

Interdependence of emotionality, anxiety, aggressiveness and subjective control in handball referees before the beginning of a game: a comparative analysis

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Abstract:

The purpose of the article is to conduct empirical research on interdependence of the key individual psychological characteristics of handball referees before the beginning of a game; perform comparative analysis of the obtained parameters of referees with different categories and identify significant dynamic changes. The study substantiates and characterizes anxiety, aggressiveness and subjective control as important features of referees' activity, affecting objectivity of results. Research methods: retrospective critical analysis of scientific literature, psycho-diagnostic testing, purposeful observation, comparative analysis using Student's t-test, Pearson's R correlation analysis. The study outlines the primary methodological postulates and technology for measuring parameters of the phenomena under study. Results. The study presents a graphical structure of subjective control of handball referees by qualification categories. Pearson's (r) correlation analysis allowed determining interdependence of the parameters under study. Positive significant correlations were identified: between emotional stability and internality in the area of achievements ($r=.286$; $p\leq.01$); between emotional stability and internality in labor relations ($r=.278$; $p\leq.01$). Negative significant correlations were registered: between internality in the area of achievements and the parameters of aggressiveness: between inclination towards direct physical aggression ($r=-.185$; $p\leq.05$) and the level of impulsiveness ($r=-.268$; $p\leq.01$); between self-estimation of reactive anxiety and internality in labor relations ($r=-.178$; $p\leq.05$). The study substantiates that the identified list of significant correlations proves that a respondent's achievement of a higher level of qualification requires mobilization of their neural and mental efforts, a high level of subjective self-control and self-regulatory capability. Conclusions. The study emphasizes that the identified correlations of the key individual psychological characteristics of handball referees before the beginning of a game are important scientific facts in the context of the research on referees' activity. It generalizes that the acquired knowledge should be operationalized into professional qualification upgrade programs for training referees in team sports. The study highlights that the obtained scientific facts can be useful for subjects of competition process, researchers in sport psychology.

Key words: mental state, reflection, referees' activity, competition process, psycho-emotional state, sport psychology.

Introduction

Fast development of the modern amateur and professional sport, in particular, sport games, imposes strict responsibility on sport referees. First of all, a sport referee is expected to make fair decisions and act without prejudice. An educational impact of referees in a competition is very important for players, trainers, official persons and spectators. Therefore, it should not be forgotten that sport referees are educators at first, and then they are judges in a sports meeting. They are obliged to be objective and models to follow for other subjects of sports activities, instill respect for their team members and competitors into players (Volkov, 2002).

Sometimes referees' activity is considered to be secondary in sport, however, a referee's impact on competition activity, understanding between referees, sportsmen and trainers is an important component of elite sport. A referee's attitude towards a game is very important. An attitude towards a game can be divided into stages: before a game, during a game and after a game. We should pay attention to these stages, since our research is aimed at identifying important scientific facts, relating to the first of the three stages, i. e. before a game. Our research is aimed at determining interdependence between the content parameters of referees' activity and a game. E. Ilyin (2000) identified a large number of characteristics affecting a referee's activity, one of them is neural and emotional tension. Referees are important figures in sport. They are expected to be not only indifferent recorders of the course of a game and violation of the rules. Sometimes they are responsible for

determining a winner not only in an individual game, but in a championship. Sometimes spectacular effects of a match depend much on them. For instance, it is possible to make a game more intense and lose a tactical aspect of it with continuous whistles because of any bump of the players. A referee can manage the process of a game in the way that he will not be noticeable, i. e. “allow playing”, but keep the heat of a game under control (Weinberg & Gould, 2015).

