Injury- and sport-specific training for sportsman with disability - sitting volleyball players -

Ph.D. thesis

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INTRODUCTION

According to the data of the World Health Organization (WHO) the rate of people with disability comes out at 10 % of the whole population of the world. Proportionally the development of medicine the rate of individuals with a somatic or mental disability grows continuously. People with some special kind of congenital or acquisitive disability, which were considered to be inconsistent with life, nowadays can be saved. As George Morris Piersol happily expressed, “years are given to life”, or as I would express: years instead of tears and fears. But: not only the quantity of years is important, but the quality of life as well. In our days nothing verifies it better than the ambitions for equality which was more and more emphasized during the last few decades.

After 1981, the International Year of Disability, the United Nations Organization (UNO) pronounced the period 1983-1992 to be the Decade of Disabled Persons. The aim was to ensure even chances in all territories of life. The European Union keeps it as an important task to increase their living standard. It is well certified, as 2003 was the European Year of Disabled People in the European Union and in Europe 2007 was addressed as “even chances for everybody”.

The Madrid Declaration issued in 2002 declares unequivocally, that disabled persons are entitled to have the same human rights as any others. It means they must have all the citizen, political, social, economical and cultural rights. It certainly includes the right for sports as well. The operative Law for Sports declares that citizens of the Hungarian Republic are entitled to the constitutional rights of the possibly highest level mental and physical health (2004. I. law about sports). The 11. point of the UNO statues attends with recreation and sports, and draws the attention, that a same quality training and preparation should be achieved by persons with disability making sport-activities, as other participants.

The carrying in effect of the laws and advises comes on a snag. In one hand there are only a few skill-qualified trainer working in sport of people with disability, on the other hand the skill-qualified trainers have no versions adapted for athletes with disability in their coaching material, there is no injury-specific knowledge material. It causes further problems: sports exercised by persons with disability are developing strongly, but the trainers' knowledge and the development of training methods don’t keep abreast with it. Successful preparation of sportsmen is impracticable without the sport-scientific researches regarding to persons with disability, and without the usage of its results.

Realizing the above mentioned facts, I would like to accede with the results of my researches to improve the sport-skilled knowledge with the theme of people with disabilities'

sport activities, to improve the sport-skilled data basics, and accede to support even chance and scientifically based preparation in sports.

THE AIM OF THE RESEARCH

The aim of my thesis is the admixture of the bare skill-literature regarding the sport of persons with disability with the results based on scientific examinations and within it especially the sitting volleyball.

The demonstration of the need of special knowledge by a questionnaire I undertake to summarize all of the results, which are indispensably important for a sitting volleyball trainer for efficient work. To this belongs the generic and specific knowledge about the sport.

Forasmuch as the sitting volleyball belongs to the Paralympics games since 1980, I begin my work with the comparing analysis of the Olympics and Paralympics movements. Furthermore the comparing and analysing historical progress of the movements I would like to get an answer, whether there is significant correlation between a good performance on the Paralympics and the Olympics, or rather the actual economic situation (GDP) of the country is determinative.

My aim is to allocate the expectations to a "good trainer" working in sport for people with disability, furthermore, in favour of the more sportsmen should participate in the Parasport movement. I would expand the factors motivating them.

With my examinations baring sportsmen's motion-organs and based on game analysis I would like to accede to the progress of this sport (sitting volleyball), to accede the scientific grounding of the efficient, injury and sport specific preparation.

Furthermore I would like to expand the reason of sitting volleyball's set-back in Hungary in the past decade, and with my pieces of advice as possible solutions I would like to accede the "reanimation" of persons with disability, within it the sitting volleyball players.

HYPOTHESISES

The theme of my research is complex, so my hypothesises are in four groups, as follows:

1. I assume regarding to the volleyball trainers knowledge and attitude of mind concerning to sport activity of people with disability, that

- active volleyball trainers do not have enough knowledge concerning to people with disability, during their trainer-studies they have never heard about the version adopted for disabled of their sport, about the sitting volleyball,
- volleyball trainers decline the possibility to be a trainer by a sitting volleyball team, because of lack of knowledge concerning to sport for people with disability and sitting volleyball.

