

**MODEL CHARACTERISTICS OF COMPETITIVE ACTIVITY OF DIFFERENT SKILLED FEMALE VOLLEYBALL PLAYERS**

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**Annotation.** *Purpose:* to determine and compare the model characteristics of competitive activity and an integrated assessment of highly qualified and skilled volleyball players. *Material:* the study involved 49 highly qualified and 53 qualified volleyball players. *Results:* identified indicators of competitive activity (intensity factors, mobility, aggressiveness, efficiency and effectiveness ratio of attack-block) and the integral evaluation of volleyball players of various skill levels. Developed a scale evaluation. Built model. Also, a comparison of model characteristics of competitive activity volleyball. *Conclusions:* the significant differences are fixed model characteristics of competitive activity in athletes of high qualification of different roles. Qualified volleyball, these differences are not so pronounced. This demonstrates the universality of minor league players.

**Keywords:** volleyball, model, competition, integral, appraisal.

**Introduction**

Analysis and evaluation of competition functioning in sports are important criteria of training process's effectiveness, because they create pre-conditions for perfection of sportsmen's training system [3; 5; 10 et al.]. However, result of competition in sport games, in volleyball in particular, does not reflect complete information about strong and weak sides both of separate players and team in general. That is why there appears demand in determination of objective model indicators of competition functioning, which could contain both qualitative and quantitative characteristics of players' functioning on site.

Application of simulation in management of training process and competition functioning, including working out of sportsmen's model characteristics, is an urgent problem, which causes interest of specialists in many kinds of sports [5; 10; 13; 17; 22 et al.], and in sport games in particular [3; 6; 8; 15; 18 et al.]. Analysis of available literature showed that different parameters of competition functioning were dealt with by V.M. Kostiukovich [3], V. Tsyganok [7], O. Shynkaruk, M. Bezmylova [9], C.-M. I. Belčić, G. Sporiš [12], Porfireanu et al [19], N. Rogulj et al [20], G. Stănculescu et al [21]. Thus, different authors researched different tactic models of game, quantitative and qualitative indicators of competition functioning and etc.

Concerning volleyball it was determined that there was great number of approaches to analysis of competition functioning. In particular, V. Gamaliy, O. Shlionska [1] offer technology of evaluation of attacking technical-tactic actions' effectiveness as a determining factor for achievement of high competition results, without consideration of defensive actions of players. Y e.V.Kudriashov, A.A. Mischenko [4], A.T. Bozhkova [14], T.J. Gabbett, B. Georgieff [16] study effectiveness of volleyball players' technical tactic actions, without paying any attention to quantitative indicators. Absence of single evaluation system as well as contradictions in approaches to analysis of competition functioning in volleyball create pre-conditions for working out and theoretical foundation of methodic of analysis of competition functioning on the base of integral evaluation. Comparison of model characteristics of competition functioning of sportswomen-volleyball players (different qualification) will permit to raise effectiveness of training and competition processes' management.

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**Purpose, tasks of the work, materials and methods**

*The purpose of the research* is to determine and compare model characteristics of competition functioning and integral evaluation of highly qualified and qualified sportswomen – volleyball players.

During season of 2013-2014 we carried out video recording of competitions (with camera SONY DCR SX 65 E), analysis and evaluation of competition functioning of highly qualified (participants of Ukrainian championship, women teams of super league – Kriazh medical university, Vinnitsa; Galytchanka -THEU- Ukrinbank, Ternopil; Chimik, Yuzny town; Regina - -MESU-OShVSM, Rivne; Orbita – ZTMC, Zaporozhye – 49 sportswomen in total) and qualified women – volleyball players (53 sportswomen of Vinnitsa national pedagogic university, Vinnitsa national agrarian university, Vinnitsa national medical university, Vinnitsa medical college, Vinnitsa technical college, Vinnitsa college of national university of food technologies, Vinnitsa cooperative institute).

For analysis and evaluation of competition functioning of qualified sportswomen we worked out five specific indicators – quantitative (coefficients of intensity, mobility, aggressiveness) and qualitative (coefficient of effectiveness and coefficient of attack-block effectiveness). Integral evaluation was worked out on the base of methodic approach of V.M. Kostiukovich [2] and supplemented according to specificities of volleyball [11].