In team sports referees are often accused of different things. One of the studies registers that 100.0% of trainers and 75.0% of players make objections to referees, from the teams of winners and the teams of outsiders. Referees' activity is always accompanied by scandals, protests of teams, analysis of competitions and disputable situations in mass media. It mostly concerns referees in team sports. Referees are often accused of prejudice in judgement, of injustice. Obviously, it is impossible to avoid it and many matches, for instance, in handball, give reasons for such an opinion. However, this public opinion is a psychological press for referees making them experience stress before a game (Weinberg & Gould, 2015). A referee's style is a manner dependent on their understanding of rules and techniques of a game. Some of them judge harshly, according to “language of law”, others are less strict. It is related to the fact that the rules contain a number of situations allowing a referee to make a subjective decision. This issue has many aspects causing quarrels, in many cases, between a trainer and a referee (Ilyin, 2000). It is also necessary to pay attention to referees' qualification. Qualification is important at each stage of a referee's activity. It is the qualification that affects neural and emotional state and the reaction of referees to non-sporty behavior of trainers or players. We established that referees with a higher category are more inclined to have a severe style of judgement when evaluating accuracy of players' techniques. Referees with the first category mostly do not react to trainers' criticism and seldom punish them for unethical behavior, but they react more strictly to players' comments (Volkov, 2002). The other research evidences that referees with the national category behave differently: most of them often punish both players and trainers. The style of judgement of referees with the European and International categories manifests itself in the fact that they punish players and trainers more seldom, than referees with the National category (Ilyin, 2000). We can summarize that all actions of referees correspond to their qualifications and related to certain aspects and specificity of a game situation. Accusing referees of mistakes, few people think over what a referee can see and remember being under the same stressful conditions as players and trainers (Volkov, 2002). Under high pressure, referees lose concentration and can react aggressively to active technical or tactical actions of players of the team whose trainer responded inappropriately to referees' actions. For instance, there are cases when a referee cannot see that a ball crossed a gate line and do not count the goal obvious for spectators, or do not take appropriate measures to punish a player (a yellow card, excluding a player for two minutes, a red card, a blue card). On the one hand, these situations are not considered to be essential, but everyone can make a mistake when making a decision under emotional pressure. In order to avoid it, video replays have been introduced in handball, helping referees choose appropriate punishment or solve a problem in top class competitions (Shalar et al., 2019b).

Referees with a high qualification are characterized by high intensity, i. e. aspiration to work with high tension. This characteristic is less obvious in referees who have stopped their career growth or had a break. In particular, referees with a high qualification have a higher level of intelligence than those who do not have promotion prospects. The research on intelligence characteristics shows that general awareness, abilities to generalize, determine logical connections between concepts and find logical regularities are higher in active referees, than in those who do not get promoted (Ilyin, 2000). These differences are related to the fact the activity of a referee with a high qualification differs in the volume and rate of processing information, therefore, it sets higher requirements to a referee's intelligence (Weinberg & Gould, 2015). Indirectly, these data are confirmed in the research showing that referees with a higher education degree receive referee categories more frequently than those with a high school diploma (Hryn, 2015).

Individual psychological characteristics of referees reflect uniqueness of an individual's psyche. Individual characteristics manifest themselves more vividly in temperament, disposition and abilities, in cognitive, emotional and volitional activities, needs and other processes. All these processes have an impact on referees' activity (Kuruch, 2019).

We aim at looking at one of the most important components of referees' activity – a mental state. In particular, an emotional-motivational state, as R. Weinberg and D. Gould (2015) claim, is an active state inducing an individual to take actions aimed at satisfying their needs. These actions can be oriented instinctively or fixed by experience, i.e. be conditional reflexes. An emotional-motivational state plays one of the most important roles in sport (Weinberg & Gould, 2015). While performing retrospective analysis we considered the results of the research on expected mental states in educational and professional activities (Popovych & Blynova, 2019a; 2019b; Popovych et al., 2019a), tourism (Popovych et al., 2019c), sports (Popovych et al., 2020b; 2020c; 2022), competition (Popovych et al., 2019b; 2021e), training (Cheban et al., 2020a; Strykalenko et al., 2019; 2020a) and other activities in which respondents are under extreme conditions (Mamenko et al., 2022; Popovych et al., 2021a; Solovey et al., 2020; Zinchenko et al., 2020; 2021; 2022).