2. Comparing the results of The Olympics and Paralympics movement I have the following hypothesises;
   - according to the number of the participants, both movements achieved a huge growth, but because of its longer history the number of participating athletes and nations is bigger at the Olympic Games, than The Paralympics.
   - I assume, that the continental partition coefficient of the countries participating The Olympics and Paralympics is different.
   - I assume that the classification (categorization) has an influence on the number of sports and sport events, which can cause some differences between the two movements.
   - I assume, that the rank-place of a certain country on the Paralympics has no linear correlation with the Olympic ranking, much more is a subject of the economic situation of the given country.

3. Regarding to the tasks of trainers and to the high-level athletes motivating facts I assume, that
   - the trainers, working with people with disability should have a wider knowledge than the others working with people without disability and even the same characteristic, attributes appear with another emphasise in the sport activity of people with disability.
   - the motivating facts of people with disability – like these by people without disability – are continuously changing.
   - the motivating facts of elite athletes with disability and sitting volleyball players motivating facts are different, and this fact is a reason of the unsuccessfulness of sitting volleyball players.
   - to be a high-level sportsman (to be a Paralympics participant) does not mean enough motivation to the systematic preparation for sitting volleyball players.

4. My hypothesises regarding to the sitting volleyball comprehend the thesis's both with the players and with the game itself. These are the following:

- In our country sitting volleyball players compose heterogenic groups in many points of view.
- In sitting volleyball – in Hungary -some kind of disabilities appears more often among the players like other type of disabilities.
- Technical elements of sitting volleyball are parallel with the elements used in volleyball, but the appearance of different elements have a different frequency in the two games
- In point of tactics – because of the variance rules – there is a difference between volleyball and sitting volleyball, and this difference indicates the need of special training tasks.

METHODS

I have got the results of my thesis by using three examination methods. these are questionnaire (survey method), comparing analysis and observation.

Survay method was used in the below 3 territories:

1. Volleyball trainer's personal equation to the sport for people with disability and to sitting volleyball was examined in a questionnaire consist of 15 partly opened partly closed questions. My aim was to find the reason why trainers working with sportsman without disability deny working with people with disability, what is their personal equation to the sport of people with disability like. My questions were grouped in 3 major categories: questions to the personal identification, questions to the activity as volleyball trainer (qualification, job, age, level and genre of the team), and questions to the knowledge about the sport of people with disability, knowledge about sitting volleyball (knowledge of rules, personal experiences, opinion). The examined sample was 100 people. 65 % of the asked volleyball trainers was male, 35% female, decimal average age 40, 53 ± 12.7 years. The youngest respondent was 19, 7, the oldest was 73 years old. 6% of the asked trainers have no qualification as trainer, by 4 % of them the qualification is in progress, 12 % of them have a basic level trainer qualification, 63% of them have a midlevel trainer qualification, 15% of them specialised trainer with diploma. There was no master trainer among the asked members. On the average they

have been practising their trainer activity since 13 ± 11 years. (1-45 years). The data were analyzed with basic statistic methods. To examine the differences among the groups the U-test by Mann – Whitney were used.

2. By monitoring the facts motivating high-level athletes with disability to sport I used the survay method as well as by determining the personal characteristics of a trainer considered to be „good" by the sportsman with disability. In April, 2006 I asked 93 athletes with disability, all of them Hungarian National player in their sport (in this year and period, all of them nominated for Hungarian national player). The questionnaire consists of 23, opened, closed and mixed questions. The questions were about the personal dates, sport carrier, its motivating background, about his trainer, his opinion of negative and positive trainer characteristics, about „the good trainer", and not at least his expectations against a „good trainer". The usable feedback was 36 questionnaire. 72,2 % of them male, 27, 8% female. Average age 33,.538 years, ± 9,98 years. According to sports, there were: 1 person track and fielder, 4 person fencer, 8 person table-tennis player, 2 person tennis player, 2 person sitting volleyball player, 5 person boccia player, 2 person judo player, 7 person swimmer, 2 person goalball player, 1 person skier and 2 person shooter. In the average the asked persons are practicing their sport since 11.91 ± 8.53 years, and now they are national players. 50 % of them have congenital, 50 % of them have acquired disability. The types of the disability: 11.1% of them people with visual disability, 88.9 % physical disability. The data were analyzed with basic statistic methods. To examine the differences among the groups the U-test by Mann – Whitney were used. To demonstrate the correlation among the variables I used the non-parametric correlation examination (Kendall Tau).

