Martial arts as sport and therapy

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Journal of Sports Medicine and Physical Fitness; Mar 2007; 47, 1; Health & Medical Complete pg. 96

The term Martial Arts is often used as a general phrase to describe many of the combat arts, which have developed in eastern cultures over the past millennium. This paper reviews the Martial Arts from the original context of a trio of life skills. This trio includes the healing arts such as acupuncture, the self-exploration arts such as yoga, and the vital life skills such as meditation. As Martial Arts suggests the waging of combat, the origins of the most common combat arts are reviewed, with an overview of the difference between the hard and the soft styles. The arts developed not only in the eastern, but also in all parts of the world, with references of these types of combat arts in the writings of the ancient Egyptians and Greeks. In modern times, the combat arts are performed for both exercise and sport. A review of the injuries that occur, and the health benefits that might be expected are discussed. A review of the medical literature that demonstrates some of these health benefits is included, with Tai Chi Chuan as the most studied of these. The health benefits discussed include strength and self-efficacy of the elderly, reduced falls, increased exercise capacity, and benefits to the immune system and autonomic nervous system. The paper emphasized the breadth of the Martial Arts and the import of these to the sports and health community.

KEY WORDS: Martial arts - Sports - Phisical fitness.

Received on November 3, 2005.
Accepted for publication on December 20, 2006

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the injuries and accidents in martial art as well as varied health benefits.

**Trio of life skills**

Martial arts are often viewed as part of the trio of life skills that consist of the healing arts, the self-exploration arts, and the vital life skills arts. The healing arts that we are now familiar include acupuncture, acupressure, acupressure massage, and some of the herbal remedies that now pervade the Western medicine subculture. Of the self-exploration arts, yoga has become more “mainstream”. Other derivatives of martial art, for example meditation, have been practiced in the United States for decades. Various practices of directed breathing and attempts to direct the energies of the psyche have begun to evolve. Many forms of mental exercise aimed at developing mental focus as well as concentration have evolved from the self-exploration arts. For the development of general self-improvement, practitioners of martial arts practiced meditation as one of the trio of life skills. As originally conceived in many of the martial arts, the development of the physical, the mental, and the spiritual being were all part of the same process. While learning martial arts in the West, we have focused separately on those life skills. As a consequence we have lost some of the context of the roots of the arts. There have been references within the Western media to this trio of life skills, which involve martial arts. Among the better known of these is the TV series, kung fu, which features a character who would reflect upon his training in the arts including philosophy, mental preparation as well as the physical training. There have been a number of motion pictures that have included these same elements, though the focus has often been on the more visually titillating combat.

**Martial arts**

As the phrase implies, martial arts were developed with the focus on waging wars. In the modern context it has evolved to systems of hand-to-hand fighting, self-defense and sport. The Western and certainly the American knowledge of these have significantly developed over the past 50 years, and as noted previously, tend to focus on those arts developed in the Asian cultures. It is interesting that over the past century, the World Wars, as well as the information revolution, have allowed martial arts, initially bathed in secrecy, to permeate into the West, and expand within our culture. It is thought that the stationing of American troops in Japan after World War II, in Korea during the Korean Conflict, and the influx of Chinese into the United States, forming Chinatowns in major US cities, have all helped inculcate martial arts into the American culture.

The martial arts that are most recognized and practiced in the US therefore are those that originated or evolved in Japan, Korea, and China. These include the various forms of ‘budo’ in Japan such as aikido, karate, kendo, sumo, judo, kyudo. The concept of budo encapsulates the spirit of the samurai or warrior, the techniques employed by them, plus the ascetic lifestyle, physical prowess and the philosophy of life that they portray. There are various tributaries of budo. These include shorin kempo, shotokan, kyushinkai, wando-ryu, goju-ryu, goju-kaï, shito-ryu, and shukokai. The martial arts of wushu from China include kung fu, tai chi chuan, pa-kua, hsing-i, huang gar chuan, choy fung, and wing fung. The popular version credited to Korea is tae kwondo; perhaps the most prevalent of the martial arts in the US and now a full Olympic sport. The various schools of tae kwondo include hapkido, tang soo do, and hwarang do. There are many other forms of martial arts however that have evolved throughout the world. Some of these are muay thai (Thailand), bando (Burma), pentjak-siat (Indonesia), bersilat (Malaysia), copoiera (Brazil), kahli (Philippines), and countless other that have yet to be as accessible in the public domain or in western publications. Discussions of martial arts have even been discovered in the writings of the ancient Greeks and Egyptians.

