

## Tactical attacking actions of competitive handball players with different qualifications

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### Abstract:

Improvements of competitive activity in handball associated with the growth of various part of training including tactical training that needs detailed study at various levels of sportsmen qualification. Aim of the research is to determine qualification differences of handball players at different stages of long-term training system. Leading in the game in attack are quantitative indicators of team tactical actions performance in the attack, including: rush, breakaway, positional attack, the total number of attacks and absolute and relative indicators of tactical action finish from different positions, location of throws per game and effectiveness of 7-meter penalty throws. High qualified sportsmen performing in general fewer throws just as less perform them after positional attack. This can be offset by using the number of effective throws or their effectiveness in total. Handball players on the stage of maximum realization of individual abilities demonstrate at extremely low rates of absolute values greater indicators of successful throws and significantly higher indicators of effectiveness both at group and at individual tactical actions during attack. For sportsmen at stage of specialized basic training are more typical parallel group interactions. For representatives of stage of preparation for higher results is observed a significant dominance of crossed group interactions. However, for sportsmen who demonstrate the highest level of sportsmanship (stage of maximum realization of individual abilities) should be determined the combined group interaction. Effectiveness of throws with different localization of their performance has qualification identified differences. The absolute leader and respectively an orienteer for less qualified handball players are sportsmen indicators that appear on the stage of maximum realization of individual abilities.

**Key words:** handball players, stage of long-term training system, group interactions.

### Introduction

Improvement of competitive activity in handball that is associated with changes in rules, increase of mental and physical load makes increasing demands on tactical training of handball players (Melnyk, Levkiv, 2008; Melnyk, 2015; Pityn, 2015). Lack of tactical training level denies effective implementation of the technical and physical potential and reduces the possibility of achieving higher sports results (Doroshenko, Czapenko, 2005; Tyschenko, 2011; Briskin, 2014).

Recently, a lot of specialists' attention is paid to development of sportsmen training models allowing bring in corrections in their educational and training process (Czyganok, 2000; Briskin, 2011, 2014; Pityn, 2013). In sports games the studies were focused only on ways to improve the control and ways to improve tactical training of sportsmen and model characteristics were considered only from the point of team tactics (Czyganok, 2000). Individual tactical actions of players were considered by experts only from the perspective as players functions (Klusov, 1982; Melnyk, Levkiv, 2007). So actual is to improve the tactical training of qualified handball players that may be conducted based on knowledge of the structure and content of their competitive activities and in particular the existing relationships.

#### Aim of the research

To determine qualification differences of handball players at different stages of long-term training system.

#### Research organization

For pedagogical observations taken games with the participation of handball players at different stages of long-term training system: specialized basic training (international tournament in memory of honorary master of sports V. Bohatikova among junior handball players, 22 protocols); preparation for higher results (championships of Ukraine among teams of Premier League in handball among men in macrocycles of training (seasons) 2009-2010, 2011-2012 and 2012-2013, 68 protocols of official games) and maximum realization of individual abilities (Olympics Games, 12 protocols).

### Methods

## Results

We can conclude that by indicator of total number of throws per game less qualified handball players (on the stage of specialized basic training and preparation for higher results) perform significantly more throws on goal (10,12% and 12,24% throws, 19,53% and 23,61% respectively) (Table 1). High qualified sportsmen create greater resistance, which reduces the number of absolute amount of throws.

However, by the number of scored goals is observed approximate numerical values between high qualified handball players and those who are at stage of preparation for higher results. An interesting situation was that the highest number of scored goals carry out handball players at stage of preparation for higher results and reliably lowest ( $r \leq 0,05-0,01$ ) sportsmen at the stage of specialized basic training (on 6,15 effective throws, 21,18% less compared with sportsmen at stage of preparation for higher results and on 3,95 effective throws, 14,71% in relation to representatives of stage of maximum realization of individual abilities).

