

Article

The Comparison of the Level of Aggressiveness of Oyama Karate and Mixed Martial Art Fighters

Lukasz Rydzik 

Institute of Sports Sciences, University of Physical Education, 31-571 Cracow, Poland;
lukasz.rydzik@awf.krakow.pl

Abstract: Background: Aggressive behavior is inherent in many sports, especially martial arts. It is usually considered undesirable; nevertheless, in some cases, it can be a motivating factor in a competition. It is important to distinguish types of aggression. The aim of this study was to compare the level of aggressiveness between athletes practicing mixed martial arts (MMA) and Oyama Karate. Methods: In total, 30 Oyama Karate and 30 mixed martial art athletes were asked about their aggressive behavior. The Buss–Perry Aggression Questionnaire was used in the study. Results were statistically analyzed. Results: There were statistically significant differences between the performance of Oyama Karate and MMA athletes ($p < 0.001$), which occurred in all the types of aggression tested (anger, physical aggression, hostility, and verbal aggression). Hence, the results of the study confirmed the accuracy of the research hypothesis that the level of intensity of aggression is higher in MMA fighters than in full-contact Oyama Karate fighters. Conclusions: Physical aggression was dominant in the evaluated fighters. The greatest difference between both groups of fighters was in verbal aggression, whereas the smallest was in hostility.

Keywords: aggression; instrumental aggression; brutality; MMA; full-contact sport; physical aggression; hostility; karate



Citation: Rydzik, L. The Comparison of the Level of Aggressiveness of Oyama Karate and Mixed Martial Art Fighters. *Appl. Sci.* **2022**, *12*, 8446. <https://doi.org/10.3390/app12178446>

Academic Editor: Mark King

Received: 4 August 2022

Accepted: 22 August 2022

Published: 24 August 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

The tendency to achieve better and better results in sports competitions, the increased professionalism and commercialization of sports, and the pressure from media contribute to aggression in sportsmen [1]. Unfortunately, aggressive behavior is closely related to an intentional and calculated inclination to inflict pain or even harm rivals [2], thereby becoming an undesirable development in sports. Aggressive behavior is intentional and used to cause a physical or mental injury in others [1], even though some researchers [3] point out that, contrary to violence, aggressiveness can be accidental and unintentional. Violence is aggressive, but aggression is not always violent [3].

The concept of aggression has many definitions. It can be defined as a negative behavioral trait that can be reflected in harmful physical or mental behavior against others [4]. Instrumental aggression can also be observed in sports activities. Its goal is to score a point or to stop a rival from gaining an advantage. Thus, it can be unofficially tolerated [5]. However, it is still associated with breaking sports rules. If a competitor complied with the rules, such activities can be conditionally accepted. The only condition, in this case, is the lack of intention of harming other people, i.e., no appearances of hostile aggression [6]. However, in the case of instrumental aggression, it still has an intentional and calculated character [1]. Supiński completely rules out its presence in the sport and considers its sanctioning as having a negative educational impact [6]. This is consistent with the position of the International Society of Sport Psychology (ISSP). Jarvis also defines assertiveness except for hostile or instrumental aggression. Assertive behavior can resemble an aggressive one; however, its goal is not to harm another person, e.g., an opponent [7].

The highest level of aggression is usually observed between the ages of 20 and 30 (the time when most athletes reach the peak of their athletic performance) [8]. Aggression also has its biological background (it is influenced by genetic profile, serotonin, norepinephrine, and dopamine levels, GABA, and COMP), and also depends on stress intensity [9]. Furthermore, the level of aggression is determined by the type of sport, with athletes participating in individual sports being less aggressive than those in team sports [10]. Even the colors of sports uniforms have an impact on the perception of aggressiveness (e.g., athletes wearing black uniforms are seen as more aggressive than others) [11]. The symptoms of aggression depend on cumulated negative aggressive energy and the strength of external stimuli that can be discharged in a controlled manner or a spontaneous outbreak [12]. The control of aggressiveness is subject to the mechanisms regulating its level. Regulation can be important enough to completely hold up even the most intense outbreak of aggression. For that reason, the initial stages of aggressive behavior have a milder form, leading to the gradual annulment of control mechanisms [13]. Aggression has an innate character and cannot be completely eliminated. Thus, it is necessary to consider the aspects that allow a person to control its level. One of them is sports [14].

