

# Self-control, aggression and bullying of martial arts practitioners and non-martial arts practitioners: A comparative study and factor analysis

## Authors' Contribution:

- A Study Design
- B Data Collection
- C Statistical Analysis
- D Manuscript Preparation
- E Funds Collection

Ting Xu <sup>1D</sup>, Zi Yan<sup>2A</sup>, Hansen Li <sup>3B</sup>, Guodong Zhang <sup>3D</sup>, Yucheng Zhang<sup>1C</sup>

<sup>1</sup> Department of Physical Education, Tarim University, Xinjiang, China

<sup>2</sup> School of Health Sciences, Merrimack College, North Andover, USA

<sup>3</sup> Institute of Sport Science, College of Physical Education, Southwest University, Chongqing, China

**Received:** 14 March 2023; **Accepted:** 05 June 2023; **Published online:** 23 October 2023

**AoBID:** 15850

## Abstract

### Background & Study Aim:

Bullying is a common phenomenon among adolescents and can significantly affect their physical and mental health. Practicing martial arts to reduce bullying has been put forward publicly. However, there is a lack of comparative studies on the mental health of martial arts practitioners and non-martial arts practitioners. Therefore, the aim of the current study is knowledge about among practitioners and non-martial arts practitioners of likely differences in self-control, aggression, and bullying, and the knowledge of the influencing factors on these phenomena.

### Material & Methods:

This study included 775 adolescents ( $M = 13.48 \pm 1.11$  years): 401 martial arts practitioners and 374 non-martial arts practitioners. Their mean average training year was  $2.35 \pm 0.89$  and we analysed the questionnaires designed to assess their self-control, aggression and bullying. Semi-structured interviews were used to examine bullying, changes in personality, and attitudes toward bullying among martial arts practitioners.

### Results:

Martial arts practitioners have higher levels of self-control and lower levels of aggression and bullying compared to non-martial arts practitioners. Different years and numbers of martial arts exercises had significant effects on self-control, aggression, and bullying in martial arts practicing adolescents. Martial arts practitioners have positive attitudes towards bullying and martial arts practice improves self-control and shapes positive behaviour.

### Conclusions:

We suggest that primary and secondary schools should pay attention to the years and number of martial arts exercise and encourage students to take part in martial arts exercise regularly, thereby enhancing self-control and decreasing their aggression and bullying.

### Keywords:

combat sports • mental health • self-control scale • sports psychology

### Copyright:

© 2023, the Authors. Published by Archives of Budo

### Conflict of interest:

Authors have declared that no competing interest exists

### Ethical approval:

The study was approved by the Ethics Committee of the Southwest University, China

### Provenance & peer review:

Not commissioned; externally peer-reviewed

### Source of support:

2022 Tarim University President's Fund Program (Xinjiang, China), no TDSKSS202216, no TDSKSS202203

### Author's address:

Yucheng Zhang, Department of Physical Education, Tarim University, Xinjiang, China; e-mail: 17735868571@163.com

**Self-control** – *noun* refers to the ability to regulate and control impulsive thoughts, feelings, and behaviours of an individual, and it is one of the most important psychological factors influencing the development of aggressive behaviours in adolescents [10].

**Aggression** – *noun* refers to the goal-driven harmful behaviour of an individual towards others or objects, which brings negative effects on the physical or mental health of individuals [14].

**Bullying** – *noun* refers to a form of aggressive harmful behaviour that is exhibited repeatedly over a period, and is characterised by a peer power differential, which includes bullying victimization and bullying behaviour [2].

**Sports psychology** – *noun* the scientific study of the mental state of sportspeople, looking at issues such as motivation, concentration, stress and self-confidence [42].

**Martial arts** – *plural noun* any of various systems of combat and self-defence, e.g., judo or karate, developed especially in Japan and Korea and now usually practised as a sport [42].

**Combat sport** – *noun* a sport in which one person fights another, e.g., wrestling, boxing and the martial arts [42].

**Self-defence** – *noun* fighting techniques used for defending oneself against physical attack, especially unarmed combat techniques such as those used in many of the martial arts [42].

**Sanda** – also known as Chinese boxing or Chinese kickboxing, is the official Chinese kickboxing full-contact combat sport. Sanda is a fighting system which was originally developed by the Chinese military based upon the study and practices of traditional Chinese martial arts and modern combat fighting techniques; it combines boxing and full-contact kickboxing, which includes close range and rapid successive punches and kicks, with wrestling, takedowns, throws, sweeps, kick catches, and in some competitions, even elbow and knee strikes [43].

**Taijiquan (Tai Chi)** – (trad. Chinese 太極拳, Simpl. Chinese 太极拳, Pinyin:

## INTRODUCTION

Bullying is defined as a form of aggressive harmful behaviour that is exhibited repeatedly over a period and is characterised by a peer power differential [1, 2]. The subject of bullying includes perpetrators, victims, and bystanders, bullying levels are mild, moderate and severe bullying [3]. And bullying has the characteristics of repetitive and intentional behaviours, adversely affecting the physical and mental health of perpetrators and victims [4]. School bullying has a high prevalence rate. A survey on bullying among Chinese students found that 26.7% of students were involved in the bullying phenomenon, including 7.3% for bullying others, 15.9% for victimization, and 4.8% for both bullying and victimization [5]. As of now, school bullying incidents are still frequent in all regions of the world, involving populations from elementary school to high school, with a gradual increase in severity and frequency of occurrence, which has become a serious problem to be solved in schools, families, and all sectors of society.

