

CAN TRAINING TAEKWONDO BE PART OF OUR AGEING?

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1 INTRODUCTION

We all are getting older, that is a fact. We cannot stop ourselves ageing but we can affect how we are getting older and what is our quality of living in our “older days”, after middle age. So we can, in some way, slow down the influence of ageing in our bodies and, by that way, in our minds as well.

General recommendations for physiological training for ageing persons in Finland are divided into five categories. This breakdown is made by the complexity of sport. The easiest and most recommended sports are indicated as number 0 and the most complex and recommended (only for few healthiest sporty individuals) are stated as number 5.

The categorisation is the following:

0. Basic exercise: Walking, Jogging, Keep-fit exercises, Orienteering
1. Cycling, Swimming, Gym, Canoeing
2. Aerobic, Bowling, Golf, Athletics
3. Cross-country Skiing, Badminton, Tennis, Squash, Volley Ball, Dancing
4. Jazz dance, Skating, Ice Hockey
5. Roller Skating, Downhill Skiing, Martial Arts

I think most Martial Arts instructors are disagreeing about this categorisation. For example, Judo and Aikido have their own training groups for older trainees in my home town Mikkeli. These Martial Arts have developed an own form of their art for older persons many years ago. After such changes of sport, these arts are for sure healthier and safer for older trainees than for example training in the Gym (category 1), Athletics (category 2), Badminton and Squash (category 3) or Ice Hockey (category 4). In my opinion, Martial Arts should work hard to make researchers in Physiological Universities more aware of their sports. Good example is Taichi, what is based on Martial Arts. Nobody could claim that Taichi is not good for health. Maybe taekwondo is not same anymore, if we develop it to direction of Taichi, but some similarities could be found in poomse training.

From this point of view, Taekwondo has been sleeping. Our Martial Art is difficult and has concentrated more to its Olympic status and its reputation as a full contact sport, than its possibilities as healthy exercise. We have to do like other Martial Arts who want to be noticed as healthy exercise for ageing persons. We have to take out some parts from our sport, or at least give less attention for example to contact sparring, high complexity jumping kicks or breaking bricks. These parts are very popular also in the sport presentations for new beginners or joint exhibitions with other Martial Arts. This is of course understandable, because these are also parts of our sport which make us different from other Martial Arts. When an ageing person, maybe 50 year old man or woman who is looking new sport for him/herself for “older days”, sees this kind of presentation, he/she will for sure go for a different gym and a different sport!

The purpose of this study is to find out facts about physiological changes and challenges of ageing from the point of view training taekwondo after middle age. Physiological changes in us are very much researched subjects. How we can respond to these changes with training taekwondo is, at least in Finland, kind of empty white paper, which I try to fill out. Other purposes of this study are to take a critical look of our sport, and find emphasis what we have to do if we want taekwondo to be also health exercise for older persons.

2 PHYSICAL CHANGES WHEN WE ARE GETTING OLDER

Ageing, getting older, is an inevitable process. We start ageing when we are between 20 and 30 years old. Some changes start earlier, some a little later, but changes will start whether we want or not. Our organism, our body tissues and cells in our body start to change and lose some of their features. Some changes can be seen quite early, some can be seen only after 50 years. But we can make difference how fast this happens and how much it affects to our daily living. Physical exercises have a major influence to most of these ageing changes. With regularly training we can decide quality of our physical welfare when we are ageing.

2.1 *Biological changes*

Behind the biological ageing are many theories. There is at least genetic theory, hormonal theory, theory of oxidation (so called free radicals in our cells) and immune and autoimmune theory. Scientific researchers are not sure which of these theories is most important. Commonly they think that genetic theory is most important when we are young, and the other theories have more influence when we are older. We can affect some of these theories with our way of life and what we eat. Most important factors are enough physical training but also enough rest, less stress, good and healthy food (but not too much!) and less alcohol or other drugs. Biggest single factor which has influence to our common health is fatness. About third of Finns over 50 years are overweight and they also have the biggest problems in their health. They die younger and have more disease than normal weighing seniors. It is also difficult to make physiological exercises when you are too heavy.

There is also normal increase in our weigh because of aging. Fluid levels in our body are decreasing and the level of fat is increasing. Because fat is heavier than fluids, we may normally weigh a little more than before.