Table 1. Indicators of tactical actions performance during attack by handball players on different stages of long-term training

Indicators	Stages of long-term training			Differences between indicators of different qualification groups of sportsmen		
	SBT (1) M±m	PHR (2) M±m	MRIA (3) M±m	1-2 abs. value (%)	2-3 abs. value (%)	1-3 abs. value (%)
1	61,95±6,18	64,07±4,37	51,83±6,82	2,12(3,30)	<b>12,24** (23,61)</b>	<b>10,12** (19,53)</b>
2	22,89±3,71	29,04±4,97	26,83±3,76	<b>6,15** (21,18)</b>	2,20 (8,21)	<b>3,95* (14,71)</b>
3	37,14±5,39	44,96±5,53	52,48±8,36	<b>7,82** (17,39)</b>	<b>7,52* (14,34)</b>	<b>15,34** (29,23)</b>
4	48,50±7,07	46,75±4,79	41,38±5,39	1,75 (3,74)	<b>5,38*(12,99)</b>	<b>7,13* (17,22)</b>
5	15,82±3,35	16,14±4,58	16,28±2,46	0,32 (2,01)	0,23 (1,42)	0,56 (3,40)
6	32,94±5,84	33,83±6,91	40,64±8,75	0,89 (2,62)	<b>6,81* (16,75)</b>	<b>7,69* (18,93)</b>
7	8,82±4,04	8,82±2,19	3,63±1,41	0,003 (0,04)	<b>5,20** (143,35)</b>	<b>5,19** (143,26)</b>
8	2,57±1,67	5,57±1,22	2,79±1,21	<b>3,00** (53,90)</b>	<b>2,78** (99,57)</b>	0,22 (8,01)
9	26,73±14,39	66,62±15,14	77,71±21,94	<b>39,89** (59,88)</b>	11,09 (14,27)	<b>50,98** (65,60)</b>
10	4,64±2,75	8,50±1,89	6,83±2,53	<b>3,86** (45,45)</b>	<b>1,67*(24,39)</b>	<b>2,20* (32,15)</b>
11	2,66±2,04	5,50±1,07	5,04±1,80	<b>2,84** (51,65)</b>	0,46 (9,09)	<b>2,38* (47,26)</b>
12	52,57±26,06	66,70±10,75	76,44±15,17	<b>14,13* (21,18)</b>	<b>9,73* (12,73)</b>	<b>23,86** (31,22)</b>

Notices: 1 – total number of throws made per game; 2 – number of scored goals per game; 3 – effectiveness of throws per game; 4 – total number of throws made per game after positional attack; 5 – number of scored goals per game after positional attack; 6 – effectiveness of throws per game after positional attack; 7 – total number of throws per game after a rush; 8 – number of scored goals per game after a rush; 9 – effectiveness of throws per game after a rush; 10 – total number of throws per game after breakaway; 11 – number of scored goals per game after breakaway; 12 – effectiveness of throws per game after breakaway; \* –  $p \leq 0,05$ ; \*\* –  $p \leq 0,01$ ; SBT – stage of specialized basic training; PHR – preparation for higher results; MRJA – maximum realization of individual abilities.

Analysis of effectiveness of throws by game showed consistency with the general theory of sportsmen training. Established that with increase of qualification is observed improvement of a significant indicator of overall effectiveness of handball players in competitive activity. Between them and representatives of the stages of specialized basic training and preparation for higher results difference is 7,82 (17,39%) with  $p \leq 0,05$ . Between them and handball players at stage of maximum realization of individual abilities – 15,34 (29,23%) with  $p \leq 0,01$ . Between handball players on stage of preparation for higher results and maximum realization – 7,52 (14,34%) with  $p \leq 0,05$ .

Set the importance of positional attack implementation. Reliably smallest quantitative indicators recorded in handball players at the stage of maximum realization of individual abilities are on 5,38 throws (12,99%) and 7,13 throws (17,22%) less that in representatives of more qualified sportsmen group.

