

**SPECIFIC PERIODIZATION FOR THE VOLLEYBALL:  
A TRAINING ORGANIZATION WITH BALL AND OF THE PHYSICAL TRAINING**Nelson Kautzner Marques Junior<sup>1</sup>**ABSTRACT**

The objective of the review was to explain how the volleyball coach organizes the ball training and the physical training with ball. The specific periodization for the volleyball the coach organizes the ball training with three contents (sequence of the volleyball skill defined, volleyball skill effort and level of volleyball skill injury). The contents are interconnected during the training organization and during the training execution. The technical training and the game situation training the coach has a subjective control of the volleyball effort and the game training this does not occur. Then, when the coach structures and prescribes the technical training and the game situation training, he needs to be concerned with the objective of the session, with the skills exercised, with the volleyball skill effort and with the level of volleyball skill injury. The game situation training the coach needs to prescribe the appropriate exercise for the team game model. Some researchers determined the strength as the most important motor capacity conditioning of the sport because the improvement of the strength causes an increase in the velocity, in the resistance and in the flexibility. The specific periodization for the volleyball the principal training is with ball. Then the best type of physical training is the intermittent training of maximum intensity of Cometti (2001, 2002). But the trainer uses the interconnected contents of the ball training during this session. In conclusion, the specific periodization for the volleyball the coach structure and prescribe the ball training with or without physical training.

**Key words:** Volleyball. Training. Effort. Periodization. Sports.

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**RESUMO**

Periodização específica para o voleibol: uma organização do treino com bola e do treino físico

O objetivo da revisão foi de explicar com o treinador de voleibol organiza o treino com bola e o treino físico com bola. A periodização específica para o voleibol o treinador organiza o treino com bola com três conteúdos (sequência definida dos fundamentos, esforço dos fundamentos e nível de lesão dos fundamentos). Os conteúdos são interconectados durante a organização do treino e durante a execução da sessão. O treino técnico e o em situação de jogo o treinador tem um subjetivo controle do esforço do voleibol e o treino de jogo isso não ocorre. Então, quando o treinador estruturar e prescrever o treino técnico e o em situação de jogo, ele necessita se preocupar com o objetivo da sessão, com o fundamento exercitado, com o esforço do fundamento e com o nível de lesão do fundamento. O treino em situação de jogo treinador precisa prescrever o exercício apropriado para o modelo de jogo da equipe. Alguns pesquisadores determinaram a força como a capacidade motora condicionante mais importante do esporte porque a melhoria da força causa um incremento na velocidade, na resistência e na flexibilidade. A periodização específica para o voleibol o principal treino é com bola. Então o melhor tipo de treino físico é o treino intermitente de máxima velocidade de Cometti (2001, 2002). Mas o treinador usa os conteúdos interconectados do treino com bola durante a sessão. Em conclusão, a periodização específica para o voleibol o treinador estrutura e prescreve o treino com bola com ou sem treino físico.

**Palavras-chave:** Voleibol. Treino. Periodização. Esportes.

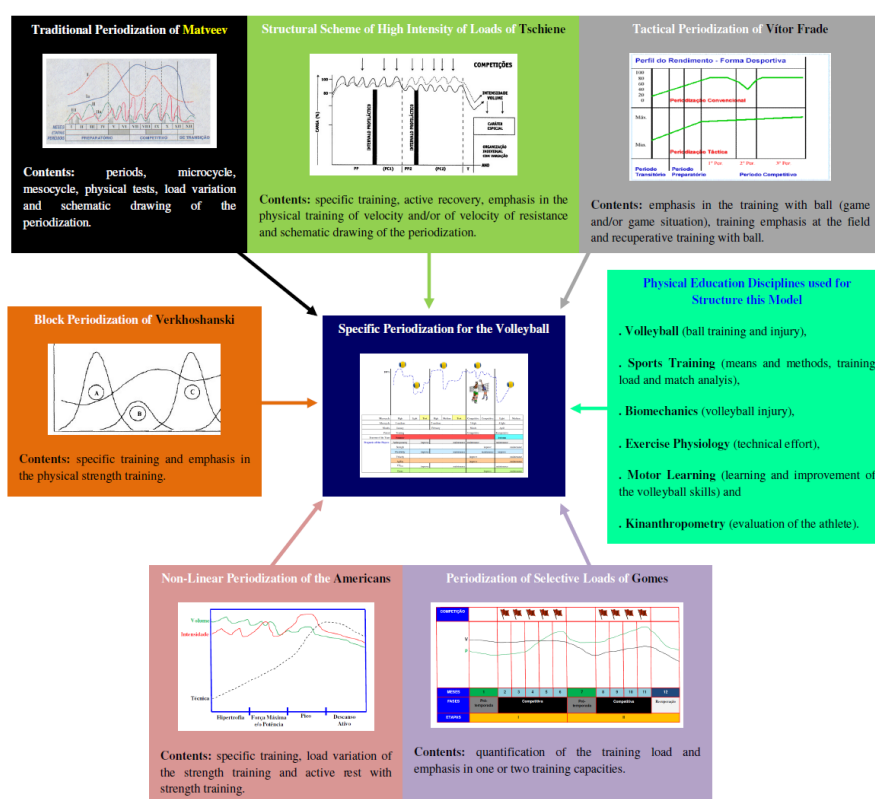
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## INTRODUCTION