When preparing for a game, referees should pay attention not only to its rules, but also to their emotional state and balance. A referee's emotional state can change in different aspects in the course of activity and affect their performance in different ways. In this case a style of judgment will change involuntarily. It may depend

directly on the reaction of spectators, trainers and players, and also indirectly on more constant factors relating to their qualification, character and temperament traits. Referees' agitation and anxiety attract attention in the context of our research. We consider agitation to be a sad and unpleasant emotional state characterized by expectation of an unfavorable course of actions, availability of negative presentiments, fear, tension and turmoil. Agitation differs from fear, since the state of agitation does not usually concern a certain object, whereas fear supposes availability of an object causing it, in particular, an individual, event or situation. At the same time anxiety is an individual's inclination to experience agitation. An individual's anxiety is mostly related to expectation of social consequences of their success or failure (Popovych et al., 2021b). Agitation and anxiety are closely related to stress. On the one hand, anxiety is a symptom of stress. On the other hand, the initial stage of anxiety determines individual stress sensitivity (Hryn, 2015: 14).

In the context of retrospective and comparative analysis, we consider interdependence of emotionality, anxiety, aggressiveness and subjective control of handball referees before the beginning of a game to be the most problematic area.

Hypothesis. We assume that the research on emotionality, anxiety, aggressiveness and subjective control of handball referees before the beginning of a game and comparative analysis will allow obtaining significant empirical results that will contribute to high-quality professional training of handball referees.

Purpose of our research is to identify interdependence of the key individual psychological characteristics of handball referees before the beginning of a game; perform comparative analysis of the obtained parameters of referees with different categories and determine significant dynamic changes.

Material and methods

Outlining the methodological foundations of the research, we should emphasize that it is necessary to pay attention to a self-regulatory capability of an individual and their ability to exert subjective control in the context of retrospective analysis of emotionality, anxiety and aggressiveness. Scientific interest consists not only in determining correlations between the key parameters of referees' activity, but also in revealing operational ability to exert subjective control, its dynamic characteristics in referees with different categories. Such articulation of the research subject induces to establish significant scientific facts related to psychology of referees' activity. Determination of correlation between the key parameters and the levels of content parameters of subjective control in referees with different categories can be very important for evaluation of referees' activity. We should highlight that it is appropriate to evaluate the level of subjective control in the situation of the respondents' pre-game readiness. It will allow accurate determination of the level of a referee's responsibility for their decisions and for the course of a game on the whole. The most important thing is that it will be done at the initial stage of a competition. Sport referees are usually differentiated by the manner they explain their decisions with regard to significant situations in a game and localize control over these situations. A referee's confidence, moderateness and objectivity are transferred to all participants of competition process through psychological mechanisms.

It is also necessary to mention that, when searching for psycho-diagnostic instruments which would reflect the research subject appropriately, we considered the methods suggested in the studies on a self-regulatory capability (Blynova et al., 2019; Halian, 2019), value-based orientations of respondents (Blynova & Kruglov, 2019; Klenina, 2019; Popovych et al., 2021g), tactical training (Popovych et al., 2021f; Shalar et al., 2019a; Strykalenko et al., 2021), excessive informational (Hudimova, 2021; Hudimova et al., 2021; Kobets et al., 2021a; 2021b) and psycho-emotional loads (Nosov et al., 2020a; 2020b; 2021a; 2021b). Special attention was paid to content parameters in the research on handball (Erdogan et al., 2014), psychological (Popovych et al., 2021c) and tactical training of handball players (Strikalenko et al., 2020b). These directions in theoretical, experimental and empirical dimensions are topical in the context of examining referees' pre-game readiness, identifying subjective control and correlation of the key parameters.