For all qualification groups are absent significant differences in the number of scored goals after positional attack (0,23-0,56 throws, 1,42-3,40% with  $p > 0,05$ ). By this indicator handball players on stage of maximum realization of individual abilities are ahead of sportsmen at the stage of specialized basic training and preparation for higher results (7,69 (18,93) with  $p \leq 0,05$  and 6,81 (16,75) with  $r \leq 0,05$  respectively), which in their turn have no significant differences on this indicator (0,89; 2,62% with  $p > 0,05$ ). Note that for the total number of throws per game after a rush there is a similar situation. Sportsmen at the stage of specialized basic training and preparation for higher results without significant differences between them (0,04%,  $p > 0,05$ ) perform significantly more throws compared to handball players on stage of maximum realization of individual abilities (on 5,19-5,20 throws 143,26-143,35 with  $p \leq 0,01$ ). Around the same, significantly less performed throws made after a rush does not deny higher percentage of these throws realization which is at level that is on 65,60%

higher than this indicator in sportsmen at the stage of specialized basic training ( $p \leq 0,01$ ). In this case sportsmen on stage of preparation for higher results are not far from their more qualified colleagues (14,27% with  $p > 0,05$ ).

By indicators of breakaway can be observe significant differences by most parameters. The largest number of throws after breakaway are carried by handball players at stage of preparation for higher results, which is on 2,20-3,86 throws (32,15-45,45%) more than in other study groups. By the number of throws effectiveness performed these sportsmen caught up with representatives of stage of maximum realization of individual abilities (difference 0,46 by effectiveness of throws, 9,09% with  $p > 0,05$ ). By this indicator other groups of sportsmen significantly ( $p \leq 0,05-0,01$ ) inferior to representatives of specialized base training stage (2,38-2,84 effectiveness of throws, 47,26-51,65%).

As for the effectiveness of throws recorded after breakaway is recorded a sequence for which there is a growth of throws effectiveness from stage of specialized basic training to the stage of maximum realization of individual abilities. Each step has significant differences ( $r \leq 0,05$ ).

Qualified handball players (stages of specialized basic training and preparation for higher results) demonstrate a significantly higher number of throws after group interactions that is on 12,19 and 11,58 throws (31,32 and 29,76% respectively with  $p \leq 0,01$ ) more than the performance of high qualified handball players on stage of maximum realization of individual abilities. Thus between groups of qualified handball players were not registered significant differences (0,61 throws per game, 1,19% with  $p > 0,05$ ) (Table. 2).

Table 2. Indicators of group and individual attacking tactical actions performance of handball players at different stages of long-term training

Indicators	Stages of long-term training			Differences between indicators of different qualification groups of sportsmen		
	SBT (1) M±m	PHR (2) M±m	MRIA (3) M±m	1-2 abs. value (%)	2-3 abs. value (%)	1-3 abs. value (%)
1	50,50±5,86	51,11±3,92	38,92±5,25	0,61 (1,19)	<b>12,19** (31,32)</b>	<b>11,58** (29,76)</b>
2	19,61±3,15	20,14±3,80	18,88±4,13	0,53 (2,63)	1,27 (6,72)	0,74 (3,91)
3	39,04±5,53	39,26±5,84	48,76±10,32	0,22 (0,56)	<b>9,50* (19,48)</b>	<b>9,72** (19,94)</b>
4	11,45±4,43	13,11±2,71	8,88±3,15	1,65 (12,61)	<b>4,23** (47,69)</b>	<b>2,58* (29,07)</b>
5	3,07±1,72	7,07±2,38	5,29±1,98	<b>4,00** (56,61)</b>	<b>1,78* (33,63)</b>	<b>2,22** (42,02)</b>
6	26,20±12,38	52,79±8,77	60,55±9,07	<b>26,59** (50,37)</b>	<b>7,76* (12,81)</b>	<b>34,35** (56,73)</b>

Notices: 1 – total number of throws made per game after group actions in attack; 2 – number of scored goals per game after group actions in attack; 3 – effectiveness of throws per game after group actions in attack; 4 – total number of throws made per game after individual actions in attack; 5 – number of scored goals per game after individual actions in attack; 6 – effectiveness of throws per game after individual actions in attack; \* –  $p \leq 0,05$ ; \*\* –  $p \leq 0,01$ ; SBT – stage of specialized basic training; PHR – preparation for higher results; MRIA – maximum realization of individual abilities.

