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**INTEGRATED TRAINING OF HIGHLY QUALIFIED RUGBY
REFEREES**

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RECREATION**

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CUPRINS

Conceptual landmarks of the research.....	4
The content of the thesis.....	9
General conclusions and recommendations.....	26
Bibliography.....	29
List of the author's publications on the subject of the thesis.....	32
Annotation (Romanian and English).....	33

LISTĂ ABREVIERI

WR — World Rugby

L1 — Level 1 / Level 1 referee training

L2 — Level 2 / Level 2 referee training

L3 — Level 3 / Level 3 referee training

TMO — Television Match Official / video match official

CPD — Continuing Professional Development

IRB — International Rugby Board

Yo-Yo IR — Yo-Yo Intermittent Recovery / test for assessing intermittent exercise capacity

ARs — Assistant Referees

R.O.D.A.A.R. — Regulation on the Organization and Conduct of Rugby Refereeing Activities

T0 — initial testing point

T1 — intermediate testing point

T2 — final testing point

CONCEPTUAL LANDMARKS OF THE RESEARCH

Relevance and significance of the research topic. Modern rugby is characterized by a high pace of play, a high frequency of contact situations, and increasing demands related to player safety, continuity of play, and the accuracy of refereeing decisions. Under these conditions, the activity of the rugby referee has become increasingly complex, requiring not only knowledge and application of the Laws of the Game, but also the ability to move efficiently, position correctly, rapidly interpret game situations, communicate clearly, and appropriately use official referee signals.

During a match, the referee must simultaneously monitor the development of play, assess the materiality of infringements, apply advantage, manage risks arising from contact situations, and cooperate with the assistant referees and the TMO, while maintaining a consistent decision-making approach [11, 31, 42]. The multi-phase nature of rugby, reflected in set pieces, breakdowns, transitions, and open play, requires continuous monitoring of key elements such as the offside line, legal entry into contact situations, tackle safety, scrum stability, and the correct management of the lineout [2, 4, 7, 43].

In this context, the training of highly qualified rugby referees must be directly aligned with the actual demands of competitive activity. Training based exclusively on learning the Laws of the Game or on accumulating refereeing experience is no longer sufficient to maintain a high and consistent level of performance. It is therefore necessary to organize a training process in which the physical, theoretical-applied, decision-making, signalling, and communication components are developed in an integrated manner, under conditions that are as close as possible to real game situations.

Description of the current state of research and identification of the research problem. The issue of referee training should be examined in relation to the overall development of high-performance sport and the specific demands of modern competition. In the specialized literature, integrated training is approached as a process of harmonizing the main components of preparation in accordance with competitive demands. This perspective is reflected in the works of N. Alexe [1], T. Bompá [3, 15], V. Tabîrța [6, 7, 10], D. Tachii and A. Budevici-Puiu [8], V. Platonov [9], A. R. Khairulin and O. G. Epov [12], B. N. Shustin [13], C. K. Argus et al. [14], T. J. Gabbett [17], Y. Verkhoshansky [35], F. Vilches [26], and I. Vozzhov [27]. These authors emphasize the need to correlate physical, technical, tactical, psychological, and cognitive preparation according to the specific requirements of high-performance activity.

When applied to refereeing, this perspective acquires a distinct meaning. Refereeing does

not involve performing the technical and tactical actions specific to athletes, but rather observing, interpreting, and controlling them in real time, under conditions of physical exertion and decision-making pressure. R.-A. Diaconescu and N. Bragarenco [4], L. J. Moore et al. [21], B. C. Motter and D. A. Simoni [22], C. Pompilio [24], J. M. Tassi [25], and T. Webb [28] highlight the importance of physical, perceptual-cognitive, decision-making, and communication training in refereeing activity. These studies confirm that officiating performance results from the interaction of several components of preparation rather than from a single isolated dimension.

An important component is knowledge and application of the Laws of the Game. Rugby regulations comprise a large number of definitions, provisions, and sanctions, which referees must interpret correctly in dynamic and often ambiguous situations [31, 37]. Theoretical-applied training cannot be reduced to memorizing regulatory provisions, but must aim at transferring them to real game situations, where decisions are made within a very short time and under pressure.

Another important area is the physical preparation of referees. Research focusing on the activity of match officials shows that they perform repeated movements, changes of direction, accelerations, and sprints throughout the match [18, 19, 23]. M. D. Jeffriess [18] emphasizes the need to analyse refereeing in terms of interconnected physical, technical, and perceptual-cognitive demands, while data concerning the intermittent nature of physical effort confirm the need for physical preparation adapted to the specific requirements of officiating.

Positioning and observational ability are also essential factors for the quality of refereeing decisions. The referee must maintain favourable viewing angles in relation to set pieces, breakdowns, and open play, which requires continuous repositioning and anticipation of the development of play [4, 5, 22, 23, 31]. Studies on perceptual-cognitive processes show that the speed of receiving and processing visual information, the functional visual field, and the ability to select relevant cues directly influence the interpretation of game situations [20, 21, 22]. At the same time, signalling and communication contribute to the clarity of decisions and to maintaining control of the game [11, 12, 31].

Successive amendments to the Laws of the Game, the development of TMO and Bunker procedures, and the increased emphasis placed on player safety have led to the growing complexity of the referee's activity [32, 36, 37, 39, 40]. In parallel, international training systems structured according to World Rugby Levels 1–3 aim at the progressive development of refereeing competencies through courses, assessment, mentoring, and video analysis [41].

In Romania, referee training is coordinated by the Romanian Rugby Federation through the Central Referees Commission and specialized training structures [29, 30]. The national system is methodologically aligned with the World Rugby framework at entry level; however, continuity

towards higher levels and the systematic use of mentoring, video analysis, and progress monitoring are less consistent. This situation highlights the need for a training approach capable of more closely correlating the components of preparation with the specific demands of competitive activity.

Research problem. The analysis of the specialized literature and referee training practice reveals a discrepancy between the complexity of the demands of modern rugby refereeing and the still fragmented nature of referee preparation. Although physical preparation, knowledge of the Laws of the Game, positioning, communication, signalling, and decision-making are addressed in the specialized literature and in training systems, they are less frequently brought together within a unified programme directly related to actual competitive demands.

At the same time, continuity of training, access to higher levels of preparation, the use of mentoring, video analysis, and progress monitoring are not applied consistently, which may lead to differences in decision-making consistency and officiating quality.

Under these conditions, the research problem consists in identifying, substantiating, and validating a methodological solution for the integrated training of highly qualified rugby referees by correlating the physical, theoretical-applied, decision-making, signalling, and communication components with the actual demands of competitive activity, with a view to increasing decision-making consistency and improving the quality of officiating.

Object of the research is the process of integrated training of highly qualified rugby referees in relation to the requirements of competitive activity.

Purpose of the research is the development and experimental validation of an integrated training programme for highly qualified rugby referees.

Research objectives. In order to achieve the purpose, the following objectives were proposed:

1. Analysis of the theoretical and methodological framework of the integrated training of highly qualified rugby referees.
2. Assessment of the level of rugby referees' training and of decision-making consistency in competitive activity.
3. Development and implementation of the experimental integrated training programme for highly qualified rugby referees.
4. Experimental verification of the effectiveness of applying the integrated training programme to highly qualified rugby referees.

Research hypothesis. It was assumed that the application of an experimental programme focused on the integrated training of rugby referees would make an essential contribution to

improving the quality of their officiating under real competitive conditions.

Research methodology. The research approach was structured in several stages so that the theoretical data, findings from competitive activity, and experimental results could be analysed together. Depending on their role in the research, the methods used were grouped into three directions:

- *The theoretical dimension* included the study of specialised literature, methodological documents, regulations, and materials concerning the training and activity of rugby referees. The selected information was analysed and related to the current requirements of high-performance refereeing;
- *The experimental dimension* included pedagogical observation, questionnaire survey, analysis of competitive activity, assessment of physical training, verification of knowledge of the Laws of the Game, and the pedagogical experiment. The questionnaire, administered to 104 rugby specialists, provided data on how the training of referees in Romania and its components are assessed.
- *The statistical dimension* focused on processing the data obtained at the different stages of the research and comparing the results. The calculated values were used to assess the dynamics of the monitored indicators and were presented synthetically in tables and figures.

The experimental sample consisted of:

12 highly qualified rugby referees included in the experimental integrated training programme. The referees were active in competitions and completed the assessments provided for in the research, being monitored under the same methodological conditions throughout the intervention. The analysis focused on the changes occurring in physical training, knowledge of the Laws of the Game, and decision-making activity carried out under competitive conditions.

The scientific novelty and originality of the research consist in:

- the development and experimental validation of a training approach intended for highly qualified rugby referees, based on the integration of the physical, theoretical-applied, decision-making, gestural, and communication components;
- the organisation of these components as interdependent parts of the training process, with constant reference to the specific requirements of officiating activity;
- the structuring of training by correlating physical effort with the application of the Laws of the Game, positioning, communication, signalling, and the decision-making process;
- verification of the effects of the integrated training programme under real competitive conditions by monitoring the changes occurring in decision-making consistency, the quality of

officiating, and the frequency of refereeing errors.