Participants. The research involved handball referees who represented different regions of Ukraine and judged women's and men's handball matches indoors, and also competitions in beach handball. 18 referees aged from 19 to 38 years took part in the research, 44.44% (n=8) of them were male and 55.56% (n=10) – female. The average age of the referees was 26.9 years (SD = 7.23). Qualification categories were represented in the following way: the European category – 4 (one referee had a break in his referee career); the National category – 4; the First category – 5; the Second category – 5 referees. Secretaries and timekeepers did not participate in the research.

Organization of research, procedures and instruments. The cross-section of the research covered 2020–2021. It allowed collecting all the necessary information by means of questionnaires and psycho-diagnostic methods, performing a large number of observations with registration of the empirical data in observation protocols. The referees agreed to participate confidentially in the research. The respondents' data were coded because of ethical issues. Confidentiality, the participants' voluntary participation and awareness allowed obtaining objective data and avoiding casual responses. In order to measure the level of the respondents' emotionality, we used the self-estimation test "Emotionality Characteristic" ("EC") (Ilyin, 2000). The questionnaire contains thirty-two questions and four scales of measurement. The scales allow measuring the following parameters of emotionality:

“Emotional Excitation” (EE), “Emotional Intensity” (EI), “Emotional Duration” (ED) and “Emotional Stability” (ES). The combination of the scales “Emotional Intensity” and “Emotional Duration” allows characterizing the respondents’ emotional responsiveness. The scale ES characterizes the impact of emotions on the efficiency of referees’ activity. We determined internal concordance of the characteristics that describe emotionality but are not an indicator of its homogeneity, by the α -Cronbach parameter being $\alpha_{CE}=.845$.

In order to determine the levels of reactive (situational) anxiety (R(S)A) and the level of personal anxiety (PA), we used the questionnaire “Scale of Reactive (Situational) and Personal Anxiety (“SRPA”) (Spielberger, 1971). The questionnaire was adapted and recommended for psycho-diagnostics of psychological parameters in sports activities by Yu. Hanin (2001). The unipolar semantic differentiated scale was used. The respondents’ responses were within: 1 – “no, this is not true” and 4 – “yes, this is absolutely true”. We determined internal concordance of anxiety characteristics by the α -Cronbach parameter being $\alpha_{SPRA}=.811$.

The levels of the referees’ aggressive behavior were measured with the method “Aggressive Behavior” (“AB”) (Ilyin & Kovalev, 2004). The method is designed for identifying respondents’ inclination towards a certain type of aggressive behavior. The method contains forty questions and the following scales: “Inclination towards Direct Verbal Aggression” (IDVA), “Inclination towards Indirect Verbal Aggression” (IIVA), “Inclination towards Indirect Physical Aggression” (IIPhA), “Inclination towards Direct Physical Aggression” (IDPhA). The fifth scale is integrating. This scale is “Level of Impulsiveness” (LI) uniting three scales: “Inclination towards Direct Verbal Aggression”, “Inclination towards Indirect Physical Aggression” and “Inclination towards Direct Physical Aggression”. The level is determined as a sum of points of the three scales. We determined internal concordance of the characteristics of aggressive behavior by the α -Cronbach parameter being $\alpha_{AB}=.832$. The next psycho-diagnostic instrument is the test-questionnaire “Level of Subjective Control” (“LSC”) (Bazhin et al., 1984). We used all the scales showing the levels of the referees’ subjective control in professional relationships, interpersonal relationships, family relationships, in the area of achievements and failures, attitudes towards health and illness. Taking into consideration the concept of integrated personality, we think that all the factors have an impact on a referee’s psycho-emotional pre-game state. The scale of general internality was not considered since it generalizes all the scales we used. Internal concordance of the characteristics of subjective control of the referees’ behavior was determined by the α -Cronbach parameter being $\alpha_{LSC}=.832$. We can state that the α -Cronbach parameters have the levels ranging from the medium level (.8) and the high level (.9) (Gottsdanker, 1978).