Significant differences were observed in the calculated sense of the effectiveness of throws after group interactions. By this indicator preference ( $p \leq 0,05-0,01$ ) received handball players at stage of maximum realization of individual abilities. From both groups of qualified sportsmen differences reached 9,50-9,72 (19,48-19,94%).

For individual attacking tactical actions are showed more expressed differences between qualification groups. For group of these indicators from stage to stage are increasing benefits of more qualified handball players. By total number of performed throws advantages have handball players on the stages of specialized basic training and preparation for higher results over the representatives of the stage of maximum realization of individual abilities. It was 2,58 and 4,23 throws, 29,07 and 47,69% with  $p \leq 0,05-0,01$ . This situation is similar with other indicators of the total number of throws. The reason for this may be a lower performance level of protective actions and less organized performance of technical and tactical actions of attacking by qualified teams (separate sportsmen).

The largest number of effective throws per game was performed by representatives of stage of preparation for higher results. By this indicator they are ahead of high qualified handball players group (2,22 effective throws, 42,02% with  $p \leq 0,01$ ) and sportsmen at stage of specialized basic training (4,00 effective throws, 56,61% with  $p \leq 0,01$ ).

For indicator of throws effectiveness after individual tactical actions is observed regular situation. This situation was confirmed in a number of indicators that we studied. Starting from the stage of specialized basic training and to maximum realization of individual abilities it increases. The difference between qualified handball players (stages of specialized basic training and preparation for higher results) is 26,59 (50,37% with  $p \leq 0,01$ ), between representatives of stage of preparation for higher results and stage of maximum realization of individual abilities – 7,76 (12,81% with  $p \leq 0,05$ ). This provided the advantage of high qualified handball players on 34,35 (56,73% with  $p \leq 0,01$ ) over sportsmen at the stage of specialized basic training.

Analysis of scientific and methodological literature showed the presence of varieties of group interactions (parallel, crossed and combined) (Table. 3).

By all indicators of this group there are significant differences between different levels handball players of different qualification. For the total number of throws after the parallel group interactions there is a significant imbalance between the sportsmen at the stage of specialized basic training and two others (the higher stage). Thus, for sportsmen of this qualification group indicators of differences between the absolute values reach 20,38 throw (119,40%) with  $p \leq 0,01$  and 25,29 throws (207,85%) with  $p \leq 0,01$  in comparison to stages of preparation for higher results and realization of maximum individual abilities respectively. Along with that, between handball players on these two stages also registered significant differences in favor of less qualified sportsmen who perform a greater number of throws (on 4,90 throws, 40,31% with  $p \leq 0,01$ ). The situation is similar to the indicator of number of effective throws. The largest number of such throws in terms of competitive activity is carried out by handball players on stage of specialized basic training (difference from 5,90 to 8,86 of effective throws, 87,86-236,36% with  $p \leq 0,01$ ), then are sportsmen of the stage of preparation for higher results (difference 2,96 of effective throws, 79,05% with  $p \leq 0,01$ ) and the least number of effective throws perform high qualified handball players.

Interest were data that indicated that there were no significant differences by effectivity of throws after parallel interactions between sportsmen at the stage of specialized basic training and realization of individual abilities (difference 0,44 throws, 1.32% with  $p > 0,05$ ). However, among all groups distinguished by effectiveness of handball players on stage of preparation for higher results (advantage 5,85-6,29 throws, 14,73-18,82% with  $p \leq 0,05$ ).