Despite the long evolution, the secrecy and the isolation of martial arts has resulted in a formation of what some consider an incomplete school of thought. Therefore there is both room for modification and reinterpretation of the techniques and philosophical outlook behind it. The malleable nature of many of these martial arts has created fertile grounds for the emergence of evolving martial arts throughout the world.

**External/hard styles and internal/soft styles**

Martial arts are often practiced as a sport. One can look at some of these sports as a role-play of self-defense. Judo, for instance, is focused on specific
throws and holds designed to incapacitate the opponent. Sumo wrestling is a sport that focuses on dislodging an opponent from a small area, without any intended incapacitation. Boxing styles include a series of punches, strikes, and parries with the purpose of scoring points in a quasi-combat condition. Tae kwon do is dominated by kicks and punches with points scored by delivering blows to the opponent.

Styles in martial arts, in particular those which include punches and kicks, may be characterized as either “external/hard styles” or “internal/soft styles.” The external/hard styles generate forces by series of body movements designed to transmit the maximum force from the trunk and legs to the striking surface. In this situation, the muscles are tense at the moment of impact but with a sense of control. Strikes are completed with the emphasis on balance at the end of the technique in order to allow the proponent to quickly prepare for a follow-up attack or to focus on a different attacker. In the internal/soft styles, such as tai chi chuan (also known as tai chi) as well as aikido, there is more emphasis on aesthetic, harmony and a sense of calmness, often dubbed as “Zen in motion.” These techniques focus on the flow of energy and the deflection and redirection of the opponent’s energy. These styles can best be conceptualized as attempts to evade and unbalance the attacker. Therefore, when choosing a martial art, the individual must choose the focus of the endeavor. If the focus is purely on sport, with competition as the goal, those martial arts and schools that focus on an internal soft style might be preferred.

Judo can be thought of as one of the more sports oriented martial arts as most Judo schools emphasize on sporting contests. With such an emphasis, the success of the individual and the school are measured in terms of success in competitions. Some martial arts emphasize on all-round health—mental, moral and physical—and self-actualization of the practitioner. These types of martial arts view competitions as distractions from these. In these schools, the attention is placed on the development and perfection of techniques. Aikido and tae chi are strong examples of these.

Even among those schools that practice for competition or external/hard styles, the rules of competition vary tremendously. Some may compete only within the school while others compete between schools. The arts that allow striking and parrying with full contact with an opponent, vary dramatically in their rules for padding and for the type of contact allowed. There are different rules for body zones allowed for striking, and the forces that can be applied to the strike. With this variety of focus, force and technique, there has evolved a wide continuum of actual practice of martial arts. With this comes a variety of athletic endeavor, and potential for injury.

Injuries and accidents in martial art

Birrer et al. tried to capture the injuries from martial arts by casting a wide net around the world. In their book, which overviewed injuries from martial arts, they review surveys sent to 107 different schools, involving 26 different styles and 6347 athletes, with a total of 9800 participant-years of experience. All were asked to report on the injuries that they had experienced. In descending order, injuries in non-tournament conditions included fingers and hands (11%), thigh/leg 10.5%, foot/toes 9.5%, and ankles 9.4%. The severity of the injuries averaged 2.66 on a 1 to 5 scale with the most severe injuries occurring to the head, thigh, ankle, neck, shoulder, and wrist. Unfortunately, the study did not define “injury” nor did it separate the styles or the rules. The review included including weaponless, those with full contact and those which allowed weapons.