### Results of the research

The structure of every model includes model characteristics and indicators [3; 5; 6 et al.]. Competition model is the most significant because optimal performance of team at competitions shall be the result of training process. According to purpose of our research we determined indicators of competition functioning and integral evaluation of highly qualified and qualified volleyball players (see table 1). Comparing data of table 1 we can note that mean results of practically all indicators of qualified sportswomen's competition functioning are lower than the same results of highly qualified sportswomen. Alongside with it, lower variation coefficients of qualified sportswomen witness about universal character of their level.

Table 1

*Model characteristics of competition functioning of highly qualified (n=49) and qualified (n=53) women – volleyball players*

Indicators of competition functioning	Qualification	Statistical indicators					
		$\bar{x}$	<i>max</i>	<i>min</i>	<i>S</i>	<i>V</i>	<i>t (p)</i>
Coefficient of intensity (CI)	HQ*	0.94	1.72	0.28	0.314	33.40	2.40
	Q**	0.82	1.22	0.51	0.171	20.85	(<0.05)
Coefficient of mobility (CM)	HQ	2.11	5.09	0.50	1.000	47.39	4.13
	Q	1.49	2.44	0.87	0.379	25.44	(<0.05)
Coefficient of aggressiveness (CA)	HQ	1.57	3.60	0.17	0,747	47.58	5.45
	Q	0.97	1.80	0.46	0.324	33.40	(<0.05)
Coefficient of effectiveness (CE)	HQ	0.64	1.00	0.25	0.163	25.47	0.77
	Q	0.62	0.80	0.39	0.099	15.97	(>0.05)
Coefficient of attack-block effectiveness (CE <sub>attack-block</sub> )	HQ	0.49	1.00	0.13	0.189	38.57	0.33
	Q	0.50	0.88	0.20	0.164	32.80	(>0.05)
Integral evaluation (IE)	HQ	5.51	8.85	3.03	1.128	20.47	5.50
	Q	4.41	6.18	2.72	0.836	18.96	(<0.05)

*Notes: \*highly qualified sportswomen-volleyball players; \*\* qualified sportswomen-volleyball players*

For correct comparison of the received results it was important to evaluate every indicator. That is why the following step was to determine ten-point scale of evaluation of competition functioning indicators on the base of V.M. Kostiukevych's methodic approach [3]. According to "rule of three Sigma" we determined area from  $\bar{x} + 3S$  to  $\bar{x} - 3S$ , which was divided into 9 equal intervals. Value  $\bar{x} - 3S$  corresponded to 1 point,  $\bar{x} + 3S - 10$  points. Value  $\bar{x} - 3S$  plus value of one interval corresponds to 2 points and etc. Thus, we worked out evaluation scale of competition function for highly qualified and qualified sportswomen – volleyball players.

In compliance with the worked out scale we evaluated indicators of competition functioning of all sportswomen in every group. As a result we obtained models of competition functioning of highly qualified (n=13) and qualified (n=14) center forward (see fig.1 a), highly qualified (n=16) and qualified wing players (n=21) (see fig.1b), highly qualified (n=6) and qualified (n=8) diagonal forwards (see fig. 1 c), highly qualified (n=8) and qualified (n=10) binders (see fig. 1 d), highly qualified (n=6) libero players (see fig.2).

