

Aggressiveness level in baseball players and Brazilian jiu-jitsu athletes

Authors' Contribution:

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

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Abstract

Background and Study Aim:

The relationship between combat sports and aggression has begun to be focused by some researchers. While Wann & Branscombe consider combat sports (e.g. boxing) as typical examples of aggressive sports, other authors assume that training of combat sports could lead to a reduction of aggressiveness among the trainees. We hypothesize that the level of aggressiveness of Brazilian jiu-jitsu athletes is lower than among baseball players.

Material and Methods:

Self-report research tool Buss-Perry Aggression Questionnaire (BPAQ) was involved in discovering the difference in aggressiveness level among players of non-combative (baseball) and combat sport (Brazilian jiu-jitsu). The research sample involves 60 male sportsman from the Czech Republic divided into two subgroups (n = 30 baseball players in the age 26.80 ± 4.75 and n = 30 Brazilian jiu-jitsu athletes in the age 26.47 ± 4.92). Descriptive statistics, T-test and size effect evaluated by Cohen's d were used for the analysis.

Results:

There are no statistically significant differences in aggressiveness level between samples A (baseball) and B (Brazilian jiu-jitsu) on the level of statistical significance 0.05%. According to Cohen's d interpretation, we can consider the significant difference between A and B samples in the verbal aggression factor (d = -0.38).

Conclusions:

According to BPAQ methodology, there is no statistically significant difference in aggressiveness level of baseball and Brazilian jiu-jitsu athletes in all four partial factors (physical aggression, verbal aggression, anger, hostility). An increase of participants number could enhance the validity and reliability of research. We highly recommended continuing research for revealing the relationships between combat systems training and aggressiveness.

Key words:

anger • hostility • physical aggression • verbal aggression

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Aggressiveness – is an attribute, attitude, or internal alertness to aggression [1].

Aggressiveness – a human characteristic manifesting itself in inclinations to hurt others, to destructive behaviour. **Aggressive** = virulent, truculent, attacking [11].

Aggression – a behaviour aimed at causing harm or pain, psychological harm, or personal injury or physical distraction [15] based on [17].

Verbal aggression – message behaviour which attacks a person's self-concept to deliver psychological pain [15] based on [17].

Physical aggression – a forceful action or procedure (as an unprovoked attack) that is hostile, destructive, or violent, and has the potential to inflict injury or damage to the target person or object, especially when intended to dominate or master [15] based on [17].

Anger – is an emotional state characterized by antagonism toward someone or something, which vary in intensity from mild irritation to intense fury and rage [15] based on [17].

Hostility – is a strong impulse inspired by feelings of anger or resentment that cause intentional harm of injury to another person or object [15] based on [17].

Bravery – means efficiency in good deeds, efficiency combined with estimable aspirations [11].

Brazilian Jiu Jitsu – is a type of fight in which a uniform or gi is used; its main purpose is to project or take your opponent down. Once on the ground, you must seek to control your adversary with different techniques (immobilizations, chokes, joints locks). In the absence of submission at the end of the fight, the winner is declared by the number of points won [19].

Capoeira – *noun* a martial art and dance form, originally from Brazil, that is used to promote physical fitness and grace of movement [20].

INTRODUCTION

Aggressiveness is an attribute, attitude, or internal alertness to aggression [1]. In a broader sense, aggressivity is a natural part of the mental equipment of a healthy individual which is designed to mobilise forces to struggle to achieve a goal and ability to resist difficulties. Some experts divide aggressiveness by purpose or direction of action. According to the purpose oriented definition, constructive and destructive aggressiveness is distinguished. While constructive aggressiveness is vital for individualisation and self-awareness, destructive aggressiveness is considered as a personality disorder [2]. Depending on the direction of action is aggressiveness divided into intropunitive (self-directed) and extra punitive (focused on the environment) [3, 4] – see an alternative definition of “aggressiveness” in a glossary.

Aggression (*lat. aggressio* – attack, assault) is an assault on a thing or person with a firm intention of harm [1]. Fromm [5] distinguishes between benign (harmless) and malignant aggression. While benign aggression (or rade controled violence [6]) is aimed to achieve goals according to social and legal norms (e.g. defence of necessity). Malignant aggression is detrimental for society (e.g. domestic violence, bullying, etc.). Use of force in controlled manner is especially needed in self-defence, which is vital competence for many professional and civic groups of citizens [7-10]. This ability is shared by some authors with the bravery concept [6, 11].