Our senses are aging and changing also. There are changes in seeing, hearing, touching, tasting and also in our "operating system", which is our central nervous system. For example, eyes are losing adaptability since we are 10 years old and many of us have to use glasses for presbyopia at least from 50 years onwards. Our hearing is weakening also. The weakening starts from about 30 years and first it makes problems to hear high voices. Later we

have problems also to locate the direction of the voice and we have problems in hearing conversation when there is lot of background noises. We cannot basically slow down the changes in our senses, but we can affect our central nervous system, especially how it deals with impulses from our senses.

Our most important organ, the brain, is aging with our body of course. Especially memory may grow weak very fast, but there are big variations between different individuals. Many brain diseases also influence our brain capacity. The most common are problems with blood circulation. If you are not using your brain, it is not working so well. "Training" the brain is useful. Different games and other activities, which activate the brain, are good training. Also physical training, which includes some challenges also to brains, is helping to keep them more active.

2.2 Changes in the musculoskeletal system

a. Power of muscles, loss of muscle mass

Our power level is decreasing about 1 % in a year normally from 50 years to 65 year and after that point about 1,5 - 2 % in a year. Fast power cells in our muscles are decreasing faster than slow cells. This means that the proportion between fast and slow cells is changing and we are getting slower when we are ageing.

In changes of the power levels there are differences between the sexes. Male individuals may still have 80 % of their maximum power levels left when they are 70 years old but females may have only about 65 % left. These differences between sexes are mainly hormonal. Reason for overall weakening and loss of muscle mass is also partly hormonal, but level of greasing in muscles and changes in working system of the muscle cell are also affecting. The relatively highest loss of power level is in lower limbs. Problems with joints and losing mobility especially in lower limbs has also influence in this.

Tendons are very important part of function of muscle system. Tendons are shortening when we are ageing and this has quite big influence in the function of the muscle.

Power training has a big influence to losing power levels. People who have trained power regularly may still have almost same power level and shape of muscles when they are older. Training lower limbs is very important when we are aging. Older people's problems with balance, blood circulation and overall immobility are strongly connected to losing functionality of the lower limbs.

b. Bones

When bones are ageing, they are degenerating, but also growing. Degeneration is happening inside the bone and growing mainly outer parts of the bone. Bone is weakening from inside after 40 years of age, males about 0,5 % in year but females about 1 % in a year. Mainly because of decreasing levels of estrogens, females are losing in their life time about 50 % of inner parts of

the bones and about 30 % outer parts of the bones. Males are losing only about 30 % of inner parts and 20 % of outer parts of the bones. When lost of bone mass is this big, condition is diagnosed as a disease called osteoporosis. The biggest problem in losing strength of the bones is susceptibility to fractures when we are, for example, falling down. These fractures are difficult to heal when we are older, and this also increases immobility when we have to lie down and wait for healing. Lying down causes other problems with muscles, aerobic endurance and joints.

We are getting shorter because of changes in our bones. We are losing about 2 cm of our length in every 10 years onwards 60 years. Our posture is also changing which has an impact to our balance but also to our outlook.

There are huge differences between individuals because of differences in the quality of food and activity level of physical training. A physically strong and active older person who is eating good food with enough minerals may have even 50 % better shape of his/her bones comparing to those who are mainly immobile and eating poor food. All these influence the condition of the bones through storage of minerals.

c. Joints

When we are getting older, level of fluid is decreasing also in our joints. Connective tissues in joints is increasing instead, and this means loss of mobility in the joint. Range of motions is going down because of these changes. Because loss of fluid in joints they do not like high jumping anymore. Flexibility and elasticity of the joints is going down also and this has an influence to jumping. If person is still making too high jumps or other activities which is heavily loading joints consequence may be osteoarthritis. This disease is very painful and may cause partly immobility which is making new problems again.

