

THESIS

4TH DEGREE GRADING

THE BENEFITS OF STRENGTH
AND CONDITIONING TRAINING
FOR THE TAEKWONDO
SPARRING COMPETITOR

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Auto Biography

I am a 32 year old 3Rd degree Black Belt and have been training in Taekwon-Do for 12 years, I have come from a very athletic background of Baseball and weight training which I participated heavily in until taking up the art of Taekwon-Do.

In this time I extensively studied the sport of bodybuilding, this included exercise selection, performance and nutritional aspects. It has given me a very good first hand knowledge of strength and conditioning training, I have found that these principles have greatly improved my Taekwon-Do performance as I have utilised these techniques and principles in my own tournament preparation training.

I have competed in sparring competition since beginning my Taekwon-Do training with good success,

- Low Taekwon-Do Club champion sparring 6 times
- Western Australian State invitational champion sparring 4 times
- First place coloured belt heavy weight division sparring 1996 Australian nationals
- Third place black belt heavy weight division sparring 1998 Australian nationals
- WA state team coaching staff for 2004 Australian nationals.
- Third place black belt heavy weight division sparring 2005 Australian nationals

Introduction

Those of us that are practitioners of Taekwon-Do understand first hand the benefits that the art has, benefits that are moral, mental and physical.

Morally Taekwon-Do teaches aspects such as the Tenets of Courtesy, Integrity, Perseverance, Self-Control and Indomitable Spirit. There are also the teachings on Moral Culture by General Choi Hong Hi himself. This is by no means the extent of the moral teachings just an example.

Mentally, “Taekwon-Do is an art that implies a way of thinking and life, and particularly in instilling moral civilisation and generating power for justice. Taekwon-Do is also known as one of the best means of developing and enhancing the emotional, perceptual and psychological characteristics that enable the younger generation, regardless of age, social status or sex, to effectively learn and participate in the social and play demands of his peers”. (Taekwon-do 1995)

Physically, Taekwon-Do has been designed by General Choi Hong Hi to provide practitioners with a well balanced and extremely healthy body, the physical benefits of Taekwon-Do will be discussed in more depth in a later section.

This thesis will investigate whether additional Strength and Conditioning training is beneficial to those practitioners of Taekwon-Do that are focused on the sparring aspect of the art. It will examine methodology behind this training and its application to Taekwon-Do.

Physical Benefits of Taekwon Do

General Choi has designed Taekwon-Do to provide practitioners with a healthy and functional body that is not only suited to and functional for use in the art of Taekwon-Do but that will see practitioners enjoy good health and well being in any sport they participate or in general daily life.

The following characteristics have been outlined in the encyclopaedia of Taekwon-Do, 1995

- Muscular strength
- Dynamic energy – the ability to throw oneself into performance with vigour
- Ability to change the direction of movement
- Agility – the ability to move the body quickly from one place in space to another
- Flexibility of joints, muscles and ligaments
- Peripheral vision
- Concentration and the ability to avoid distraction
- Understanding the mechanics and techniques of body movements

Taekwon-Do is designed to not bulk up a practitioner but in fact has been proven to be a body normaliser. This is in the sense of helping underweight practitioners increase lean muscle mass and helping practitioners with excess body weight to shed some of this weight.

“Taekwon-Do’s high repetition, low resistance movements develop a longer, leaner and more flexible musculature. Such muscles have more of their areas close to blood supply routes, thus producing maximum endurance and well being.” (Taekwon-do 1995)

Benefits of Strength and Conditioning Training

The Taekwon-Do practitioners performance can be further supplemented by additional strength and conditioning training, as the name implies this training is broken into two parts, although they need not be mutually exclusive. Not only can the use of strength and conditioning training improve performance but it can also help in the rehabilitation from injury and can assist the practitioner in getting back into training quicker.