The specific periodization for the volleyball was elaborate with the influence of the traditional periodization of Matveev (1991), with some contents of the structural scheme of high intensity loads of Tschiene (1992), of the block periodization of Verkhoshanski (1995), of the non-linear periodization elaborate by the Americans (Kraemer e Häkkinen, 2004), of the periodization of selective loads of Gomes

(2002) and of the tactical periodization of Vítor Frade (Carvalho, 2001).

The author of the specific periodization for the volleyball used some contents these periodization models because the volleyball literature determined high performance with these types of periodization of the volleyball player (Marques Junior, 2018). The figure 1 illustrates the content used of others models in the specific periodization for the volleyball.



**Figure 1** - Contents of other models of periodization that Marques Junior (2017) used for the elaboration of the specific periodization for the volleyball.

Collective sports games the training needs to have the maximum possible the use of the ball because the objective is to improve the technique and tactics of the athlete (Garganta, 1991; Lourenço, 2010). The specific periodization for the volleyball follows this information because the training is almost always with ball during the technical training, the game situation training, the volleyball match and the physical training (Marques Junior, 2011).

The physical training the player needs to practice during the session with ball training

because the volleyball player exercises the game and the physical conditioning at the same time (Marques Junior, 2014; Zakharov, 1992). Then, specific periodization for the volleyball is organized with three contents (sequence of the volleyball skill defined, volleyball skill effort and level of volleyball skill injury) (Marques Junior, 2018). But the physical training of the specific periodization for the volleyball the physical trainer deserves to use the intermittent training of maximum intensity of Cometti (2001, 2002) because during this training the volleyball player

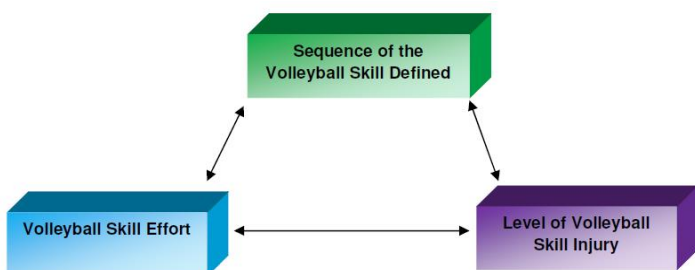
practices the ball training and the physical training at the same time.

### How this training is organized?

The periodization literature does not have this information (Afonso and collaborators, 2017; Kiely, 2018). Then, the objective of the review was to explain how the volleyball coach organizes the ball training and the physical training with ball.