Table 3. Indicators of performance of group tactical actions varieties in attack by handball players at different stages of long-term training

Indicato rs	Stages of long-term training			Differences between indicators of different qualification groups of sportsmen		
	SBT (1) M±m	PHR (2) M±m	MRIA (3) M±m	1-2 abs. value (%)	2-3 abs. value (%)	1-3 abs. value (%)
1	37,45±6,18	17,07±2,16	12,17±3,86	<b>20,38** (119,40)</b>	<b>4,90** (40,31)</b>	<b>25,29** (207,85)</b>
2	12,61±3,16	6,71±1,38	3,75±1,29	<b>5,90** (87,86)</b>	<b>2,96** (79,05)</b>	<b>8,86** (236,36)</b>
3	33,87±6,58	39,72±7,40	33,43±13,52	<b>5,85* (14,73)</b>	<b>6,29* (18,82)</b>	0,44 (1,32)
4	5,05±2,10	15,96±1,61	12,04±2,05	<b>10,92** (68,40)</b>	<b>3,92** (32,58)</b>	<b>7,00** (58,10)</b>
5	2,00±1,18	6,36±1,77	5,46±1,25	<b>4,36** (68,54)</b>	<b>0,90* (16,47)</b>	<b>3,46** (63,36)</b>
6	40,09±23,26	39,81±10,20	45,92±10,64	0,28 (0,71)	<b>6,12* (13,32)</b>	5,84 (12,71)
7	8,00±3,23	18,07±2,64	14,71±2,52	<b>10,07** (55,73)</b>	<b>3,36** (22,87)</b>	<b>6,71** (45,61)</b>
8	3,36±1,52	7,07±2,52	9,67±2,31	<b>3,71** (52,43)</b>	<b>2,60* (26,85)</b>	<b>6,30** (65,20)</b>
9	41,11±16,12	38,53±10,78	64,85±8,49	2,58 (6,70)	<b>26,32** (40,59)</b>	<b>23,74** (36,61)</b>

Notices: 1 – total number of throws made per game after parallel group tactical action in attack; 2 – number of scored goals per game after parallel group tactical action in attack; 3 – effectiveness of throws per game after parallel group tactical action in attack; 4 – total number of throws made per game after crossed group tactical action in attack; 5 – number of scored goals per game after crossed group tactical action in attack; 6 – effectiveness of throws per game after crossed group tactical action in attack; 7 – total number of throws made per game after combined group tactical action in attack; 8 – number of scored goals per game after combined group tactical action in attack; 9 – effectiveness of throws per game after combined group tactical action in attack; \* –  $p \leq 0,05$ ; \*\* –  $p \leq 0,01$ ; SBT – stage of specialized basic training; PHR – preparation for higher results; MRJA – maximum realization of individual abilities.

During analyzing of crossed group interactions indicators revealed a different situation. The largest number of throws performed by handball players at stage of preparation for higher results that is on 3,92-10,92 throws (32,58-68,40%) with  $p \leq 0,01$  more than in representatives of other qualification groups. Number of effective throws per game after crossed group interactions are also significantly higher in representatives of stage of preparation for higher results (on 0,90-4,36 throws, 16,47-68,54% more with  $p \leq 0,05-0,01$ ). However, by the total effectiveness preference is given to handball players on the stage of maximum realization of individual abilities that is on 5,84-6,12 higher than in representatives of qualified handball players groups.

Despite the fact that handball players at stage of preparation for higher results dominated by the total number of throws after the combined group interactions (3,36-10,07 throws, 22,87-55,73% with  $p \leq 0,01$ ), but by effective throws and overall effectiveness of throws after these group interactions yield to sportsmen at stage of maximum realization of individual abilities (2,60 effective throws and 26,32%).

To clarify the features of localization at end of throws in competitive activity of different qualification handball players were studied indicators of throws on goal (tab. 4).

The data about the number of throws performance show that handball players at stage of preparation for higher results perform less throws than their colleagues from the line. They concede on this indicator on 4,98

throws (48.12%) to sportsmen at stage of specialized basic training and on 4,77 throws (31,52%) to representatives of stage of maximum realization of individual abilities. This indicates that in the case of handball players at stage of preparation for higher results fewer attacks can reach advantageous position for realization of a throw (Melnyk, Levkiv, 2007).