3. The 3. theme, where I was using the survay method was the examination of the characteristic impairment of the motion organs by the sitting volleyball players, their motivation background, and the and the players combination in itself. With a help of a questionnaire consist of 20 questions (followed by linked questions) I have examined 54 players of 8 Hungarian sitting volleyball teams. The questions were conceived by the following mean stream: questions for personal identification, questions about the type, the localization and date of origin of the impairment, the person's ideas for the future regarding the sport and his sport and about the motivating facts. 20 % of the answer-giving was female, 80% male. Decimal average age of 38,3 ± 10,2 years. The youngest player was 19,33, the oldest was 54,83 years old. The average sport age – years spent by

sitting volleyball – was 10,07 ±9,7 years. The data were analyzed with basic statistic methods. To examine the differences among the groups the U-test by Mann – Whitney were used.

I have used the **comparing analysis** method by analyzing the documents regarding the Olympics and Paralympics movements. My analysis covered the progress of the movements, the change of the contests (quantitative), the amount of the participating countries and athletes, furthermore the background of the achieved results. In favour of expanding the correlation between a successful Paralympics games and the Olympics games, I have registered the ranking places among the countries on the Olympics and Paralympics backward until 1960, when the first Paralympics took place. The correlation was examined by Spearman ranking correlation. The same method was chosen to demonstrate the correlation between the ranking place achieved on the Paralympics and the actual economic status of the given country. In the economics the GDP (gross domestic product) signifies the economic production of a country in a given period. It measures the domestic income and efficiency, so it is often used as an indicator for the average living-standard of the citizens. In favour of expanding the correlation between the economic position and the appearance on the Paralympics, I examined the ranking place by the GDP in 2004 (Athens Paralympics), and the ranking place of the given country achieved on the Olympics and Paralympics. The correlation was examined by Spearman ranking correlation.

To expand the techniques, the tactics, the incidence rate of certain game elements (technical elements) I used the **observation method.** I analysed international male and female games filmed by a video camera. The basis of the analyses was the observation principle of volleyball games by Rigler. The execution of six play elements (servings, blocks, receiving the serving, setting, attacks, defence – that means every kind of hits) were registered and analyzed. The number of the analyzed technical elements is shown in the first table. (While investigating servings, 131 men's and 208 women's servings were analysed in order to compare the to kind of games.) The analysis was made in different aspects.

Analysed play element	Quantity of analysed elements in women's sitting – volleyball matches	Quantity of analysed elements in men's sitting – volleyball matches	Total
Servings	194 pieces	438 pieces	632 pieces
Receiving servings	169 pieces	488 pieces	657 pieces
Setting	185 pieces	803 pieces	988 pieces
Attack	190 pieces	550 pieces	740 pieces
Defense	171 pieces	458 pieces	629 pieces
Block	253 pieces	443 pieces	696 pieces

Table 1. Quantity of analysed elements of sitting volleyball games

The executing method and techniques of every hits were registered.

I divided the sitting volleyball field to 9 parts according to Rigler's volleyball investigations. That was the base of registering the place of ball touches, the way of the ball, and the execution of any play elements. I rated every hit from 1 to 3 according to its efficiency, except blocks, where I rated from 1 to 5. I used non-parametric correlating examination, Kendall Tau statistics method to investigate the correlation of the executing place, techniques and other variables with efficiency. To demonstrate the difference between women's and men's play I used the U test of Mann-Whitney.