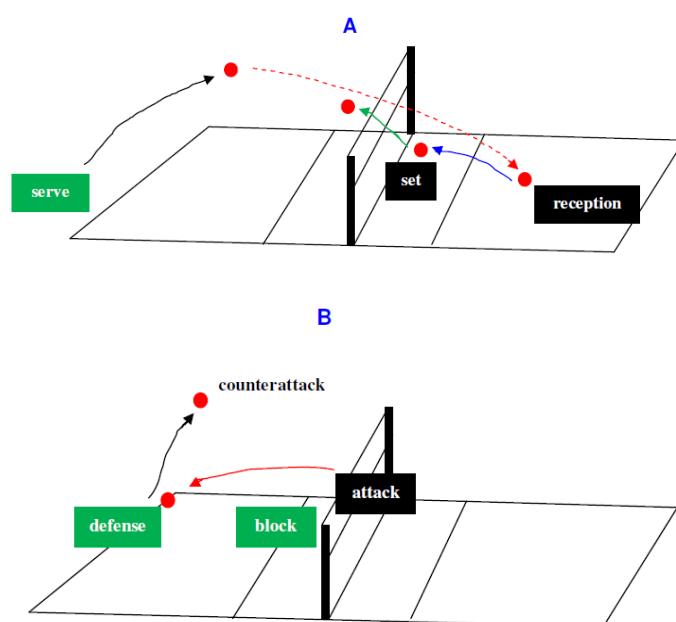
### ORGANIZATION OF THE BALL TRAINING

The specific periodization for the volleyball the coach organizes the ball training with three contents (sequence of the volleyball skill defined, volleyball skill effort and level of volleyball skill injury) (Marques Junior, 2014). Then, these contents are interconnected during the training organization and during the training execution. The figure 2 illustrates the three contents for the coach structure the ball training of the specific periodization for the volleyball.

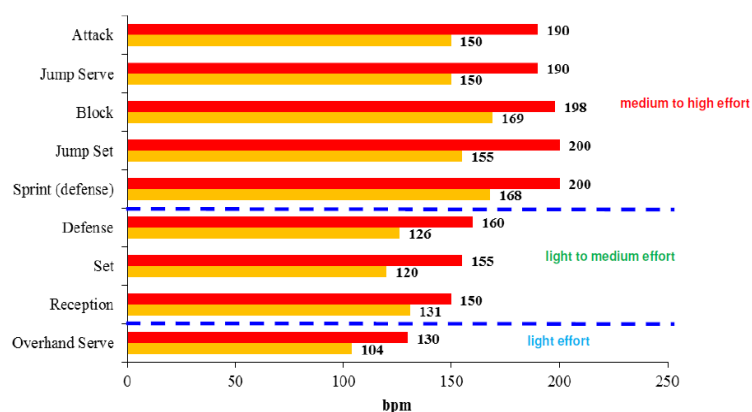


**Figure 2** - Interconnected contents for the volleyball coach prescribes the ball training.

The volleyball match has a sequence of skills defined during the game (American Volleyball Coaches Association, 1997). When there is no error of some skill the serve starts the match, after the opponent practices the reception, the set and the attack. The volleyball team that practiced the serve, the volleyball player practices the block and the player of the back court practices the defense, then the players start the counterattack. The figure 3 illustrates the defined sequence of the skills during the volleyball match.



**Figure 3** - Volleyball skills during the volleyball match.



**Figure 4** - Heart rate (HR) of the volleyball skill (minimum value in orange and maximum in red).

The volleyball's greatest efforts are the jump skills and the defensive displacement in high velocity (Marques Junior, 2016; Horta and collaborators, 2017). Then, the technical training and the game situation training the volleyball coach prescribe the session with the objective of improve the biomechanics of the volleyball skill (Marques Junior, 2009), but the coach prescribe the exercise based on the volleyball skill effort with the objective of has the control subjective of the effort during the session (Marques Junior, 2018). But the volleyball match and the game training the coach has difficulty for determine before of the activity the level of effort (Gomes, 1999).

Marques Junior (2017) determined the effort of each volleyball skill with the result of the heart rate in beats per minute (bpm). The figure 4 illustrates the values.

Other content very important for the coach elaborates the training is the level of volleyball skill injury. This content can be applied in the technical training and in the game situation training (Marques Junior, 2014). Several studies about the volleyball injuries (beach and indoor volleyball) determined the maximum number of injuries of 8 to 41% of the block, 2 to 37% of the set, 5 to 37% of the defense, 8 to 32% of the attack, 8

