

## ORIGINAL PAPER

# Correlation of Aggressiveness and Anxiety in Fighteeng Sports

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**Introduction:** in fighting sports there are many opened issues related with levels of aggression and anxiety. **Material and methods:** Our study is performed with healthy young athletes: kick boxers, karate fighters, and boxers. Examined group consisted of 55 members (45 male) with average age of  $20.2 \pm 3.8$  years. In analysis of level of aggression Questionnaire A-87 is used. Its purpose is assessment of aggressive behaviour in provoked situations, or measurement of impulsive aggression. Questionnaire A-87 consists of 15 items of different situations with five possible responses. **Results and Discussion:** The possible responses or reactions are the five most frequent forms of aggressive responses: a) verbal manifest aggression (VM); b) physical manifest aggression (PHM); c) indirect aggression (IND); d) verbal latent aggression (VL), and e) physical latent aggression (PHL). In the analysis of anxiety is used Beck Anxiety Inventory, BAI. Average training period was  $7.8 \pm 3.6$  years. Even 37 athletes during sporting carriers were injured, and most of examiners (precisely 13) experienced 3 injuries. Average value of BAI was  $12.7 \pm 8.7$ . Average value of total aggression was  $152.2 \pm 40.9$ ; highest levels were observed in VM (33.9) and VL (30.1). Significant positive correlations of all components of aggression with level of anxiety is observed ( $p < 0.05$ ), most prominent IND ( $r = 0.4263$ ;  $p = 0.0012$ ), and VL ( $r = 0.4163$ ;  $p = 0.0016$ ), and also total aggression ( $r = 0.4822$ ;  $p = 0.0002$ ). Slightly significant positive correlation of total aggression with age of examiners is also observed ( $r = 0.2668$ ,  $p = 0.0489$ ). Positive correlation VM ( $r = 0.4928$ ;  $p = 0.0001$ ), PHL ( $r = 0.2761$ ;  $p = 0.0413$ ), and total aggression ( $r = 0.347$ ;  $p = 0.0094$ ) is observed with number of injuries of examined athletes. Also, positive correlation ( $r = 0.2927$ ,  $p = 0.0301$ ) is observed with level of anxiety and number of injuries. Higher level of aggression and anxiety might change attitude of some sports authorities (especially coaches), and additional psychological training of fight sports might be necessary. **Conclusion:** Assessment of basically levels of aggression and anxiety of athletes might be valuable not only in sport activities, but in overall aspects of life. **Key words:** fighteeng sports, aggressiveness, anxiety.

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## 1. INTRODUCTION

Aggressiveness is an indivisible part of the ambience in sporting arenas, where in fact, becomes a behav-

ing manner. It is, therefore, behavioral, emotional reaction, which is basically intended to inflict damage, physical or psychological harm (1). It is expressed

directly through verbal, physical or combined attacks or indirectly through compensation or indirect aggression (2). It is suitable, for example, when used for self-defense, but can be destructive.

“Active” aggressiveness means physical and verbal attacks, and “passive” causes adverse consequences by failure to take deliberate action. While the “offensive” aggression is normally expressed during the struggle for territory or individuals of the opposite sex, “defensive” is usually expressed in life-threatening situations, and is related to increased fear (3).

According to social learning theory the aggression is a behavior learned in the process of amplification and modeling (4), and by the frustration-aggressive hypothesis the human aggressive behavior is caused by frustration (5). In the sports context, frustration occurs by block of sportsman efforts to achieve the goal of the sports. On the other hand, parents sometimes uncritically “pushing” their children in competitive sports, probably wishing to achieve their personal, unmet goals, or to find it as a suitable preparation for later life (6). Pagelow (1984) noted that aggressive children tend to have aggressive parents, and parents can be strong models of aggression (7). Freishlag and Schmidke (1979) emphasize the importance of parental influence on the moral reasoning of young athletes (8).

Anxiety involves unpleasant feelings in the form of anticipation of something that is uncomfortable. Unlike fear, which is caused by a realistic,

well-known danger, anxiety is difficult to identify. Normal (objective) anxiety occurs when people react appropriate to the situation, but after a certain period comes to adaptation and anxiety disappears (9). Anxiety as a feature of anxiety disorders is of disproportionately high intensity compared to the situation that causes a feeling of anxiety and interferes with the individual's ability to perform normal activities (9).

Common is the comorbidity of anxiety with depression, addiction and aggressive behavior (10). The particular aggressiveness and violence is likely to develop as a result of generally disturbed emotional regulation, such as abnormally high or low levels of anxiety (11).