Zemper et al. reviewed injuries that occurred in tae kwon do. On the whole, injuries tend to be as high as 10% to 25% of the participants. For the most part, these data reflect the injury potential of full contact conditions, with few restrictions as to where the contact may occur. Within this context, others have noted the injury rate to be 12.7-25%. Under more controlled conditions, others have recorded tae kwon do as having much less injury rates. Burke et al. looked at 2498 athletes, aged 18 to 66, who participated in tournaments which allowed only light contact by the striking surface and for bade punches to the head. Here the injuries to the athletes were 0.44%, less frequent than noted in many other sports including baseball, softball, women’s volleyball, and men’s soccer. In these tournaments, only 1 of 2500 athletes discontinued participation as a result of trauma, with 65% of the trauma occurring due to contact and 32% occurring due to secondary falls. Looking at injury rates within other sports, in 1995-1996 the National Collegiate Athletic Association ran a study of sports related injuries within colleges. It showed that “Spring football league” had the highest rate of injuries both in games and practice, and also those that required...
7 or more days of lost time, with wrestling and women’s gymnastics coming in a close second and third. The injuries to those involved in the martial arts, when regulated, would be among the lowest within this scale. The caveat however is that the age group of the National Collegiate Athletic Association group does not match well with that of much of the other data, and therefore must be reviewed carefully to determine the likelihood of injury to any group and in comparison to other sports.

It is interesting to note that the wide range of injuries indicated by these data, in part seems to reflect the rules allowed within the practice of martial arts. Practiced as a full contact sport, the injury rate seems much higher than most other sports. However, when practiced as a light contact sport, martial arts such as tae kwon do seem to be very safe. Indeed, if we define injury as “trauma which necessitates discontinuation of competition”, then the injury rate in tae kwon do is among the lowest of all sports that have been documented so far. 18, 20, 21

In reviewing the etiology of injury as experienced in tournaments and/or competition, much of the trauma is secondary due to contact with the opponent or the floor. Injuries that result in discontinuation of competition seem more related to movements initiated by the injured rather than those initiated by the opponent. It seems worthwhile therefore to consider motions of the martial art practitioner. Motion analysis laboratory kinematics and kinetic data are helpful in evaluating the nature of such movements. In reviewing the movements of tae kwon do, Burke et al.18 demonstrated a variety of joint angle of velocities that were obtained in three basic kicks: the sidekick, the roundhouse kick, and the snap or thrust front kick. The data showed that the angular velocities in these kicks vary tremendously, demonstrating a three-fold difference between the kicks. In reviewing the sacrum angle velocities, movement of the pelvis is clearly different between the back kick and the roundhouse kick where over 50% difference in velocities were noted on these movements. It is also clear from the angle velocities that the speed of the kick begins to increase more quickly for roundhouse kick. Some kick speeds peak towards the end of the kick when compared with others. This demonstrates, therefore, that within one martial art style, there are different forces on different areas of the body that may vary depending on which technique is being produced. The stylistic movements requiring jumps and spinning jumps produce additional forces as some techniques involve leaving the ground. Additionally, spinning techniques produce rotational torque to joints, which can be further increased by the combination of jumping techniques, and altered by contact with a target. Thus far, the net effect of these techniques has not been well explored, though clearly such exploration is necessary, as the sports medicine physician should be able to suggest modifications of certain techniques and/or avoidance of certain techniques to reduce the risk of injury.

**Health benefits of martial arts**

While the literature on the sports aspects of martial arts have focused on the potential injuries resulting from their practice, there is a body of literature that focuses on the health benefits of combat martial arts. As with most literature on martial arts, these are mostly written from an Eastern perspective. The Western medical paradigm has only recently focused on combat martial arts along with some of the other aspects of the trio of healing arts. At a later time and at a more extended discussion of these topics, the health benefits of this trio might be explored. Among these, this paper will focus only on the positive effects of the combat martial arts.

