

# A Review of the Effects of Martial Arts Practice on Health

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## ABSTRACT

Martial arts are ancient forms of combat, modified for modern sport and exercise. Participation in the martial arts is increasing, particularly for youth. Martial arts provide health-promoting and meaningful exercise for millions of practitioners. Benefits from this practice include better overall health and balance, as well as an improved sense of psychological well being. They do not promote aggression and may be used as a treatment modality for youth who are at-risk for violence.

This article provides an overview of martial arts for physicians who may evaluate such injuries in their practice. Physicians may wish to consider recommending martial arts to patients as a beneficial form of exercise. They are relatively safe compared to many other sports, and most martial arts injuries are comparatively minor. Risks can possibly be reduced by limiting exposure of inexperienced students, as well as using protective equipment, including mouthguards, eye/face protection, headgear, and padding.

## INTRODUCTION

Martial arts have been practiced for thousands of years. They are often defined as offensive and defensive combat systems. These systems may involve unarmed training and/or practice with weapons. Modern martial arts usually have their origins in the Orient, and are typically combat arts that have been modified for sport, self-defense, and recreation. Traditional martial arts schools often incorporate mental or meditative training into their practice to encourage positive personal transformation.

Many US communities have martial arts schools, with students of all ages. There are about 6.5 million martial

arts participants in the United States (written communication, November 2007). Participation increased over 28% between 2000 and 2004 for youth.<sup>1</sup>

The term martial arts is often broadly applied to stylistically different disciplines. Karate and taekwondo emphasize striking with feet and fists. Judo, jujitsu, and other similar styles emphasize grappling (wrestling-type maneuvers), joint locks, and throwing techniques. Mixed martial arts (MMA) are modern styles that blend the techniques previously mentioned. MMA competitions have been televised nationally for some years and are increasingly popular. Still other styles emphasize practice with weapons, or flowing movements, such as tai chi. This article focuses on traditional martial arts, which are better-studied than the newer MMA styles.

Martial artists may participate in sparring (rule-based, unrehearsed fighting), with variable levels of physical contact between opponents and variable levels of protective equipment. Many also compete in tournaments.

### *Martial Arts Practice and General Health*

In an era of increasing obesity in both children and adults, and an epidemic of physical inactivity, it seems more important than ever for physicians to promote exercise to their patients.<sup>2</sup> Physical activity provides important health benefits and reduces morbidity and mortality.<sup>2</sup> Martial arts are an enjoyable alternative to “traditional exercise” for many and offer unique opportunities to learn self-defense and new skills in a group setting.

While young people commonly practice martial arts, the benefits of martial arts are not confined to the young; middle-aged participants demonstrated significantly better aerobic capacity, balance, strength, body fat percentages, and flexibility compared to sedentary controls.<sup>3</sup> Elderly participants made gains in numbers of pushups performed, trunk flexion, and balance time on 1 foot.<sup>4</sup>

### *Fall Prevention and Martial Arts Practice*

Every year, there are millions of injuries from falls. They are the leading cause of accidental deaths in

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older adults; there were 15,800 elderly deaths from falls in 2005.<sup>5</sup> In 2000, medical costs related to falls among the elderly were more than \$19 billion in the United States alone.<sup>5</sup> A number of interventions have been shown to reduce falls, including exercise programs of varying composition, fall hazard assessments and education, as well as modification of medication regimens.<sup>6-7</sup>

Many physicians have recommended tai chi, a traditional Chinese martial art, for exercise and fall prevention in their elderly patients. Tai chi practice is based on patterns of smooth, flowing movements. There is an emphasis on balance and coordination in this particular martial art, thus it has been proposed that tai chi practice may help prevent falls in the elderly. The low-impact movements are readily taught and learned, the exercise is of moderate intensity, and tai chi is also very cost-effective to implement, requiring no equipment.

