

## Preliminary correlation between anthropometric and performance data in volleyball about the transition period

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### Abstract:

In the non professional sports activities, it is usually stopped the training session at the end of the last play-off or play-out championship game. At the end of the season the athletes are tired, in need of rest, with the desire to have a break from all the trainings and matches. This study should be a first one because the revision of literature doesn't carry out any results about this topic. This study is oriented to find a correlation between anthropometric and performance data, taking as a point of reference volleyball athletes. The aim is the estimated reduction in performance following the transition period due to the inactivity of athletes and knowing descriptive indices such as average, median and mode in order to organize the training annual planning. Experimental research by testing with physical and anthropometric tests at the end of regular season and the beginning of next one. From the statistical analysis of the tests on both group A and group B, it is possible to state that the transition period has produced a worsening in almost all the skills analyzed. What should be done is to exploit the time available for individual and specific interventions so that this period can bring significant benefits in increasing the athletic skills of young athletes.

**Keywords:** anthropometric, performance, skill test.

### Introduction

In the non professional sports activities, it is usually stopped the training session at the end of the last play-off or play-out championship game. At the end of the season the athletes are tired, in need of rest, with the desire to have a break from all the trainings and matches (Raiola, D'Isanto, 2016). Nevertheless, it is not the optimal situation that will allow our players to be in good condition in the following season (Altavilla et al., 2018ab, 2017). Providing that on average the amateur championships end approximately around the end of May and the first training usually starts at the beginning of September; therefore, the athletes haven't trained for 14 weeks, so they haven't good health condition related to agonistic sports (Tiziana et al., 2017).

The period of time from the end of the championship until September is usually defined as the transition period. The long pause is disregarded by many clubs, especially by the amateurs; in fact, what they do is closing their gym, coaches and trainers go on holiday. Very carefully, holidays are essential after a long competitive and stressful season, but they should be planned.

During the summer, it is very common that the lifestyle is not the same the competition period, so the whole physiological parameters value go down. Just the qualitative aspects do not go down for the different characteristics (Di Tore et al., 2018, Raiola 2018, Raiola, Di Tore, 2017, Di Tore, Raiola, 2012) This study should be a first one because the revision of literature doesn't carry out any results about this topic because many studies are in all subjects of volleyball (D'Isanto et al., 2018, 2017ab, 2016, Parisi, Raiola, 2014ab, Gaetano, 2012ab). This study is oriented to find a correlation between anthropometric and performance data, taking as a point of reference volleyball athletes The period taken into account is the transition period between the 2017/2018 competitive season and that one of 2018/2019.

The aim is the estimated reduction in performance following the transition period due to the inactivity of athletes and knowing descriptive indices such as average, median and mode in order to organize the training annual planning; moreover, it is also important in order to choose the best period in relation to the overall data emerged.

From the beginning of the 2017/2018 season, anthropometric samples have been taken and various types of performance tests have been given to the athletes, following the canons of the scientific study (Raiola et al., 2018, Raiola, 2014, Raiola Di Tore, 2012abc, Raiola, 2012, 2013).

## Methods

Experimental research by testing with physical and anthropometric tests at the end of regular season and the beginning of next one (Cirillo et al., 2016). The sample are divided in two groups: group A of 12 females volleyball players, 12-16 years old, and 10 females ones, 18-25 years old. It chooses the tests that satisfied the basic parameters per simplicity, objectivity and reproducibility. For each one of them it has been indicated the criteria to measure and execute.

### *Anthropometric tests*

Height: must be calculated by placing the athlete (barefoot) with her or his shoulders against a wall, heels attached to the wall and using a team (Triangle);

Weight: the athlete in uniform steps on a scale, digital if possible;

### *Speed tests*

Fast run with manual timing 20 meters

Material: -speedometer to one hundredth of a second; -start and finish lines.

Description : The start happens upright, running one at a time. The athlete places the tip of his or her foot just behind the starting line and without command runs at maximum speed cutting the finish line being careful not to get out of the track. 3 tests with a minimum recovery time of 4 minutes and a maximum of 10 minutes.

Measurement: Record the time of the best test to the nearest hundredth of a second. Record the time by focusing on the foot behind the athlete at the time of start.

### *Strength test*

Throwing of a ball while sitting down

To measure the explosive strength of the upper limbs, which is influenced by the athlete's degree of coordination and the length of the limbs.