Many mental disorders are associated with disturbed social functioning and explicit aggressiveness (12) because the neural circuits that regulate emotions and social behavior are multiple interwoven. In fact, deficits in social behavior that lead to excessive aggression can develop as a result of disrupted emotional regulation (13).

Testosterone, the main male sex steroid, has been for long time respected factor in the manifestation of aggression, both in animals and humans (14,15). Proven is a connection between testosterone levels in circulation and levels of aggression, for example during puberty, when testosterone levels in mammals and aggression are elevated (16).

From the sport point of view it is interesting research results which indicate that there is increase in levels of testosterone and cortisol in male karate fighters which participate in the "real" fight, but not in the kata, and that the levels were higher in those who have lost than the winners. Defeated showed a higher degree of anxiety (17).

Interestingly, however, higher doses of testosterone administered to healthy men, regardless of exercise or lack of physical activity does not increase aggressiveness (18). However, this does not exclude the possibility that higher doses of multiple steroids might provoke angry behavior in people who have previous psychopathological disorders (19).

The serotonergic (5-HT) system

plays an important role not only in the pathophysiology of depression, but also anxiety and aggression (20).

Analysis of aggression in sports requiring additional attention, because it carries a certain sport related specifics. Aggressiveness and violence in sport are, or at least should be, sanctioned, and those who take part in sports with a "high risk" are taking the risk of personal physical injury (21). Philosophy of "win at all costs" for athletes often leads to unethical and aggressive behavior, creating a negative and destructive impact, not only to young athletes, but also the entire community. In this context by research is still difficult to answer whether sports provides a positive outlet for the instinctive tendencies of aggression or, conversely, because of its competitive nature, even leading to an increased aggressiveness (22).

There are many open questions related to the level of aggression and anxiety in people engaged in martial arts, and previous studies are mainly limited to a separate assessment of their level, and rare are the ones that put these levels in relation to each other, as well as in connection with age, duration of training or number of injuries athletes. This paper is an attempt to partially illuminate this problem.

#### **The goals of this research are:**

To determine the level of aggression and anxiety of those who are engaged in martial arts and determine their mutual correlation;

To determine the correlation between the level of aggressiveness with age of subjects, sport experience duration, and the number of injuries;

To determine the correlation between the level of anxiety with age of subjects, sport experience duration, and the number of injuries.

## **2. PATIENTS AND METHODS**

The study was conducted on healthy active athletes arranged in three martial arts club: Tom Cat kick-boxing club Tuzla (18 respondents), Karate Club Forma, Tuzla (22 respondents), and the boxing club Giprom Tuzla (15 subjects), in the period May–June 2011.

The test group consisted of 55 patients (the majority or 45 subjects were men) with mean age  $20.2 \pm .8$  (13-28)

years. At the same time the role as the coach and the participants in the fight had 4, while other 51 subjects were only participants in the fights. There were no respondents who were involved in recreational training.

Analysis of all clubs is performed before the regular training. At the time of analysis neither respondent was at the stage of recovery from injury, or was previously treated by a psychiatrist or psychotherapist.

In analyzing the aggressiveness the Questionnaire on Aggressiveness A8 was used (22). Aimed at assessing aggressive behavior in provoking situations, and measuring impulsive aggression. It consists of 15 items—the situations, and every situation is provided with 5 possible responses. Situations are examples of provoking situations that are commonly encountered in everyday life.

The five most common responses offered for each situation is one of 5 modes of impulsive aggression: verbal manifested aggression (VM), physically manifested aggression (FM), indirect or shifted aggression (IN), verbal latent aggression (VL), and the physical latent aggression (FL).

Results are obtained by linear summation of responses to 15 particles, and the possible range on each of the 5 scales is from 15 to 75. The overall result is a measure of the tendency of individuals to respond with aggression in provoking situations, and is formed by summing up the results of 5 subscales. This total score can be in a range from 75 to 375.

In the analysis of anxiety in the tested group was used Beck's Anxiety Inventory (BAI). Ranked in the following range: minimum (without anxiety) (0-9), mild anxiety (10-16), moderate anxiety (17-29), severe anxiety (30-63).

In addition to the degree of aggression and anxiety of the respondents was identified their mutual correlation, as well as correlation of aggression components with a duration of training martial arts and number of injuries. Also is determined the correlation between the level of anxiety with age, duration of martial arts training and number of injuries.