The scientific problem solved consisted in identifying and substantiating a methodological solution for optimizing the training of highly qualified rugby referees, under conditions in which the modern game requires a closer correlation between physical effort, applied knowledge of the Laws of the Game, positioning, communication, and decision-making. Solving this problem made it possible to structure a training intervention aimed at increasing decision-making consistency, improving the quality of officiating, and reducing refereeing errors in competitive activity.

The theoretical significance of the thesis is determined by the further development of the conceptual and methodological framework regarding the training of highly qualified rugby referees, by relating integrated training to the specific nature of refereeing activity. The research argues that referee performance cannot be explained solely by knowledge of the regulations or by the level of physical preparation, but by the coordinated functioning of the physical, theoretical-applied, decision-making, gestural, and communication components in the real context of the game. Through this approach, the thesis broadens the theoretical perspective on refereeing in rugby, highlighting the relationship between integrated training, decision-making stability, and the quality of officiating.

The applied value of the thesis lies in the possibility of using the developed programme in the training, professional development, and assessment of highly qualified rugby referees. It provides practical guidelines for organising the content of physical, theoretical-applied, decision-making, gestural, and communication training, as well as for monitoring referees' progress in relation to the demands of competitive activity. Through its structure, the programme can support the improvement of officiating quality, the reduction of refereeing errors, and the standardisation of certain training and assessment procedures within the structures responsible for the development of match officials.

Implementation of the research results. The research results were implemented in the training and professional development process of highly qualified rugby referees and may serve as a methodological reference for organising and assessing the training of highly qualified referees. The results obtained may be used by federations, refereeing commissions, and training structures as methodological support for organising, monitoring, and assessing referee training.

Publications on the thesis topic: During the research, 10 scientific articles were published in specialised journals indexed in international databases, as well as in the proceedings of scientific conferences.

Volume and structure of the thesis: the thesis comprises 136 pages of main text, including the introduction, 3 chapters, general conclusions, recommendations, a bibliography containing 175 cited sources, and 11 appendices. The thesis includes 15 tables and 35 figures.

Keywords: rugby referee, integrated training, competitive activity, decision-making consistency, quality of officiating.

THESIS CONTENT

In the Introduction, the relevance and importance of the issue addressed were presented, the current situation in the research field was described, and the research problem was formulated, together with the object, purpose, and objectives of the research. The research hypothesis, the methodology used, the scientific novelty and originality, the current scientific problem solved, the theoretical significance and applied value of the thesis, the implementation and approval of the research results, the publications on the thesis topic, the volume and structure of the thesis, as well as the keywords, were also presented.

In Chapter 1, entitled „*Theoretical Foundations of the Integrated Training of Highly Qualified Rugby Referees*”, the theoretical and methodological reference points explaining the specific features of rugby referee training, the changes in officiating activity resulting from the evolution of the Laws of the Game, and the ways in which these requirements are reflected in training systems at international and national levels are analysed.

A first reference point is the functional profile of the rugby referee. Research devoted to match officials shows that their performance is simultaneously influenced by physical capacity, positioning, visual perception, anticipation of play, and speed of decision-making. Moore L. J. et al. [21] address the perceptual-cognitive component of refereeing, highlighting the role of selecting relevant information and rapidly processing stimuli in competitive situations. Motter B. C. and Simoni D. A. [22] pay particular attention to the relationship between perception, positioning, and decision quality, while Tassi J. M. [25] and Webb T. [28] analyse refereeing from the perspective of the competencies required to maintain consistency under pressure.

Physical demands represent another important dimension of refereeing activity. Studies on rugby match officials highlight the intermittent nature of physical effort, the alternation of movements performed at different intensities, and the need to repeatedly perform accelerations, sprints, and changes of direction [19, 23]. Jeffriess M. D. [18] shows that the analysis of refereeing must consider physical, technical, and perceptual-cognitive demands together, since the position from which play is observed depends directly on the referee's ability to move and reposition

efficiently.

From this perspective, positioning is not merely a matter of movement, but a mechanism through which the referee gains access to relevant information. Maintaining a functional distance from play and selecting a favourable viewing angle influence the assessment of contact situations, offside lines, and the legality of actions in the ruck, maul, lineout, or scrum [4, 21, 23]. Effective positioning requires anticipation of the development of play and repositioning before the critical area of play becomes visually inaccessible.

The theoretical-applied component is related to the referee's ability to transform knowledge of the Laws of the Game into a decision appropriate to the context. The Laws do not operate exclusively with fixed situations, and the same infringement may have different consequences depending on its materiality, the existing advantage, and its effect on the continuity of play. For this reason, theoretical training must be complemented by scenarios, video analysis, and examination of real game situations. Post-match analysis and feedback processes are used precisely to compare the referee's interpretation with the criteria applied at performance level [38].

Communication and signalling also occupy a distinct place. Referee signalling serves to make decisions understandable to players, coaches, and spectators, while verbal communication is used both preventively and for explaining and managing phases of play. In a game characterized by frequent contact situations and rapid transitions, clarity of communication can contribute to reducing repeated infringements and maintaining control without excessive interruptions.

An important change in refereeing activity has been determined by the evolution of the Laws of the Game and the standardization of their application. The amendments introduced in recent years have aimed not only at more accurate sanctioning of infringements, but also at player safety and maintaining continuity of play. Procedures related to head contact, revisions to scrum management, clarifications concerning the ruck, and the increased emphasis on offside have changed the referee's observation and intervention reference points [32, 37, 40].

Video technology has added another dimension to the decision-making process [42]. The amendment of the TMO protocol was aimed at achieving faster and more accurate decisions [36], while the introduction of the Bunker procedure separated the detailed review of certain phases of play from the immediate continuity of the match [39]. These tools provide support to the referee, but also require additional competencies in communication, information selection, and the clear delimitation of responsibilities among match officials.

The Law Application Guidelines and Shape of the Game documents have also contributed to standardizing officiating priorities. They emphasize ruck management, offside control, safety in contact situations, and the reduction of unnecessary delays [37]. Consequently, referee training

must focus not only on knowledge of the text of the Laws, but also on understanding how they are prioritized and applied during a particular competitive period.

In international practice, however, the application of the same Laws acquires particular features determined by competitive traditions and the way training is organized. A comparison of the models used in France, New Zealand, England, and Romania highlights differences regarding the role of the referee, the level of intervention, the use of preventive communication, the approach to continuity of play, and the use of video analysis. The French model places greater emphasis on control and prevention, the New Zealand model prioritizes flow and minimal intervention, while the English system emphasizes standardization, consistency, and systematic performance assessment. In Romania, training priorities are oriented towards strengthening refereeing technique, physical preparation, communication, and consistency of interpretation.

The differences between these models show that referee development is determined not only by participation in courses, but also by the existence of a support system after certification. In this regard, match observation programmes, periodic assessments, feedback, and mentoring serve to connect initial training with actual competitive activity [16, 33, 38, 41].

At international level, World Rugby organizes training through a progressive sequence of levels. Level L1 provides the foundation required for understanding the referee's responsibilities and applying fundamental procedures; L2 develops competencies in positioning, game management, and performance analysis; L3 is intended for officials progressing towards higher performance levels and involves a more in-depth approach to game management, analysis, and professional development.

However, comparison of national systems shows that access to this pathway is not identical. Some federations have a complete structure, with internal pathways aligned with World Rugby levels and consistent mechanisms for mentoring and assessment. In other systems, access to advanced levels depends more heavily on selection, opportunities provided by the international federation, and the availability of accredited educators. Rugby Australia, for example, structures the development of officials through a national framework dedicated to their training and progression [34], while the Rugby Football Union uses distinct tools for the development and assessment of match officials [33].

In Romania, training is organized through the Romanian Rugby Federation and the structures responsible for refereeing activity. The system follows a progression through internal levels and uses elements of the World Rugby framework; however, progression towards advanced training does not have the same continuity as in systems with complete development pathways. For this reason, practical experience, match assessment, and professional development activities

acquire particular importance in referee development.

The analysis of training models thus highlights two complementary requirements. The first concerns the existence of a clear progression from basic training to performance level. The second concerns continuity between the course, ongoing training, and officiating activity. In the absence of such continuity, competencies developed separately may remain insufficiently transferred into the game.

Therefore, rugby referee training should be regarded as a continuous process in which initial training is complemented by specific physical preparation, analysis of game situations, positioning exercises, decision-making scenarios, communication, signalling, and performance feedback. This perspective provides the methodological basis necessary for moving from the theoretical analysis of refereeing activity to the concrete assessment of the level of preparation and decision-making behaviour in competition.

In Chapter 2, entitled „*Methodological Framework and Comparative Assessments (Opinions, Competitive Activity, International Benchmarks) Regarding the Training of Rugby Referees*”, the results of the diagnostic stage of the research are presented, obtained through the analysis of specialists’ opinions, the assessment of referees’ competitive activity, and the comparison of physical and signalling demands in different competitive contexts. The data collected made it possible to identify the components of training that require increased attention and to formulate methodological reference points for optimizing the training process of highly qualified rugby referees.