RESULTS

The results of my investigations – in connection with the themes in my hypothesis - is as follows:

According to the attitude and **knowledge of the volleyball trainers** regarding to the sport activity of people with disability we can allocate, although 100 % of the active volleyball trainer have already heard about the sitting volleyball, they do not have enough knowledge regarding the sport activity of people with disability. During their studies only 14% of them have heard about the adapted version of their sport, about the sitting volleyball. Furthermore we can appoint, that 80 % of the active volleyball trainers befriend the sport, the contests of the persons with disability, nevertheless 20% advise the sport as only a part of the therapy. Even so 62% of them would not contract trainer activity by sitting volleyball players. The

three facts of the condemnation in their importance sequence were; not enough skill-oriented knowledge (54,84%), lack of time (20,97%) psychical factors (9,68%).

As a result of **comparing the Olympics and Paralympics movements** we can state, that the amount of the participating countries and sportsman shows a growing tendency. At that point of view both movements went through on a huge growth, but because of its longer history in a given year the amount of the participating country and athletes on the Olympics is higher, than on the Paralympics.

The distribution of the participating countries by continents differs. On the last Olympics Games (Athens, 2004) Africa was represented by 26%, Europe 24% Asia 22% America 21% the Ocean and lands beyond 7%. Contrarily on the Paralympics Europe gave the most countries by 33%, then Asia 23%, Africa 21%, America 18% and at last, as on the Olympics as well The Ocean and lands beyond 4%.

My examinations turned off, that the categorization providing even chances on the Paralympics has an influence on the amount of sports and sport events. The Paralympics classification involves the increase of the contests, as long as on the Olympics we can observe the increase the offer of the sports.

On the Olympics 37.5% on The Paralympics 44.44% of the sport are put through ball (team) games. The so called „aesthetic" branches, and the ones judging by points were absolutely missing on the Athens Paralympics, otherwise in the same year they were represented by 9,4% on the Olympics.

My rank correlation examination proved, that the achieved ranking place on the Olympics and Paralympics are in a significant, linear correlation with each other (Spearman R= 0,510095), but at the same time there is no significant correlation with the given country's actual economical status neither on the Olympics (Spearman R= 0,15899), nor on the Paralympics (Spearman R= 0,238919).

On the basis of my examinations regarding **the trainers of people with disability** and the assumptions set on them we can appoint, that the trainers working with people with disability - against the others working with athletes without disability – have a more complex task. Beside the corporal expansion and the psychic advocacy they have to attend injury specific tasks as well. That's why the sportsman expect other – more – attributes. While for the athletes without disability the three most important trainer's attributes are the years long tutorial experience, the skill-orientated knowledge and a kind of general intelligence till then the athletes with disability prefer – in importance sequence – the skill-orientated knowledge,

availability of placidity and toleration, having self-control, upstandingness and bluntness. The results allude to the reduced self-appraisal of the people with disability, as on the 7. position appears the readiness for sacrifice as an expectation against the trainer. The need of this attitude does not come up by athletes with disability at all.

The bilateral confidence is indispensable for the trainer's work. This fact is proved by the result of my examination, as per the 72,2 % off national players consider the belief between the player and the trainer to be the same, and 42,2 % of them scored bilaterally it "5".

My results regarding to the **motivation facts** exfoliated as follows. I have found many significant differences between the athletes with congenital and acquired disability. The 55,5% of the athletes with congenital disability were motivated by the parents at the beginning, on the second place they mention their teachers. Among the athletes with acquired disability there are 50 %, who began to make sport activities under the influence of the friends, and there is only a 22,2 % who were affected by the parents. (There is no significant difference between male or female). 8,3 % of the interviewed athletes began to sport upon a medical advise or influenced by the therapist. Regarding to sport-past I have found significant differences among the athletes with disability as well. Against the athletes with congenital disability the athletes with acquired disability had previously motion experiences (55%), it means, they had sport activities before they began the present sport. This ascertainment is true only for the male athletes, 72 % of the female athletes did not have sport activities before they began the present sport. Against this 83,3% of the athletes with congenital disability began the sport carrier in the present sport.

The importance of the first training's positive atmosphere was proved by the examination, as 70% of the national player-level athletes remember to the first training in their present sport as a positive experience.