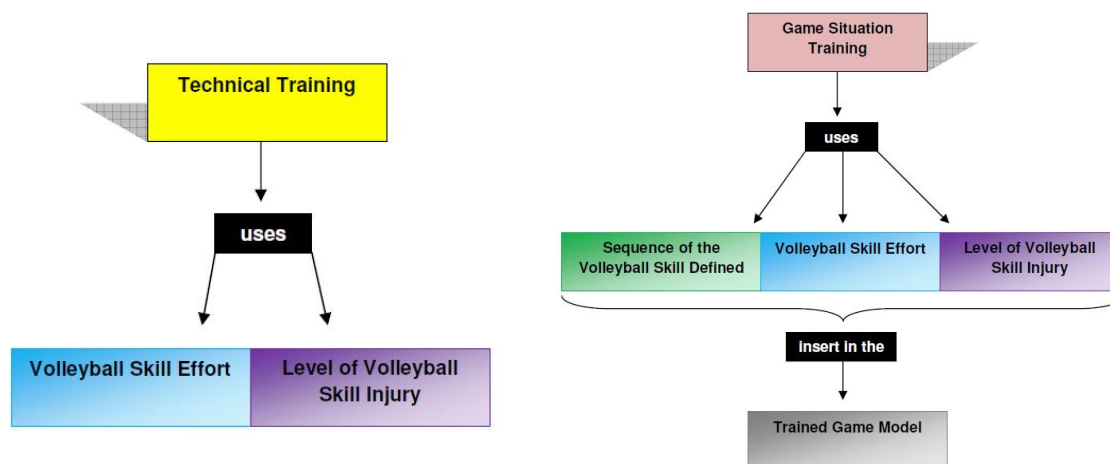
to 32% of the jump power serve, 8 to 20% of the serve (are others serves) and 1 to 14% of the reception (Aagaard, Scavenius and Jorgensen, 1997; Bhairo and collaborators, 1992; Ghirotto, Padovani and Gonçalves, 1994; Gerberich and collaborators, 1987; Marques Junior, 2004; Tadiello and De Rose, 2006; Watkins and Green, 1992). Therefore, the skills with more effort (jump skills) had more injuries.

The table 1 shows the contents for the coach prescribe the session with ball during the specific periodization for the volleyball.

**Table 1 - Values to prescribe the volleyball training.**

Skill	Effort (HR)	Level of Injuries	Result for Structure the Training
Overhand Serve	Light (104 to 130 bpm)	8 to 20% (low to medium)	Light effort and low to medium injury level
Reception	Light to Medium (131 to 150 bpm)	1 to 14% (low)	Light to medium effort and low injury level
Set	Light to Medium (120 to 155 bpm)	2 to 37% (low to high)	Light to medium effort and low to high injury level
Defense	Light to Medium (126 to 160 bpm)	5 to 37% (low to high)	Light to medium effort and low to high injury level
Jump Power Serve	Medium to Hard (150 to 190 bpm)	8 to 32% (low to high)	Medium to hard effort and low to high injury level
Attack	Medium to Hard (150 to 190 bpm)	8 to 32% (low to high)	Medium to hard effort and low to high injury level
Jump Set	Medium to Hard (155 to 200 bpm)	2 to 37% (low to high)	Medium to hard effort and low to high injury level
Block	Medium to Hard (169 to 198 bpm)	8 to 41% (low to high)	Medium to hard effort and low to high injury level
Sprint (defense)	Medium to Hard (168 to 200 bpm)	8 to 37% (low to high)	Medium to hard effort and low to high injury level

**Legend:** Note: The classification of the lesion percentage of the table 1 was established by the author, being as follows: 0 to 10 is low, 11 to 21 is medium and 22 or more is high.



**Figure 5 - Type of training uses interconnected contents for the volleyball coach prescribes the ball training.**

Then, when the coach structures and prescribes the technical training and the game situation training, he needs to be concerned with the objective of the session, with the skills exercised, with the volleyball skill effort and with the level of volleyball skill injury. The game situation training the coach needs to prescribe the appropriate exercise for the team game model. The type of training uses one or

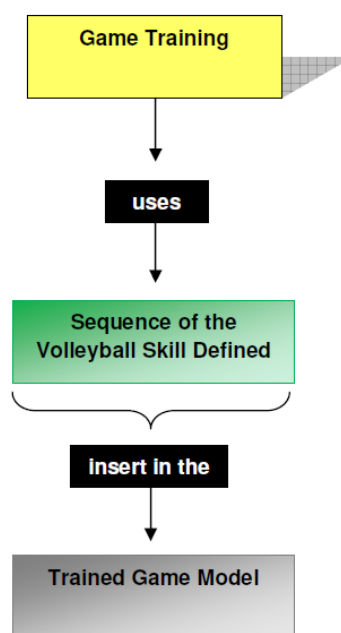
more contents for the volleyball coach prescribe the ball training. The figure 5 illustrates the result.