Statistical analysis. Mathematical processing of the statistical data was performed by means of the programs “Statistical Package for the Social Sciences” version. 24 and “MS Office Excel 2007”. The empirical parameters by the referees’ qualification categories were compared using Student’s t-test. Pearson’s R correlation analysis was used to determine significant correlations. Statistically reliable data not less than $p \leq .05$ were considered to be a significant level. Frequency descriptive characteristics of the key research parameters are given for reliability and replication of the empirical research.

Results

Tabl. 1 contains the empirical results of frequency descriptive characteristics by the self-estimation test “Emotionality Characteristic” (Ilyin, 2000). The data are differentiated by the referees’ qualification categories.

Table 1. Frequency descriptive characteristics by the self-estimation test “EC” (n=18)

Scale	Referees qualification	Arithmetic mean (M)	Mean-square deviation (SD)
Emotional Excitation (EE)	EC	3.85	.87
	NC	3.60	.85
	I	3.71	.86
	II	3.90	.87
Emotional Intensity (EI)	EC	4.82	1.19
	NC	5.01	1.21
	I	5.22	1.23
	II	5.21	1.23
Emotional Duration (ED)	EC	3.6	.85
	NC	3.7	.85
	I	3.8	.85
	II	3.3	.84
Emotional Stability (ES)	EC	2.81	.79
	NC	3.32	.84
	I	3.74	.86
	II	3.89	.87

Note: EC – referees with the European category; NC – referees with the National category; I – referees with the First category; II – referees with the Second category.

Frequency descriptive characteristics were obtained by means of the self-estimation test “EC” being within the acceptable limits with the results obtained in other research (Ilyin, 2000; Kuruch, 2019). High indexes of emotional excitation in the respondents VV and RL (the Second category) evidence a strong reaction and little

professional experience. The empirical parameters by the referees' qualification categories were compared using Student's t-test. We can state that the changes in the parameters EE, EI and ED have a positive tendency, but they are not significant ($p > .05$). It can be explained by the fact that excitation, intensity and duration of emotions have genotypic nature and are mainly innate characteristics depending on neural processes, i. e. closely related to temperament. Significant differences were identified in comparison of the indexes of ES between the referees of the II and NC ($t=2.1$; $p \leq .05$) and EC ($t=3.9$; $p \leq .01$). A similar result of differences in this parameter was registered between the I and NC ($t=2.0$; $p \leq .05$) and EC ($t=3.4$; $p \leq .01$). The differences are not significant between the referees of the II and I. Since emotional stability is capable of developing in professional activity, when qualification gets higher this index obviously increases. We can state that identification of the levels of emotional stability can play a key role in evaluation of referees. In our opinion, it is necessary to determine the limit of emotional stability for each category, and if the indexes are below it, the applicants cannot be awarded a higher qualification category. Tabl. 2 contains the empirical results of frequency descriptive characteristics by the questionnaire "Scale of Reactive (Situational) and Personal Anxiety ("SRPA") (Spielberger, 1971). The data are also differentiated by the referees' qualification categories.

Table 2. Frequency descriptive characteristics by the questionnaire "SPRA" (n=18)

Scale	Referees' qualification	Arithmetic mean (M)	Mean-square deviation (SD)
Reactive (Situational) Anxiety (R(S)A)	EC	24.10	9.12
	NC	25.96	8.34
	I	28.37	9.02
	II	29.11	9.54
Personal Anxiety (PA)	EC	27.02	8.12
	NC	26.12	8.10
	I	28.34	8.56
	II	28.22	8.51

Note: EC – referees with the European category; NC – referees with the National category; I – referees with the First category; II – referees with the Second category.

The obtained frequency descriptive characteristics by the questionnaire "SRPA" are within the acceptable limits with the results obtained in the research in the field of sport (Hudimova, 2021). Comparison of the parameters by Student's t-test shows that only in R(S)A there are significant differences between the respondents of the II and EC ($t=2.1$; $p \leq .05$). It can be explained by the fact that reactive anxiety depends on a number of situational factors and is rather respondents' agitation unlike personal anxiety. The level of professional qualification shows that reactive anxiety decreases with experience, whereas personal anxiety has changeable indexes in the course of a referee's career.