A good example of Western investigation of the health benefits of martial arts amount to various versions of ‘movement therapy’ that are epitomized by tai chi.

T'ai chi is, as noted above, one of the internal styles of martial arts, with 5 main schools. The Chen school is the oldest among the five. This school specializes on combining quick and slow large movements. The Yang School, involves slow, large movements. There are 108 of these movements, practiced in the traditional style, while the shortened version consists of 37 movements. The wu style and the hao style involve mid-paced, compact movements. Quick and compact movements characterize the fourth style, propagated by the Sun School. In the 1950s, the yang style of t'ai chi was introduced into the National Fitness Program in China. A simplified version of 24 movements issued by the Chinese National Fitness Committee takes 5 min to complete. More recently, the modified form of t'ai chi belonging to the Yang School was included in the Asian Games.22

The practice of t'ai chi is associated with a reduction in falls and lower extremity strengthening. Lan noted an increase in strengthened flexibility with the daily use of the 108-movement form. Judge et al.24 noted less
postural sway using exercise including tai chi. Others have shown strength and balance improvement and the maintenance of this improvement due to the use of tai chi. Again this was seen in a study done by Li et al., who recruited subjects from a physically inactive geriatric population and placed them in a 6 month randomized, controlled trial, with allocation to tai chi or exercise stretching control. After 6 month postintervention follow-up, it was shown that the tai chi participants showed greater improvement in measures of functional balance and reduced their risk of falls when compared to the control group.

A multicentered trial consisting of different interventions was conducted by Wolf et al. and reported under the title ‘Frailty and Injuries: Cooperative Studies of Intervention Techniques’ (FICSIT). Among the varied interventions examined in this trial, tai chi was the only group exercise that reduced falls within the 15 weeks of training. The study also demonstrated that fear of falling was significantly reduced in those subjects receiving both the tai chi and the balance training. This finding is consistent with the view that tai chi is tolerable among those with lower extremity arthritis as reported by Kirsteins et al. They also reported that those with rheumatoid arthritis demonstrated good tolerability. Others have shown improved range of motion in meta-analysis from randomized controlled trials and controlled clinical trials examining the benefits and harms of exercise programs. Wu et al. looked at isokinetic strength of leg muscles and postural stability between those who had practiced tai chi for at least 3 years and those who had never practiced it. The study showed that subjects with long-term exposure to tai chi had a higher knee extensor strength and smaller foot center of pressure excursions during quiet stance. This implies that tai chi helped maintain postural stability. Overall, tai chi has demonstrated lower extremity strengthening, reduction in falls, improved postural stability, reduced fear of falling, and improved confidence of moving. It is worthwhile to note that these benefits are especially impressive among frail elderly communities.

Other medical conditions have been shown to benefit from tai chi. Yeh et al. looked at patients with chronic stable heart failure and left ventricular ejection fractions (≤40%), comparing primary outcomes (quality of life, exercise capacity) and secondary outcomes (serum B-type natriuretic peptide and plasma catecholamine levels) between the two groups. One group participated in a 12-week tai chi program with normal care, and the other with pharmacologic therapy, dietary and exercise counseling. Yeh and his group found that the patients in the tai chi group showed improved quality of life scores, increased distances walked in 6 min, and a decrease in the serum B-type natriuretic peptide levels.

The metabolic benefits of tai chi have been demonstrated with the yang style of 108 movements producing exercise intensity of 52% to 63% of VO₂ max. Experienced tai chi practitioners demonstrate demands equivalent to brisk walking (3 miles per hour). The short form and the long form have different energy requirements (2.9 m vs 4.1). This suggests that the simplified 24 movements of yang style which often takes 5 min to complete has a robust effect on subjects the long yang style, exceeded a median heart rate of 70% of the predictive maximum. In this study the rate of decline of VO₂ max was significantly less in the Yang style practitioners than in the control group. Additionally, Young et al. assessed the effects of yang style of tai chi on blood pressure with 62 sedentary and mildly hypertensive individuals who were involved in 12 weeks of tai chi or moderate intensity exercise. Both groups demonstrated significant reductions in blood pressures. Tai chi was also found to have cardiovascular effects with studies following patients who had undergone recent coronary artery bypass grafting surgery. Studies following patients with recent myocardial infarction also noted beneficial effects. Brown et al. as well as Schneider et al. demonstrated positive effects on the autonomic nervous system when tai chi was used as an alternative to more traditional exercises such as jogging.