In the analysis are used the mean

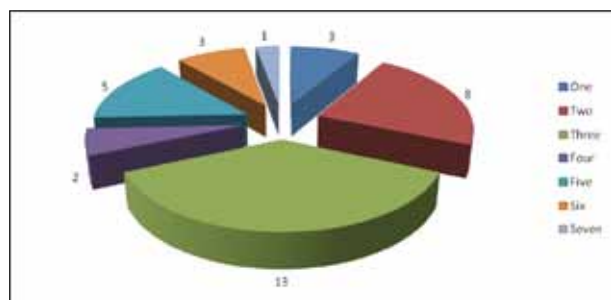


FIGURE 1. Distribution of respondents involved in martial arts in relation to the number of injuries

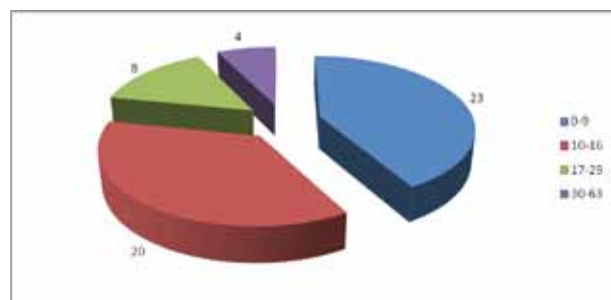


FIGURE 2. Distribution of anxiety degrees in subjects involved in martial arts measured by Beck's Anxiety Inventory (BAI). 0-9 minimal or no anxiety, 10-16 mild anxiety, 17-29 moderate anxiety, 30-63 severe anxiety.

AGGRESSIVENESS	Mean	SD	Min	Max
Verbal manifested	33.9	11.9	15	71
Physical manifested	29	10.8	15	59
Indirect shift	29	9.2	16	51
Verbal latent	30.1	8.8	15	35
Physical latent	29.4	10.6	16	67
Total	152.2	40.9	85	285

TABLE 1. Mean values of the components of aggression measured by Questionnaire for aggressiveness of respondents who are engaged in combat sports  $r=0.3588$ ;  $p=0.0071$

values with standard deviation and coefficient of linear correlation, a value of  $p<0.05$  were taken into account as significant.

AGGRESSIVENESS	r	p
Verbal manifested	0.2234	0.1011
Physical manifested	0.2381	0.0801
Indirect shift	0.2478	0.0681
Verbal latent	0.2314	0.0891
Physical latent	0.1301	0.2435
Total	0.2668	0.0489

TABLE 2. The correlation of the components of aggressiveness with age expressed in years in respondents engaged in combat sports

### 3. RESULTS

The average experience in particular sport of the respondents was  $7.8\pm 3.6$

(2-16) years and the average duration of training was  $1.5 \pm 0.25$  (1-2) hours, with the average number of training per week of  $5\pm 1.3$  (2-7).

Injuries had 37 respondents and the distribution of the number of injuries is shown in Figure 1. The largest number of respondents (13) had three injuries and the average number of injuries was  $2.2\pm 2$  (0-7).

The highest average score of anxiety had kick-boxers (16.8), followed karate fighters (12.7) and boxers (7.9). The average rate of anxiety in all subjects measured with the BAI was  $12.7\pm 8.7$

(0-40), a majority of respondents, a total of 35, were without anxiety, while there were 16 with mild anxiety present (Figure 2).

Approximately the same average levels of overall aggression had a kick-boxers (160.2) and boxers (159.5). Mean for total aggression score was  $152.2\pm 40.9$ , and the highest average values were noticed in the verbal manifested and verbal latent aggression (Table 1).

There was a significant positive correlation between all components of aggression (Figure 3, 4, 5, 6), most pronounced with indirect shift and verbal latent, with the degree of anxiety, as well as the overall aggressiveness with the anxiety level (Fig. 8).

There was a significant positive correlation of overall aggressiveness

AGGRESSIVENESS	r	p
Verbal manifested	0.0956	0.4873
Physical manifested	-0.2513	0.0642
Indirect shift	-0.1577	0.2501
Verbal latent	-0.0085	0.9503
Physical latent	-0.1895	0.1657
Total	-0.1249	0.3635

TABLE 3. Correlation between aggressiveness components with duration of sports experience expressed in years in respondents engaged in combat sports

with age, without association between individual components of aggressiveness (Table 2). There was no connection between the duration of the martial arts experience with the degree of aggressiveness of the respondents (Table 3).

It was found a positive correlation between verbal manifested, latent and total physical aggression with the number of injuries of the respondents (Table 4).