If person is making a lot of stretching regularly he can slow down these changes. Also a good level of the power in the muscles around joints is helping to keep mobility of joints. Avoiding too heavy punches inside the joints is important to keep joints healthy as long as possible.

d. Aerobic endurance

Our most important muscle, our heart is also getting older. Its maximum capacity is going down about one beat in a year. Basic calculation for maximum heart rate is $220 - \text{years}$ after 20 years. So for example 50 year old person's maximum heart rate is about 170 ($220 - 30$ years). This and stiffening of the walls of the heart means lower aerobic endurance. At the same time our respiratory system is weakening about 10 – 20 % in 70 years. All these changes mean lower capacity in aerobic endurance which has influence in our overall physical condition. Again, an active regularly training person can make significant progress in aerobic endurance comparing to person who is not training.

e. Balance

One small part in our physical capacity is good balance. The so called labyrinth in our inner ear is in control of our balance. This organ is also ageing and loses its capacity. Also, loss of power levels especially in lower limbs, changes in our senses and nervous system have a big influence to problems with balance. Biggest problem is falling down and through our weakened bones we may have fractures easily and this causes other problems.

Balance is a small but important part of ageing persons health. Especially in Nordic countries' slippery winter, it is very important to keep on foot and not to fall down and break you self.

f. Mobility

Mobility is going down clearly when we are ageing. Changes in bones, muscles and tendons have also a big influence in changes in mobility. Losing elasticity of all participating tissues has an effect in losing mobility.

Mobility can be kept up quite long with regularly stretching and exercising with full range motions.

g. Central nervous system

Last but not least we will have changes in our whole central nervous system. This system contains "messages" from different senses, processing this "data" and send "orders" to musculoskeletal system. This system is our "operating system" which keeps us going.

Because all parts are growing slowly weaker, the whole system is weakening. Senses are giving messages slower and more inaccurately. Reaction between message of sense and action is slower and action itself is slower too.

Operations of our autonomic nervous system are fading too. This system is important to functions of internal organs. It has also the important task of controlling the stress level in us. That is the reason why ageing persons have lower tolerance to handle stress than younger persons. Also, seniors cannot endure so much coldness, hotness, physical stress and diseases than younger ones.

Challenging training has something to do to with the whole system: senses, reactions and actions, and training is very important to keep up the level of physical condition and performance. Reasonable physical training has also good influence to our stress levels.¹

¹ In chapter two main sources have been researches of Finnish Age Institute (in Finnish Ikäinstituutti), Finnish Institute of Health and Fitness (in Finnish Suomen terveysliikuntainstituutti) and The UKK Institute (institute named by former Finnish President, in Finnish UKK-instituutti)

3 HOW TRAINING TAEKWONDO CAN AFFECT TO OUR AGEING

3.1 Influences to our biological systems

Training taekwondo has positive influences to our biological ageing. Our brains are working hard, because even if someone else (normally the instructor) is planning the training sessions, the trainee still has to use his/her brains in many ways. Taekwondo has to concentrate to training: he/she has to remember combinations, poomse or different sparring techniques. When taekwondo is an advanced trainee, normally he/she must also apply techniques in many ways during the exercise, especially in couple training and sparring.

We can affect to the condition of some of our senses, such as the sense of angle of joints (sense of position) and the sense of movement. Instead we cannot have influence on, i.e., our sight or hearing. Of course we use them in training, but not in a different way than normally.

How can an instructor take into account ageing taekwondoins during trainings:

Best way to take into account aged taekwondoins is to have an own group for them like juniors normally have. If this is not possible due to lack of resources or lack of aged trainees, a clever instructor can still notice aged taekwondoins and their changing biological systems in many ways during normal training.

One possibility influence senior taekwondoins' brains and central nervous system is to give them more independent tasks during training. They can plan some combinations by themselves; they can have more freedom in couple training (hosinsul, step sparrings and so on).

More ideas of "training" senses are presented in the next chapter (part e. Balance).

3.2 Influences to our musculoskeletal system

a. Power of muscles, loss of muscle mass

Regular training of taekwondo will keep up power levels of the whole body. Because taekwondo is a kick-oriented martial art, it will take naturally care of training important power level of lower limbs. Taekwondo is a combination of resistance power and speed power. The only category which taekwondo has no influence on is maximum power. When we use our muscles regularly, the loss of muscle mass is slower.

How can an instructor take into account ageing taekwondoins during trainings:

Instructor must keep in mind, that there have to be some power training in almost every training session. Focus must be in power training of the lower limbs.