Research has shown that combat sports fighters with poorer technique and tactics are likely to overcome their shortcomings using aggressive behavior that violates the emotional sphere of another person [15]. Behavior in a ring or on a mat has a stigma of aggressiveness, but it results from the rules that prevail there and is used to show the combativeness of the fighters. It is not aggression in the psychological sense but assertive behavior, which does not breach the general fair-play rules [6]. Basiaga et al. [16] proved that combat sports fighters have lower levels of aggression than people who practice combat sports recreationally. Similar studies concerning kickboxers have also proved a positive role of sports in reducing the level of aggression in competitors. On the other hand, Jarvis cited the results of Young's studies that demonstrated an increase in the level of aggression in competitors in contact sports [7]. There is no unambiguous evidence of the effect of the level of aggressiveness of the competitors on sports performance. The study of Graczyk et al. [17] showed that in combat sports, the level of aggression decreases at a champion level or in professional fighters with many years of experience. It is worth noting that in sports, especially contact sports, the risk of problems that occur with social adaptation is much higher than in the different types of human activity [13]. The tendency to show aggression drawn from performing sports can cause serious problems with social adaptation after the end of a sports career. It should be noted that a person pursuing a sports career needs to be guided by a sports objective and comply with the rules of the given sport, especially if "brutality and aggression is its face". In combat sports, it is necessary to keep in mind the potential of the fighter and the type of aggression he or she uses [18]. A search of the literature found studies in the field of aggression and sports performance in boxing [19]. Analyses were also conducted to evaluate the probability of winning in the context of player aggressiveness [20]. In the case of mixed martial arts (MMA), an aggressive and smart way of fighting offers a better chance of success [15]. Although recent psychological studies have included MMA athletes [21,22], competition in both combat forms is based on bouts with no restrictions with regard to the force of punches and kicks. The results of a study comparing full-contact with light-contact karate fighters showed that the former has a higher intensity of aggression [23]. Psychological studies of Eastern martial art athletes showed higher scores of aggressiveness in the sports where the rules of the competition allow the use of more destructive techniques, which consequently leads to a higher risk of injury [24]

What is missing, however, is a comparison of the components of aggressiveness in MMA fighters and full-contact Oyama Karate athletes. The objective of this paper is to compare the level of aggressiveness of Oyama Karate and MMA fighters. In Oyama Karate, training involves instilling mental values and implementing basic ethical rules. However, in mixed martial arts, training is focused purely on the sport and the preparation of the fighters for competitions. The research hypothesis was formulated as follows: mixed

martial art fighters demonstrate a higher intensity of aggression than full-contact Oyama Karate fighters.

2. Materials and Methods

2.1. Participants

The study was carried out on 60 male fighters aged 18 to 25. There were 30 full-contact Oyama Karate fighters and 30 mixed martial art fighters. A survey was conducted from November to December 2021. The mean age was 21.9 ± 2.25 years in MMA fighters and 22.03 ± 2.37 years in Oyama Karate fighters. The mean training experience was 7.8 ± 1.3 years in the group of MMA fighters and 7.73 ± 1.31 years in the group of Oyama Karate fighters. All the evaluated fighters had at least 7 years of training experience. The sample size was determined using the G*Power software, while the detailed inclusion and exclusion criteria are listed in Table 1.

Table 1. Inclusion and exclusion criteria.

Inclusion	Exclusion
Training experience of at least 7 years	Training experience of less than 7 years
Active participation in competitions	No participation in competitions
Training continuity	Irregular training
Age > 18 years	Age < 18 years
Good health status	Training-limiting diseases
Male	Female

2.2. Instruments

The Buss–Perry Aggression Questionnaire (1992) was used in the study. The validity and reliability of the questionnaire have been confirmed by multiple scientific studies [25–28]. The questionnaire was used to assess different types of aggression, the level of physical and verbal aggression, and hostility. Each question in the questionnaire could be answered in 5 different ways on a scale of 1 to 5 points. Each number represented a sentence, and they were as follows:

1. Extremely uncharacteristic of me;
2. Somewhat uncharacteristic of me;
3. Neither uncharacteristic nor characteristic of me;
4. Somewhat characteristic of me;
5. Extremely characteristic of me.

All the respondents filled in the same questionnaire. The test results were entered into a spreadsheet where they were subjected to statistical analysis. The study was approved by the Ethics Committee at the regional medical chamber in Krakow, No. 287/KBL/OIL/2020.