Material : -1 kg medical ball - chair without armrests of adequate height -double decameter

Description : The decameter is put on the ground with the zero corresponding to the projection on the ground of the inner part of the chair. The athlete while sitting down with the trunk leaning against the backrest, takes the 1 kg medicinal ball with two hands and throws it from the chest ahead as far as possible without detaching his shoulders from the backrest.

Measurement : From the projection of the inner part of the backrest to the point of arrival. Three tests are carried out in succession and the best is recorded;

### *Long jump while standing up*

To measure the explosive force of the lower limbs, which is influenced by the athlete's degree of coordination and the length of the limbs.

Material : Decameter - Exercise mats

Description: The subject stands upright, without taking his feet off the ground and with the tip of his toes touching the bottom line of the field (or at least the starting line). With slight oscillations, he prepares to jump by bending his legs and bringing his arms back. Then he jumps on a metric tape (or marked field line) as long as possible – as it happens in the long jump of athletics - stretching his arms ahead and falling as far as possible on even feet.

It is allowed:

To swing with the arms and to be springy.

To place the hands or other parts of the body on the landing.

It must not be allowed: to move the feet or exert pressure during loading.

Measurement : Usually, what is measured is the distance between the starting line and the part of the body that touches the nearest surface, then it is indicated the best among the three tests.

### *Speed test*

Circuit of skill (speed and coordination):

Description : The athlete decides when to start, glides to his or her left and then returns, always gliding back to the first cone. He runs forwards until he/she touches the red cone, then runs backwards until he/she touches the blue cone. At this point he/she runs forward again making a slalom between the 3 cones, at the exit he/she heads in the 3 circles jumping on even feet; finally, she runs fast passing between the two cones placed on the side line of the field.

**Results**

Tabel. 1. Group A: Anthropometric data

Athlete	Height		Weight	
	June	September	June	September
1	1,65	1,67	74	79
2	1,59	1,62	47	42
3	1,53	1,53	53	58
4	1,6	1,66	60	57
5	1,65	1,67	51	52
6	1,58	1,61	50	49
7	1,59	1,59	66	63
8	1,61	1,61	62	70
9	1,66	1,66	57	55
10	1,54	1,55	50	51
11	1,51	1,52	52	56
12	1,64	1,64	68	66

Tabel. 2. Group B: Anthropometric data

Athlete	Height		Weight	
	June	September	June	September
1	1,57	1,59	48	46
2	1,67	1,67	60	64
3	1,62	1,62	56	55
4	1,67	1,67	57	58
5	1,62	1,62	56	56
6	1,58	1,58	57	56
7	1,70	1,70	63	63
8	1,60	1,60	57	59
9	1,58	1,58	55	56
10	1,60	1,60	57	59

**Table 3**

Group A (n=12)	M	SD
Age (year)	14,8	3,7
Height (cm)	160,1	5,1
Weight (Kg)	57,8	9,1

**Table 4**

Group B (n=10)	M	SD
Age (year)	21,6	3,9
Height (cm)	162,2	4,2
Weight (Kg)	56,9	4,3

Tabel. 5. Data of strength and long jump.

Throwing of a ball while sitting down						Long jump while standing up					
group A			group B			group A			group B		
	June	September		June	September		June	September		June	September
1	5,3	4,99	1	4,18	4,29	1	1,65	1,34	1	1,74	1,95
2	4,1	3,96	2	5,9	5,43	2	2,1	2	2	1,53	1,68
3	5,15	4,64	3	4,84	5,14	3	1,56	1,37	3	1,73	1,75
4	4,15	4,26	4	4,94	5,25	4	1,67	1,65	4	1,72	1,81
5	4,79	4,36	5	4,79	4,5	5	1,85	1,92	5	1,63	1,64
6	4,68	3,96	6	5,36	4,9	6	1,7	1,64	6	1,6	1,67
7	4,65	4,19	7	5,86	5,18	7	1,46	1,21	7	1,89	1,93
8	5,8	4,81	8	5,36	4	8	1,47	1,49	8	1,76	1,59
9	5,2	4,97	9	4,7	4,6	9	2,3	2,03	9	1,58	1,7
10	5	4,41	10	4,83	4,74	10	1,71	1,53	10	1,4	1,63
11	4,33	4,14				11	1,65	1,5			
12	4,9	4,59				12	1,55	1,29			
Average	4,83	4,44	Average	5,07	4,8	Average	1,72	1,58	Average	1,65	1,73
Median	4,845	4,385	Median	4,89	4,82	Median	1,66	1,515	Median	1,675	1,69
Max	5,8	4,99	Max	5,9	5,43	Max	2,3	2,03	Max	1,89	1,95
Min	4,1	3,96	Min	4,18	4	Min	1,46	1,21	Min	1,4	1,59
SD	0,48	0,35	SD	0,51	0,44	SD	0,24	0,26	SD	0,13	0,12
CV	0,1	0,08	CV	0,1	0,09	CV	0,14	0,17	CV	0,08	0,07
T test	0,000588884		T test	0,121837003		T test	0,002217573		T test	0,062929933	