The game training the coach does not elaborate the session with the content of the volleyball skill effort and of the level of volleyball skill injury. But this training uses the sequence of the volleyball skill defined and the volleyball team practices the match with the

game model. The figure 6 illustrates the explanation.

### How the coach prescribes the interconnected contents of the ball training?

In the example, the coach prescribed a high physical stress in the athlete because during 30 minutes the players practiced game situation training of attack and block (Marques Junior, 2018). This session has a medium to hard effort and low to high injury level. The second exercise the volleyball players practiced an active rest with the technical training of overhand float serve by 10 minutes. After the active rest, the players practiced several types of serve and others players practiced the reception. This exercise had a time of 20 minutes. The figure 7 illustrates the training sheet the exercises.



**Figure 6** - The game training uses one content for the volleyball coach prescribes the ball training.

### Training Sheet of the Specific Periodization for the Volleyball

Period: .....of Training..... Mesocycle: .....1..... Microcycle (days): .....7 days.....  
 Session: ..... medium to hard (training skill effort).....

Date and Week: ....June 7 (Thursday)..... Training Time: ....60 minutes .... (1 hour)....

### Result for Structure the Training

Overhand serve: light effort and low to medium injury level / Reception: light to medium effort and low injury  
 Set and Defense: light to medium effort and low to high injury level  
 Jump Power Serve, Attack, Jump Set, Block and Sprint (defense): medium to hard effort and low to high injury level





Type of Training	Objective	Type of Practice	Time	Effort	Percentage of Injury
1) <b>Attack and Block</b> (game situation training)	Improve the two skills ( <b>high physical stress</b> ).	Blocked	30 minutes	medium to hard	low to high
2) <b>Overhand float Serve</b> (technical training)	<b>Active rest</b> after several jumps (attack and block).	Blocked	10 minutes	light	low to medium
3) <b>Jump Power Serve and Reception</b> (game situation training)	Improve the serve and train the reception players.	Blocked	20 minutes	medium to hard (serve) light to medium (reception)	low to high (serve) low = (reception)
			<b>Total: 60 minutes</b> (1 hour)		

**Figure 7** - Training structure of the specific periodization for the volleyball.

The training sheet the reader can have access in the link to the side - [https://www.researchgate.net/publication/323692245\\_Planilha\\_de\\_Treino\\_da\\_Periodizacao\\_Especificada\\_para\\_o\\_Voleibol](https://www.researchgate.net/publication/323692245_Planilha_de_Treino_da_Periodizacao_Especificada_para_o_Voleibol).

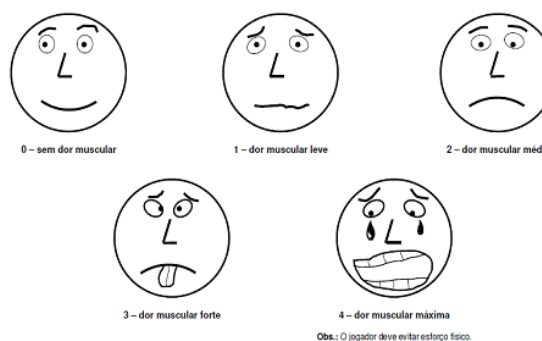
After the training, the volleyball coach shows for the volleyball player the faces scale

**A**

Descritor	Classificação
 Repouso	0
 Leve	1 2 3
 Médio	4 5 6 7
 Forte	8 9 10

**B**

### Classificação da Dor Muscular



**Figure 8 - (A) faces scale of the subjective perception of effort adapted of Foster and (B) faces scale of the subjective perception of the muscle soreness of the physical effort of the volleyball.**

The use of the faces scale of the subjective perception of effort adapted of Foster is important for the coach calculate the training load, the monotony of loads and strain loads recommended by Foster and collaborators (2001). Marques Junior (2017) explained in details these calculations, but the reader needs to consult this article.