Studies have found that there is an association between physical activity and exposure to bullying, as the amount of physical activity increased, there was a significant decrease in bullying exposure [6]. Martial arts are not only a form of sport but also an expression of cultural education. In China, many parents send their misbehaving youngsters to martial arts schools for martial arts training, thereby regulating behaviour. Martial arts as a form of fitness, also plays a positive role in moral education, helping to reduce social violence and foster positive appropriate behavioural patterns [7]. In addition, research that martial arts exercise can reduce the aggression level of college students, and the longer the years of martial arts training, the lower the aggression level [8]. For the bullied, the longer they practice martial arts, the less frequently they were bullied, and the more positively they were about resisting bullying [9]. Therefore, martial arts exercise has become a positive attempt to reduce bullying.

Self-control is the ability to regulate and control impulsive thoughts, feelings, and behaviours of an individual, and it is one of the most important psychological factors influencing the development of aggressive behaviour in adolescents [10]. Studies show that low self-control is closely related to behavioural problems, and the better the self-control, the less aggression

is likely to occur [11]. Martial arts, as one of the most important means of preventing violence, can develop an individual's self-control through martial arts training, thus reducing aggressive or bullying behaviour [12]. The long-term practice of *taijiquan* has a positive effect on emotions and self-control among participants [13]. Thus, martial arts exercise helps to improve individuals' self-control and reduce aggressive behaviour.

Aggression refers to the goal-driven harmful behaviour of an individual towards others or objects, which brings negative effects on the physical or mental health of individuals [14]. Aggression is mainly manifested through the form of physical aggression, verbal aggression, anger, and hostility. According to the frustration-aggression theory, the negative emotions generated in a frustrating situation can easily lead to aggressive behaviour in the individual [15]. Aggressive and bullying behaviours often occur because the bully is unable to control anger and negative emotions. Therefore, aggression is a key component of measuring an individual's mental health, which seriously affects the physical and mental health and future growth of individuals.

As one of the mainstream sports, martial arts may influence individual behavioural patterns. Scholars have found that adolescents who participate in traditional martial arts show decreased violence and an improvement in impulsivity and inappropriate social behaviour [16]. A meta-analysis found that male adolescents have reduced initial levels of hostility after participating in traditional martial arts training [17]. Previous studies revealed that martial arts exercise may reduce reactive and proactive aggression in adolescents [18]. As a result, young people who practice skills related to self-control become more disciplined and less aggressive [19]. As a means of self-defence, martial arts exercise is loved and respected by the public. The research topic of martial arts exercise and school bullying has been concerned with the continuous emergence of school bullying incidents. There is a lack of comparative studies on the mental

The cognitive aim of the current study is knowledge about among practitioners and non-martial arts practitioners of likely differences in self-control, aggression, and bullying, and the knowledge of the influencing factors on these phenomena.

Therefore, the research task of this study is to verify whether there are differences between martial arts practitioners and non – martial arts practitioners in self-control, aggression and bullying, and to analyse the factors that influence them. The first questions to be addressed in this study: the differences in self-control, aggression, and bullying between martial arts practitioners and non-martial arts adolescents, and the research hypothesis is proposed: H1: martial arts practitioners have higher self-control scores than non-martial arts adolescents; H2: martial arts practitioners have lower aggression than non-martial arts practitioners. H3: martial arts practitioners have lower bullying scores than non-martial arts practitioners. The second question is to explore the influencing factors of self-control, aggression, and bullying among martial arts practitioners, and the research hypothesis is proposed: H4: Years of martial arts exercise positively predicted self-control, negatively predicted aggression and bullying; H5: Number of martial arts exercise positively predicted self-control, negatively predicted aggression and bullying.

## MATERIAL AND METHODS

### Sample

A total of 820 questionnaires were distributed in China and 796 were returned. 21 incomplete questionnaires were excluded, leaving 775 valid questionnaires for inclusion in the analysis. Participants were 401 martial arts practitioners and 374 non-martial arts practitioners. The martial arts practitioners train for at least an hour a day, 5 to 6 days a week. Their mean average training year was  $2.35 \pm 0.89$  years. Among them, there were 76 less than half a year, 147 six months to one year, 140 one year to two years, 38 more than two years. martial arts courses mainly include *wushu* routines (e.g., *taijiquan*), taekwondo and sanda. Non-martial arts practitioners are engaged in daily physical education activities. All participants' ages ranged between 11 and 16 years ( $M = 13.48 \pm 1.11$ ).

### Procedure

This study adopted a cluster sampling to identify subjects from three martial arts speciality in Guizhou, Guangxi, and Xinjiang provinces in China. The teaching philosophy of all three martial arts speciality schools is based on cultural studies, with physical activities including regular

physical education programmes and martial arts speciality programmes. The martial arts teaching model integrates martial arts morality education into the martial arts curriculum to regulate behaviour. The questionnaire was administered after school hours and consent was obtained from the schools and the students' parents. This study emphasized the information given by participants was completely voluntary and anonymous. All subjects agreed to participate and provided written informed consent in accordance with the Declaration of Helsinki.

The study was approved and supervised by the Ethics Committee of the Southwest University, China.