Tabl. 3 contains the empirical results of the frequency descriptive characteristics by the method "Aggressive Behavior" ("AB") (Ilyin & Kovalev, 2004). The data are differentiated by the referees' qualification categories.

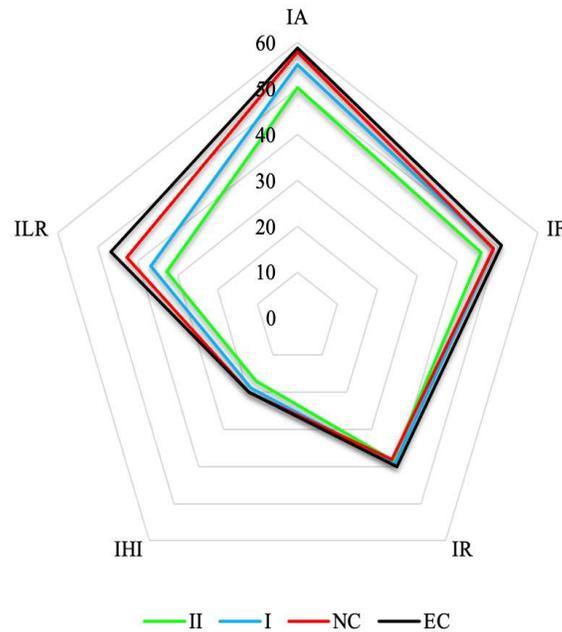
Table 3. Frequency descriptive characteristic by the method "AB" (n=18)

Scale	Referees' qualification	Arithmetic mean (M)	Mean-square deviation (SD)
Inclination towards Direct Verbal Aggression (IDVA)	EC	3.92	1.01
	NC	3.88	1.01
	I	4.12	1.11
	II	4.15	1.12
Inclination towards Indirect Verbal Aggression (IIVA)	EC	4.01	1.08
	NC	4.11	1.09
	I	4.45	1.35
	II	4.43	1.32
Inclination towards Indirect Physical Aggression (IIPhA)	EC	2.75	.91
	NC	3.12	.99
	I	2.31	.74
	II	2.11	.69
Inclination towards Direct Physical Aggression (IDPhA)	EC	1.65	.55
	NC	1.86	.56
	I	2.05	.67
	II	2.11	.69
Level of Impulsiveness (LI)	EC	2.25	.72
	NC	2.35	.79
	I	2.55	.89
	II	2.75	.92

Note: EC – referees with the European category; NC – referees with the National category; I – referees with the First category; II – referees with the Second category.

The frequency descriptive characteristics obtained with the method “AB” correspond to the results of approbation (Ilyin & Kovalev, 2004) and the data of the other research (Kuruch, 2019). Comparing the parameters by Student’s t-test we can state that in the dimension IDPhA there is a significant difference between the data of the respondents of the II and EC ($t=2.7$; $p\leq.05$); in the dimension of LI there is also a difference in the data of the respondents of the II and EC ($t=2.5$; $p\leq.05$). These results can be explained by the fact that inclination towards direct physical aggression and the level of impulsiveness are mental phenomena depending on a regulatory capability and professional growth of a referee. This dependence should be examined at the next stage for availability of a significant correlation, at this stage we can identify a significant difference and a positive tendency.

Fig. 1 presents a graphical structure of subjective control of the referees of all qualification categories based on the indexes of the arithmetic mean (M) of the parameters determined with the test-questionnaire “Level of subjective control” (“LSC”) (Bazhin et al., 1984).



Note: IA – internality in the area of achievements; IF – internality in the area of failures; IR – internality in relationships; IHI – internality concerning health and illness; ILR – internality in the area of labor relations; II – referees with the Second category; I – referees with the First category; NC – referee with the National category; EC – referees with the European category.