Theoretical backgrounds have recently been proposed as to why “hard” martial arts such as tae kwon do might be appropriate for the elderly. Some studies have examined the benefits of tae kwon do to senior populations. One such study looked at participants that attended more than 85% of the classes. This study showed that there was an increase in the average number of push-ups, trunk flexion, and balance time on each foot in addition to enhanced subjective elevated wellbeing. There was an effective increase in one-leg balance in the population that was examined. The overall dropout rate was also extremely low which suggests that not only are the elderly capable of participating in such a hard martial art form as tae kwon do but that they can also develop motivation and interest.
to continue practicing it. Looking at another form of martial arts that constitute “hard” martial art, Perrin et al. concluded that the practice of Judo had a positive effect on training sensorimotor adaptabilities of the elderly population and impacting them with promotion of balance control, flexibility and agility.

Studies have been conducted to determine whether martial art exercise programs improve physical and psychological wellbeing. On the whole, these studies suggest that martial arts, through multifaceted channels, are playing significant roles in improving wellbeing and retarding both emotional and physical ailments. They can also be safe and effective in promoting balance, control, flexibility, and cardiovascular fitness in older patients with chronic conditions. The question remains whether some of the alleged benefits of these exercises may be secondary to the relaxation effects of exercise rather than the direct cardiovascular effects. However it is possible that anti-oxidant mechanisms of exercise could work in tandem to avert adverse mechanisms that are linked to stress and cardiovascular dysfunction. In addition to enhancing cardiovascular functioning, there are also suggestions that martial arts can have positive effects on subtle and sublime distress that are associated with affective dysfunction and other parameters of subjective distress.

Considering the rehabilitative and health benefits of some of the martial arts highlighted above, there are still lingering conceptual and clinical questions. For example, it is difficult to disentangle whether it is the exertion or the meditative aspects of these martial arts that produce the noted benefits. Another confounding variable is whether philosophical outlook expounded from some of the martial arts that teaches controlled aggression, rhythmic breathing and pious and self-discipline philosophy are contributing to these well-known positive outcomes of these martial arts. Similarly, improvement in one’s movement as well as accompanying customary rewards such as changes of belt color might increase self-esteem and, in turn, trigger other subtle health benefits.

Conclusions

In summary, although the philosophical and conceptual framework of some of the above-mentioned martial arts may appear to be alien to biomedical models, there is abundant evidence to suggest that some of the commonly practiced martial arts appear to have beneficial effects on various health related parameters. These benefits are not limited to subjective domains such as lessening of adverse emotional reactions but also to more mundane and intransigent cardiovascular abnormality and postural musculoskeletal impairments; some of which have so far remained impervious to modern biomedical intervention. The ratio of risks and benefits of this endeavor needs to be seriously contemplated, as martial arts is part and parcel, kicks, punches and falls. As many illnesses are triggered by lifestyle, stress and tribulation of modernity, one may wonder whether the panacea for the 21st century lies not on the biogenetic revolution but on the serious contemplation of the efficacy of one of the trio of life skills that owe its beginning from various ancient civilizations that have been widely embraced in the communities around North America.

References


All Martial Arts are great to train but they do not teach you how to fight. Boxing teaches you how to throw a mean punch, but if the fight goes to the ground the boxer is done for.Â Just because there are masculine women like you who enjoy traditionally masculine things like contact sports and martial arts, doesn’t make those points untrue. Men do need an outlet for their natural masculine aggression. Women do like men who are strong and capable of defending them.