## Measures

### Self-control scale

A modified Chinese version of the self-control scale to assess the self-control ability of adolescents [20]. Ten items were presented to the participants, such as 'It's hard for me to change my bad habits'. The scale was scored on a 5-point scale from 'complete nonconformity' to 'complete conformity'. After the reverse questions in the questionnaire were re-coded, the higher total scale scores indicated better self-control. Cronbach's  $\alpha$  of the self-control scale was 0.82 in our sample. The results of confirmatory factor analysis (CFA) for self-control scale showed:  $\chi^2/df = 2.03$ , SRMR (standardized root mean square residual) = 0.04, RMSEA (root mean square error of approximation) = 0.03, GFI (goodness of fit index) = 0.98, CFI (comparative fit index) = 0.98, IFI (incremental fit index) = 0.98, NFI (normed fit index) = 0.97, TLI (Tucker-Lewis index) = 0.97.

### Aggression questionnaire

This study adopted the modified Chinese version of the Aggression Questionnaire to assess the aggression of adolescents [21]. The questionnaire consists of four dimensions, and it reflects physical aggression, anger, hostility, and displaced aggression. A representative item was 'Once in a while I can't control the urge to strike another person'. The questionnaire contained 20 items in total. Items were answered on a scale of 1 (very non-compliant) to 5 (very compliant), with higher scores indicating greater aggression. Cronbach's  $\alpha$  of the aggression questionnaire was 0.91 in our sample. The results of confirmatory factor analysis (CFA) for aggression questionnaire showed:

*tàijiquán*) – literally: "Fist of the Great Limit"; Chinese internal martial art, one of the types of Wushu (...). Popular as a health gymnastics, but the prefix "quan" (fist) implies that Taijiquan is a martial art [44].

**Wushu** – *noun* Chinese martial arts considered collectively [42].

$\chi^2/df = 1.62$ , SRMR = 0.04, RMSEA = 0.02, GFI = 0.96, TLI = 0.97, CFI = 0.98, IFI = 0.98, NFI = 0.95.

### **Bullying Questionnaire**

A modified Chinese version of the Olweus Bullying Questionnaire was adapted to investigate the experiences of bullying among martial arts practitioners and non-martial arts practitioners during the recent two months [22]. Bullying refers to bullying victimization and bullying behaviour, all items were answered on a scale of 0 (it never happened) to 4 (very often). Bullying victimization contains seven items, such as 'Some students hit, kicked, pushed, hit or threatened me', the higher scores indicating higher frequency of bullying. The results of confirmatory factor analysis (CFA) for bullying victimization questionnaire showed:  $\chi^2/df = 5.82$ , SRMR = 0.02, RMSEA = 0.07, GFI = 0.97, CFI = 0.96, IFI = 0.96, NFI = 0.96, TLI = 0.95. Cronbach's  $\alpha$  of the bullying victimization questionnaire was 0.85 in our sample. Bullying behaviour contains seven items, including the frequency of perpetrators of physical, verbal, and relational bullying. A representative item was 'Hit, kick, push, bump into other students' where higher scores indicated greater severity of bullying behaviour. The results of confirmatory factor analysis (CFA) for bullying behaviour questionnaire showed:  $\chi^2/df = 2.58$ , SRMR = 0.01, RMSEA = 0.03, GFI = 0.98, TLI = 0.98, CFI = 0.99, IFI = 0.99, NFI = 0.98. Cronbach's  $\alpha$  of the bullying behaviour questionnaire was 0.83 in our sample.

### **Testing for common method bias**

All scales were collected in the form of self-reported questionnaires, and the data may be at risk of common method bias. In response, this study adopted the method proposed by previous researchers to control for common method bias [23]. In terms of procedural control, the study focused on the anonymity of questionnaire responses and data protection by increasing the number of reverse scoring questions in the questionnaire to reduce subjects' guesses about the purpose of the study; in terms of statistical control, Harman's single factor test was used to test for common method bias. The results of this study showed that there were 10 factors with an eigenvalue greater than 1, and the explained variance of the first factor is 28.3%, which is less than the threshold of 40%. This indicated that the common method bias was not likely to affect the current results.

### **Statistical analysis**

SPSS 21.0 software was used for reliability testing, descriptive statistics, independent samples t-test, one-way ANOVA, correlation analysis, and regression analysis. Firstly, this study conducted a reliability analysis of psychological scales and descriptive statistics of the background of subjects (N or n) using mean (M), standard deviations ( $\pm$  or SD).

Differences between martial arts practitioners and non-martial arts practitioners in terms of self-control, aggression, and bullying were examined by t-tests. Secondly, ANOVA was used to examine differences in self-control, aggression, and bullying between martial arts practitioners with different years of training.

Then the relationship between the years of exercise, the number of exercises (n), the time of exercises, the intensity of exercises, self-control, aggression, and bullying among martial arts practitioners were further examined using Spearman correlation analysis. The causal relationships between the years of exercise, the number of exercises, self-control, aggression, and bullying were further examined using regression analysis.

In addition, this study also used semi-structured interviews to understand bullying victimization and bullying behaviour, changes in personality, and attitudes toward bullying among martial arts practitioners after taking up martial arts. Confirmatory factor analysis (CFA) was performed to evaluate the goodness-of-fit of the questionnaire measurement with AMOS21.0. To test the adequacy of the estimated model, we used  $\chi^2/df$ , RMSEA, SRMR, and GFI, TLI, CFI, IFI, NFI [24].