For effectiveness of throws are clear advantages of sportsmen at the stage of maximum realization of individual abilities. Sportsmen at this stage to perform on 1,74-2,26 throws (17,28-22,43% with  $p \leq 0,05$ ) more than representatives of other stages. This once again confirms the quality of qualified sportsmen training. However, unexpected was the situation with the effectiveness of throws from the line. Set that handball players at stage of preparation for higher results have significantly higher indicators (on 8,19-21,65%) compared with sportsmen at other stages of long-term sportsmen training system. However, we attribute that the differences derived from the fact that the total number of throws made is also considerably lower. It means that in cases when sportsmen on stage of preparation for higher results bring the ball to the 6-meter line, the level of realization is higher as these moments in the game should be considered "100%".

Table 4. Indicators of throws on goal performance by handball players in competitive activity at different stages of long-term training

Indicators	Stages of long-term training			Differences between indicators of different qualification groups of sportsmen		
	SBT (1) M±m	PHR (2) M±m	MRIA (3) M±m	1-2 abs. value (%)	2-3 abs. value (%)	1-3 abs. value (%)
1	15,34±4,48	10,36±2,67	15,13±4,14	<b>4,98** (48,12)</b>	<b>4,77* (31,52)</b>	0,22 (1,43)
2	8,34±2,95	7,82±2,50	10,08±2,85	0,52 (6,64)	<b>2,26* (22,43)</b>	<b>1,74* (17,28)</b>
3	53,78±10,24	75,43±9,85	67,24±8,01	<b>21,65** (28,70)</b>	<b>8,19* (12,19)</b>	<b>13,46** (20,02)</b>
4	34,73±6,87	47,14±3,64	26,17±5,28	<b>12,42** (26,34)</b>	<b>20,98** (80,16)</b>	<b>8,56** (32,72)</b>
5	7,75±2,43	14,43±3,14	10,50±3,13	<b>6,68** (46,29)</b>	<b>3,93* (37,41)</b>	<b>2,75* (26,19)</b>
6	22,51±5,44	30,45±6,08	40,45±10,41	<b>7,93** (26,05)</b>	<b>10,00* (24,73)</b>	<b>17,93** (44,34)</b>
7	7,50±2,39	6,71±1,60	6,58±2,10	0,79 (11,70)	0,13 (1,99)	0,92 (13,92)
8	3,48±1,61	4,96±1,26	3,58±1,55	<b>1,49** (29,95)</b>	<b>1,38* (38,54)</b>	0,11 (2,96)
9	45,44±13,05	74,55±10,40	58,09±21,82	<b>29,11** (39,05)</b>	<b>16,46* (28,34)</b>	<b>12,65* (21,78)</b>
10	2,98±1,12	2,46±0,82	3,96±2,30	<b>0,51* (20,82)</b>	<b>1,49* (37,74)</b>	0,98 (24,78)
11	1,84±0,95	1,82±0,54	2,63±1,54	0,02 (1,07)	<b>0,80* (30,61)</b>	<b>0,78* (29,78)</b>
12	61,10±27,74	76,79±25,19	72,19±20,61	<b>15,39* (20,12)</b>	4,29 (5,95)	11,10 (15,37)

Notices: 1 – total number of throws made per game from line; 2 – number of scored goals per game from line; 3 – effectiveness of throws per game from line; 4 – total number of throws made per game from back line; 5 – number of scored goals per game from back line; 6 – effectiveness of throws per game from back line; 7 – total number of throws per game made from edges; 8 – number of scored goals per game made from edges; 9 – effectiveness of throws per game made from edges; 10 – total number of throws made per game from 7m; 11 – number of scored goals per game from 7m; 12 – effectiveness of throws per game made from 7m; \* –  $p \leq 0,05$ ; \*\* –  $p \leq 0,01$ ; SBT – stage of specialized basic training; PHR – preparation for higher results; MRIA – maximum realization of individual abilities.