To analyse opinions regarding the level and content of referee training in Romania, a digital questionnaire was administered to 104 specialists. The sample included active referees officiating matches in national championships at different age categories, referee trainers and educators, as well as federation managers involved in the organization of rugby competitions. The instrument comprised 15 questions concerning the level of referee training in relation to international standards, the components of training, difficulties in interpreting the Laws of the Game, physical preparation, positioning, signalling, communication, and strategies considered effective for developing decision-making ability.

An initial finding concerned the assessment of the overall level of referees in Romania. Of the respondents, 55.8% considered that their training met international standards, 34.6% considered that the level met them only partially, while 9.6% indicated a level insufficient for officiating international matches. The results reflect a generally favourable assessment, but also highlight the existence of differences in the level of referee training.

With regard to the components of training that can ensure a higher level of performance

during match officiating, 86.5% of the specialists indicated the interpretation of game situations and decision-making, 64.4% physical preparation, and 61.5% knowledge of the Laws of the Game. Communication was mentioned by 48.1% of the respondents, while positioning and movement on the field were indicated by 44.2%. These results place the decision-making component at the centre of training, in direct relation to physical level and the correct application of the Laws (figure 1).

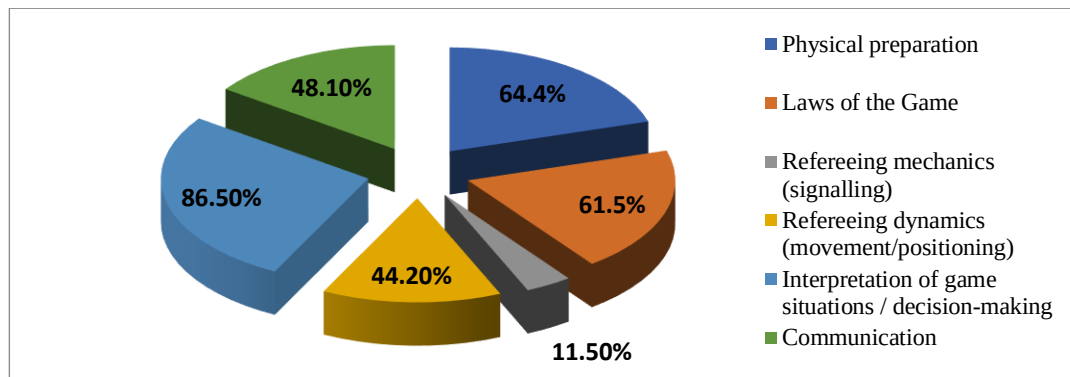


Fig. 1. Components of rugby referee training that can ensure a higher level of performance during match officiating

In terms of physical preparation, endurance was indicated by 84.6% of the respondents, coordinative abilities by 63.5%, and stamina by 51.9%. The specialists' responses reflect the characteristics of refereeing activity, which is marked by repeated movements, changes of pace, and successive repositioning throughout the match.

The analysis of difficulties related to knowledge and interpretation of the Laws of the Game revealed higher values for Law 9 – Foul Play, indicated by 63.5% of the respondents, Law 19 – Scrum, with 61.5%, and Law 15 – Ruck, with 59.6%. Difficulties were also reported regarding offside, tackle, maul, lineout, and situations in which players are on the ground. The frequency of these responses shows that phases involving a high density of contact and several possibilities of interpretation require more in-depth theoretical-applied training.

In terms of communication, 48.1% of the respondents considered that a highly qualified referee should combine communication based on the application of the Laws of the Game with clear and convincing expression and elements of instructional communication. Communication is thus associated not only with conveying the decision, but also with managing player behaviour and preventing repeated infringements.

In developing interpretation and decision-making competencies, 96.2% of the specialists indicated knowledge and correct application of the Laws of the Game, while 69.2% indicated the analysis of official matches and the discussion of game situations together with experienced referees (figure 2).

Feedback provided by officials or colleagues was mentioned by 48.8% of the respondents,

mentoring by 42.3%, and the analysis of game situations using information technologies by 40.4%. The results support the use of training methods based on real situations, applied analysis, feedback, and reflection on decisions.

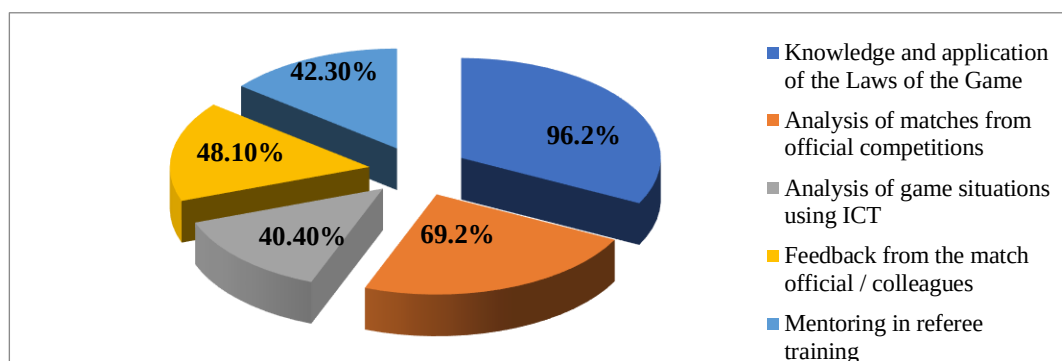


Fig. 2. Effective strategies for developing competencies in interpreting game situations and decision-making

The *analysis of competitive activity* focused on the main situations in which the referee must observe, interpret, and decide: penalties, passes, kicks from hand, scrums, lineouts, rucks, mauls, and cards. Twelve matches from the 2023 Rugby World Cup, 12 matches from the 2022–2023 European Nations Championship, and 12 matches from the Romanian Championship from 2019 to May 2023 were analysed, for a total of 36 matches.

The comparison highlighted differences between the three competitive contexts. The highest values were recorded for rucks, with averages of 151.00 phases per match at the Rugby World Cup and 151.58 phases per match in the European Championship, compared with 120.00 phases per match in the Romanian Championship.

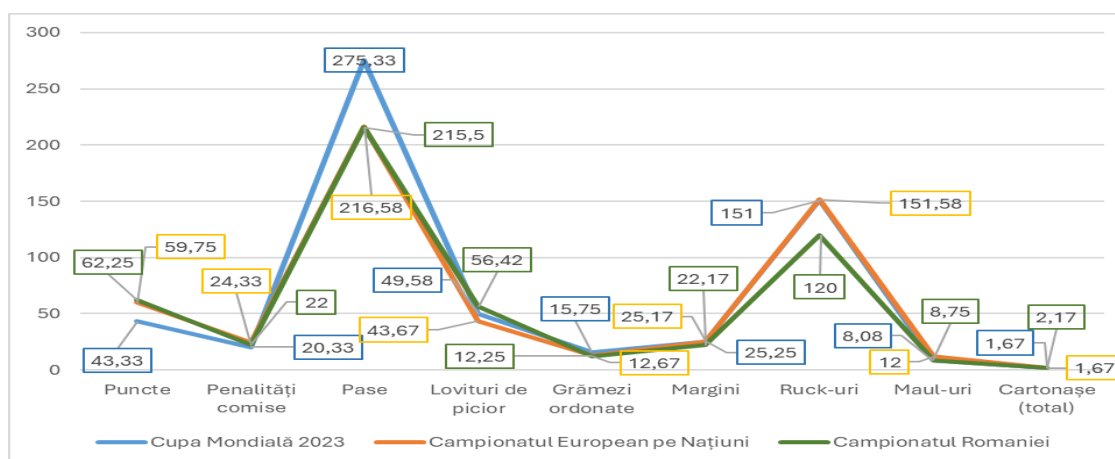


Fig. 3. Comparison of game indicators in national and international rugby competitions

In the European Championship, an average of 24.33 penalties per match was recorded, compared with 20.33 at the Rugby World Cup. The Romanian Championship was characterized by a higher number of kicks, with an average of 56.42 per match, compared with 49.58 at the Rugby World Cup and 43.67 in the European Championship. The average number of cards was

2.17 per match in the domestic competition and 1.67 in the two international competitions (fig. 3).

The structure of these indicators shows that decision-making demands differ according to the profile of the competition. The high number of rucks involves repeated interventions regarding legal entry into the phase, contesting the ball, player positioning, and offside lines. At the same time, the frequency of kicks requires rapid repositioning and control of transitions, while penalties and cards require the application of consistent criteria regarding the severity, materiality, and recurrence of infringements.

Therefore, the volume of a phase reflects not only its frequency, but also the number of situations in which the referee must select relevant information and make a decision within a short period of time. Maintaining consistent interpretation criteria throughout the match thus becomes an essential component of decision-making consistency.

The analysis of motor activity complemented these findings by highlighting the movement characteristics of the referee and assistant referee in the three competitive contexts. In the case of the referee, the total number of high-speed running sequences was 72.7 per match at the Rugby World Cup, 59.3 in the European Championship, and 65.5 in the Romanian Championship. Most movements were performed over short and medium distances, which confirms the need for frequent repositioning in relation to the succession of phases of play (figure 4).