The motivating facts by the persons with disability – similarly to the non disabled ones – are changing by the time. At the beginning 61% of them was motivated to sport as a proof of himself, 33,3% as a proof of milieu. By the time the participation on the Paralympics (75%), and out of sheer habit (75%) is in the background of the regular sport activity. The aim to keep the health by the sports becomes to an important motivating factor as well by the influence of the time spent in sport. As at the beginning 44% of the athletes were motivated by this point of view, now days (close to the top of sport-carrier) 61,1% of them consider to keep the health by the sport activity as an important factor.

I found difference among the motivating factors in case of elite athletes with disability and sitting volleyball players. As 75% of high-level sportsman were motivated by the participation on the Paralympics, till then only 19,3% of sitting volleyball players have the same factor in the background of the sport activity. From this fact I conclude, that a kind of reason of sitting volleyball players' flop is the absence of the ambition to the outstanding accomplishment, as to be a Paralympics player is not enough motivation for a sitting volleyball player. Most of them are making sport on a hobby level, just to keep the health. This fact influences negatively to become a high-level sportsman.

Upon my questionnaire regarding to the Hungarian **sitting volleyball players** we can appoint, that they are heterogenic by age, genre, type of injury, status of motion-organs. Respect must be paid to this fact during the trainings methods and training facilities. Against the heterogeneity the appearance of some kind of injuries is higher, than others. The incidence rate of players with amputation is higher among the volleyball players than other injuries. (39% of motion-injured volleyball-players are amputated.)

As a result of my **volleyball and sitting volleyball game analysis** I found the usage of generic volleyball elements. However, saving hits and blocks are used more often in sitting volleyball than in volleyball. We can ascertain that differences in the rules of volleyball and sitting volleyball cause dissimilarity in the games themselves in the aspect of tactics, which differences lead to the need for special training exercises. These special exercises are as follows, grouped by the play elements:

According to training exercises for **servings** we can conceive:

- In order to have greater efficiency in serving, sitting volleyball players should be inspired to use the whole service zone. They do not have to insist on the earlier service zone (the area behind the first, back-right position)
- placing the servings should be practised with the help of a target-table (for example a small box, a footstool) Most of their servings are placed to the middle of the court where it can be easily got. Instead of this they might dare to risk drawing the bead on the areas of the end and side lines.
- Concentration should be developed during the serving-trainings in order to not have wobbliness among the sets.
- The execution and arrival of the servings is team-dependent. In the aspect of a trainer that means two things: first, teams can be observed, so trainers can map opponents, second, as

it is also true for their own team, they should goad their players to shuffle the opponents by continuously changing the arrival of their servings.

The training exercises for **receiving servings and defending** are the follows:

- In the defensive actions of sitting volleyball overhand passes and saving spikes are typical, so it is extremely important to practice these. Trainers should aspire to gain when saving is not a reflex action, but practised movements, so it is useful to practise digs and other saving actions, including passing the ball with foot.
- Players should be aspired to use overhand passes as often as they can not only when receiving a serving, but in defending actions as well, as it has better efficiency.
- There are two rounds of duties when talking about playing the ball back to the opponents' court by the first pass. First, defensive players should learn how to shuffle off back-attacking and attacking defence should also be practised by every player, even if it is blocking, hit or an off speed hit.

With **se**ttings the followings can be conceived:

- As for the top level sitting volleyball teams, their characteristic is the 4:2 playing system, and because it is often impossible for the setter to catch imprecise receiving, players specialised for setting should also take part in attacks actively, that's why its practice is indispensable.
- because the above mentioned reasons (aggravated catch of imprecise hits in sitting volleyball) every player has to learn precise setting (in contrast to volleyball, where in a high level the setter is specialized).
- to widen the tactical repertoire setters practise counter-move settings backwards and side direction joined together with developing fastness
- players (even attack players) should not practice setting only from the position2., but they should be able to prepare a hit from every point of the court.
- setting the ball to a back row player should be practised nearly as much as that to a first line player during trainings, as the opponents' block can be avoid more easily with a back row attack

Special tasks regarding to **attack**s as the following:

- As it was already mentioned regarding to settings, in most cases the setters are not setting from the net, or do not set always from the same position, so the players should practice the attack of the balls coming from the line 2 and from the reverse side.