Figure 1. Structure of subjective control of handball referees by qualification categories

This diagram type allows visual estimation of the area formed by the connected points of the measured five parameters of subjective control. The area of the diagram formed by the connected lines evidences a self-regulatory resource of the referees within each qualification category. We should emphasize that the results are largely expected and an increase in all the parameters occurs from the II to the EC. The only exception is the parameter internality in relationships (IR) which is ($M=38.16$) in the respondents with the NC, and it is higher in the respondents with the II and I being ($M=38.36$) and ($M=39.36$), respectively. The values of internality concerning health and illness (IHI) are equal in the respondents with the NC and EC ($M=19.89$). Comparing the parameters by Student’s t-test, we can state that in the dimension IA there is a significant difference between the data of the respondents with the II and EC ($t=2.2$; $p\leq.05$); in the dimension ILR there is also a difference in the respondents with the I, II and EC being ($t=3.1$; $p\leq.01$) and ($t=2.3$; $p\leq.05$), respectively. The identified differences can be explained by the fact that internality in achievements and labor relations becomes dominant with higher qualification and there is an increase in these parameters because of some dynamics in family relationships, friendship and attitudes towards health and illness. We assume that at this stage of professional growth there can be activity of the psychological mechanism of replacement and compensation, when maximum concentration in one area causes less concentration in others.

In order to test the hypothesis and achieve the purpose of the research that the parameters of emotionality, anxiety, aggressiveness and subjective control of referees have significant correlations, we determined pair correlations in Tabl. 4.

Table 4. Ranked correlations of subjective control and parameters of referees' emotionality, anxiety and aggressiveness (n=18)

Pair correlation	r-Pearson	Level of significance
IA – ES	.286**	p ≤ .01
IA – IDPhA	-.185*	p ≤ .05
IA – LI	-.268**	p ≤ .01
ILR – ES	.278**	p ≤ .01
ILR – R(S)A	-.178*	p ≤ .05

The significant correlations obtained by means of Pearson's (r) correlation analysis evidence positive stable correlations of emotional stability with internality in the area of achievements ($r=.286$; $p\leq.01$) and emotional stability with internality in labor relations ($r=.278$; $p\leq.01$). We identified a negative significant correlation of internality in the area of achievements with the parameters of aggressiveness: inclination towards direct physical aggression ($r=-.185$; $p\leq.05$) with the level of impulsiveness ($r=-.268$; $p\leq.01$); reactive (situational) anxiety with internality in labor relations ($r=-.178$; $p\leq.05$). The identified correlations prove the fact that subjective control in the area of achievements and labor relations is in the plane of the respondents' professional qualifications.

Discussion

The obtained empirical results are related to, confirmed or disproved by the facts examined in the research on referees' activity conducted by other scientists. We took into consideration that referees' mental states are affected by emotions and temperament types, character traits, judgement styles, referees' categories and even the mood accompanying an individual in all activities. We established that focusing only on game rules in a preparation process and ignoring one's psycho-emotional state can have a negative impact and cause incoordination of functions, i. e. reduce high reliability in referees' activity (Shalar et al., 2009). The other study proves that such an attitude towards referees can accelerate mental fatigue and cause psycho-emotional exhaustion (Popovych et al., 2021d). A self-regulatory component and self-control are important in referees' preparation for a game. In particular, self-motivation determines orientation and intensity of referees' efforts to increase their operational ability and readiness to judge a competition. We established that a respondent looks for certain situations or aspires to them, or that some situations can ensure the best result. Intensity of an effort characterizes the degree of attempts made by an individual in a certain situation under certain conditions (Blynova et al., 2020; Popovych et al., 2020a).

There are no significant differences in the parameters of the respondents' emotionality: EE, EI and ED ($p>.05$) correspond to the research examining referees' temperament and outlining excitation, intensity, strength and dynamicity of neural processes in different types of referees' temperament (Kuruch, 2019).