This structure of physical effort shows that the referee must be able to repeat accelerations and changes of direction without reducing the ability to observe and interpret. Favourable positioning depends not only on knowledge of movement routes, but also on the ability to reach, in time, a position from which the phase can be correctly assessed.

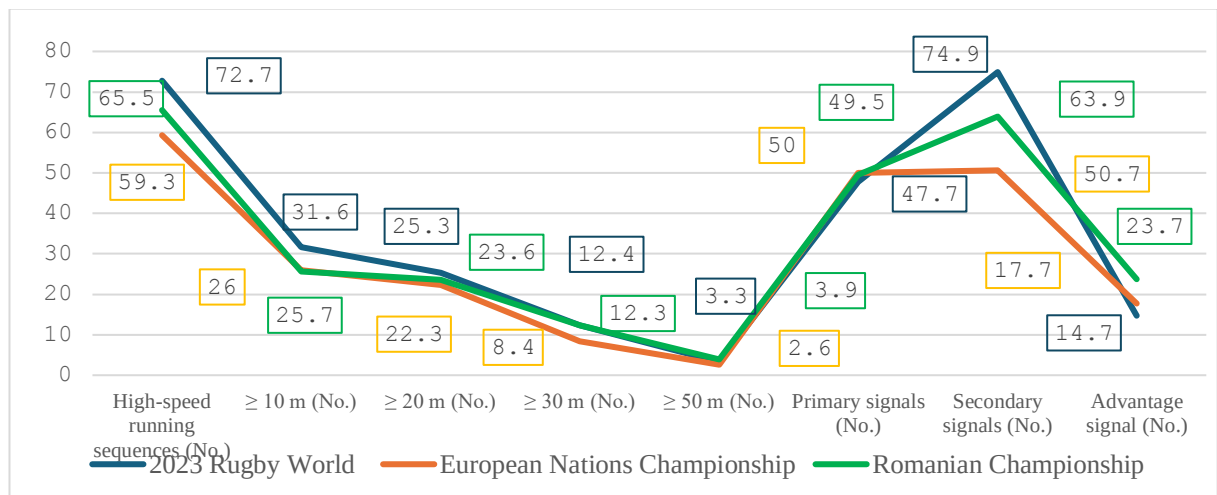


Fig. 4. Motor demands of the referee in matches from the Rugby World Cup, European Championship, and Romanian Rugby Championship

Signalling activity overlaps with these demands. At the Rugby World Cup, an average of 47.7 primary signals, 74.9 secondary signals, and 14.7 advantage signals per match were recorded.

In the European Championship, the values were 50.0 primary signals, 50.7 secondary signals, and 17.7 advantage signals, while in the Romanian Championship they were 49.5, 63.9, and 23.7, respectively. Thus, movement, observation, decision-making, communication, and signalling do not occur successively as independent activities, but are combined within the same officiating sequence.

For the assistant referee, the profile of physical demands shows different characteristics. The total number of high-speed running sequences was 59.4 per match at the Rugby World Cup, 52.4 in the European Championship, and 42.9 in the Romanian Championship. A distinctive characteristic is the frequency of long-distance movements. At the threshold of at least 50 m, averages of 12.5 sequences were recorded at the Rugby World Cup, 13.0 in the European Championship, and 11.8 in the domestic championship (figure 6).

The similar values for runs of at least 50 m confirm the specific nature of the assistant referee's activity, as the official must maintain alignment with play, follow rapid transitions along the touchline, and preserve the conditions required for correct signalling. In this case, the ability to sustain longer movements must be associated with maintaining attention and rapidly transmitting information to the referee.

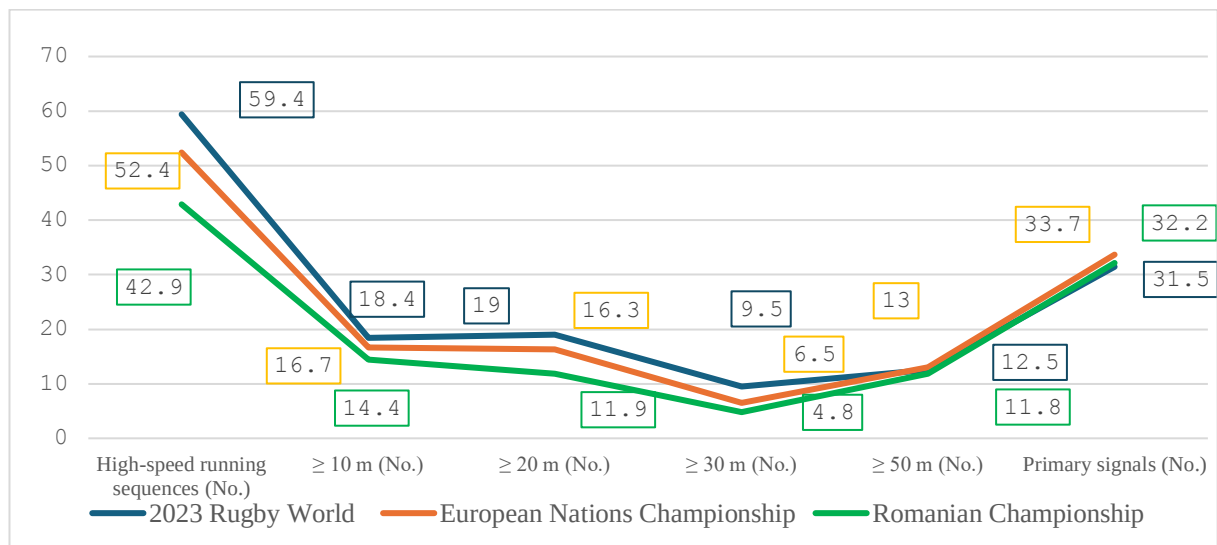


Fig. 5. Motor demands of the assistant referee in matches from the Rugby World Cup, European Championship, and Romanian Rugby Championship

The comparative results therefore highlight different functional profiles within the same officiating team. The referee is predominantly exposed to short- and medium-distance repositioning, with repeated changes of direction and movement close to contact phases, while the assistant referee more frequently performs long-distance movements dictated by the progression of play along the longitudinal axis of the field. These differences must be taken into account when organizing specific physical preparation and selecting the exercises used.

The analysis of the results concerning specialists' opinions, decision-making activity, and motor demands was complemented by comparison with the World Rugby L1–L3 training programmes (Table 1). The extent to which the critical dimensions are reflected shows that training progresses from the development of basic competencies related to the Laws, safety, positioning, and communication towards activities involving the interpretation of complex situations, performance analysis, pressure management, and the maintenance of decision-making consistency.

Table 1. Degree of representation of critical dimensions in rugby referee training programmes (L1–L3)

Critical dimensions	Level 1	Level 2	Level 3	Observations
1. Visual perception and positioning	Partial	Partial	Partial	Positioning recommendations are provided, but systematic training of perceptual-cognitive skills is lacking.
2. Decision-making consistency and application of the Laws	Partial	Partial	Partial / Present	The Laws of the Game are covered, but standardized practice through video simulations and uniform feedback is lacking.
3. Psychological preparation and emotional control	Absent	Absent	Partial	There are no formal modules for managing stress, tense moments, mental refocusing, and awareness of errors in perception and interpretation.
4. Operational communication within the officiating team	Partial	Partial	Partial	General protocols exist, but microcommunication standards are lacking: short phrases, confirmations, and limits on communication time.
5. Game management and integrity	Partial	Partial	Partial	There is no formal progression pathway for referee intervention: prevention – warning – sanction; education regarding interpretation errors is addressed only marginally.
6. Physical preparation and competitive hygiene	Partial	Partial	Partial	Fitness testing is present, but methodological guidance is lacking regarding the integration of repeated effort with cognitive tasks, nutrition, recovery, and adaptation to travel.
7. Performance analytics and reflection	Absent	Partial	Partial	Observation is present, but common performance indicators and a standardized debrief format are not defined.

The results of the analysis showed that the main components required for officiating are present in the training programmes, but the degree of their development and the way in which they are correlated differ from one stage to another. The traditional components – knowledge of the Laws of the Game, positioning, communication, and physical preparation – are well represented, while decision-making under pressure, psychological control, video analysis, post-match reflection, and the simultaneous integration of multiple demands require clearer methodological organization.

Based on these findings, the methodological requirements that guided the design of the experimental integrated training programme were formulated:

I – Integration of the training components within the same training structure. The physical, theoretical-applied, decision-making, psychological, signalling, and communication components

are addressed in a functional relationship.

II – Relating the content to situations specific to the game of rugby. The tasks are structured around phases and situations that frequently require referee intervention.

III – Progressive dosing of training tasks. Complexity increases gradually, from controlled situations to decision-making after physical effort and under competitive pressure.

IV – Differentiation of content according to the role performed within the officiating team. The tasks are adapted to the specific characteristics of the referee and the assistant referee.

V – Control, feedback, and continuous regulation of training. Testing, observation, video analysis, and feedback are used to monitor progress and adjust the tasks.