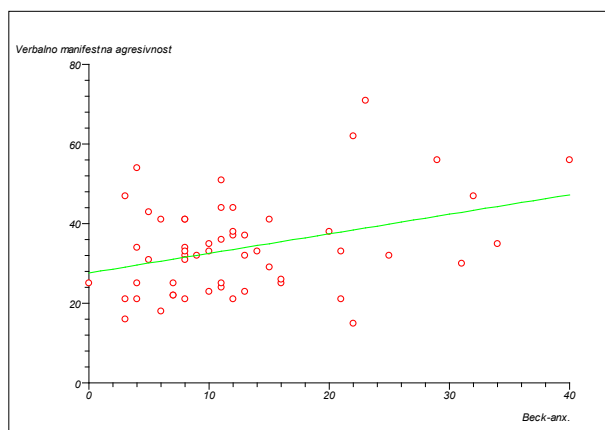


FIGURE 3. Correlation of verbal manifested aggression and the degree of anxiety measured by Beck's Anxiety inventory (Beck-anx) of respondents who are engaged in combat sports.  $r=0.3515$ ;  $p=0.0085$

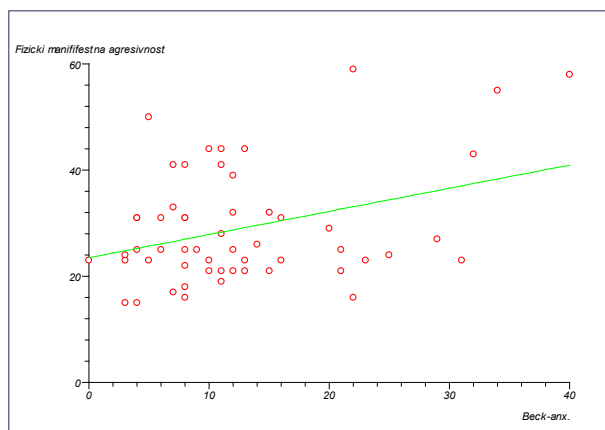
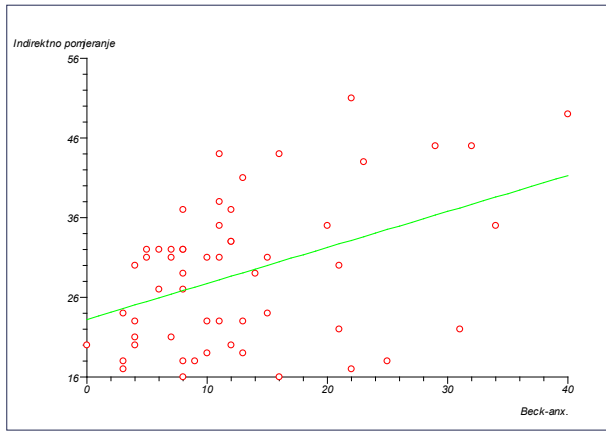
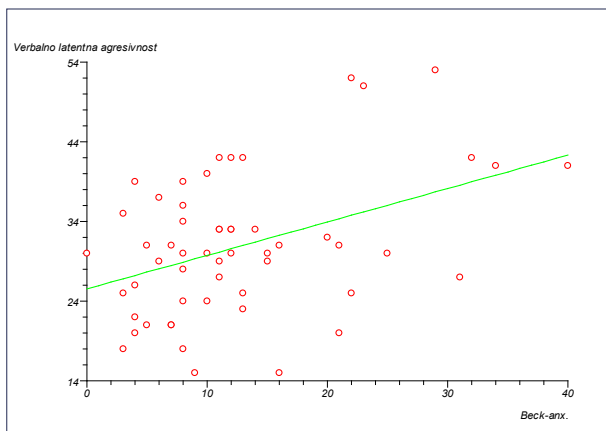


FIGURE 4. Correlation of physically manifested aggression and the degree of anxiety measured by Beck's Anxiety Inventory (Beck-anx) of respondents who are engaged in combat sports.  $r=0.4263$ ;  $p=0.0012$



**FIGURE 5.** Correlation of indirect shift and the degree of anxiety measured by Beck's Anxiety Inventory (Beck-anx) of respondents who are engaged in combat sports.  $r=0.4163$ ;  $p=0.0016$



**FIGURE 6.** Correlation of verbal latent aggressiveness and the degree of anxiety measured by Beck's Anxiety Inventory (Beck-anx) of respondents who are engaged in combat sports.  $r=0.3865$ ;  $p=0.0036$

There was no connection between the level of anxiety with age and duration of sports experience, while there was a positive correlation between levels of anxiety with the number of injuries (Table 5).