In sport, aggression is closely related to performance. An athlete striving to win over an opponent must act sufficiently vigorously and aggressively to overcome the opponent's performance. It is a manifestation of benign aggression that does not hurt others. Such aggression is regulated by rules and therefore socially tolerated. From this point of view, the specific place occupies combat sports and martial arts. According to Pačesová & Putala [12] direct physical aggression is an integral part of the performance in these sports.

The relationship between combat sports and aggression has begun to be focused by some researchers. The central research question is, where the training of combative systems brings positive attributes for society (e.g. self-control), or negative attributes (e.g. support of violence). Wann & Branscombe [13] consider combat sports (e.g. boxing) as typical examples of aggressive sports. Other authors [12, 14, 15] assume that training of combat

sports could lead to a reduction of aggressiveness among the trainees. Kalina & Barczyński [16] emphasize educational and healthy values of combative systems, which should be practised with respect for human dignity and rules to protect mental and somatic integrity of all participants.

We were interested, whether of combat sports training the influence on aggressiveness is correct or not. We were focused on the comparison of aggressiveness level between two groups of athletes – baseball players and brazilian jiu-jitsu athletes in our study. We hypothesize that the level of aggressiveness of Brazilian jiu-jitsu athletes is lower than among baseball players.

MATERIAL AND METHODS

Participants

The research sample involves 60 male sportsman from the Czech Republic divided into two subgroups. The first group (A) is composed by 30 baseball players from three different clubs in Brno City starting in the extra league, the highest Czech baseball competition. The second group (B) is composed by 30 Brazilian jiu-jitsu athletes from three different clubs in Brno City, who are actively and regularly participating in competitions (detailed presented in Table 1).

Stude designe

Self-report research tool Buss-Perry Aggression Questionnaire (BPAQ) was used for data gathering [17]. Data on total aggressiveness are structured into four partial factors: physical aggression, verbal aggression, anger and hostility.

Following null and alternative hypothesis were established. H_0 : There is no statistically significant difference between the BPAQ results of group A (baseball players) and group B (Brazilian jiu-jitsu athletes) in one or more factors of aggression (verbal aggression, physical aggression, hostility, anger). H_1 : There is the statistically significant difference between the BPAQ results of group A (baseball players) and B (Brazilian jiu-jitsu athletes) in one or more factors of aggression (verbal aggression, physical aggression, hostility, anger).

Statistical analysis

The estimation is based on the arithmetic mean, the median, the standard deviation, the minimum and maximum value. Advanced statistical methods were involved for more detailed analysis.

Table 1. Research sample of Czech Republic male athletes.

Sport	Number of participants	Statistics indicators	Age (years)	Martial arts experience (years)
Baseball	30	Mean	26.80	0.00
		SD	4.75	0.00
		Minimum	20.00	0.00
		Maximum	35.00	0.00
Brazilian jiu-jitsu	30	Mean	26.47	5.67
		SD	4.92	3.59
		Minimum	20.00	2.00
		Maximum	35.00	17.00

Firstly, normality test was performed. Given that the data originates from the standard layout, parametric tests could be used. For the comparison of two samples the T-test was performed. We are using Cohen's *d* indicator calculation.

According to Cohen's *d* indicator, we can consider the significant difference ($d = -0.38$) between samples A and B samples in the verbal aggression factor (Table 5). Brazilian jiu-jitsu athletes have a higher tendency to verbal aggression (Figure 3).

RESULTS

In the baseball players sample, scores in two factors (anger, physical aggression) are very slightly higher than mean values according to BPAQ methodology. On the other hand, in two other factors (verbal aggression, hostility), baseball players scored slightly below the BPAQ mean values (Table 2, Figure 1).

Different results were observed in the Brazilian jiu-jitsu athletes sample (Table 3, Figure 2). Slightly enhanced scores are indicated in two factors (verbal aggression, anger). In two other factors (physical aggression, hostility) values were slightly below the mean BPAQ values.

There are no statistically significant differences between samples A and B on the level of statistical significance 0.05% (Table 4). Based on results we refute the alternative hypothesis and confirm the null hypotheses.