If it is possible in dojang, there could be also some sessions of weight training from time to time. In these cases focus can be in careful and reasonable maximum power training, mainly again to the lower limbs.

b. Bones

Taekwondo training is made mainly on foot, in standing position, but also on the floor (for example some of the hosinsul training). It is very good for our bones that we make different moves on foots, and also some running, reasonable jumping and kicking and punching different objects. All this activates our bones and helps to keep them as strong as possible. Bones like reasonable loading.

How can an instructor take into account ageing taekwondoins during trainings:

It is important to have different actions on foots and also on hands, back and neck. Careful running and jumping is good for bones, also kicking and hitting different objects like sacks. Also reasonable contact training with protectors is good for our bones.

The instructor must, from time to time, talk about food and the importance of minerals to trainees, especially for women.

c. Joints

Taekwondo, like most of martial arts, is very good for joints. In training we do a lot of different moves with large trajectories and without extra weight. Joints have actions and activation. There is a clear connection also to mobility of our joints/limbs.

How can an instructor take into account ageing taekwondoins during trainings:

Taekwondo as a sport itself takes care of large trajectories when we are training. Instructor must remember that the joints of aged persons are not so moveable anymore and there are some changes which affect training.

An aged taekwondoins should not jump so much anymore, especially on hard platform. Some careful jumping is good, but not too much, too high or too often.

The highness of the kicking is going slowly down when taekwondo is ageing and that is normal. Reasonable highness in the kicking gives good activation to joints but it is not too hard for them.

d. Aerobic endurance

Training taekwondo for 1 – 1,5 hours without significant breaks develops our aerobic endurance. Normal taekwondo training session is in this point of view good training for this feature. We also have to admit that taekwondo is not the best training method for aerobic endurance. Our heart rate varies too much in normal taekwondo training and that doesn't give the best results for long term aerobic endurance. Based on the heart rate we go too often to anaerobic area when we are training and our basic aerobic endurance is not developing optimally. Taekwondo training gives good impulses to our heart rate capacity instead, and it replaces other interval training for short term and maximum heart rate training. It is good for long term aerobic endurance to make steady long lasting exercises with walking, jogging, cycling or with other sports at least once in a week.

How can an instructor take into account ageing taekwondoists during trainings:

There have to be variations in heart rate and breathing during taekwondo lessons. Sometimes it is useful to have harder training with higher heart rates; sometimes the instructor has to give easier restorative training. These easier lessons are very good to teach new techniques and hard lessons are good for so called playback training. The instructor must also encourage trainees to have long lasting steady aerobic endurance training on their free time at least once a week.

e. Balance

As mentioned in Chapter 2, good balance is a very important skill to especially the oldest trainees in our groups. Taekwondo is a very good tool to develop balance. As noticed before, senses, power levels and agility in our movement are vital to keep up balance. If we make some special training to balance in addition to normal taekwondo techniques, we can give the best tool for healthy ageing. Then taekwondoists stay up in slippery winter weather conditions, in stairs and so on.

How can an instructor take into account ageing taekwondoists during trainings:

An instructor can make special balance training in many ways. There can be different balance tasks during normal taekwondo training; there can be special balance lessons with balance track training. The important part is making balance training with rotation and after fast getting up from mat. It is also important to train for situations when we lose our balance. It is vital to land safely when we are falling down. These training methods also simulate situations from normal life.

f. Mobility

Stretching is very hard to train because it is painful and boring. It is especially demanding when it is made alone. It is beneficial for effective stretching that we make it together. We can also use different methods in stretching. In addition to basic static stretching we can do dynamic stretching and stretching in pairs, so called passive stretching. To train taekwondo techniques, especially kicking, we have to stretch a lot. This serves also ageing taekwondoins purposes to keep up their mobility in “older days”.

How can an instructor take into account ageing taekwondoins during trainings:

An instructor has to study different stretching methods him/herself. To develop mobility muscles and joints need different activation and stimulus. Stretching for older taekwondoins should not be as hard as for younger persons. Trainees have to be well warmed and stretching should be made carefully with time but without hard power or any stretching equipments.

g. Central nervous system

Combination of senses, reactions and moving is very easy to train in taekwondo. Our techniques and methods of training activate normally our central nervous system. It is very good training for this system when you are having stimulus through your senses, you make fast reactions and you choose right response. It activates system much more than basic physically exercises with jogging etc.