Systematic reviews demonstrate that tai chi practice improves balance, strength, flexibility, and may reduce falling in elderly practitioners; however, significant limitations or biases were noted in many of these studies.<sup>8-10</sup> One study compared the performance of elderly participants with mild balance impairment before and after a combined balance and stepping training program (CBST) versus a tai chi program; the CBST participants demonstrated modestly better improvement on a test of balance, stepping, and functional mobility.<sup>11</sup>

Further well-constructed longitudinal studies should help determine if tai chi offers any unique fall reduction benefits to practitioners. Tai chi is probably effective as a very safe and low-cost intervention to help reduce falls.

### *Martial Arts Practice and Psychological Health*

#### **Martial Arts and General Well-Being**

At first glance, martial arts simply seem to be a way to blend exercise and self-defense training. However, many martial artists see their practice as not only a means to achieve these goals, but as a pathway to self-mastery. Traditional martial arts practice usually incorporates an element of meditation and breath control, and takes place in an environment of discipline, self-respect, and courtesy to others. These practices improve psychological health by promoting relaxation, self-esteem, and mind-body coordination.<sup>12</sup>

Studies report an improvement in psychological health related to martial arts practice, including improved anger management and sense of well-being, and decreased depression and sleep disruption.<sup>12-15</sup> Breast cancer survivors randomly assigned to 12 weeks

of tai chi practice noted gains in self-esteem compared to those in a psychosocial support group, who actually had declines in their self-esteem.<sup>16</sup> Martial arts practice may be a useful adjunct to traditional psychotherapy.<sup>12-14</sup>

#### **Martial Arts and Aggression**

The popular media often portrays martial arts in a negative manner, glamorizes stylized “Hollywood” violence, and furthers the misconception that martial arts training attracts violent individuals or promotes aggression, particularly in children.

Research demonstrates that martial arts do not generally attract violent individuals or promote violence. Beginning students who identified their reasons for pursuing training wanted to learn self-defense, develop confidence, participate in exercise, and foster self-discipline.<sup>17</sup> Children who began martial arts training did not score differently than peers on an aggression questionnaire.<sup>18</sup> A martial arts program for children at risk for violence and delinquency produced behavior improvements after 10 weeks of training.<sup>19</sup> Levels of aggression and hostility were reduced the longer subjects participated in martial arts training.<sup>20-22</sup>

Instructors often ask or encourage students to leave training when it becomes apparent that the student’s behavior or attitude is not compatible with the philosophy of the school. Thus, practitioners who reach an advanced level of achievement may have been selected to be less aggressive.

#### **Martial Arts and ADHD**

Many parents and martial arts instructors believe that martial arts practice is therapeutic for children who have Attention-Deficit/Hyperactivity Disorder (ADHD), which is characterized by impaired concentration and/or impulsive hyperactivity. Martial arts promote concentration and reduce impulsivity by requiring students to focus intensely on a physical activity, follow verbal and visual commands, and practice in a controlled, disciplined environment. There are case reports describing martial arts as a successful adjunctive treatment for ADHD.<sup>22</sup> Certainly this would be an appealing and low-cost therapy; however, there is little or no research to confirm the validity of this approach, and further study is needed confirm the apparent utility of martial arts as an adjunctive treatment for ADHD.

#### **Martial Arts Injuries**

Martial arts are potentially dangerous. Participants may use combat techniques designed to cause harm, though in a controlled situation. Surprisingly, a large survey demonstrated that martial arts are safer than many

other sports, including football, basketball, and wrestling.<sup>23</sup> This safety record is probably due, at least in part, to careful instruction and control in practice and competition.

The most common types of martial arts injury are sprains, strains, and contusions. Less common injuries include fractures, dislocations, and dental injuries.<sup>23-25</sup> The particular style of martial art practiced impacts the types and rates of injury. This makes intuitive sense; martial arts vary widely in the techniques they employ (kicking, striking, blocking, joint locking, throwing, etc) and they are often stylistically quite different. For instance, upper extremity injuries were more common in judo, head and face injuries more common in karate, and lower extremity injuries more common in taekwondo, a style that emphasizes kicking.<sup>25</sup> Taekwondo practitioners also had a higher injury rate than those practicing aikido, kung fu, karate, or tai chi.<sup>26</sup>