These reference points made it possible to orient the content towards the demands actually observed in competitive activity. Physical preparation was related to the real profile of movements, the application of the Laws of the Game to phases that present difficulties of interpretation, and decision-making training to situations in which positioning, physical effort, communication, and time pressure act simultaneously.

The correlation of the diagnostic data thus provided the basis for selecting and organizing the means subsequently included in the experimental integrated training programme for highly qualified rugby referees.

In **Chapter 3**, entitled *„Experimental Validation of the Effectiveness of the Training Programme for Highly Qualified Rugby Referees”*, the applied part of the research is presented, within which the experimental integrated training programme intended for highly qualified rugby referees was developed, implemented, and evaluated. The programme was constructed by correlating the physical, theoretical-applied, decision-making, signalling, and communication components and by relating them to situations encountered in actual officiating activity.

The experimental programme was integrated into the 2023–2024 annual training plan. The training basis of the intervention was concentrated in two mesocycles, each consisting of six microcycles, with three training sessions per week and refereeing practice at weekends. During the other periods of the annual plan, the referees continued their competitive activity, and the matches officiated were used for applying the practised content, observation, analysis, and feedback.

In the first stage (Table 2), emphasis was placed on developing the functional base, positioning, updating knowledge of the Laws of the Game, and basic decision-making. In the following stage, the tasks were more clearly oriented towards decision-making under conditions of fatigue, complex communication, signalling at an increased pace, and refereeing behaviour in situations close to competition. The microcycle represented the operational link through which the

transition was made from controlled training to integrated application in contexts close to actual match conditions.

The content of the microcycle aimed to increase tolerance to intermittent effort, develop the running–decision-making–signalling connection, optimize movement routes and rapidly achieve the appropriate viewing angle, as well as repeat sprints while maintaining decision quality. For this purpose, shuttle runs, continuous running, routes involving changes of direction, angle drills, repeated sprints, and exercises in which the motor response was followed by a decision, communication, and a referee signal were used.

Table 2. Model of the integrated training microcycle for highly qualified rugby referees

Mesocycle I, Microcycle I				Saturday/Sunday – refereeing practice
Day	Monday	Wednesday	Friday	
Objectives	Increasing tolerance to intermittent effort and developing the running–decision-making–signalling connection	Optimizing movement routes and rapidly achieving the viewing angle	Developing the ability to repeat sprints while maintaining decision quality	
Intervention characteristics	Physical–decision-making (basic signalling)	Aerobic-intermittent effort with changes of direction and angles	Repeated sprints and shuttle runs	
Volume	70 min	75 min	70 min	
Intensity	70–80% of HRmax	75–85% of HRmax	80–90% of HRmax	
Means	<ul style="list-style-type: none"> • Warm-up. • Specific intervention: – 10 × 20 m shuttle run (out and back), with 15–20 s of walking between repetitions; on the return, the call is made: advantage, sanction, etc., and the corresponding signal is performed. – 4 × 60 s continuous running, with 60 s rest; after each set, when a scenario is indicated, the participant makes the decision through a verbal call and signals. • Recovery after effort. 	<ul style="list-style-type: none"> • Warm-up. • Specific intervention: – Angle bands: 3 × 8 repetitions, diagonal touchline–centre routes (25–30 m); at the end of each diagonal, following the whistle, the signal corresponding to the announced scenario is performed. – S-shaped route: 3 × 10 repetitions over 40 m, followed by a 10 m diagonal movement to achieve the optimal viewing angle within a maximum of 4 seconds – whistle and signalling corresponding to the announced scenario. • Recovery after effort. 	<ul style="list-style-type: none"> • Warm-up. • Specific intervention: – 2 sets × 6 sprints of 30 m, recovery by walking (40–60 s); during the final 10 m, the decision is announced and the signal is performed. – Shuttle runs 0–5–10–15–20 m, 4 repetitions, 1 min rest; at the end of each shuttle run, the decision is made and the signal is performed. • Recovery after effort. 	

To assess the changes in physical preparation, the Yo-Yo Intermittent Recovery test was used. Its selection was determined by the similarity of its structure to the specific demands of rugby refereeing, characterized by repeated repositioning, short-distance accelerations, successive sprints, and frequent changes in intensity. The assessment was carried out at three time points: T0, between 15–18 August 2023; T1, between 8–10 January 2024; and T2, between 21–24 June 2024. All tests were conducted according to the same protocol and under similar conditions (Table 3).

The results indicate a favourable development in intermittent exercise capacity. The group mean increased from 16.57 levels at T0 to 16.90 at T1 and 17.25 at T2. At the same time, the

standard deviation decreased from 1.26 to 0.93 and then to 0.77, while the coefficient of variation decreased from 7.62% to 5.48% and then to 4.45%. The differences between the three assessment points were statistically significant: T0–T1, $t = 3.47$; T1–T2, $t = 4.24$; T0–T2, $t = 3.75$, with $P < 0.01$ in all cases.

Table 3. Dynamics of the mean Yo-Yo test results of the referees included in the pedagogical experiment

<i>Statistical indicators</i>	T0	T1	T2	T0 – T1	T1 – T2	T0 – T2
$\bar{X}$ (mean result, levels)	16,57	16,90	17,25	+0,33	+0,35	+0,68
S (standard deviation)	1,26	0,93	0,77	–	–	–
m (standard error of the mean)	0,36	0,27	0,22	–	–	–
CV (%) (coefficient of variation)	7,62	5,48	4,45	–	–	–
t (Student's t -test value)	–	–	–	3,47	4,24	3,75
p (statistical significance threshold)	–	–	–	p <0,01	p <0,01	p <0,01

Note: $t_1 = T0-T1$; $t_2 = T1-T2$; $t = T0-T2$.
 $n=12$, $f = 11$, $P = 0.05; 0,01; 0,001$
 $t = 2,201; 3,106; 4,437$

Figure 6 highlights the increase in the mean value and the reduction in the indicators of variation between the initial and final testing.

From an applied perspective, the results show that the referees are better able to sustain the intermittent efforts specific to the game, reposition more efficiently, and recover more rapidly between periods of exertion. On the field, these changes support the maintenance of movement pace, proximity to play, and decision-making stability throughout the match..



Fig. 6. Dynamics of the Yo-Yo test results of the referees included in the pedagogical experiment – initial and final testing

In addition to the analysis of physical preparation, the development of the level of knowledge of the Laws of the Game was also monitored. The assessment was carried out at the

same three time points, T0, T1, and T2, using a test consisting of 35 items, with analysis of the mean number of incorrect answers, the mean percentage of errors, and the change in the variability of the results.

Table 4. Dynamics of the mean results of the assessment of knowledge of the Laws of the Game among the referees included in the pedagogical experiment (n = 12)

<i>Statistical indicators</i>	<i>T0</i>	<i>T1</i>	<i>T2</i>	<i>T0–T1</i>	<i>T1–T2</i>	<i>T0–T2</i>
$\bar{X}$ (mean number of errors)	10,00	7,00	5,42	-3,00	-1,58	-4,58
% (mean percentage of errors)	28,57	20,00	15,47	–	–	–
<i>S</i> (standard deviation)	3,05	1,13	1,44	–	–	–
<i>m</i> (standard error of the mean)	0,88	0,33	0,42	–	–	–
<i>CV</i> (%) (coefficient of variation)	30,45	16,12	26,65	–	–	–
<i>t</i> (Student's <i>t</i> -test value)	–	–	–	-3,20	-5,06	-5,65
<i>p</i> (statistical significance threshold)	–	–	–	P <0,01	P <0,001	P <0,001

Note: $t_1 = T0-T1$; $t_2 = T1-T2$; $t = T0-T2$.

$n=12$, $f = 11$; $P = 0.05$; 0.01 ; 0.001

$t = 2,201$; $3,106$; $4,437$

The mean number of errors decreased from 10.00 at T0 to 7.00 at T1 and to 5.42 at T2. The mean percentage of errors correspondingly decreased from 28.57% to 20.00% and then to 15.47%. The differences were statistically significant: T0–T1, $t = -3.20$, $P < 0.01$; T1–T2, $t = -5.06$, $P < 0.001$; T0–T2, $t = -5.65$, $P < 0.001$.

Figure 7 highlights the reduction in the mean percentage of errors from the initial to the final testing. The results show that the progress was not limited to reviewing the theoretical content, but was supported by the application of the Laws of the Game in situations close to real refereeing, through situational exercises, phase analysis, and feedback aimed at correcting errors.

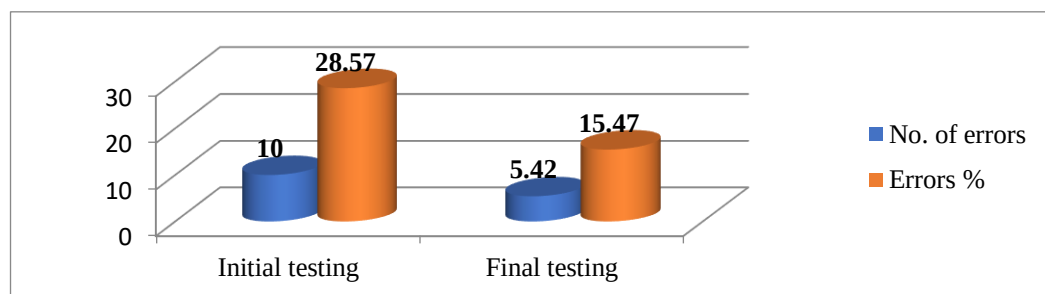


Fig. 7. Dynamics of errors in the assessment of knowledge of the Laws of the Game

The next stage of the evaluation involved analysing the referees' competitive activity before and after the implementation of the experimental programme. For each referee, three matches were monitored during the period August–October 2023 and three matches during April–June 2024, Table 5. The comparative analysis of the volume of game phases aimed to verify the comparability of the competitive context in the two periods, so that the reduction in errors could not be explained by a smaller number of game situations.