2.3. Statistical Analyses

Statistical analysis of the collected material was conducted using the Statistica 13.3 software (StatSoft, Kraków, Poland). The Shapiro–Wilk test confirmed the normal distribution for each variable. A two-way ANOVA (sport \times variable) followed by post hoc (HSD Tukey’s test) was used. The level of statistically significant differences was set at $p < 0.05$.

3. Results

The presence of statistically significant ($p < 0.001$) differences was demonstrated between the results of Oyama Karate and MMA fighters in all the categories studied (anger, physical aggression, hostility, and verbal aggression) (Table 2).

Table 2. Different types of aggressiveness and the levels of hostility and physical and verbal aggression.

Variables	Groups	<i>n</i>	\bar{x}	SD	<i>p</i>
Anger	Oyama Karate	30	15.17	4.37	<0.000
	Mixed martial arts	30	21.63	3.81	
Physical aggression	Oyama Karate	30	18.63	5.57	<0.000
	Mixed martial arts	30	27.17	4.92	
Hostility	Oyama Karate	30	17.40	4.83	0.008
	Mixed martial arts	30	21.30	3.04	
Verbal aggression	Oyama Karate	30	13.07	3.84	<0.000
	Mixed martial arts	30	19.07	3.20	
Total	Oyama Karate	30	64.27	15.76	<0.000
	Mixed martial arts	30	89.17	7.88	

n—number of subjects; \bar{x} —mean; SD—standard deviation; *p*—statistical significance; values in bold are statistically significant.

Two-way analysis of variance (ANOVA) showed highly significant between-sport differences with respect to all the variables and significant differences between the variables. Interaction analysis (sport \times variable) also showed significantly higher scores for each type of aggression in MMA athletes. Hence, the results of the study confirmed the accuracy of the research hypothesis that MMA fighters have higher levels of intensity of aggression than full-contact Oyama Karate fighters (Table 3).

Table 3. Detailed results of ANOVA analysis.

Source of Variation	df	Mean Square	F-Value	<i>p</i> -Value	η -Square	α -Power
Sport	1	2906.3	175.13	<0.000	0.377	1.000
Variable	4	362.5	21.85	<0.000	0.232	1.000
Interaction	4	40.7	2.45	0.046	0.032	0.698
Residual	290	16.6	-			

Values in bold are statistically significant.

All the results presented above indicate that MMA fighters had higher results in all the categories of aggressive behavior. A more detailed analysis revealed the smallest differences in hostility and the largest differences in verbal aggression. Among all the evaluated types of aggression in both types of fighters, the highest results were found in physical aggression.

4. Discussion

The aim of this research was to compare the level of aggression between Oyama Karate and MMA fighters. The analysis performed in this study showed that the level of aggressiveness in MMA fighters was higher than in Oyama Karate fighters in all the evaluated categories. Therefore, MMA fighters had higher levels of general or total aggression. This appears to be consistent with previous research on the predisposition and tendency to be aggressive in athletes [15,29].

Zdebska-Biziewska [30] also pointed out the clearly aggressive character of MMA. This can result from definitely more brutal fighting during competition, which requires more offensive tactics from fighters compared with those commonly used in Oyama Karate. Research conducted by Piepiore [31] showed that the more brutal the fight, the greater the aggressiveness of the fighters.

The characteristics of MMA fighting seem to favor increased aggression in athletes.

What seems to be important is the structure of the entire fight, which consists of stand-up and ground fighting, in which the athlete can perform elbow strikes, hammer punches, and kicks on a lying opponent [32]. This is particularly significant in the context of reports by Kalużny and Kalina [33], who proved that the most common response of an aggressively attacked man is an even greater level of aggression toward the attacker.

The results of the study may be related to the social environment from which athletes of both sports may come. Oyama Karate is a martial art that parents often choose for their children [34]. MMA training, on the other hand, is often determined by the athlete's own choice and affiliation with the fan community [35–37]. It seems to be an interesting direction for further research to see if athletes who begin karate and MMA training are also characterized by different levels of aggressiveness.

Another argument confirming the hypothesis may be the ethical side, which is overlooked in the training of MMA. Oyama Karate is a martial art that is related to the general lifestyle based on karate philosophy, which promotes the moral development of the athlete, as do other Asian martial arts [38]. The main feature differentiating martial arts from other sports is the very aspect of spirituality related to self-improvement. This element is very often overlooked in combat sports aimed only at achieving better sports results [39]. This difference was proved by the American psychologist Trulson, whose study was cited in a study by Kalina and Jagiełło [40]. Furthermore, this was confirmed by recent studies on the dimensions of aggression among athletes practicing martial arts and combat sports [41]. The range of MMA rules also includes many brutal techniques, i.e., front kicks to the thigh, heel kicks to the feet, elbow strikes, and multiple knee kicks while holding the head [32].