Tabel. 6 . Data of speed and skill tests

speed test 20M group A			group B			SKILL TESTS					
	June	September		June	September	group A		group B		June	September
1	4,03	4,12	1	3,78	3,53	1	9,56	10,19	1	8,81	8,56
2	4,03	3,62	2	3,69	3,78	2	10,13	9,38	2	8,59	10,06
3	3,88	3,85	3	3,44	3,56	3	8,19	9,18	3	8,4	9,12
4	3,78	3,85	4	3,66	3,69	4	9,78	9,75	4	7,5	8,78
5	3,81	3,75	5	3,87	3,75	5	9,62	10,19	5	8,41	8,84
6	3,9	3,75	6	3,84	3,78	6	9,81	8,81	6	9,25	9,75
7	4,09	3,94	7	3,62	3,6	7	10,19	10,56	7	8,22	8,5
8	4,03	3,84	8	3,69	3,75	8	8,15	9,25	8	8,81	9,44
9	3,41	3,66	9	4,12	3,63	9	9	9,21	9	9,41	9,69
10	3,94	3,84	10	4,15	3,91	10	9,47	9,53	10	9,09	9,28
11	3,94	3,78				11	9,4	9,56			
12	3,94	3,95				12	10	9,47			
Average	3,89	3,82	Average	3,78	3,69	Average	9,44	9,59	Average	8,64	9,2
Median	3,94	3,84	Median	3,735	3,72	Median	9,59	9,5	Median	8,7	9,2
Max	4,09	4,12	Max	4,15	3,91	Max	10,19	10,56	Max	9,41	10,06
Min	3,41	3,62	Min	3,44	3,53	Min	8,15	8,81	Min	7,5	8,5
SD	0,17	0,13	SD	0,21	0,11	SD	0,65	0,48	SD	0,53	0,51
CV	0,04	0,03	CV	0,06	0,03	CV	0,07	0,05	CV	0,06	0,05
T test	0,179641962		T test	0,179011621		T test	0,448524203		T test	0,007572859	

Tabel 7 . Correlation between speed test and skill tests (in June)

		N	Correlation	Sign.
Couple 1	Speed test & skill tests	12	,512	,089

Tabel 8 . Correlation between speed test and skill tests (in September)

		N	Correlation	Sign.
Couple 1	Speed test & skill tests	12	,213	,506

### Discussion

From the statistical analysis of the tests on both group A and group B, it is possible to state that the transition period has produced a worsening in almost all the skills analyzed. All the girls have had worse results during the transition period in the strength of the lower limbs, upper limbs and in the skill test. The only ability which seems not to have been affected is the speed test on the 20m.

In particular, we have seen that Group A is worse than Group B for several reasons:

- different basic athletic skills between the two groups, group B athletes have greater coordination skills;
- some of the girls in group B kept training.

Such worsening of the A group is confirmed also from the correlations (in tab. 7-8); in which the correlation between speed test and skill tests of September (0,213) got worse compared to that one of June (0,512). Despite these differences, only in the long jump tests from a standing position, there were obvious differences since the power test of the lower limbs was very much related to the technique of the execution. All this implies that the two groups are homogeneous from a physical point of view but the difference can be in the technique and coordination skills.

### Conclusion

In this work it has collected test data of volleyball athletes of (12-16 years) and (18-25 years), analyzing the decreasing performance over the transition period. It believes that these data confirm the hypothesis that an excessive transition period leads to a decreasing performance and it is therefore appropriate to urge the teams to continue the season at the end of the championship. What should be done is to exploit the time available for individual and specific interventions so that this period can bring significant benefits in increasing the athletic skills of young athletes; moreover the girls could learn the methodology and mentality of physical training similar to that one employed by the advanced team. Every club should invest more in this transition period. In any case, at the end of the year it is essential to plan and limit the “stop” of the players in order to avoid their bad physical conditions. This solution would improve the level of all sectors of volleyball and would then allow those involved in physical preparation at the highest levels to only worry about how to exalt the physical aspects and avoid having this kind of problem for athletes and for trainers (D’elia et al., 2018).

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