## **RESULTS**

### **Comparison analysis**

There was a significant difference in self-control ( $t = 6.24$ ,  $p < 0.001$ ), self-control score among martial arts practitioners ( $M = 34.61 \pm 8.28$ ) higher than that non-martial arts practitioners ( $M = 31.06 \pm 7.53$ ); there was a significant difference in aggression ( $t = -5.78$ ,  $p < 0.001$ ), aggression score among martial arts practitioners ( $M = 47.23 \pm 16.55$ ) lower than that non-martial arts practitioners ( $M = 54.07 \pm 16.44$ ); there was a significant difference in bullying victimization ( $t = -3.89$ ,  $p < 0.001$ ), bullying victimization

score among martial arts practitioners (M = 4.58 ±4.87) lower than that non-martial arts practitioners (M = 5.99 ±5.20); there was a significant difference in bullying behaviour (t = -5.52, p<0.001), bullying behaviour score among martial arts practitioners (M = 1.90 ±3.37) lower than that non-martial arts practitioners (M = 3.44 ±4.30) (Table 1).

Therefore, the hypotheses H1, H2, and H3 were confirmed, and results indicate that martial arts practitioners have higher levels of self-control and lower levels of aggression and bullying compared to non-martial arts practitioners.

**Analysis of variance**

An ANOVA of the different years of martial arts exercise with regards to self-control, aggression, bullying among martial arts practitioners indicated significant results. There were

significant differences among (1) self-control scores (F = 12.01, p<0.001; i.e., under one year < more than one year and one year to two years < more than two years); (2) aggression scores (F = 10.78, p<0.001; i.e., under one year > more than one years); (3) bullying victimization scores (F = 7.11, p<0.001; i.e., less than half a year > more than two years and six months to one year > more than one years ); and (4) bullying behaviour scores (F = 3.65, p<0.01; i.e., less than half a year > more than two years and six months to two year > more than two years) (Table 2).

**Correlation analysis**

We further found that (1) years of martial arts exercise was positively correlated with self-control (r = 0.25), negatively correlated with aggression (r = -0.25), bullying victimization (r = -0.18), and bullying behaviour (r = -0.13); (2) number of

**Table 1.** Comparison analysis between MA practitioners and non-MA practitioners (n = 775).

| Variable               | Group | N   | M     | SD    | t        | p     |
|------------------------|-------|-----|-------|-------|----------|-------|
| self-control           | 1     | 401 | 34.61 | 8.28  | 6.24***  | 0.000 |
|                        | 2     | 374 | 31.06 | 7.53  |          |       |
| aggression             | 1     | 401 | 47.23 | 16.55 | -5.78*** | 0.000 |
|                        | 2     | 374 | 54.09 | 16.44 |          |       |
| bullying victimization | 1     | 401 | 4.58  | 4.87  | -3.89*** | 0.000 |
|                        | 2     | 374 | 5.99  | 5.20  |          |       |
| bullying behaviour     | 1     | 401 | 1.90  | 3.37  | -5.52*** | 0.000 |
|                        | 2     | 374 | 3.44  | 4.30  |          |       |

Note: **MA**: martial arts; **1** MA practitioners; **2** non-MA practitioners. \*\*\*p<0.001.

**Table 2.** Difference in self-control, aggression and bullying with different years of MA exercise (n = 401).

| Variable               | Variable value (M & SD) |                |                |               | F        | p     | Multiple comparison     |
|------------------------|-------------------------|----------------|----------------|---------------|----------|-------|-------------------------|
|                        | A<br>(n = 76)           | B<br>(n = 147) | C<br>(n = 140) | D<br>(n = 38) |          |       |                         |
| self-control           | 32.96 ±8.12             | 32.42 ±7.83    | 36.51 ±8.11    | 39.39 ±7.56   | 12.01*** | 0.000 | A<C, A<D, B<C, B<D, C<D |
| aggression             | 51.77 ±15.25            | 50.97 ±15.51   | 42.69 ±16.68   | 40.44 ±16.48  | 10.78*** | 0.000 | A>C, A>D, B>C, B>D      |
| bullying victimization | 5.09 ±4.88              | 5.61 ±4.93     | 3.80 ±4.63     | 2.21 ±3.56    | 7.11***  | 0.000 | A>D, B>C, B>D           |
| bullying behaviour     | 2.14 ±3.40              | 2.30 ±3.17     | 1.71 ±3.75     | 0.39 ±0.85    | 3.65*    | 0.013 | A>D, B>D, C>D           |

Note: **MA** martial arts; **A** less than half a year; **B** six months to one year; **C** one year to two years; **D** more than two years; \*p<0.05; \*\*\*p<0.001.

martial arts exercises was positively related to intensity of martial arts exercise ( $r = 0.11$ ), self-control ( $r = 0.17$ ), negatively related to aggression ( $r = -0.16$ ), bullying victimization ( $r = -0.21$ ), and bullying behaviour ( $r = -0.17$ ); (3) time of martial arts exercise was positively related to intensity of martial arts exercise ( $r = 0.20$ ) and negatively related to bullying victimization ( $r = -0.12$ ), and (4) self-control was negatively related to aggression ( $r = -0.71$ ), bullying victimization ( $r = -0.44$ ), and bullying behaviour ( $r = -0.31$ ); aggression was positively correlated with bullying victimization ( $r = 0.56$ ) and bullying behaviour ( $r = 0.37$ ), bullying victimization positively related to bullying behaviour ( $r = 0.46$ ) (Table 3).