The use of the aforementioned techniques during the training process can also result in increased aggressiveness among players. This was evidenced by research on a group of taekwondo fighters traditionally trained with all the associated symbolism, in whom the level of aggression decreased following the training [42,43]. However, in a group of fighters trained using a modern approach exclusively based on technical exercises, the levels of both aggression and fear increased. These results indicated that physical aggression is the most commonly used type of aggression in both groups. Boostani [44], who studied kickboxing fighters, achieved similar results. Interestingly, according to Rotter [45], the physical aggression of youth involved in sports several times a week was higher than that of those physically inactive. However, the level of aggression of the athletes decreased with an increase in their training experience. A long training experience involves a series of failures and disappointments. Oyama Karate is a martial art where practitioners are awarded belts. In order to be promoted to a specific rank, the athlete must undergo an examination of combat and techniques, which are often conducted against opponents with higher rankings [46]. Such an approach instills respect for the opponent and humility. Therefore, it seems justified to say that people more inclined toward physical aggression are more likely to be involved in sports, but this inclination is reduced with greater involvement in sports. Physical aggression in full-contact competitions is inevitable. However, it does not have to be hostile, and its symptoms can be used as a motivating factor during sports competitions.

Aggressiveness has been explored in many scientific studies regarding not only its negative consequences but also the desirable elements of fighters that it may produce, especially in combat sports fighters [47–50]. Knowledge of the tendency for aggression shown by sportsmen and the differences in the level of aggression between the competitors of various sports allows for a better understanding of the mechanism of the development and control of aggression. To this end, psychological examinations were conducted on athletes practicing various combat sports and martial arts for their tendency to engage in antisocial behavior, including the risk of aggressive behavior outside the competitions. Furthermore, it should be taken into account that sports shows involving these athletes can provide young people with aggressive behavioral patterns, so psychological examinations of these athletes are of particular importance in the prevention of public health [51].

5. Conclusions

This study identified differences in aggression levels between athletes of martial arts and combat sports (karate vs. MMA). MMA fighters are characterized by higher levels of aggression, which may be due to many of the factors analyzed in the Discussion section of the present study. It seems important to further explore these problems and analyze the potential triggers of aggression. The study prompts reflection on the impact of cultural differences between the East and West, where these sports developed. Further exploration of this topic and the identification of factors that increase aggression may promote the introduction of programs to prevent the development of such behavior among athletes. The findings also encourage preventive measures for MMA fighters. It seems beneficial to introduce them to mental training focused on the development of self-control and coping with aggression in everyday situations [29]. It seems important for athletes to be able to distinguish between aggression that is useful in combat and very harmful in everyday life.

In conclusion, it can be stated that physical aggression was dominant in the athletes participating in this study. However, it is worth noting that the mixed martial art fighters participating in the study had higher levels of aggression than fighters of full-contact Oyama Karate. Furthermore, the greatest differences between the participants were found in verbal aggression, whereas the smallest one was in hostility.

Funding: This research received no external funding.

Institutional Review Board Statement: This research was approved by the Bioethics Committee at the Regional Medical Chamber (No. 287/KBL/OIL/2020).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Acknowledgments: I would like to thank Psychologist Prof. Joanna Basiaga Pasternak for her help in conducting the research.

Conflicts of Interest: The author declares no conflict of interest.