DISCUSSION

In some studies, self-report research tool Buss-Perry Aggression Questionnaire (BPAQ) was in use [17]. Comparing a group of man (in the age of 17-23 years) without combative sports training ($n = 150$) and combat sports (martial arts) athletes ($n = 150$) from diverse systems: 50 boxing, 50 capoeira, 50 jujutsu enhanced aggressiveness was identified by non-training group and boxers. On the other hand capoeira and jujutsu group showed signs of lower aggressiveness [14]. Pačesová & Putala [12] also discovered enhanced aggressiveness level by a non-sport group of a young man ($n = 59$) in comparison with swimmers ($n = 65$) and combat sports athletes ($n = 48$), all in the age of 15 ± 3.01 years.

In our research no statistically significant differences between samples of baseball and Brazilian jiu-jitsu athletes were observed on the level of

Table 2. Descriptive statistics of baseball players (the last column includes the mean value for each factor according to BPAQ methodology, which is based on the sample of $n = 612$ males [17]).

Variable	Descriptive statistics					BPAQ [17]	
	N	Mean	Median	Minimum	Maximum	SD	Mean
Physical aggression	30	24.43	23.50	12.00	34.00	5.74	24.30
Verbal aggression	30	15.13	15.00	8.00	23.00	3.49	15.20
Anger	30	18.86	19.00	9.00	29.00	4.68	17.00
Hostility	30	20.66	20.50	12.00	32.00	4.54	21.30

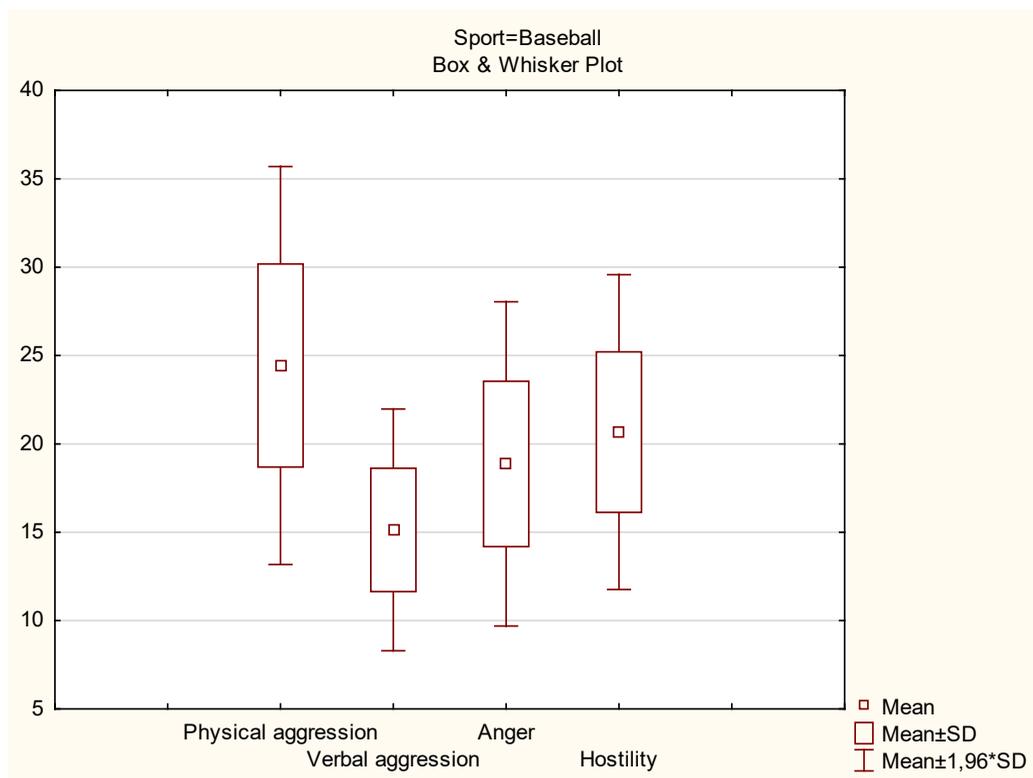


Figure 1. Descriptive statistics of baseball players (n = 30).

statistical significance 0.05%. The size effect is significant in the verbal aggression factor ($d = -0.38$). This divergence could be influenced culturally. Brazilian jiu-jitsu brings into Czech training group kind of Brazilian mentality. Joking and making fun of each other in more competitive manner is common communication style in the community. Maybe this style of communication can shift the sense of verbal aggressiveness.