### Regression analysis

The years of martial arts exercise positively predicted self-control, negatively predicted aggression, bullying victimization, and bullying behaviour (Table 4). Number of martial arts

exercise positively predicted self-control, negatively predicted aggression, bullying victimization, and bullying behaviour (Table 5).

Therefore, the hypotheses H4 and H5 were confirmed.

### Analysis of interview

Martial arts practitioners F1 to F4 were not bullied; martial arts practitioner F5 was bullied. On the first question of if any of their classmates were bullied, martial arts practitioners F1 to F5 were more positive in their attitudes towards bullying behaviour, mainly by stopping bullying behaviour or by telling their teachers to solve the problem. On the question of whether those who have been practicing martial arts for a long time or those who do not practice martial arts like to bully others, martial arts practitioner F1 gave unclear answers; martial arts practitioner F2 thought that students who have been practicing martial arts for a short

**Table 3.** Descriptive statistics and correlations ( $n = 401$ ).

| Variable                    | 1              | 2              | 3             | 4     | 5              | 6             | 7             | 8    |
|-----------------------------|----------------|----------------|---------------|-------|----------------|---------------|---------------|------|
| 1. Years of MA exercise     | 1              |                |               |       |                |               |               |      |
| 2. Number of MA exercise    | 0.23           | 1              |               |       |                |               |               |      |
| 3. Time of MA exercise      | -0.07          | 0.08           | 1             |       |                |               |               |      |
| 4. Intensity of MA exercise | -0.05          | <b>0.11*</b>   | <b>0.20**</b> | 1     |                |               |               |      |
| 5. Self-control             | <b>0.25**</b>  | <b>0.17**</b>  | 0.09          | 0.03  | 1              |               |               |      |
| 6. Aggression               | <b>-0.25**</b> | <b>-0.16**</b> | -0.08         | -0.03 | <b>-0.71**</b> | 1             |               |      |
| 7. Bullying victimization   | <b>-0.18**</b> | <b>-0.21**</b> | <b>-0.12*</b> | 0.01  | <b>-0.44**</b> | <b>0.56**</b> | 1             |      |
| 8. Bullying behaviour       | <b>-0.13**</b> | <b>-0.17**</b> | -0.07         | -0.03 | <b>-0.31**</b> | <b>0.37**</b> | <b>0.46**</b> | 1    |
| M                           | 2.35           | 2.55           | 3.05          | 3.37  | 34.61          | 47.23         | 4.56          | 1.88 |
| SD                          | 0.89           | 1.20           | 0.92          | 1.00  | 8.28           | 16.55         | 4.81          | 3.33 |

Note: **MA**: martial arts; \* $p < 0.05$ ; \*\* $p < 0.01$ .

**Table 4.** Regression analysis in self-control, aggression and bullying with years of MA exercise ( $n = 401$ ).

| Variable             |           | Variance analysis indicators |       |       |                |                 |       | 95%CI            |
|----------------------|-----------|------------------------------|-------|-------|----------------|-----------------|-------|------------------|
| independent          | dependent | Beta                         | t     | p     | R <sup>2</sup> | F               | p     |                  |
| years of MA exercise | SC        | 0.25                         | 5.26  | 0.000 | 0.06           | <b>27.74***</b> | 0.000 | (1.483, 3.249)   |
|                      | AG        | -0.25                        | -5.22 | 0.000 | 0.06           | <b>27.32***</b> | 0.000 | (-6.456, -2.927) |
|                      | BV        | -0.18                        | -3.83 | 0.000 | 0.03           | <b>14.72***</b> | 0.000 | (-1.538, -0.496) |
|                      | BB        | -0.13                        | -2.65 | 0.008 | 0.01           | <b>7.07**</b>   | 0.008 | (-0.857, -0.128) |

Note: **MA** martial arts; **SC** self-control; **AG** aggression; **BV** bullying victimization; **BB** bullying behaviour; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

**Table 5.** Regression analysis in self-control, aggression and bullying with number of MA exercise (n = 401).

| independent           | dependent | Variance analysis indicators |       |       |                |                 |       | 95%CI            |
|-----------------------|-----------|------------------------------|-------|-------|----------------|-----------------|-------|------------------|
|                       |           | Beta                         | t     | p     | R <sup>2</sup> | F               | p     |                  |
| number of MA exercise | SC        | 0.17                         | 3.62  | 0.000 | 0.03           | <b>13.15***</b> | 0.000 | (0.564, 1.901)   |
|                       | AG        | -0.16                        | -3.25 | 0.001 | 0.02           | <b>10.58***</b> | 0.000 | (-3.553, -0.877) |
|                       | BV        | -0.21                        | -4.32 | 0.000 | 0.04           | <b>18.72***</b> | 0.000 | (-1.234, -0.463) |
|                       | BB        | -0.17                        | -3.57 | 0.000 | 0.03           | <b>12.77**</b>  | 0.000 | (-0.758, -0.220) |

Note: **MA** martial arts; **SC** self-control; **AG** aggression; **BV** bullying victimization; **BB** bullying behaviour; \*\**p*<0.01; \*\*\**p*<0.001.