The material to collect the data of the faces scale of the subjective perception of effort adapted of Foster and of the faces scale of the subjective perception of the muscle soreness of the physical effort of the volleyball can be accessed in [https://www.researchgate.net/publication/323692537\\_Planilha\\_para\\_Coletar\\_o\\_Esforco\\_e\\_a\\_Dor\\_Muscular\\_do\\_Jogador\\_de\\_Voleibol\\_Atlética](https://www.researchgate.net/publication/323692537_Planilha_para_Coletar_o_Esforco_e_a_Dor_Muscular_do_Jogador_de_Voleibol_Atlética).

### Organization of the physical training

The physical trainer prescribes the physical training needs to know the motor capacity conditioning for elaborates the session (Arruda and Hespanhol, 2008). The studies about the volleyball efforts during the game are important for the physical trainer detect the motor capacity conditioning (Carrillo and collaborators, 2017; Olmedo and collaborators, 2017).

The physical effort of the volleyball (beach and indoor volleyball) during the rally is of 1 to 10 seconds and the pause has duration of 11 to 30 seconds (Moreno and collaborators, 2017; Padilla, Marques Junior and Lozada, 2018; Stankovic and collaborators, 2017). The volleyball player during the rally practices action in high velocity with emphasis in the explosive strength and with explosive resistance strength (Arruda and Hespanhol, 2008b; Marques Junior, 2017d).

The anaerobic resistance is important during the rally and aerobic resistance has important participation during the pause for recover the volleyball player of the rally effort (American Volleyball Coaches Association, 1997). The most actions of the volleyball are the jumps (Marques Junior, 2014b; Pastore and collaborators, 2016). The jump skills and the high speed defensive displacements are the greatest volleyball efforts (Marques Junior, 2017). The distance covered during the match is short, between 1 to 10 meters (Hank, Zahalka and Maly, 2015; Marques Junior, 2014).

The motor capacity conditioning for prescribes the physical training of the volleyball are the strength, the velocity, the resistance and the flexibility (Rose Junior and Silva, 2006). Some researchers determined the strength as the most important motor capacity conditioning of the sport because the improvement of the strength causes an increase in the velocity, in the resistance and in the flexibility (Carvalho, Gonçalves and Silva, 2006; Kraemer and Häkkinen, 2004). Others volleyball studies the physical training of the volleyball players was with emphasis in the strength training (bodybuilding and plyometric training) (Altini Neto, Pellegrinoti and Montebelo, 2006; McGown and collaborators, 1990; Rigolin da Silva and collaborators, 2004; Simões and collaborators, 2009).

Second Verkhoshanski (2001), the work of explosive resistance strength and of reactive strength deserves more attention during the physical training of the volleyball because they are most demanding motor capacity during the volleyball match. The strength training the volleyball player can exercise with the ball training, with the anaerobic resistance training and with the velocity (Cometti, 2002b; Tubino and Moreira, 2003).

The specific periodization for the volleyball the principal training is with ball (Marques Junior, 2011). Then the best type of physical training is the intermittent training of maximum intensity of Cometti (2001, 2002). But the trainer uses the interconnected contents of the ball training during this session (sequence of the volleyball skill defined, volleyball skill effort and level of volleyball skill injury).

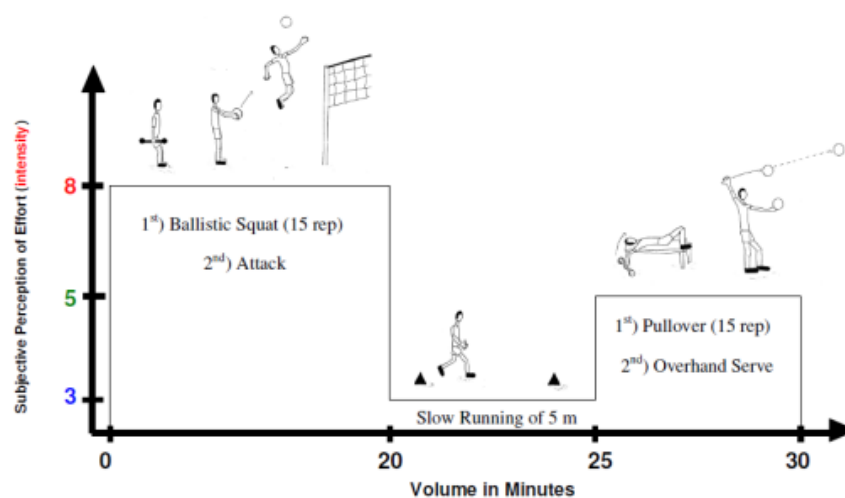
The article taught two examples of the intermittent training of maximum intensity during the technical training and the game situation training.