Following limitations of research should be considered. Firstly, the validity of data obtained with self-report tools can be influenced by the motivation and frankness of tested persons. To enhance the validity and trustworthiness of

data, we instructed the tested persons and motivated them for introspection and the most accurate responses related to one's person. Secondly, using the BPAQ methodology [17] we cannot consider the final level of aggressiveness of tested persons, but just their tendency to behave aggressively. Also, the level of aggressiveness variable in time. From that reason, it would be methodologically profitable to measure group of combat sports players and other groups in the longer span. The best design would be measurement before starting combat sports training and after some specific period. Finally, it is not clear, if people with specific personality features do not incline to participate in specific sports. Level of

Table 3. Descriptive statistics of Brazilian jiu-jitsu athletes (the last column includes the mean value for each factor according to BPAQ methodology, which is based on the sample of n = 612 males [17]).

Variable	Descriptive Statistics						BPAQ [17]
	N	Mean	Median	Minimum	Maximum	SD	Mean
Physical aggression	30	23.20	22.00	14.00	37.00	5.67	24.30
Verbal aggression	30	16.46	16.00	11.00	23.00	3.36	15.20
Anger	30	18.36	18.00	12.00	32.00	4.64	17.00
Hostility	30	19.90	20.00	11.00	35.00	5.90	21.30

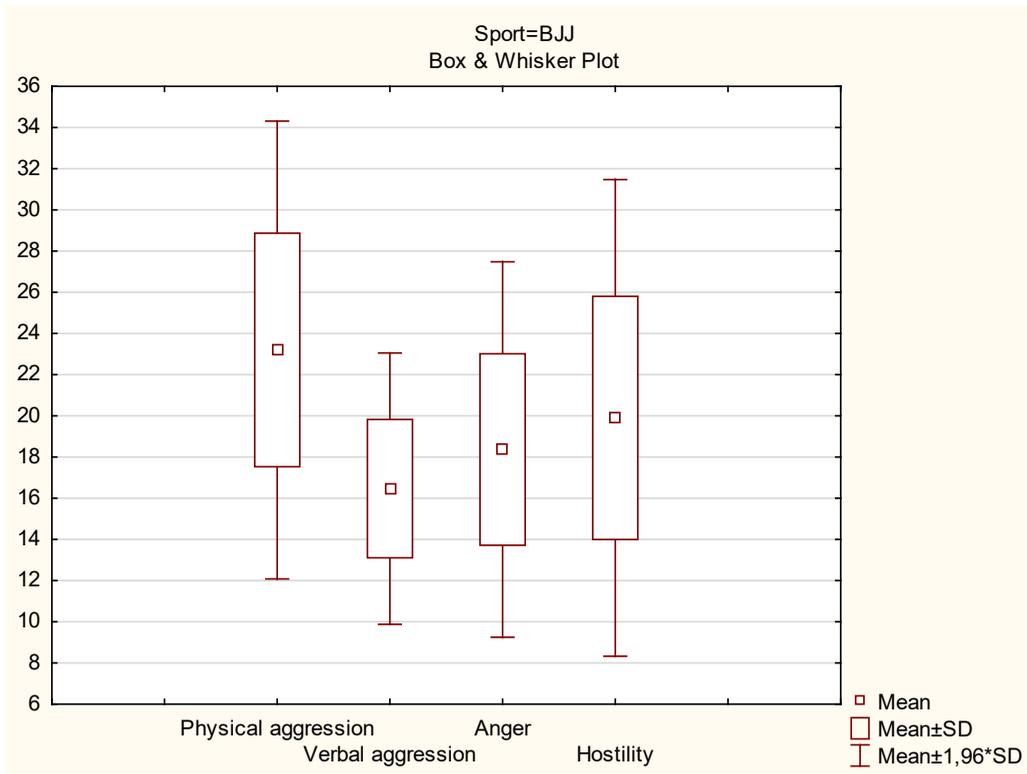


Figure 2. Descriptive statistics of Brazilian jiu-jitsu athletes (n = 30).

aggressiveness of specific combat sports players could be influenced not just by the training itself, but by choice of a system according to their personality. Concerning the statistical procedure, we have to consider the number of research participants (n = 60), divided into two subgroups. The statistical significance could increase with increasing number of tested persons.