time are more likely to bully others than those who have been practicing martial arts for a long time; martial arts practitioner F3 thought that those who do not practice martial arts are more likely to bully others; martial arts practitioners F4 to F5 thought that those who do not practice martial arts are more likely to bully others because they were not educated in martial virtues. On the question of reasons for learning martial arts, martial arts practitioners F1 to F5 learned martial arts mainly to strengthen their bodies, protect others and protect themselves. In terms of attitudes towards bullying behaviour, martial arts practitioners F1 to F5 have more positive attitudes towards bullying behaviour, are opposed to bullying behaviour, and

will take the initiative to stop the behaviour if they find bullying around them. In terms of personality changes and attitudes towards dealing with problems, martial arts practitioner F1 had a change in personality and attitude in that he was more able to endure hardships and control emotions; martial arts practitioner F2 was more able to work hard and disciplined at school; martial arts practitioner F3 was more courageous and responsible after learning martial arts; martial arts practitioner F4 has improved self-control, is more self-disciplined and more active in doing things; martial arts practitioner F5 was more active and proactive and more willing to take the initiative to help others (Table 6).

**Table 6.** Results of martial arts practitioners’ interviews (n = 5).

| Item  | F1  | F2  | F3   | F4   | F5   |
|---|---|---|--|--|--|
| 1. Have you been bullied and explain why?   | No  | No  | No   | No   | Yes, maybe I am a bully  |
| 2. What would you do if a classmate was being bullied?  | Stop it, if not, I will tell the teacher          | Tell the teacher  | Tell the teacher   | Tell the teacher   | Tell the teacher   |
| 3. Do you think that people who have been practicing martial arts for a long time like to bully others or those who don't like to bully others? | Unclear   | Short time learning martial arts                        | People who don't practice martial arts because they don't have a bottom line | People who do not learn martial arts are easier to bully because they are not educated in martial arts virtues | Martial arts practitioners are educated in martial arts virtues and so will discipline their own behaviour |
| 4. Reasons for practicing martial arts?   | Strengthening the body                            | Protecting others                                       | Protect myself   | Strengthen your body and protect myself  | Protect myself, protect others   |
| 5. What is your attitude towards bullying after martial arts training?  | Anti-bullying behaviour                           | Aversion to classmates who engage in bullying behaviour | Oppose bullying and if you find it, go and stop them                         | Very resistant to this kind of bullying  | Opposition   |
| 6. How has your personality and attitude towards dealing with problems after martial arts training?   | More able to endure hardship and control emotions | More able to work hard and be more disciplined          | More courageous and responsible  | Improved self-control, more self-discipline, more motivated to do things                                       | Be more proactive so I can step in and help others   |

## DISCUSSION

The present investigation has revealed that martial arts practitioners had higher levels of self-control, lower levels of aggression, and lower frequency of bullying victimization and bullying behaviour than non-martial arts practitioners. And the longer the year of martial arts practice, the better the individual's self-control, the lower the level of aggression, and the lower the frequency of bullying; the number of martial arts practices, the better the individual's self-control, the lower the level of aggression, and the lower the frequency of bullying. In addition, the longer the time of martial arts practice, the lower the frequency of the individual was bullied.

The results showed that martial arts practitioners had higher self-control than non-martial arts practitioners, while martial arts practitioners had lower levels of aggression than non-martial arts practitioners, which is consistent with the hypothesis of this study. It was found that the practice of *taijiquan* could improve hard-working spirit, self-control, and improve their moral qualities as well as willpower [25]. Participation in martial arts training had a significant effect on improving self-control, adolescents need to train hard because their performances are usually bonded with their school marks or sports career [26]. Experimental studies have concluded that practicing martial arts improves self-control and the ability to respond properly to problems, thus regulating their behaviour [27]. therefore, martial arts training can reduce individual aggression through self-control [28].

Previous studies found that non-martial arts practitioners had a higher level of aggression, and martial arts practice improves emotional self-control and reduces levels of anxiety and aggression [29]. Martial arts sports that are predicated on developing a moral spirit not only provide students with a broader set of skills but also develop critical thinking and self-control in individuals, which may reduce aggression [30]. The possible explanation is that the philosophy of traditional martial arts refers to a 'Zen state' that can enable the practitioners to achieve a sense of no aggression, thus reducing the individual's anger and aggression through meditation [31]. Martial arts training, as a sport in physical activity, provides the possibility of resolving mood and relieving tension, thus reducing the level of aggression [32]. Therefore, in the process of

controlling school bullying, individual self-control and self-restraint ability can be improved through martial arts courses, thereby decreasing individual aggression.

Regarding bullying, studies found that compared with non-martial arts practitioners, less bullying among martial arts practitioners, and prolonged martial arts training may reduce a child's exposure to bullying [33]. Because martial art emphasizes respect, self-regulation, and health promotion this practice may be an effective alternative to institutional anti-bullying [34]. In addition, practicing martial arts, such as karate, may improve the resilience and self-efficacy of youth and make them less likely to engage in aggressive behaviour or be bullied [35]. The possible mechanism by which martial arts exercise affects campus bullying behaviour is that physical exercise promotes the production and release of endorphins in the human body, reduces activities such as adrenaline and cortisol, and thus reduces the negative effects caused by campus bullying [36]. Martial arts exercise is an effective carrier for cultivating rule awareness, providing students with rich 'existential connections' for life education, legal education, and moral education [37, 38]. Martial arts exercise can effectively reduce students' negative emotions such as tension, anger, and depression, and promote individuals to adopt positive coping methods to solve problems [39, 40]. Therefore, martial arts practice is a healthy and positive way of life, in line with the eastern precepts of martial arts, it will not increase the attack of violence, but will improve the awareness of violence prevention, and then self-protection [41].