Table 5. Comparability of competitive contexts based on refereeing indicators

No.	Name, Surname	Period	Positioning and signalling in set pieces				Positioning and signalling at breakdowns		Application of advantage
			Kick-off / Restart (No.)	Scrum (No.)	Lineouts (No.)	Penalty kicks / Free kicks (No.)	RUCK(nr)	MAUL(nr)	(No.)
1	A.R.	Before	9,67	17	23	24,33	78	10	9
		After	10,33	16,67	22,72	22,33	89	12	12,33
2	B.M.	Before	13,33	11,33	25	23,33	88	9	9
		After	15	13	25,90	25,67	95	10	10,67
3	B.M.	Before	13,33	11,33	25	23,33	88	9	9
		After	15	13	25,90	25,67	95	10	10,67
4	F.N.	Before	12	12,33	27,67	22,33	89	9	8,67
		After	13,33	13	28,84	24,67	95	10	10,67
5	G.M.	Before	14	13,67	25,33	26,67	81	11	7,67
		After	12,33	15	25,83	27	87	12	11,67
6	I.V.	Before	8	13	24	26	78	8	8,33
		After	9,67	11	25,79	23,33	84	9	12,33
7	K.A.	Before	14,33	12	25	27,33	90	8	8
		After	12,33	10,67	26,64	26,67	95	8	11,67
8	N.A.	Before	15	13,67	23,67	22,67	69	9	7,33
		After	13	13	23,75	25,33	92	9	9,67
9	P.R.	Before	9,33	16,67	20	23,33	80	12	9
		After	11	16,67	18,25	20,67	85	13	12
10	R.C.	Before	10	13,67	26	26	80	11	8,67
		After	10,33	14,67	24,51	28	86	12	12,67
11	S.C.	Before	11,67	16,33	23	27	83	10	8
		After	11,67	16,67	22,94	24,67	63	12	12
12	S.R.	Before	11,67	15,67	24,33	25,33	82	11	8,33
		After	9,67	17,33	23,30	25,33	88	12	12,33
	X̄	Before	11,86	13,89	24,33	24,80	82,17	9,75	8,42
		After	11.97	14,22	24,53	24,95	87,83	10,75	11,56
	S	Before	2,24	2,05	1,89	1,79	6,00	1,29	0,57
		After	1.87	2,228	2,65	2,04	8,88	1,60	0,92
	m	Before	0,64	0,59	0,54	0,52	1,73	0,37	0,16
		After	0,54	0,66	0,77	0,59	2,56	0,46	0,27
	CV(%)	Before	18,90	14,81	7,75	7,22	7,30	13,21	6,79
		After	15.63	16,06	10,82	8,18	10,11	14,91	7,99
	t		0,064	0,582	0,584	0,226	2,066	5,745	11,243

The data show that, for most of the phases analysed, the volume remained similar between the two periods. For kick-offs and restarts, the mean was 11.86 before the implementation of the programme and 11.97 after the intervention. For scrums, the values were 13.89 and 14.22, for lineouts 24.33 and 24.53, and for penalty kicks and free kicks 24.80 and 24.95 situations per match. These small differences support the existence of comparable competitive contexts.

A different trend was observed for advantage, where the mean increased from 8.42 to 11.56 situations per match. Therefore, in the final stage, the referees had to manage an even higher volume of such situations, which is important for the subsequent interpretation of errors.

Two main indicators were used to analyse decision-making activity: the mean number of errors per match and the error rate per 100 phases. Relating the errors to the actual volume of phases allowed a more balanced assessment of decision-making consistency. The errors were analysed in relation to the referee's positioning, the mechanics of signalling and communication, and the application of the Laws of the Game within the specific context of each phase (Table 6).

Table 6. Summary of refereeing indicators before and after the implementation of the integrated referee training programme (n = 12)

No.	Phases		Analysis of matches before the implementation of the programme		Analysis of matches after the implementation of the programme		Statistics for refereeing errors	
			Numb. ($\bar{X} \pm m$)	Errors ($\bar{X} \pm m$)	Numb. ($\bar{X} \pm m$)	Errors ($\bar{X} \pm m$)	t	P
1.	Set pieces	Kick-off and restart kick (No.)	11,86 $\pm$ 0,64	0,06 $\pm$ 0,000001	11,97 $\pm$ 0,54	0,05 $\pm$ 0,000001	-3,825	< 0,01
2.		Scrum (No.)	13,89 $\pm$ 0,59	3,44 $\pm$ 0,12	14,22 $\pm$ 0,66	2,10 $\pm$ 0,08	-9,369	< 0,001
3.		Lineout (No.)	24,33 $\pm$ 0,54	0,54 $\pm$ 0,01	24,53 $\pm$ 0,77	0,34 $\pm$ 0,01	-13,34	< 0,001
4.		Penalty kick and free kick (No.)	24,80 $\pm$ 0,52	0,33 $\pm$ 0,01	24,95 $\pm$ 0,59	0,22 $\pm$ 0,01	-20,835	< 0,001
5.	Breakdowns	Ruck (No.)	82,17 $\pm$ 1,73	6,73 $\pm$ 0,10	87,83 $\pm$ 2,56	5,23 $\pm$ 0,08	-15,156	< 0,001
6.		Maul (No.)	9,75 $\pm$ 0,37	0,55 $\pm$ 0,02	10,75 $\pm$ 0,46	0,41 $\pm$ 0,02	-6,009	< 0,001
7.		Application of advantage (No.)	8,42 $\pm$ 0,16	0,40 $\pm$ 0,01	11,56 $\pm$ 0,27	0,32 $\pm$ 0,01	-8,341	< 0,001
8.	Playing time	Effective playing time (sec.)	84, 12	Time spent in regrouping 59,28%	85, 34	Time spent in regrouping 56,27%		
9.		Continuous playing time (sec.)	34,25		37,32			

Note: n = 12; f = 11; P – 0,05; 0,01; 0,001;
t – 2,201; 3,106; 4,437.

For the kick-off and restart kick, the volume of phases remained practically constant, from 11.86 to 11.97 situations per match, while the mean number of errors decreased from 0.06 to 0.05.

For the scrum, figure 8, the mean number of phases increased slightly from 13.89 to 14.22 per match, while the mean number of errors decreased from 3.44 to 2.10. The error rate per 100 phases decreased from 24.77 to 14.77, representing a reduction of 40.4%, and the difference was statistically significant, $t = -9.369$, $P < 0.001$

The reduction in errors in this phase indicates a more consistent application of procedures and better management of positioning, the timing of intervention, and the regulatory criteria specific to the scrum.

At the lineout, Figure 9, the volume remained practically constant, from 24.33 to 24.53 situations per match. Under these conditions, the mean number of errors decreased from 0.54 to 0.34, while the error rate per 100 phases decreased from 2.22 to 1.39, representing a relative reduction of 37.6%.

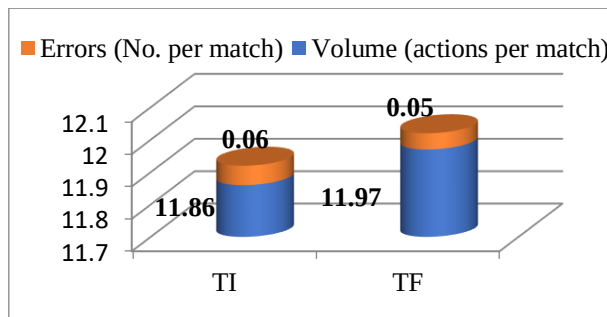


Fig. 8. Refereeing errors in the scrum

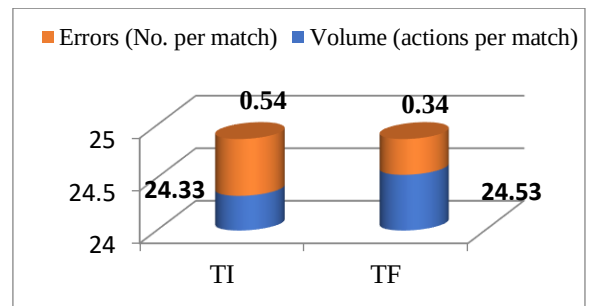


Fig. 9. Refereeing errors at the lineout

This development indicates an improvement in positioning, the timing of intervention, the clarity of signalling, and the consistent application of the criteria specific to the lineout.