#### 4. DISCUSSION

Positive correlation as of total, also of all individual components of the aggressiveness with anxiety level confirms the statements that these two mental functions are in mutual relationship (12, 13).

On the other hand, a positive correlation between the levels of aggressiveness with age raises the question of optimal age of athletes to practice martial arts, when the increase in aggression by athlete can have harmful consequences. Interestingly, in older individuals there is no correlation with anxiety, which can also be an aggravating factor

should have its "psychological limit", especially in older athletes. Further more, as sole participation in the match and a possible poor outcome may indeed, but not always, be a source of further frustration and deepen the aggressiveness of the fighters.

It was noted that participation in competitive games encourages young men and girls on aggression, regardless of the outcome (23). It was found that even observers of such events have become significantly more aggressive.

because the "objective" anxiety to a certain limit may have a protective character, and made a person more prudent in the fight. In other words, the growing aggressiveness without anxiety can lead to poor situation assessment and uncritical entering into fight.

Although expected, the positive correlation with the total number of injuries and, especially, verbal manifested aggression leads to further reflection. Although the level of anxiety is positively correlated with the number of injuries, the number of injuries

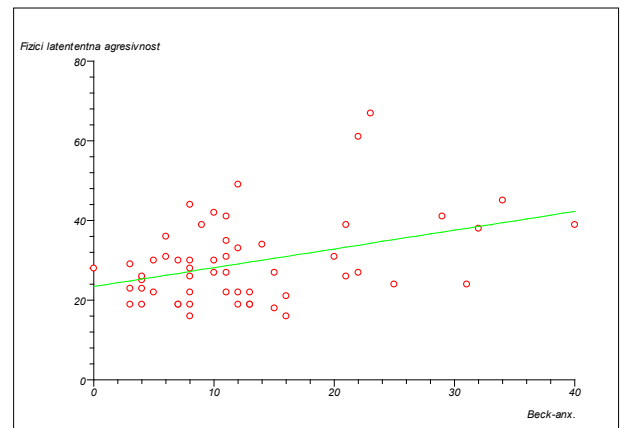
AGGRESSIVENESS	r	p
Verbal manifested	0.4928	0.0001
Physical manifested	0.1648	0.2292
Indirect shift	0.1592	0.2458
Verbal latent	0.2473	0.0687
Physical latent	0.2761	0.0413
Total	0.3470	0.0094

**TABLE 4:** The correlation with of components of aggressiveness with number of injuries in respondents engaged in combat sports

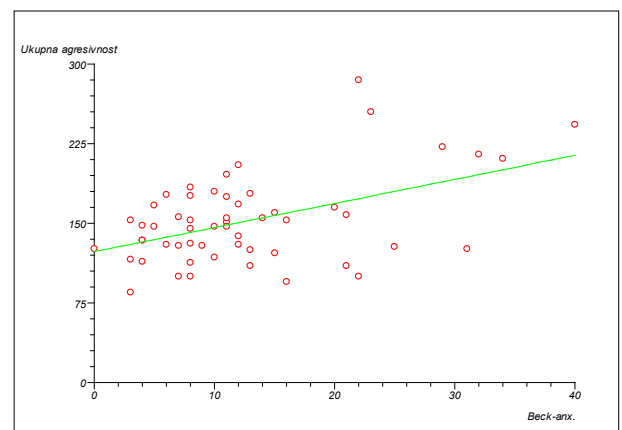
	r	p
BAI/age	-0.0545	0.6926
BAI /sport experience	-0.2206	0.1056
BAI /number of injuries	0.2927	0.0301

**TABLE 5:** Correlation between levels of anxiety measured with the Beck's Anxiety Inventory (BAI) with age, the duration of sports experience and number of sports injuries in respondents engaged in combat sports

That loosing the game might be an important factor causing frustration sup-



**FIGURE 7.** Correlation of the physical latent aggressiveness and the degree of anxiety measured by Beck's Anxiety Inventory (Beck-anx) of respondents who are engaged in combat sports.  $r=0.4822$ ;  $p=0.0002$



**FIGURE 8.** Correlation of total aggressiveness and the degree of anxiety measured by Beck's Anxiety Inventory (Beck-anx) of respondents who are engaged in combat sports.



ports the observation that competitive sports generate either catharsis with decreasing levels of aggression, or conversely, increase aggression, depending on the outcome of the match (24,25). Athletes in individual sports have experienced more frustration than those in team sports when loses, and participation in both types of sport leads to reduction in aggressiveness when they won. However, the type of sport has a certain influence. Although the children who have had a judo training did not had higher scores of aggression after training, those who had other forms of martial arts training were more aggressive (26). We want to note that the judoka are not included in this analysis, and testing of the complete sample was done before the regular training.