How can an instructor take into account ageing taekwondoins during trainings:

An instructor should plan lessons with different stimulus with sight, touching or hearing and give right combination for this situation. Training in pairs is also very useful. Application in training, especially for choosing the right counter techniques, is very important and useful for our central nervous system.²

4 TRAINING TAEKWONDO IN DIFFERENT AGE GROUPS

4.1 Age group 40-50 years

Before the age 40, there are no special needs for taekwondoins' training from the age point of view. After 40 years different changes start to slowly affect our body, as described in Chapter 2.

² In chapter three main sources have been experiences of training new “Laboratory Group” in writers own Club Mikkeli. There have been own group for ageing taekwondoins' 12/2014 – 04/2015 and writer have been made studies in practical way and have been instructor for this group and have tested ideas of this chapter in practice.

A Taekwondoist between 40-50 years should take care more what he/she is eating. It is useful to avoid too much drinking or other drugs, especially cigarettes. At this age group we make decisions how our ageing is starting. We make big decisions about our quality of life in older days. Of course the choices what we made when we were younger also affect, but not too much. We can still "save" ourselves.

Training taekwondo in this age group is not very different from when we were younger. We have to avoid hard jumping to save our joints. It is also good to build better power levels from this age on, so it is easier to keep up the level when we are older. Maybe hard contact kyorugi-training is not so useful anymore. If we get wounds, they are healing much slower than in younger days.

If we have an own group for older taekwondoists it is good to take in this age category together with older trainees. So the "minimum" age limit for senior groups could be about 40 years. For this age group it is good to have some introduction of training methods in older days and also to have motivation that taekwondo is still having some thing to give after you are 50 years old!

4.2 Age group 50-60 years

This is maybe the most important age group if we want the senior taekwondoists to join our sport. This is also the most important age to start thinking what we are doing with our body and why.

Practically all changes in our biological systems and in our musculoskeletal system are starting in this age group. It varies from individual to other how strongly and how fast these changes are affecting but for sure they are starting now.

Training taekwondo in this age group is basically learning new ways to train. If a Taekwondoist is an old competitor, it is hard to give up hard training. If a taekwondoist is starting again after a long break, it is quite difficult to learn new ways to train in this age. Our nervous system is still remembering old methods and intensity but our ageing body cannot do so anymore.

New methods of training, avoided things and things which should be pointed are described in Chapter 3.

4.3 Age group over 60 years

There is not too many taekwondoists in this age group, at least not in Finland. But for sure we will have them shortly because our older Sabumnims and Kyosanims are closing to this age group. There are senior taekwondoists with kup-levels in many clubs and they are closing this age group too.

In the future taekwondo in Finland, or at least Sim Uu in Finland, have to take this age group in deep consideration. In camps they are not able to train hard 3 times a day. They cannot, or maybe they can for a while but not for long, do

same as younger taekwondoins are doing. For this age group it is very important to train regularly, but much more reasonably and kind of softer than basic taekwondo training. But, as described in chapters 2 and 3, it is also vital to have regular physical training. We affect then to taekwondoins' quality of life in older days but also to our hole public health system!

Methods of training are again described in this study before, it is important to follow these guidelines if we want to guarantee health impact to our oldest taekwondoins.

Like master Ko has said many times: "It is easy to break, but it is much more difficult to heal!"

5 CONCLUSION

In my club, I have had an own group for over 40-year-old taekwondoins starting from December 2014. The group has been active about five months now. There are around 8-10 trainees of which the youngest are just turned 40 and the oldest is now almost 60 years old. We are training together once a week and some of them are also training in normal groups.

I have tested these ideas in their training and I have followed their development and also asked feedback from them. Results are very promising. All of them are developing or at least holding their level. All are enjoying this new method of training and are coming to train every week with strong commitment. Spirit is very high and for the instructor it is very rewarding to see their smiling faces and enjoyment of taekwondo every Monday!

I have also talked with other senior group instructors in other Martial Arts (Aikido, Judo and Boxing) in our dojang. They have similar experiences with their groups.

If Taekwondo wants to be one of those Martial Arts which have something to give for every age group, also for seniors, it is in a hurry to make the changes which are described in this study! It is rewarding for the club and the instructors, but most of all, senior taekwondoins their selves!

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