For penalty kicks and free kicks, the volume of phases remained almost identical, from 24.80 to 24.95 situations per match. The mean number of errors decreased from 0.33 to 0.22, while the error rate per 100 phases decreased from 1.33 to 0.88, representing a relative reduction of 33.7% (figure 10).

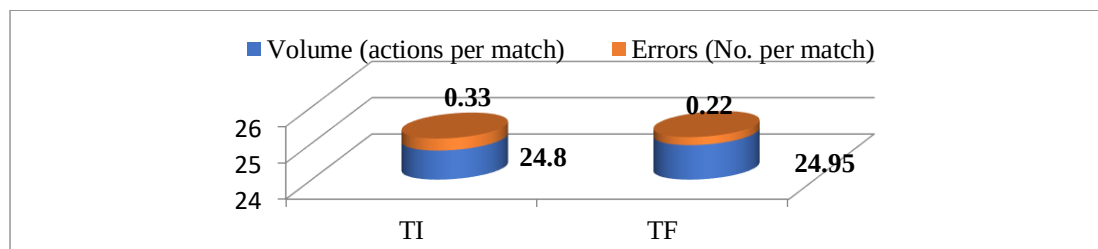


Fig. 10. Refereeing errors for penalty kicks and free kicks

In the ruck and maul phases, Figures 11 and 12, the same trend of decreasing errors was observed. In the maul, the error rate per 100 phases decreased from 5.64 to 3.81, despite a slight

increase in the volume of this phase.

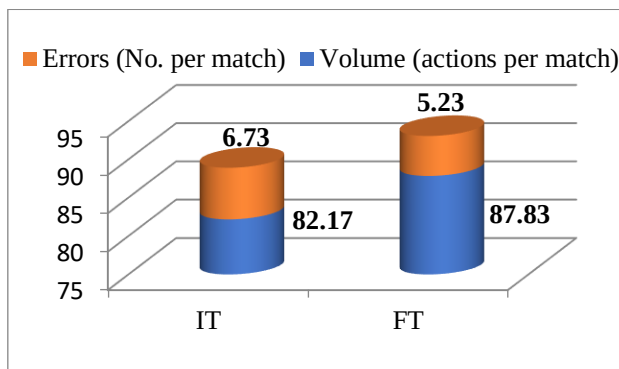


Fig. 11. Refereeing errors at the ruck

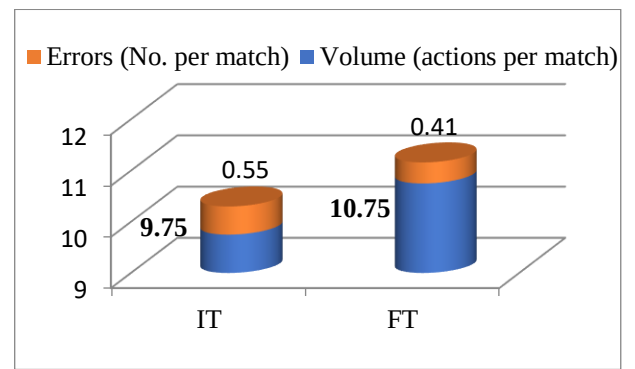


Fig. 12. Refereeing errors at the maul

The largest relative reduction was recorded in the application of advantage, figure 13. The number of situations increased from 8.42 to 11.56 per match, while the mean number of errors decreased from 0.40 to 0.32. The error rate per 100 phases decreased from 4.75 to 2.77, representing a reduction of 41.7%.

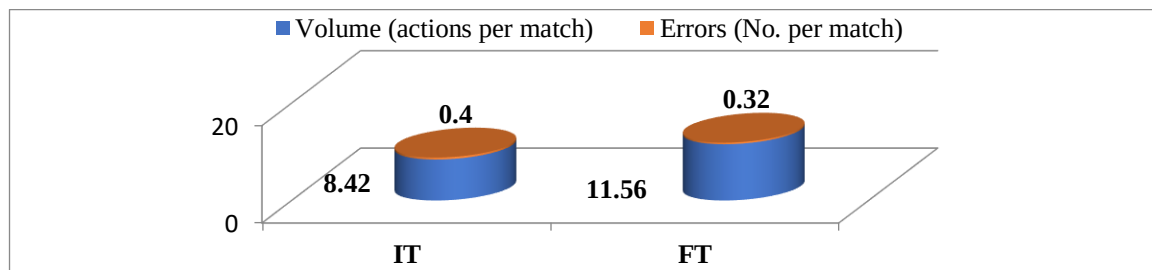


Fig. 13. Refereeing errors in the application of advantage

The result is relevant because the reduction in errors occurred despite an increase in the volume of advantage situations. This development indicates a more reliable assessment of continuity of play and better calibration of the moment when advantage should be maintained or terminated.

Taken as a whole, the results concerning decision-making consistency show the same direction across all analysed categories. Under conditions in which the volume of phases remained comparable or increased slightly in certain situations, both the number of errors and the normalized error rates decreased. In set pieces, a more consistent application of procedures and positioning was observed, while in the ruck and maul there was more reliable management of contact criteria, legal entry, the offside line, and access to the ball. In the application of advantage, better management of continuity of play can be observed.

The results obtained show that the effects of the programme were manifested simultaneously in physical preparation, knowledge of the Laws of the Game, and decision-making activity carried out under real competitive conditions. The increase in intermittent exercise capacity, the reduction in errors in theoretical-applied testing, and the decrease in errors in the main phases of the game support the effectiveness of the integrated training programme applied to

highly qualified rugby referees.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

1. The analysis of the theoretical and methodological framework showed that highly qualified rugby refereeing today takes place in a much more demanding context than in traditional models of officiating. The pace of the game, the density of contact phases, the emphasis placed on player safety, and the need to maintain the flow of competition require the referee to act rapidly, accurately, and consistently. Under these conditions, training cannot be reduced to knowledge of the Laws of the Game or to general physical fitness. The quality of officiating depends on the way in which specific physical preparation, application of the Laws, positioning, signalling, communication, and decision-making support one another during the match. This results in the need for methodological interventions aimed at the correlated development of these components and at adapting training to the actual requirements of high-performance refereeing.

2. The study of referee training systems at international level and in Romania made it possible to identify important curricular reference points, particularly through the World Rugby architecture, organized into progressive levels of training. However, the results of the analysis show that effective training cannot rely solely on certification, but requires continuity, observation in the game, mentoring, video analysis, feedback, and applied assessment. In Romania, there is a functional training base and methodological alignment at entry level, but progression towards higher levels and the consistent use of standardized assessment require further strengthening. This situation shows that referee development must be supported through more stable mechanisms of monitoring, adjustment, and professional development.

3. The opinions of rugby specialists confirmed that referee training has a real foundation, but also areas requiring improvement. In the questionnaire administered, 55.8% of respondents assessed the level of training as adequate, 34.6% considered it only partially aligned with current requirements, while 9.6% assessed it as inadequate. Correct interpretation of game situations and appropriate decision-making were indicated by approximately 86.5% of respondents, confirming the central role of the decision-making component. Physical preparation, mentioned by 64.4%, and knowledge of the Laws of the Game, indicated by 61.5%, complete the profile of the essential components. At the same time, the diagnostic stage showed that the greatest difficulties occur in foul play, ruck, scrum, open play, breakdowns, communication, and the combination of primary and secondary signalling. These findings show that referee training must more clearly correlate decision-making, physical effort, the Laws, positioning, signalling, and communication.

4. The comparative analysis of the physical and signalling activity of referees in national and international competitions outlined the actual profile of refereeing demands in rugby. For the

referee, the mean number of high-speed running sequences was 72.7 at the Rugby World Cup, 59.3 in the European Championship, and 65.5 in the domestic championship, indicating a high volume of repeated movements and repositioning. The most frequent demands occurred over short and medium distances, which are necessary for approaching the phase of play and maintaining the optimal viewing angle.

5. The results of the diagnostic stage formed the basis for developing the experimental integrated training programme, organized by correlating specific physical preparation, theoretical-applied preparation, decision-making preparation, theoretical-psychological preparation, communication, and refereeing signalling. The programme was structured into two mesocycles and twelve microcycles, with three training sessions per week, complemented by refereeing practice at weekends, which made it possible to bring the training tasks closer to the concrete requirements of competitive activity.

6. The analysis of physical preparation highlighted a gradual increase in intermittent exercise capacity. In the Yo-Yo Intermittent Recovery test, the group mean increased from $\bar{X} = 16.57$ at the initial testing, to $\bar{X} = 16.90$ at the intermediate testing, and to $\bar{X} = 17.25$ at the final testing. The reduction in the standard deviation and coefficient of variation shows that progress was manifested not only in the mean value, but also through greater stability of the results within the group.

7. The results of the assessment of knowledge of the Laws of the Game showed a consistent decrease in errors. The mean number of incorrect answers decreased from $\bar{X} = 10.00$ at T0, to $\bar{X} = 7.00$ at T1, and to $\bar{X} = 5.42$ at T2, while the mean percentage of errors decreased from 28.57% to 15.47%. This development shows that the programme supported the consolidation of knowledge of the Laws and the more reliable application of the Laws of the Game in situations close to refereeing activity.