There are a number of key physical attributes which make up the complete athlete and the complete Taekwon-Do practitioner, these include: speed, coordination, flexibility, and strength. Increase any of these qualities, without adversely affecting the others, and you will have a more improved physical specimen.

The body's strength can be enhanced through the use of resistance training and the body's conditioning (eg endurance) can be enhanced by the use of cardiovascular training, as previously mentioned this training does not have to be mutually exclusive.

Strength Training

Strength training is best trained through the use of resistance exercises, this training needs to have a resistance used that is progressively heavier, to best do this weight training equipment is to be used. This equipment can be free weights or machines, free weights are the preferred method. One common misconception regarding weight training is that it will have a detrimental effect on speed, flexibility and coordination. This is not the case if performed properly with correct exercise selection and the correct repetition range to maximise strength gains.

To determine what kind of strength training best suites the Taekwon-Do practitioner it is necessary to understand the types of muscular contractions that the body performs. These contractions can be distinguished as

- Static contractions (also called isometric contractions)
- Dynamic contractions (also known as isotonic contractions)
 - Concentric
 - Eccentric

During isometric contractions, the length of the muscles do not visibly change. Keeping the arm extended during a punch would be an example of isometrically contracting the muscles. During dynamic contractions, the length of the muscles changes. When the muscles are shortening, this is called concentric contraction and when the muscles are lengthening, it is called eccentric contraction. An example of both types of contractions would be actions of the quadriceps during the extension phase of a kick (concentric contraction) and that of the hamstrings (eccentric contraction).

Dynamic contractions are the best stimulation for achieving muscular strength, along with these types of contractions there are other principals that must be followed to achieve best results. They are,

- The overload principle
- Full range of motion
- Large muscles, small muscles
- Front / back and upper / lower balance
- Correct exercise selection
- Correct exercise technique
- Recovery

The overload principle is based on the theory that when the muscles are placed under a certain amount of stress (eg weight being lifted) the muscles are slightly damaged, the body will naturally heal itself and force the muscles to become larger and stronger. The next time that you lift weights the resistance needs to be slightly heavier to continue the growth process, therefore the muscles need to be continually overloaded.

Muscles will best respond to weight training when utilised through their full range of motion, this is also beneficial to the Taekwon-Do practitioner as techniques are executed through their full range of motion and therefore it is important to train the exercises in this manner.

When muscles fatigue, training will become less productive. Therefore it makes sense to train larger muscles before smaller muscles to gain the most from strength training. If the triceps (small muscles) are exercised and fatigued before chest exercises are performed this will seriously affect the ability to perform an exercise such as the bench press which is designed to stress the muscles of the chest (large muscles).

It is essential to balance opposing muscle groups, one of the most important reasons for doing this is related to the prevention of injuries. If the hamstrings are too weak compared to the quadriceps muscles, chances will be greater that they will get injured during kicking.

Exercise selection is vitally important, for best results from strength training exercises must be chosen that allow the trainer to maximise results from the minimum amount of training. To best do this compound exercises need to be utilised, a compound exercise is an exercise that recruits more than one muscle group. An example of this would be the squat that recruits most muscles of the legs as opposed to the leg extension that stimulates the quadriceps only.

Not only is the correct exercise selection vitally important but the correct execution of the exercises is a must to avoid injury. Attempting to lift weights that are too heavy with poor technique is a sure way for the Taekwon-Do practitioner to injure themselves. Research has shown that 4 – 6 repetitions of 4 – 6 sets, increasing the weight on each successive set, produced the most significant increases in strength. This coupled with cycling the levels of intensity during the weekly workouts will assist constant strength gains without burning out the athlete. Cycling can be done through the use of three weight sessions per week based on a heavy / light / medium rotation. Heavy workouts being 100% intensity, light being 80% intensity and medium being 90% intensity.