The technical training had 30 minutes of duration and the strength training was practiced with the bodybuilding of explosive resistance strength with 15 repetitions (rep). The first exercise had 20 minutes and the 16 volleyball players practiced the ballistic squat (load of 32 to 62 kilograms, kg) and after the players practiced the attack without setter. The objective of the player practices first the explosive resistance strength and after the volleyball skill was for the athlete practices the skill with increase of the recruitment of motor units (MUs) (Cometti, 2001). This exercise is important because the volleyball player practices the volleyball skill with more strength.

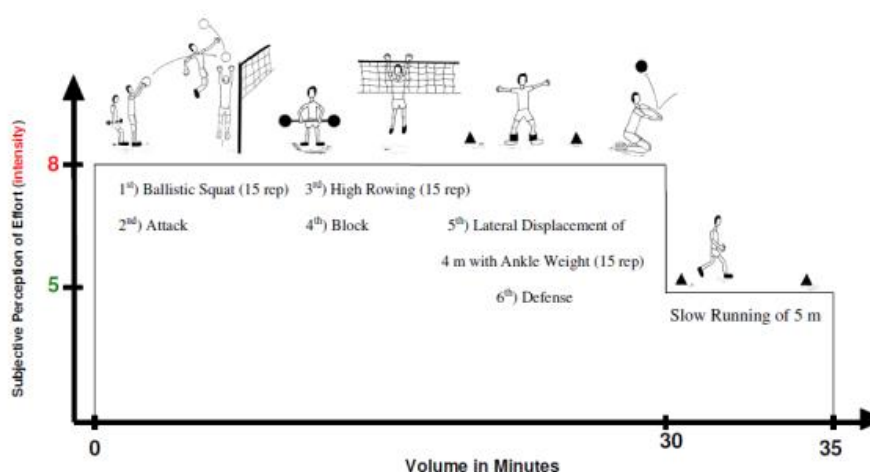
Then, the coach determined a subjective perception of effort (SPE) with classification 8 for this exercise with the faces scale of the SPE adapted of Foster (Marques Junior, 2017b, see figure 5). Other activity of the volleyball coach was the use of the interconnected contents of the specific periodization for the volleyball (see figure 2 and 4). The result for structure the training of the table 1 determined for the attack a medium and hard effort and with a low to high injury level. Therefore, the exercise was strong. Then, the volleyball coach prescribed a recovery work of slow running of 5 meters (m) with 5 minutes of duration (value 3 in the faces scale adapted of Foster, is a classification light).

The third exercise was of medium effort (value 5 of the faces scale) because the players practiced a strength training (unilateral pullover of 5 to 15 kg) and after the overhand serve during 5 minutes. The volleyball skill of the overhand serve the players practiced with the objective of improve the serve and of executed a light effort because before the volleyball players practiced many attack jumps (hard effort and high injury level). Then, the third exercise the players are more fatigued, the level of injury is higher (Marques Junior, 2015).

But the overhand serve is safer than the attack because has a low to medium injury level. This training organization was based on the interconnected contents of the specific periodization for the volleyball. The figure 9 illustrates the explanations.



**Figure 9** - Technical training during the intermittent training of maximum intensity.



**Figure 10** - Game situation training during the intermittent training of maximum intensity.

After the technical training, the 16 volleyball players of the example practiced during 35 minutes the game situation training during the intermittent training of maximum intensity with the objective of improve the attack of the zone 2, 3 and 4 (net zone). The coach prescribed the first exercise with the sequence of the volleyball skill defined because the exercise had attack, block and defense.

The content of the volleyball skill effort and level of volleyball skill injury were inserted in the training because after of the practice of the attack and of the block that is with hard effort and with high injury level. Then the player practiced the defense with light to medium effort and is an active recovery.

The first exercise of the game situation training had 30 minutes and the players

practiced at the same time the strength training of explosive resistance training (15 repetitions, rep) because the exercise of attack, block and defense the players practiced during the sequence of the volleyball game.