The obtained results on reactive and personal anxiety are confirmed in the studies of the classics in the research on anxiety (Hanin, 2001; Spielberger, 1971; 1972). According to C. Spielberger (1972), the process of agitation consists of the following components: an impact of stress-causing factors in a situation of sports activities, perception of a threat and the state of agitation itself. In this way the scientist shows that mental and physiological changes in an organism occur at the stage of a sportsman's perception of a threat, prediction of a failure is a determinant of agitation (Spielberger, 1972).

A certain level of anxiety is a natural and obligatory feature of an active individual. Everyone, and especially a sportsman, is characterized by an individual optimal level of agitation at which psycho-physical abilities are maximum. "Zone of optimal functioning" of psyche is inherent in every sportsman. Efficiency of a sportsman's activity will be the best when the level of sensitivity is within this zone. For instance, according to Yu. Hanin (2001), some sportsmen will achieve their better results under conditions of the highest excitation, some – under complete relaxation, others – under moderate excitation (Hanin, 2001). Correlation of internality in labor relations with reactive anxiety ($r=-.178$; $p\leq.05$) is an empirical confirmation of the regularity of functioning of the outlined processes.

The identified list of significant correlations (see Tabl. 4) evidences that a respondent's achievement of a higher qualification level requires mobilization of their neural and mental efforts and a high level of a self-regulatory capability (Cheban et al., 2020a; 2020c). It proves that it is subjective control that allows detecting significant correlations with important individual psychological characteristics of referees. Having obtained the data on the above parameters, we can identify their correspondence to a referee's category and forecast the probability of respondents' progressing.

We can state that the research on emotionality, anxiety, aggressiveness and subjective control of handball referees before the beginning of a game and the comparative analysis with substantiation of the empirical data allowed obtaining important scientific facts. These facts will contribute to high-quality professional training of handball referees. They should be operationalized into professional qualification upgrade programs for training referees in team sports.

Conclusions

1. The obtained results of the research on interdependence of emotionality, anxiety, aggressiveness and subjective control of handball referees before the beginning of a game operationalize the procedure of solving problems of professional training and competition process.

2. The selected psycho-diagnostic instruments made it possible to involve an optimal number of scales for relevant reflection of the research subject. It allowed reflecting the content parameters of the referees' key individual psychological characteristics and creating a graphical structure of the handball referees' subjective control by their qualification categories.

3. Comparative analysis combined with Student's t-test allowed identifying all the significant differences of the parameters under study. The list of the significant differences between the respondents' categories is given below: emotional stability between the referees of the I and NC ($t=2.1$; $p\leq.05$) and EC ($t=3.9$; $p\leq.01$); emotional stability between the referees of the I and NC ($t=2.0$; $p\leq.05$) and EC ($t=3.4$; $p\leq.01$); reactive anxiety between the respondents of the II and EC ($t=2.1$; $p\leq.05$); IDPhA between the data of the respondents of the II and EC ($t=2.7$; $p\leq.05$); LI in the respondents of the II and EC ($t=2.5$; $p\leq.05$); IA between the data of the respondents of the II and EC ($t=2.2$; $p\leq.05$); ILR in the respondents of the I, II and EC equals ($t=3.1$; $p\leq.01$) and ($t=2.3$; $p\leq.05$), respectively.

4. Pearson's R correlation analysis allowed identifying positive significant correlations: between emotional stability and internality in the area of achievements ($r=.286$; $p\leq.01$); between emotional stability and internality in labor relations ($r=.278$; $p\leq.01$). Negative significant correlations were registered: between internality in the area of achievements and aggression parameters: between inclination towards direct physical aggression ($r=-.185$; $p\leq.05$) and the level of impulsiveness ($r=-.268$; $p\leq.01$); between reactive (situational) anxiety and internality in labor relations ($r=-.178$; $p\leq.05$).

5. The hypothesis was confirmed and the purpose was achieved. We can generalize that the research on the key individual psychological characteristics of handball referees before the beginning of a game allowed obtaining important scientific facts. These facts will contribute to high-quality professional training of handball referees and they should be operationalized into professional qualification upgrade programs for training referees in team sports.

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