Aside from the stimulation put onto the muscles through the weight training one of the most important, but overlooked aspects of strength training is recovery. The body must be allowed adequate rest and therefore it is recommended that at least one day of rest be taken between strength training sessions. Along with the rest periods allowed adequate nutrition must also be undertaken to assist the body in the recovery process.

Conditioning Training

Conditioning can also be referred to as endurance, as in other sports, endurance in Taekwon-Do is very important in order to compete at a high level. In some cases, endurance may make the difference between winning or losing, it will allow the Taekwon-Do practitioner to continue a high level of performance for a longer period of time. Endurance is also important relative to the prevention of injuries, the more tired the athlete gets the easier mistakes creep into the execution of techniques, which may lead to injuries such as muscle pulls, twisted ankles or even hyperextension of the knee to name but a few.

Endurance can be divided into two categories, aerobic and anaerobic, with these two types of endurance being trained with different techniques to serve different purposes. To determine which of these types of endurance training is more suited to the Taekwon-Do practitioner there is a need to understand the benefits of both types and the ways in which they are trained.

Aerobic endurance is best suited for activities with low, steady-state intensities, activities such as running a marathon or participating in a triathlon. These activities require the body to maintain this lower level of intensity for several hours at a time. This type of endurance can be trained by the athlete undertaking jogging at a steady, moderate pace, gradually increasing the length of time that the jogs are done for so as to develop the required level of endurance.

Anaerobic endurance is best suited for activities that require the athlete to generate a high level of intensity for short periods of time, a two to three minute burst of this type of intensity is the maximum that the body will allow. Training this kind of

endurance is best achieved through the use of short burst of high intensity activity such as a sprint followed by a short period of a low intensity such as jogging slowly. These two activities need to be alternated for the two minute to three minute period to maximise results

For the competitive Taekwon-Do practitioner to be successful they will require a combination of both types of endurance but most focus needs to be put on the Anaerobic aspect of endurance training, aerobic endurance will provide a good base for the anaerobic training and should be developed before serious anaerobic training is undertaken.

It can now be seen that anaerobic endurance is needed most by the competitive Taekwon-Do practitioner after the types of endurance have been investigated. A sparring bout in competitive Taekwon-Do is made up of 2 x 2 minute rounds with a 1 minute rest break in between, the activity in the bout consist of brief high intensity bursts followed by moments of lower intensity activity such as moving around the ring. Anaerobic endurance is ideal for this type of activity to be sustained.

Combining Strength and Conditioning Training

As mentioned in the outset of this thesis, strength and conditioning training need not be treated entirely as separate entities. Although the training principles are different and they are being used to develop the body in different ways they can be used hand in hand and trained in the same training cycle. When trained correctly without too much focus being directed to one of these training aspects, combined, they can help the Taekwon-Do practitioner achieve great results and become an even better athlete.

It does need to be taken into account that this kind of training should be cycled throughout the year and use as preparation for tournaments, it is a heavy training cycle that cannot be sustained for the entire year. Ideally it would be used in the competitive off season, to develop the strength and endurance to help sustain the

athlete whilst the more technical sides of tournament training such as tactics and technique execution are trained closer to the tournament date.

An example training schedule and plan may look like the following, this is just one plan that can be developed following the principle discussed throughout this thesis.

Weekly Schedule

Monday	Weight training (90% intensity)
Tuesday	Taekwon-Do / Endurance training
Wednesday	Weight training (100% intensity)
Thursday	Rest day
Friday	Taekwon-Do / Endurance training
Saturday	Weight training (80% intensity)
Sunday	Taekwon-Do / Endurance training

Sample Weight Training Routine

This routine takes into account the principles of;

- Choosing large compound exercises that will train the most parts of the body with a minimal amount of exercise variation, exercises such as the squat, power clean and bench press. Barbell curls have been added for additional arm strength.
- Enough periods of rest between workouts, three weekly sessions with at least one day's break between weight sessions.
- Exercises that will work the overall body, following the front / back and upper / lower principles
- Use of the overload principle by pyramiding the amount of weight used on each successive set.
- Cycling weekly intensity through the use of three weekly workouts with varying levels of intensity.