This work revealed that long-term practice of martial arts has positive effects on individual physical and psychological development. In the process of school bullying, bullies are mainly unable to control their negative emotions such as anger and irritability. When dealing with stressful events, they tend to adopt negative coping to deal with problems, thus promoting the generation of school bullying. This study provides new empirical support for investigating the relationship between adolescent self-control and aggressive behaviours such as bullying, expands the positive impact of martial arts training on adolescent behaviour, and provides an implementation scheme for reducing bullying.



However, martial arts include diverse types from different countries, and each martial arts type is a skill produced jointly under specific national culture, identity, and thinking mode, with its cultural characteristics and ideology, which have a certain influence on individual behaviour, character, and thinking. Furthermore, whether there are cross-cultural differences in the influence of martial arts training on behaviour, and the influence of martial art types on individual behaviour is different, needs to be further studied.

## CONCLUSIONS

In summary, martial arts training as an effective coping style, improves an individual's self-control and thus reduces the occurrence of aggression and bullying. Compared to other competitive sports, martial arts based on moral discipline has a unique advantage in regulating individual behaviour and moral education, which inhibits individuals from developing externalizing problems such as hostility and aggression, thus reducing individual involvement in school bullying.

## REFERENCES

- Renshaw TL, Roberson AJ, Hammons KN. The Functionality of Four Bullying Involvement Classification Schemas: Prevalence Rates and Associations with Mental Health and School Outcomes. *Sch Ment Health* 2016; 8: 332-343
- Arslan G, Allen K-A, Tanhan A. School Bullying, Mental Health, and Wellbeing in Adolescents: Mediating Impact of Positive Psychological Orientations. *Child Indic Res* 2021; 14: 1007-1026
- Yu L, Ma Z. "Campus Bullying": Connotation Identification, Application Limits and Redefinition. *Educ Dev Res* 2018; 38(12): 26-33 [in Chinese]
- Chen G. The Perception to Definition of Qifu Phenomenon from Primary and Junior Middle Students. *Stud Psychol Behav* 2014; 12(5): 639-644 [in Chinese]
- Yang J, Xie Y, Qu H et al. Reported Rate of Bullying-related Behaviors among Chinese Students: A Meta-analysis. *Chin J Health Psychol* 2016; 24(11): 1658-1662 [in Chinese]
- Wang L, Jin G, Zhang Y. Influence of Physical Exercise on School Bullying of Junior Middle School Students – Chain Mediation Role of Psychological Resilience and Self-efficacy. *J Phys Educ* 2022; 38(1): 67-73 [in Chinese]
- Kusnierz C, Cynarski WJ, Gorner K. Social reception and understanding of combat sports and martial arts by both school students and adults. *Ido Mov Cult* 2017; 17(1): 30-37
- Shen C, Xu Z-X, Qin J-Q. Relationship between Aggressive Behavior and Big Five Personality of Martial Arts Specialized College Students. *J Nanjing Inst Phys Educ (Nat Sci)* 2016; 15(1): 100-104, 138 [in Chinese]
- Shao H, Li C, Dai L. Study of Wushu as a Interference Project of Children bullying Behavior – From the essence and connotation of spiritual morality of Wushu. *Tech Pract Fighting* 2018; 3(3): 73-76 [in Chinese]
- Telzer EH, Masten CL, Berkman ET et al. Neural regions associated with self control and mentalizing are recruited during prosocial behaviors towards the family. *NeuroImage* 2011; 58(1): 242-249
- Coyne MA, Wright JP. The stability of self-control across childhood. *Pers Individ Differ* 2014; 69: 144-149
- Kim I. Treating Violence in the School Through Traditional Martial Arts. *Int J Educ Reform* 2004; 13(4): 308-324
- Wu J, Wang W, Wang Z. A Study on the Influence of Long-term Wushu Practice on the Emotion Management and Self-control of Practitioners Taking Taijiquan as an Example. *Chin Wushu Res* 2017; 10: 6-9 [in Chinese]
- Berkowitz L. *Aggression: Its Causes, Consequences, and Control*. New York: McGraw-Hill; 1993
- Li X, Li Z, Zhang L. Relationships between Social Support and Aggression of Adolescents: The Chain Mediating Roles of Self-Esteem and Self-Control. *Psychol Dev Educ* 2017; 33(2): 240-248 [in Chinese]
- Zivin G, Hassan NR, DePaula GF et al. An effective approach to violence prevention: traditional martial arts in middle school. *Adolescence* 2001; 36(143): 443-459
- Harwood A, Lavidor M, Rassovsky Y. Reducing aggression with martial arts: A meta-analysis of child and youth studies. *Aggress Violent Beh* 2017; 34: 96-101
- Fung ALC, Lee TKH. Effectiveness of Chinese Martial Arts and Philosophy to Reduce Reactive and Proactive Aggression in Schoolchildren. *J Dev Behav Pediatr* 2018; 39(5): 404-414
- Ronen T, Rosenbaum M. Developing Learned Resourcefulness in Adolescents to Help Them Reduce Their Aggressive Behavior: Preliminary Findings. *Res Social Work Prac* 2010; 20(4): 410-426
- Tan S-H, Guo Y-Y. Revision of self-control scale for Chinese college students. *Chin J Clin Psychol* 2008; 16(5): 468-470 [in Chinese]
- Liu J-S, Zhou Y, Gu W-Y. Reliability and validity of Chinese version of Buss-Perry Aggression Questionnaire in adolescents. *Chin J Clin Psychol* 2009; 17(4): 449-451 [in Chinese]
- Zhang WX, Wu JF, Jones K. Modification of the Chinese version Olweus bullying/victimization questionnaire. *Psychol Dev Educ* 1999; 15(2): 18-22
- Zhou H, Long L. Statistical remedies for common method biases. *Adv Psychol Sci* 2004; 12(6): 942-950 [in Chinese]
- Wen Z, Ye B. Analyses of Mediating Effects: The Development of Methods and Models. *Adv Psychol Sci* 2014; 22(5): 731-745 [in Chinese]
- Li H. A Brief Discussion on the Cultivation Function of Taijiquan on Teenager's Will and Character. *Chin Wushu* 2019; 8(1): 67-69 [in Chinese]
- Xu T, Li H, Yan Z et al. The effects of self-control on bullying behaviour among martial arts practicing adolescents: based on the analyses of multiple mediation effects. *Int J Sport Exerc Psychol* 2022; 20: 1-14
- Fabio RA, Towey GE. Cognitive and personality factors in the regular practice of martial arts. *J Sports Med Phys Fit* 2018; 58(6): 933-943
- Shachar K, Ronen-Rosenbaum T, Rosenbaum M et al. Reducing child aggression through sports intervention: The role of self-control skills and emotions. *Child Youth Serv Rev* 2016; 71: 241-249
- Morvay-Sey K, Rétsági E, Pálvölgyi A et al. A trait aggression in young Hungarian practitioners of Japanese martial arts. *Arch Budo* 2019; 15: 11-21
- Joseph J. *Physical Culture and Alternative Rehabilitation: Qualitative Insights from a Martial Arts Intervention Program*. In: Joseph J, Crichlow W, editors. *Alternative Offender Rehabilitation and Social Justice*. London: Palgrave Macmillan; 2015: 55-77
- Lafuente JC, Zubiaur M, Gutiérrez-García C. Effects of martial arts and combat sports training on anger and aggression: A systematic review. *Aggress Violent Behav* 2021; 58: 101611
- Kuśnierz C, Cynarski WJ, Litwiniuk A. Comparison of aggressiveness levels in combat sports and martial arts male athletes to non-practising peers. *Arch Budo* 2014; 10: 253-260