8. The analysis of competitive activity and decision-making consistency showed that the effects of the programme were transferred to real matches. The comparability of the pre-post context was supported by the relatively stable volume of the main phases of play, which allows the reduction in errors to be interpreted as an effect of training rather than as a result of less demanding matches. Refereeing errors decreased in all analysed categories, both in absolute values and when expressed per 100 phases. Significant decreases were recorded in the scrum, ruck, maul, penalty kicks and free kicks, lineout, and especially in the application of advantage, where the error rate decreased by 41.7%. These results indicate more stable decisions, better-calibrated interventions, clearer signalling, and more reliable management of continuity of play.

9. The research results confirm the formulated hypothesis and demonstrate the

effectiveness of the experimental integrated training programme applied to highly qualified rugby referees. The improvement in specific physical preparation, the reduction in errors in the assessment of knowledge of the Laws of the Game, and the decrease in refereeing errors in competition support the same conclusion: integrated training contributes to increasing decision-making consistency and improving the quality of officiating.

The personal contribution of the research consists in the substantiation, development, and experimental validation of an operational integrated training programme designed in relation to the actual requirements of rugby refereeing.

The scientific problem solved consists in optimizing the integrated training of highly qualified rugby referees by correlating the physical, theoretical-applied, decision-making, and communication-signalling components, with effects on reducing refereeing errors, improving the quality of officiating, and strengthening a methodological model applicable to the training and professional development of match.

The training of highly qualified rugby referees should be organized through an integrated approach in which specific physical preparation, the theoretical-applied dimension, decision-making, positioning, signalling, and communication are correlated with real game situations.

- The ***annual training plan*** should include distinct periods of integrated training before the start of the competitive season and during major breaks in the season, in order to consolidate the functional base and recalibrate refereeing decisions.
- ***Physical preparation should be oriented towards the intermittent nature*** of refereeing effort through the use of repeated accelerations, changes of direction, short- and medium-distance sprints, and repositioning exercises associated with decision-making tasks.
- ***Theoretical-applied training should be carried out by relating the Laws of the Game to specific refereeing situations***, with emphasis on phases that generate greater difficulties of interpretation: foul play, ruck, scrum, maul, advantage, and open play.
- ***Video analysis, feedback, and post-match assessment should be systematically integrated into the training process*** in order to identify errors, standardize interpretation criteria, and adjust the content of subsequent microcycles.
- It is recommended ***to differentiate certain training content according to the role performed within the officiating team***, taking into account the motor, positional, and communication characteristics of the referee and assistant referees.
- ***Progress monitoring should include indicators of physical preparation, knowledge and***

application of the Laws of the Game, positioning, signalling, communication, and decision-making consistency, with errors related to the actual volume of game phases.

- **The developed programme may be used by federations, refereeing commissions, and training structures as methodological support for organizing**, monitoring, and evaluating the training of highly qualified rugby referees.

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ADNOTARE

Diaconescu Robert-Andrei „*Pregătirea integrală a arbitrilor de rugby de înaltă calificare*”,

Teză de doctor în științe ale educației, Chișinău, 2026.

Structura tezei: adnotare, introducere, 3 capitole, concluzii generale și recomandări, bibliografie 175 surse, 194 pagini, text de bază 136 pagini, 15 tabele, 35 figuri, 11 anexe. Rezultatele cercetării sunt publicate în 10 lucrări științifice.

Cuvinte-cheie: arbitru de rugby, pregătire integrală, activitate competițională, consistență decizională, calitatea oficerii.

Scopul cercetării constă în elaborarea și validarea experimentală a unui program de pregătire integrală a arbitrilor de rugby de înaltă calificare.

Obiectivele cercetării: 1. Analiza cadrului teoretic și metodologic al pregătirii integrale a arbitrilor de rugby de înaltă calificare. 2. Evaluarea nivelului pregătirii arbitrilor de rugby și a consistenței decizionale în activitatea competițională. 3. Elaborarea și implementarea programului experimental de pregătire integrală a arbitrilor de rugby de înaltă calificare. 4. Verificarea experimentală a eficienței aplicării programului de pregătire integrală aplicat arbitrilor de rugby de înaltă calificare.

Noutatea și originalitatea științifică constau în elaborarea și validarea experimentală a unui demers formativ destinat arbitrilor de rugby de înaltă calificare, în care componentele fizică, teoretico-aplicativă, decizională, gestuală și comunicațională sunt organizate ca părți interdependente ale pregătirii. Caracterul original al cercetării este susținut de raportarea acestor componente la cerințele concrete ale oficerii în meci și de verificarea efectelor programului în condiții competiționale reale.

Problema științifică actuală soluționată constă în identificarea și argumentarea unei soluții metodologice pentru optimizarea pregătirii arbitrilor de rugby de înaltă calificare, prin corelarea efortului fizic, a cunoașterii aplicative a Legilor jocului, a poziționării, comunicării, gesticii și deciziei. Soluționarea acestei probleme a contribuit la creșterea consistenței decizionale, îmbunătățirea calității oficerii și reducerea erorilor de arbitraj.

Semnificația teoretică a lucrării este determinată de completarea cadrului conceptual și metodologic privind pregătirea arbitrilor de rugby de înaltă calificare, prin raportarea pregătirii integrale la specificul activității de arbitraj. Cercetarea argumentează că performanța arbitrului poate fi explicată prin funcționarea corelată a componentelor fizice, teoretico-aplicative, decizionale, gestuale și comunicaționale în contextul real al jocului. Prin această abordare, lucrarea extinde perspectiva teoretică asupra arbitrajului în jocul de rugby, evidențiind legătura dintre pregătirea integrală, stabilitatea decizională și calitatea oficerii.

Valoarea aplicativă a lucrării constă în posibilitatea utilizării programului elaborat în activitatea de formare, perfecționare și evaluare a arbitrilor de rugby. Programul oferă repere practice pentru organizarea conținuturilor de pregătire și pentru monitorizarea progresului arbitrilor în raport cu cerințele competiționale.

Implementarea rezultatelor științifice. Rezultatele cercetării au fost implementate în procesul de formare și perfecționare a arbitrilor de rugby de înaltă calificare și pot constitui un reper metodologic pentru organizarea și evaluarea pregătirii arbitrilor de înaltă calificare. Rezultatele obținute pot fi utilizate de federații, comisii de arbitri și structuri de formare, ca suport metodologic pentru organizarea, monitorizarea și evaluarea pregătirii arbitrilor.

ANNOTATION

**Diaconescu Robert-Andrei, „Integrated training of highly qualified rugby referees”,
PhD thesis in educational sciences. Chisinau, 2026.**

Structure of the thesis: annotation, introduction, 3 chapters, general conclusions and recommendations, bibliography comprising 175 sources, 194 pages, 136 pages of main text, 15 tables, 35 figures, and 11 appendices. The research findings have been published in 10 scientific papers.

Keywords: rugby referee, integrated training, competitive activity, decision-making consistency, quality of officiating.

Purpose of the research to develop and experimentally validate an integrated training programme for highly qualified rugby referees.

Research objectives: 1. To analyze the theoretical and methodological framework of the integrated training of highly qualified rugby referees. 2. To assess the level of rugby referees' training and their decision-making consistency in competitive activity. 3. To develop and implement an experimental integrated training program for highly qualified rugby referees. 4. To experimentally verify the effectiveness of the integrated training program applied to highly qualified rugby referees.

The scientific novelty and originality of the study consist in the development and experimental validation of a formative approach designed for highly qualified rugby referees, in which physical, theoretical-applied, decision-making, gestural, and communication components are organised as interdependent elements of the training process. The originality of the research is further supported by aligning these components with the specific demands of match officiating and by evaluating the effects of the programme under real competitive conditions.

The scientific problem solved consists in identifying and substantiating a methodological solution for optimising the training of highly qualified rugby referees through the integration of physical effort, applied knowledge of the Laws of the Game, positioning, communication, signalling, and decision-making. Addressing this problem contributed to greater decision-making consistency, improved officiating quality, and a reduction in refereeing errors.

The theoretical significance of the thesis lies in the further development of the conceptual and methodological framework for the training of highly qualified rugby referees by relating integrated training to the specific demands of refereeing activity. The research substantiates the view that refereeing performance is determined by the coordinated functioning of physical, theoretical-applied, decision-making, gestural, and communication components within the actual context of the game. From this perspective, the thesis broadens the theoretical understanding of rugby refereeing by highlighting the relationship between integrated training, decision-making consistency, and officiating quality.

The applied value of the thesis lies in the possibility of using the developed programme in the training, professional development, and assessment of rugby referees. The programme provides practical guidelines for structuring training content and for monitoring referees' progress in relation to competitive demands.

Implementation of scientific results. The research findings were implemented in the training and professional development of highly qualified rugby referees and may serve as a methodological reference for the organisation and assessment of their training. The results obtained may be used by rugby federations, refereeing commissions, and referee education structures as methodological support for organising, monitoring, and evaluating referee training.

DIACONESCU ROBERT-ANDREI

**PREGĂTIREA INTEGRALĂ A ARBITRILOR DE RUGBY DE
ÎNALTĂ CALIFICARE**

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