Continuing research on aggression in sport and aggressiveness of athletes do not lose their relevance. An important argument is the conclusions from the latest review (meta-analysis) of work on aggression and violence in amateur sport. Sport, while meeting the recommended assumptions, can be an effective way to reduce aggressiveness [18].

Table 4. Results of the t-test: baseball players (A); Brazilian jiu-jitsu athletes (B).

Variable	Mean & SD		Difference	t-value	df	p
	A (n = 30)	B (n = 30)				
Physical aggression	24.43 ± 5.74	23.20 ± 5.67	1.23	0.83	58	0.40
Verbal aggression	15.13 ± 3.49	16.46 ± 3.36	1.33	-1.50	58	0.13
Anger	18.86 ± 4.68	18.36 ± 4.64	0.50	0.41	58	0.67
Hostility	20.66 ± 4.54	19.90 ± 5.90	0.76	0.56	58	0.57

Table 5. Results of the size effect analysis results BPAQ between baseball players (n = 30) and Brazilian jiu-jitsu athletes (n = 30).

Variable	d
Physical aggression	0.21
Verbal aggression	-0.38
Anger	0.11
Hostility	0.14

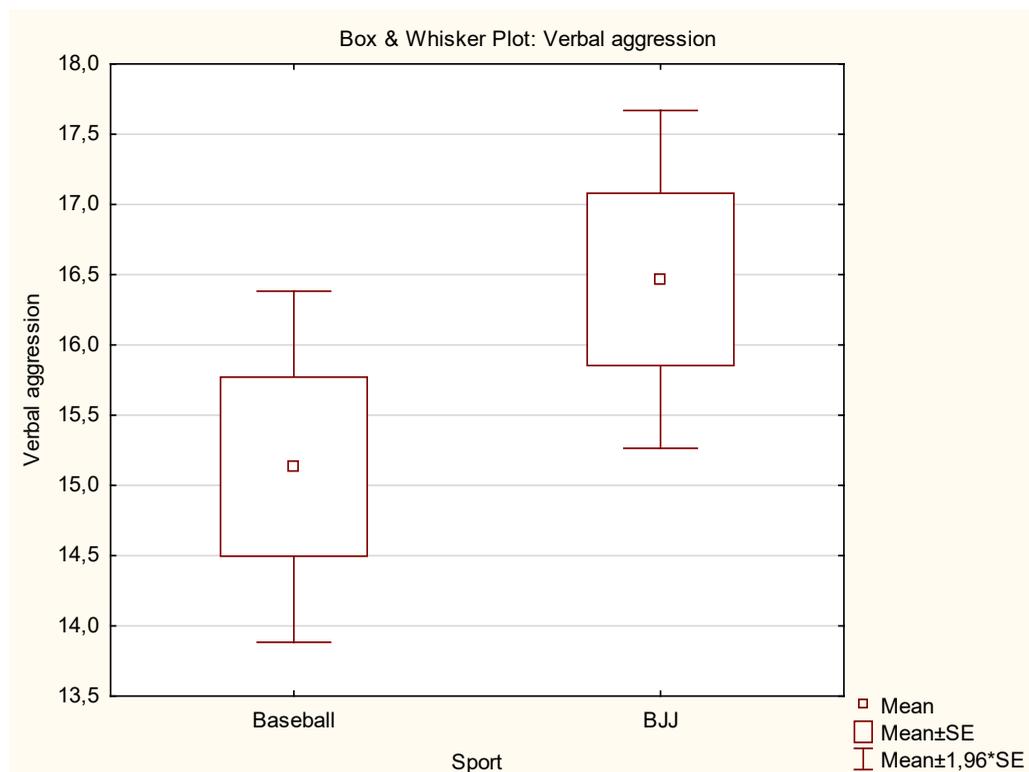


Figure 3. The difference between verbal aggression in baseball players (n = 30) and Brazilian jiu-jitsu athletes (n = 30).

CONCLUSIONS

According to BPAQ methodology, there is no statistically significant difference in aggressiveness level of baseball and Brazilian jiu-jitsu athletes in all four partial factors (physical aggression, verbal aggression, anger, hostility). The size

effect is significant in the verbal aggression factor ($d = -0.38$). An increase of participants number could enhance the validity and reliability of research. We highly recommend continuing research for revealing the relationship between combat systems training and aggressiveness.

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