- Every player should practice the attack not only the third ball, but the put over ball by the opponent, and the ball played by the receiver of the setting, including the forwarder too, as he takes part actively in the attacking tasks. As the attacks from the first ball are the most efficient, their practice should not be only under pressure of circumstances, but it must be practiced knowingly during the trainings.
- The female sitting volleyball players have to practice the more accurate play in sake of being able to close their attack with a real attacking touch (hitting or dropping) instead of the basic touches.
- Players must learn to kill the balls coming to the net, or close to the block of the opponent. It's a good possibility, if the side players are practicing the pull out of the ball from the block, or theirs hit out, by our results the players rarely use this tactics.
- As the fault percentage of the attacks from third balls is very high (because of high efficacy of the static block), players should practice to hit the balls far from the net, or find practical attack variances against the high block.
- As the landing point of the attacks and the number of balls springing away from the block are incalculable, a speedy dislocation should be practiced in the field defense.

According to the results of the observations the following training tasks can be conceived regarding to the **block**:

- To practice the blocking of the serving would be practical if all of the players in the first row would block the possibly farthest from each other in sake of covering the possibly biggest face of the 6 meters net, to discourage the opponent to risk the flat servings, to help the own team-mate's receive of serving
- It's not worth – even in case of an attack in the middle – to use 3 players, because it does not increase the efficacy, but makes the aspect of the defending players harder as a greater part of the field remains defenceless.
- By composing a team, the injuries of the players should be paid attention. Solid block can be made only in case if they are the possibly farthest to each other in the moment of blocking. To do this there is a need of the reverse position of the extant down members, and this not can be done by every player.

CONCLUSIONS

As a summary to my investigation I can establish that a sitting volleyball trainer must have specific knowledge to work successfully. Trainers' justification that most of them do not

assume trainers' role with sitting volleyball players because they do not have enough knowledge of this sport, is right. From those volleyball trainers who would not assume, 58,84% had this reason for the refusal. 38% of the active trainers would even have their function with athletes with disability. That's why I think it is important to introduce specialists to sport for people with disability. Knowledge of sports adapted to people with disability should be part of trainers' extension courses. With the help of this, we could surmount the feeling of scantiness, and quest of enterprising trainers would be done. They could then get information how and where to start, if they have such ambitions.

The investigation also pointed out that trainers dealing with athletes with disability should have versatile knowledge. Different factors are important in their personality and characteristics. Professional knowledge of trainers dealing with people with disability should be defined in a wider sense. For selection and for personalized training, - which is of high priority for people with disability - sport- and injury specific knowledge is extremely important, which must be part of trainers' specific attainments. People with disability need tolerance, calmness, honesty and objectivity.

The trainer should be aware of motivating factors, and has to consider this during the process of choosing. They also need to know that these motivating factors might change in time. (Like it was proven in our examination.)

In my opinion choosing sportsmen is not only the job of trainers, as for a people with disability there are less sports facilities than for children or adults without disability. As it has turned out from my investigation, doctors or rehabilitation therapeutics wended people with disability towards sport only in infinitesimal cases. To have more people with disability taking part in sport, medical professionals should be hustled.

By this I mean both those who work in the area of physiotherapy, other therapeutics (because they meet people with acquired injuries) and school doctors, nurses, whose help is important when talking about introducing sport to birth-lessoned or to children who got injuries school-aged. The function of the latter group is going to rise in the forthcoming years, as with the spread of integrated education they are the sole to meet with children with easier disability (who are suited for sitting volleyball) and can make them familiar with sport.

In my opinion there is only one way to improve the situation of Hungarian sitting volleyball: if a well-established replacement-training education begins, based on young injured.

To the resuscitation of sitting volleyball, to the athlete's (who are motivated and capable of development) coaching a special sitting volleyball trainer is needed, who knows

sitting volleyball itself and its difference from the ordinary volleyball , and with his or her special knowledge he or she is expedient for differing training- conduction.

I hope I could expansively delineate the specifications of sitting volleyball in my thesis, and I hope I can be conducive to the development of sport for people with disability and to the expansion of the technical literature and knowledge.

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