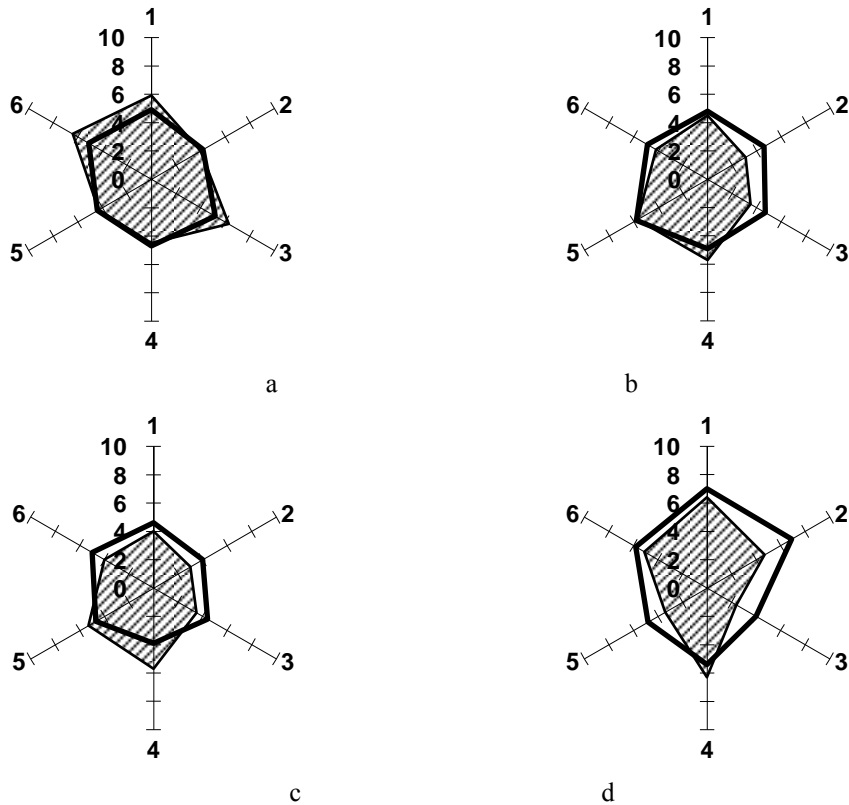


Fig.1. Models of competition functioning of different qualification sportswomen-volleyball players:

a –center forwards, b – wing players, c – diagonal forward, d – binder, 1 – coefficient of intensity; 2 – coefficient of mobility; 3 – coefficient of aggressiveness; 4 – coefficient of effectiveness; 5 – coefficient of attack-block effectiveness; 6 – integral evaluation.

- ▨ volleyball players of high qualification
- qualified volleyball players

Analysis of the received results permits to say that the highest coefficient of effectiveness belonged to binders (6.4 points of highly qualified and 7.0 points of qualified volleyball players), because coefficient of intensity reflects quantity of technical-tactic actions, fulfilled by volleyball player in one game; binders participate practically in every combination, creating favorable position for attack. High CI of center forwards (5.9 points of highly qualified and 4.9 – of qualified volleyball players) is connected with active behavior of these sportswomen on front line: constant attacks, blocks, imitations of attacks and so on. Insignificant difference of coefficient of intensity was between values of diagonal forwards and wing players (4.0 and 4.4 points of highly qualified and 4.6, 4.8 points of qualified sportswomen accordingly). The least CI was registered for libero players (2.9 points) and it was connected with the fact that they participated only in team’s defensive actions.

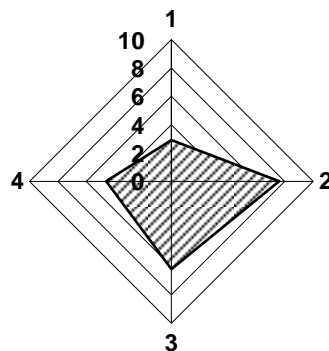


Fig.2. Model of competition functioning of highly qualified sportswomen – volleyball players (libero):

1 – coefficient of intensity; 2 – coefficient of mobility; 3 – coefficient of effectiveness; 4 – integral evaluation

Coefficient of mobility characterizes quantity of technical-tactic actions, fulfilled by a player in one game in second and third regimes of coordination complexity. The highest CM was registered in highly qualified libero (7.6 points) that is connected with specificity of coefficient's determination for players of this role [11]. High CM was registered in binders (4.7 points for highly qualified and 6.9 points for qualified players) because it is a quantitative indicator of competition functioning. Concerning forwards of first and second temps, CM does not differ significantly: in highly qualified sportswomen it changes from 3.0 points (diagonal forwards) to 4.0 points (center forwards); in qualified sportswomen – from 4.0 (diagonal forwards) to 4.6 (wing players).