Among all qualification groups the largest number of throws from back line make sportsmen at stage of preparation for higher results that with a significant advantage (12,42 and 20,98 throws, 20,98 and 80,16% with  $p \leq 0,01$ ) are ahead of representatives of other qualification groups. These sportsmen (stage of preparation for higher results) also are ahead of representatives of other qualification groups by indicators of total number of effective throws from the back line. Advantage is between 3,93-6,68 throws (37,41-46,29% with  $p \leq 0,05-0,01$ ). However, by effectiveness of throws in this group handball players on stage of preparation for higher results significantly inferior to sportsmen on stage of maximum realization of individual abilities, the advantage of which is 10,00 throws (24,73% with  $p \leq 0,05$ ). Last position by this indicator occupy handball player at the stage of specialized basic training that inferior to other qualification groups on 7,93-17,93 throws (26,05-44,34%) with  $p \leq 0,01$ .

During the description of next indicators (number of throws from edges) was received data indicating that significant differences between sportsmen of all stages is absent (0,13-0,92 throws, 1,99-13,92% with  $p > 0,05$ ). However, when considering the original rate (effective throws) revealed advantage on the side of handball players at stage of preparation for higher results (1,38-1,49 throws, 20,82-37,74% with  $p \leq 0,05$ ) among representatives of other qualification groups. Unexpected were indicators of throws from edges. It was established that the effectiveness is observed in sportsmen at stage of preparation for higher results. The advantage over representatives of other qualification groups was 29,11 (39,05%) from handball players at the stage of specialized basic training and on 16,46 (28,34%) from representatives of the stage of maximum realization of individual abilities. This determines the need for further research in this direction. Along with that,

as a result for our program is a need to save sportsmen level of technical and tactical training, in particular by the effectiveness of throws from edges in competitive activity.

According to data received about throws from 7-meter (penalty) line have its general features for competitive activity in handball. We have established qualification differences. Revealed that by the number of such throws lead high qualified handball players and they are far outweigh from sportsmen at other stages that we studied (0,51-1,49 throws, 20,82-37,74% with  $p \leq 0,05$ ). We attribute this with more competitive character during competitions in handball on the stage of maximum realization of individual abilities. A similar situation holds for the number of effective throws. The advantage of high qualification sportsmen was 0,78-0,80 effective throws (29,78-30,61% with  $p \leq 0,05$ ). In this case by the productivity of throws from 7-meter line remained significant difference with sportsmen at the stage of specialized basic training (15,39 by absolute and 20,12% by relative value). For sportsmen t stage of preparation for higher results no significant differences were found (4,29, 5,95 with  $p > 0,05$ ).

## Discussion

We received scientific data that complement the existing (Doroshenko 2013, Klusov, 1982, Melnyk, Levkiv, 2008) and show that for the system of long-term handball players' improvement the stage of preparation for higher results in comparison with others is characterized by searching and disclosure of effective reserves in the process of training. The reasons may be to achieve optimal levels of physical and technical training, ordering of sportsmen action in accordance with the general objectives of the team.

The established data indicate the need for emphasis on effectiveness of qualified handball players for the purpose of achievement indicators close to 50% of throws effectiveness per game.

High qualified sportsmen in general make less throws and make less throws after positional attack. This can be offset by using the number of successful throws or their effectiveness in total.

Complemented scientists data (Doroshenko, Czapenko, 2005; Melnyk, 2008; Tyschenko, 2011) about the highest realization of throws by high qualified handball players and while no differences between the groups of qualified handball players. This indicates that sportsmen at stage of preparation for higher results don't realize their qualification reserve in competitive activity, particularly in relation to attacking action during positional attack.

Received results indicate that for contingent of qualified handball players in contrast to the high qualified is usual another strategy of competitive activity. However, it requires substantial correction to align indicators to the level of handball players at stage of maximum realization of individual abilities. We can confirm that for high qualified handball players in competitive activity performance of breakaway is not typical.