33. Xu T, Zhang G. Research progress of restraining campus bullying by martial arts training. *Rev Artes Marciales* 2019; 14(2s): 50-52
34. Greco G, Fischetti F, Cataldi S et al. Effects of Shotokan Karate on resilience to bullying in adolescents. *J Hum Sport Exerc* 2019; 14(4proc): S896-S905
35. Greco G, Cataldi S, Fischetti F. Karate as anti-bullying strategy by improvement resilience and self-efficacy in school-age youth. *J Phys Educ Sport* 2019; 19(Suppl 5): 1863-1870
36. Zhang XQ, Qiu F. The Influence of Physical Exercise on Aggressiveness of Adolescents: Chain Mediation of Coping Style and Psychological Elasticity. *J Harbin Sport Univ* 2019; 37(5): 85-91 [in Chinese]
37. Martinkova I, Parry J, Vagner M. The Contribution of Martial Arts to Moral Development. *Ido Mov Cult* 2019; 19(1): 1-8
38. Xu Z-x, Gong Z-w. How does physical education let "moral establishment and student cultivation" become possible. *J Phys Educ* 2019; 26(4): 8-15 [in Chinese]
39. Oh C-u, Kim N-c. Effects of T'ai Chi on Serotonin, Nicotine Dependency, Depression, and Anger in Hospitalized Alcohol-Dependent Patients. *J Altern Complement Med* 2016; 22(12): 957-963
40. Xu T, Li Y, Chen X et al. Effect of physical activity volume on active coping style among martial arts practicing adolescents: the mediating role of self-efficacy and positive affect. *Arch Budo* 2020; 16: 315-324
41. Lu C. Eastern martial arts and violence prevention: Reversing a stereotype. *Arch Budo* 2008; 4: 32-36
42. Dictionary of Sport and Exercise Science. Over 5,000 Terms Clearly Defined. London: A & B Black; 2006
43. [https://en.wikipedia.org/wiki/Sanda\\_\(sport\)](https://en.wikipedia.org/wiki/Sanda_(sport)) (accessed 2023 Feb 25)
44. <https://journalist-nsk.ru/en/vrediteli-v-dome/taiczicyuan-stil-yan-buninskaya-alleya-bazovaya-programma-obucheniya.html> (accessed 2023 Feb 25)

**Cite this article as:** Xu T, Yan Z, Li H et al. Self-control, aggression and bullying of martial arts practitioners and non-martial arts practitioners: A comparative study and factor analysis. *Arch Budo* 2023; 19: 119-128