#### *Prevention of Martial Arts Injuries*

##### **General Measures**

Traditionally, many martial arts schools limit the sparring of lower-ranked or less-experienced students, because inexperience is associated with injury. Indeed, 1 study found that predisposing factors to injury included less experience, male sex, and sparring in practice or competitions.<sup>23</sup>

##### **Padding and Headgear**

Wearing hand protection reduces the incidence of fractures and lacerations,<sup>27</sup> although research concerning boxing injuries clearly indicates that even substantial hand protection will not prevent all hand injuries.<sup>28</sup>

Headgear and other protective equipment probably help to prevent minor abrasions, lacerations, and contusions. It is controversial whether headgear prevents serious injuries like concussion or intracranial injury. A large survey of martial arts trauma did conclude that use of protective equipment was associated with a reduced severity and rate of injury.<sup>23</sup>

##### **Mouthguards**

Mouthguards have been recommended for many years to help prevent dental injuries in sport.<sup>29</sup> In the 1920s, boxing was the first sport to adopt mouthguards for participants.<sup>30</sup> Meta-analyses of studies involving mouthguards indicate that the incidence of orofacial injuries is 1.6-1.9 times higher in non-users.<sup>30</sup>

Mouthguards have been purported to lower the incidence of concussions by reducing impact transmitted to the brain from a blow to the jaw. This is not well-supported in the literature, however. A survey of college basketball players showed that those who used custom-

fitted mouthguards had less dental trauma than non-users, though the incidence of concussion and oral soft tissue injuries was not statistically different between the 2 groups.<sup>31</sup> A literature survey indicated that evidence for mouthguard-related reductions in concussions was inconsistent and no conclusions could be made.<sup>30</sup> Certainly mouthguards are inexpensive; their use has minimal downside, and may help prevent significant and costly dental injuries.

##### **Eye and Face Protection**

Martial arts are contact sports, where participants deliberately target an opponent's face with strikes and kicks. Other sports with less intentional contact to the head actually employ or require eye protection (racquetball, for instance) whereas most martial arts do not.<sup>32</sup> Hypema, retinal detachment, lens dislocation, and blindness have all been infrequently reported from martial arts injuries.<sup>23,33</sup>

Many martial arts equipment companies manufacture clear plastic face guards or padded metal grilles that integrate into standard sparring headgear. These devices do provide a significant level of eye and face protection. There are no published studies regarding the use of these protectors in martial arts. Hockey visors and face protectors have been shown to reduce eye and face injuries in hockey players, without increasing concussions or neck injuries.<sup>34-35</sup>

Incorporating eye and face protection into martial arts training and tournaments would likely require a major cultural change and a rule requiring this type of protection. Currently, few martial artists wear this type of protection, and many participants would likely regard the equipment as a nuisance, or as an impairment to their vision or breathing.

##### **CONCLUSION**

Martial arts are an increasingly common and important form of exercise for many individuals. While any form of exercise benefits physical well-being, martial arts may also improve the practitioner's sense of psychological well-being and provide self-defense training.

Physicians who care for athletes should be aware of martial arts, their benefits and risks, common injuries that may occur during participation, and their prevention. Physicians may consider recommending martial arts to patients of all ages who are interested in exercise. Tai chi is frequently recommended for patients with mobility restrictions or the elderly because of its low-impact nature. Physicians who see children with ADHD or who are at-risk for violence may consider recommending martial arts as a supplemental treatment

for these conditions. Martial arts might also be a suitable adjunctive treatment for some patients with depression or sleep disturbances. These styles of combat and defense, though ancient in origin, may actually prove more relevant than ever. These unique forms of exercise can help address many current community challenges of obesity, inactivity, violence, and aging populations.

How should a prospective student decide which martial art to practice? No martial art school or style is right for everyone. Schools vary widely in their style, philosophy, quality of instruction, cost, and expectations of the student. Prospective students should visit several schools and decide which style and instructor best fit their needs. Low-cost martial arts classes are often available through community centers or municipal programs. No matter where students practice, they should wear protective gear when sparring, and sparring sessions should be closely supervised by qualified instructors.

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