement in e-sports causes cognitive fatigue before the subjective feeling of fatigue appears, which aligns with the concept of compensatory fatigue. Thus, it turns out that the mechanism of fatigue is similar regardless of the type of sport, but the authors do not reveal how such compensation occurs. We assume that, as in our research, these are the motivational aspects of the activity.

A special approach to studying mental fatigue in runners is highlighted by the research of T. Pickering et al. (2024). The differentiation made by the researchers between active and passive fatigue from cognitive work is particularly interesting. The second important aspect of the study is that passively exhausting tasks lead to a decrease in motivation, although without any significant impact on cognitive or physical work. Thus, the relationship between motivation and fatigue and its manifestations requires more thorough research.

Conclusions

Compensatory phase of fatigue, as a special type of functional state of a person, temporarily occurs due to overload and leads to a decrease in the efficiency, physical performance, and cognitive functions of athletes. Compensatory phase of fatigue negatively impacts the mental and emotional state of athletes, manifesting as stress, decreased motivation, and depressive states. At the initial stage, fatigue may be imperceptible and have a compensatory nature. Fatigue compensation can occur through volitional mechanisms that stimulate task performance. High motivation can reduce the subjective feeling of fatigue.

It has been established that with an increase in the level of motivation for sports activities (emotional satisfaction, striving for physical self-expression, social-emotional, social-moral motive, achievement of success, preparation for professional activities, civic-patriotic), the indicators of psycho-physiological state (well-being, activity, mood, performance, interest, desire to perform sports tasks, confidence in one's abilities) significantly improve.

It has been proven that with the increase in the indicators of the motivational structure components of a football player's personality (internal motive, cognitive motive, competitive motive, self-respect motive, imbuing personal significance to activity results, level of task's difficulty, manifestation of volitional effort, assessment of level of achieved results, self-potential assessment, planned level of effort, the expected level of activity results, consistency of results, initiative), the indicators of psychophysiological states also increase. Football players with a pronounced avoidance motive and a motive of changing current activity exhibit poor well-being and mood, low levels of activity, performance, self-confidence, and desire to engage in sports activities.

It has been found that football players with high indicators of dominant purposes in sports have significantly lower indicators of professional maladjustment, such as emotional changes, decrease in general activity, feelings of fatigue, violation of the "sleep-wakefulness" cycle, somatic-vegetative disorders. As the aspects of the motivational sphere of football players oriented towards successful performance increase, feelings of saturation, monotony, stress, and fatigue decrease, thus increasing the player's efficiency.

Research shows that athletes with high achievement motivation are less likely to experience fatigue, somato-vegetative disorders, and are less prone to emotional fluctuations, oversaturation, and stress. At the same time, these football players demonstrate high performance in sports activities, a strong desire to achieve their purposes, confidence in their abilities and a good mood.

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