Monday

Workout 3 (90%)

	Set 1	Set 2	Set 3	Set 4	Set 5
Power Clean (5 reps)	60	60	65	70	75
Bench Press (5 reps)	75	85	95	105	115
Squat (5 reps)	60	70	80	90	100
Barbell Curl (20 reps)	40	40			

Wednesday

Workout 1 (100%)

Set 1	Set 2	Set 3	Set 4	Set 5
60	65	75	80	85
90	100	110	120	130
70	80	90	100	110
45	45			

Saturday

Workout 2 (80%)

Set 1	Set 2	Set 3	Set 4	Set 5
60	60	65	65	70
70	80	90	100	110
60	60	70	80	90
37.5	37.5			

To further increase the benefits of this routine and to provide additional conditioning the three large exercises of power clean, bench press and squat can be done in circuit fashion. Completing the first set of the power clean then moving onto the first set of the bench press and then onto the first set of the squat, the circuit will continue to all 5 sets of each exercise are completed.

Sample Endurance Training Routine

This routine takes into account a period of aerobic training required to develop a good base to then train anaerobic capacity to get the Taekwon-Do practitioner into top tournament sparring condition. After the initial 6 weeks of building the aerobic base the endurance training is then restricted to sessions that last 11 minutes only with a structure based loosely on sparring rounds, the endurance training is set at 3 x 3 minute rounds with a 1 minute rest in between each round. In each of these 3 minute periods there needs to be at least 6 high intensity bursts of 3-5 seconds followed by steady movements such as jogging or bouncing in place every minute of the round.

These bursts replicate the high intensity efforts that occur in a round of sparring and are most easily trained by the use of sprint training. To train this anaerobic endurance the amount of sprints per round obviously needs to be built gradually over the weeks as per the below schedule

Weeks 1-3	3 weekly sessions of jogging, moderate pace, duration 15 minutes
Weeks 4-6	3 weekly sessions of jogging, moderate pace, duration 20 minutes
Week 7	1 session per endurance training day of 3 x 3 minute rounds, 1 minute rest between rounds, 2 evenly spaced bursts per minute totalling 6 bursts per round.
Week 8	1 session per endurance training day of 3 x 3 minute rounds, 1 minute rest between rounds, 3 evenly spaced bursts per minute totalling 9 bursts per round.
Week 9	1 session per endurance training day of 3 x 3 minute rounds, 1 minute rest between rounds, 4 evenly spaced bursts per minute totalling 12 bursts per round.
Week 10	1 session per endurance training day of 3 x 3 minute rounds, 1 minute rest between rounds, 5 evenly spaced bursts per minute totalling 15 bursts per round.
Week 11	1 session per endurance training day of 3 x 3 minute rounds, 1 minute rest between rounds, 6 evenly spaced bursts per minute totalling 18 bursts per round
Week 12	1 session per endurance training day of 3 x 3 minute rounds, 1 minute rest between rounds, 7 evenly spaced bursts per minute totalling 21 bursts per round

Following this schedule will build a tremendous amount of Taekwon-Do specific endurance that will allow the practitioner to compete at a very high level and allow the competitor to recovery well between rounds.

In the weekly training schedule there are obviously sessions of Taekwon-Do training that are listed, the make up of these sessions will be determined by the position in the training cycle that the Taekwon-Do practitioner is in and the closeness to the tournament.

Conclusion

It is hoped that through the principles and theories that have been discussed and outlined in this thesis it can be seen that additional Strength and Conditioning training can be of benefit to the Taekwon-Do sparring competitor.

This can be achieved by following sound principles, a well structured training plan that cycles intensity in both the strength and endurance training and a plan that does not favour either one of the activities greatly and that still allow time for Taekwon-Do specific training.

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