There is a discussion “whether athletes tend to be more *unsportsmanlike* than persons who are not actively involved in sports,” and that long periods of involvement and high level of physical contact in sports has a negative effect on the moral reasoning of the athletes (30). Gardner and Janelle (2002) tested the athletes and individuals who are not actively involved in sports to evaluate the legitimacy of the manifestation of aggressive actions by athletes in contact and non contact sports. They found that the judgment to legitimize aggressive behavior was inversely related to moral reasoning of the responsible person (31).

Sports, in fact, can serve as a medium for learning and reinforcing the sporting spirit and moral reasoning, with aggression and unsportsmanlike conduct that occurs primarily in response to an adverse situation. It is important that the sports authority—leaders (especially coaches) do not express aggression, and to support the sporting spirit of the athletes (26). Treasure (2002) notes that participation in sports with a poor leadership has a devastating lifelong impact on a child’s moral development (27). It was noted that proclamation of pro-aggressive norms of the team’s most powerful predictor of aggressive athletes (28, 29). From these studies, it can be argued weather the unsporting behavior of young athletes is learned and reinforced depending on the type of sport and leadership author-

ity, especially the coaches.

However, in a completely different context, these observations may actually inspire optimism. Proof is the study of Daniel and Thornton (1989), which reveals that the martial arts can actually serve to reduce hostility under good leadership (30). It can be argued that participation in sport, if you provide quality leadership and the environment, facilitates and teaches the spirit of sports and moral reasoning. Hence the contention that the coach may be the most important person to influence the amount of aggressive or fair-play behavior expressed in the context of competitive sports (31).

The significance of our study could be the fact that higher levels of aggression and anxiety in sport may require not only an appropriate intervention of the coach, but also adequate psychological preparation, of sportsmen in the combat sport (which requires a greater involvement of a psychologist or psychotherapist). If the level of anxiety and aggression jump out of basic values, which can have a negative impact on outcome, further measures for their reduction are needed, as in order to achieve better results and prevent injury or excessive situations in the arena. Preliminary determination of the level of aggression and anxiety in a certain type of personality can be decisive for the selection, continuation, and abandonment or change of the sport, for example, athletes with a big dose of aggressiveness can choose the sport in which this level is necessary. In other words, taking into account the assumption that the martial arts must contain a certain amount of aggression, raises the question of standardization of the optimal level of aggression for some (especially martial arts) sports.

To continue practicing martial arts is necessary to take into account the individual’s age and number of injuries. However, in terms of sports medicine, it is important also that an increase in levels of aggression and anxiety, may reflect some psychological, somatic and endocrine disorders, including abuse of certain substances, and may be the basis for further analysis. Basic levels of aggression and anxiety of athletes, therefore, are not an important factor only in

terms of sports, but in all aspects of life.

## 5. CONCLUSIONS

There is a significant correlation between all components of aggression and total aggression with the level of anxiety among those who were engaged in combat sports.

There was a moderate correlation between total aggression with age, as well as total and verbally manifested aggression with the number of injuries of the respondents.

Higher levels of aggression and anxiety may require appropriate attitude of sport authorities, especially coaches, certain psychological preparation of athletes in a combat sport (involvement of a psychologist or psychotherapist), and others, because the basic level of aggression and anxiety of the athletes do not need to be relevant only in terms of sporting activities but in all aspects of life.

**Conflict of interest: none declared.**

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Monday, 06 February 2012

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Topics of the Journal are: complete computerization of medical facilities, medical registers, statistics, geographic information systems, telemedicine, legal framework and software protection of health information, electronic documents (electronic medical history, hospital e-passport), the legal basis of the use of digital signatures, computer system of compulsory and voluntary health insurance, the compatibility of computer programs, development of common



### STC2012 MOSCOW



**EFMI STC2012 Moscow**

Welcome to the 11 International Special Topic Conference of the European Federation for Medical Informatics in Moscow, Russian Federation 18-21 April 2012  
Conference theme:  
**Large Scale Projects in eHealth Partnership for Modernisation STC2012**

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