A comprehensive review of tactical actions indicators in the attack demonstrated that there are trends by which effectively become important group tactical actions during attacking. However handball on the stage of maximum realization of individual abilities demonstrate at extremely low rates of absolute values greater indicators of successful throws and significantly higher ( $p \leq 0,05-0,01$ ) indicators of effectiveness both at group and at individual tactical actions during attack.

On one hand, the results indicate that the lower qualification handball players are more effective when performing parallel group interactions. On the other hand, the comparison of these data with the total number of throws after the parallel interactions indicates that educational and training process must strive to reduce the part of these interactions in group actions in the attack.

Summarizing received data about indicators of group tactical actions varieties during attack worth noting that we first established the dominance of a particular kind in competitive activity of handball players on a separate stage of long-term training. Thus, for sportsmen at stage of specialized basic training are more typical parallel group interactions. For representatives of stage of preparation for higher results is observed a significant dominance of crossed group interactions. However, for sportsmen who demonstrate the highest level of sportsmanship (stage of maximum realization of individual abilities) should be determined the combined group interaction. This allows us to assert the need to change the priorities in the tactical training of handball players from stage to stage. Also is worth noting generalized sequence of learning and improvement of tactical group interactions that may be offered for direct implementation into the system of handball players training. By it first should be involved parallel group interaction then crossed and at the end can be used combined group interaction.

We confirmed that effectiveness of throws with different localization of their performance has qualification identified differences. The absolute leader and respectively an orienteer for less qualified handball players are sportsmen indicators that appear on the stage of maximum realization of individual abilities.

## Conclusion

1. Attacking tactical action are result-determining factors of competitive activity of handball players during all stages of long-term sportsmen training. Leading during the game in attack are quantitative indicators of team tactical actions performance in the attack, including: rush, breakaway, positional attack, the total number of attacks and absolute and relative indicators of finished tactical action from different positions, location of throws per game and effectiveness of 7-meter penalty throws.

2. High qualified handball players at stage of maximum realization of individual abilities perform on average  $51,83 \pm 6,82$  throws per game with the effectiveness of  $52,48 \pm 8,38\%$ . Effectiveness of throws by high qualified handball players after their performance in the positional attack (40,64%) significantly inferior ( $p \leq 0,05$ ) to indicators after other kinds of attack (72,19-77,71%). Indicators of throws effectiveness have significantly pronounced disparity ( $p \leq 0,01$ ) in favor of group interactions after which  $18,88 \pm 4,13$  balls from game cross the goal line after individual actions –  $5,29 \pm 1,98$  balls from the game (effectiveness  $48,76 \pm 10,32\%$  and  $60,55 \pm 9,07\%$  respectively). The largest number of throws performed by high qualified handball players from the back line ( $26,17 \pm 5,28$  throws) representing 50,49% of all throws during competitive activity. Much less ( $p \leq 0,05$ ) performed by them throws from the line ( $15,13 \pm 4,14$  throws), edges ( $6,58 \pm 2,10$  throws) and 7-meter ( $3,96 \pm 2,30$ ).

3. Players of qualified handball teams at stage of specialized basic training perform  $62,11 \pm 7,8$  attacks using positional attack is done  $48,52 \pm 8,2$ , the rest part falls on the fast attack: breakaway  $8,9 \pm 5,1$  and rush  $4,68 \pm 3,5$ . Average effectiveness of attacking actions of sportsmen at this stage of long-term training is 36.63% in total (according effectiveness of positional attack is 29,23%, breakaway – 26,02% separation – 55,34%).

4. Features of attacking tactical actions of qualified handball players at stage of preparation for higher results is associated with the largest part of throws from positional attack in the structure of the total number of throws and of them effective are (70% and 56%); highest effectiveness of throws from 7-meter line (76,49%) and attacking tactical action after breakaway and separation (66,62% and 66,70%); dominant part of group interaction in the structure of throws effectiveness (79,58%); optimal throws effectiveness from the line, from the edge and from 7-meter set in competitive activity (74-76%).

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