The ballistic squat (load of 30 to 62 kg), the high rowing (load of 25 to 65 kg) and the lateral displacement of 4 m with ankle weight (load of 3 to 6 kg) the volleyball players practiced the special strength preparation of Verkhoshanski (1995) with the objective of simulate sports technique of the volleyball.

When the players finished the strength training for increased the recruitment of MUs, the volleyball players of each skill practiced the attack, the block and the defense. The coach classified this exercise with strong (value 8 in the faces scale adapted of Foster), then after the players practiced this exercise with



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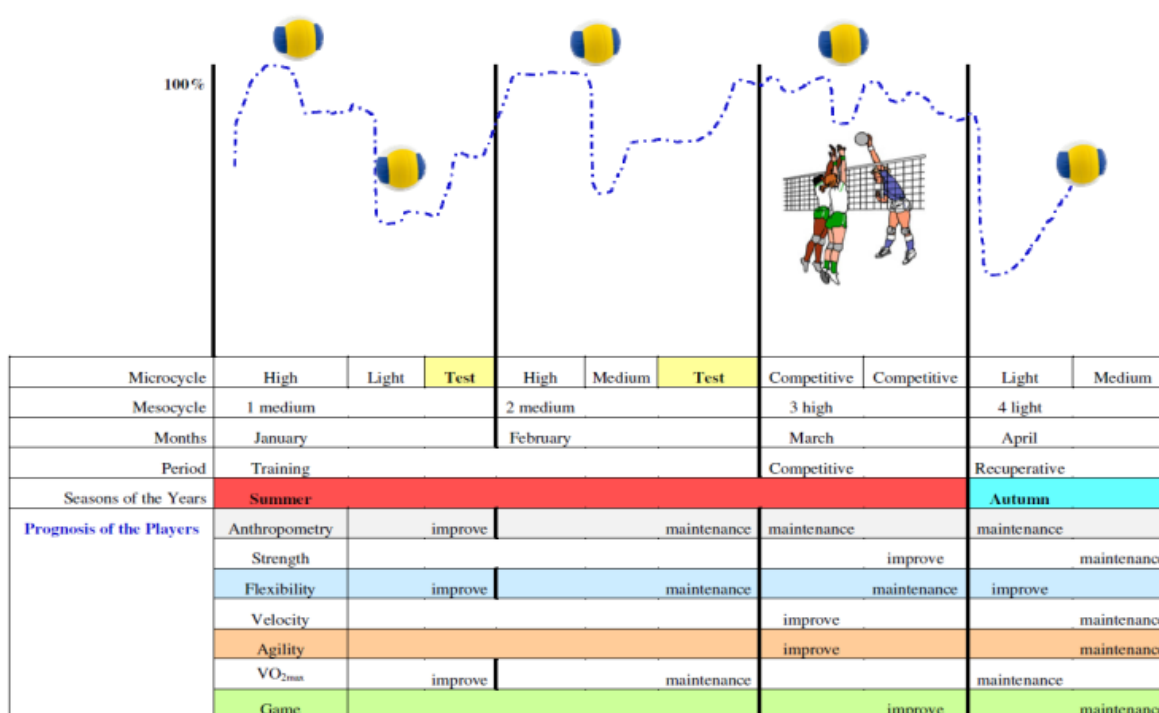
duration of 30 minutes, the coach prescribed a recovery work of slow running of 5 m with 5 minutes of duration (value 5 in the faces scale). The figure 10 illustrates the explanations.

The use of the intermittent training of maximum intensity during the game training is simple. For example, the players practiced the game training during 30 minutes and they stop the game to practice strength training in the

time of 15 minutes. This procedure is until players finish the game training.

The article taught how the volleyball coach should organize the ball training and the physical training during the specific periodization for the volleyball.

The article is finished with the schematic drawing that represents the specific periodization for the volleyball.



**Figure 11** - Representation of the specific periodization for the volleyball through of the drawing, the dashed line in blue with some balls is the training load. The spike drawing with double block shows the competitive period.

## CONCLUSION

The specific periodization for the volleyball uses three interconnected contents for structure the ball training. But the technical training and the game situation training the coach has a subjective control of the volleyball effort and the game training this does not occur.

The physical training of the specific periodization for the volleyball is with ball. The physical trainer uses the intermittent training of maximum intensity and the principal motor capacity is the strength. In conclusion, specific periodization for the volleyball the coach

structure and prescribe the ball training with or without physical training.

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