Coefficient of aggressiveness reflects intensity of competition duel directly near net (attacks, block and so on). There are clear distinctions in mean value of CA of highly qualified volleyball players. In particular, the highest CA was registered in center forwards (6.3 points) and the lowest belonged to binders (2.4 points) and it was connected with specificities of game roles. Mean CA value of highly qualified wing players and diagonal forwards was 3.5 points. Concerning qualified sportswomen-volleyball players of different roles CA distinctions were insignificant: for center forwards it was 5.2 points, for wing players – 4.7 points, for diagonal forwards – 4.4 points, for binders – 4.0 points. It was connected with universal character of players' technical level; indeed, owing to unsuccessful defensive actions players have to re-adjust (forwards – realize pass, binders – fulfill attacks)..

Coefficient of effectiveness characterizes player's significance in team and is determined as relation of successful technical tactic actions (TTA) to total sum of TTA. It was determined that in general team aspect coefficient of effectiveness of qualified volleyball players is, in average, lower than the same of highly qualified volleyball players; it is connected with higher level of highly qualified volleyball players and, accordingly, with greater number of mistakes and less experience of qualified volleyball players. Alongside with it, we registered that the highest coefficient of effectiveness belongs to both qualified (5.4 points) and highly qualified (6.3 points) binders, whose competition functioning is connected to large extent with partners' actions, who, realizing defensive actions, try to create the best conditions for binders' passes.

Libero – is rather narrow specialization of defense with task to receive ball and pass it to binder, whose perfection is facilitated by players of this role. That is why it is logic that CE of highly qualified libero is 6.2 points.

Forwards, in average, have less coefficient of effectiveness than other players and it is connected with the fact that they more then other are in constant duel with opponents. In particular, there is insignificant difference of forwards' coefficient of effectiveness: diagonal forwards – 3.9 points, center forwards– 4.7 points, wing players – 4.9 points. Concerning highly qualified players, wing players and diagonal forwards have 5.7 points and center forwards – 4.5 points. Lower CE of highly qualified forwards of first temp is connected with great quantity of not realized blocks. This also the reason of low coefficient of attack-block effectiveness of center forwards (4.3 points). The lowest of CE (attack-block) among highly qualified players was registered in binders (3,4 points). Wing players and diagonal forwards have insignificant difference in CE (attack-block) – 5.7 and 5.3 points accordingly. Qualified wing players have CE (attack-block) 5.8 points and corresponds to highly qualified players' (of the same role) level. Qualified center and diagonal forwards, binders have mean CE (attack-block) in frames from 4.4 points to 4.8 points.

Integral evaluation, which includes both quantitative and qualitative indicators, is an objective criterion of evaluation of volleyball competition functioning. Qualified sportswomen-volleyball players have insignificant difference in integral evaluation. It changes from 4.9 - 5.1 points for forwards to 5.8 points for binders. Highly qualified volleyball players have more expressed difference in integral evaluations. In particular the best results belong to diagonal forwards (4.0 points) and wing players (4.2 points) Integral evaluation at level of 4.6 and 5.1 points belonged to libero and binders accordingly. The highest integral evaluation had center forwards; it was 6.4 points. вона становить 6,4 бали.

#### **Conclusions:**

1. Analysis of scientific literature showed demand in determination of model characteristics of competition functioning of sportswomen-volleyball players of different qualification, which would permit to increase effectiveness of training and competition processes' management and serve as bench marks for future researches.

2. We have determined that mean indicators of competition functioning of qualified sportswomen-volleyball players statistically differ ( $p < 0.05$ ) from results of more experienced, highly qualified sportswomen.

3. We have registered substantial distinctions of model characteristics of competition functioning of highly qualified sportswomen (of different game roles), while, at the same time, in qualified volleyball players these distinctions are not so expressed that witness about universal character of technical level of less experienced volleyball players.

*The prospects of further researches* imply studying of interconnections between indicators of physical, functional and technical-tactic fitness as well as competition functioning of sportswomen-volleyball players.

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