References

1. Krishnaveni, K.; Shahin, A. Aggression and its influence in sports performance. *Int. J. Phys. Educ.* **2018**, *1*, 29–32.
2. Nezabravka, G. Aggression in Youth Athletes. *Res. Kinesiol.* **2015**, *43*, 205–209.
3. Anderson, C.A.; Bushman, B.J. Effects of Violent Video Games on Aggressive Behavior, Aggressive Cognition, Aggressive Affect, Physiological Arousal, and Prosocial Behavior: A Meta-Analytic Review of the Scientific Literature. *Psychol. Sci.* **2001**, *12*, 353–359. [[CrossRef](#)] [[PubMed](#)]
4. Keeler, L. The Differences in Sport Aggression, Life Aggression, and Life Assertion among Adult Male and Female Collision, Contact, and Non-Contact Sport Athletes. *J. Sport Behav.* **2007**, *30*, 57–77.
5. Jarvis, M. *Psychologia Sportu*; Gdańskie Wydawnictwo Psychologiczne: Gdańsk, Poland, 2003.
6. Supiński, J. Geneza agresji wśród dzieci i młodzieży oraz jej znaczenie w sporcie. In *Psychologia Sportu w Treningu Dzieci i Młodzieży*; Krawczyński, M., Nowicki, D., Eds.; Biblioteka Trenera: Warszawa, Poland, 2004.
7. Jarvis, M. *Sport Psychology: A Student's Handbook*; Routledge: London, UK, 2006; ISBN 9781135420512.
8. Archer, J. Sex Differences in Aggression in Real-World Settings: A Meta-Analytic Review. *Rev. Gen. Psychol.* **2004**, *8*, 291–322. [[CrossRef](#)]
9. Gronek, P.; Wieliński, D.; Gronek, J. Genetic and non-genetic determinants of aggression in combat sports. *Open Life Sci.* **2015**, *10*, 7–18. [[CrossRef](#)]
10. Maxwell, J. Anger rumination: An antecedent of athlete aggression? *Psychol. Sport Exerc.* **2004**, *5*, 279–289. [[CrossRef](#)]
11. Frank, M.G.; Gilovich, T. The dark side of self- and social perception: Black uniforms and aggression in professional sports. *J. Pers. Soc. Psychol.* **1988**, *54*, 74–85. [[CrossRef](#)]
12. Stepnik, A. Agresja—dwa ujęcia biologiczne/Aggression—Two Biological Depictions. *IDO—Ruch Dla Kult. Cult.* **2009**, *9*, 111–118.
13. Lorenz, K. *Tak Zwane Zło*; Wydawca: Warszawa, Poland, 1966.
14. Burton, R.W. Aggression and Sport. *Clin. Sport. Med.* **2005**, *24*, 845–852. [[CrossRef](#)]
15. Rosario, D.; Kerr, J.H.; Rhodius, A. The experience of aggression among mixed martial arts athletes interpreted through reversal theory. *Int. J. Sport Psychol.* **2014**, *45*, 79–99.

16. Basiaga-Pasternak, J.; Szafraniec, Ł.; Jaworski, J.; Ambroży, T. Aggression in competitive and non-competitive combat sports athletes. *Ido Mov. Cult. J. Martial Arts Anthropol.* **2020**, *2*, 17–33.
17. Graczyk, M.; Hucinski, T.; Norkowski, H.; Pęczak-Graczyk, A.; Rozanowska, A. The level of aggression syndrome and a type of practised combat sport *Journal of Combat Sports and Martial Arts. J. Combat Sport. Martial Arts* **2010**, *1*, 1–14.
18. Want, S. *Socjologia Zachowań Chuligańskich w Sporcie. Sport Wyczyn.* **1993**, *1–2*, 24–36.
19. Martinez, S.G. *Aggression and Boxing Performance: Testing the Channeling Hypothesis with Multiple Statistical Methodologies*. Ph.D. Thesis, Wright State University, Dayton, OH, USA, 2017.
20. Collier, T.; Johnson, A.L.; Ruggiero, J. Aggression in Mixed Martial Arts: An Analysis of the Likelihood of Winning a Decision. In *Violence and Aggression in Sporting Contests*; Springer: New York, NY, USA, 2011; pp. 97–109.
21. Andrade, A.; Batalha Silva, R.; Dominski, F.H. Application of Sport Psychology in Mixed Martial Arts: A Systematic Review. *Kinesiology* **2020**, *52*, 94–102. [[CrossRef](#)]
22. Cooper, S.; Lochbaum, M. A Systematic Review of the Sport Psychology Mixed Martial Arts Literature: Replication and Extension. *Eur. J. Investig. Health Psychol. Educ.* **2022**, *12*, 77–90. [[CrossRef](#)]
23. Karolczak-Biernacka, B. Problem agresji w sporcie. In *Logos i Etos Polskiego Olimpizmu*; Lipiec, J., Ed.; WN: Kraków, Poland, 1994.
24. Litwiniuk, A.; Grants, J.; Kravalis, I.; Obmiński, Z. Personality traits of athletes practicing eastern martial arts. *Arch. Budo* **2019**, *15*, 195–201.
25. Bryant, F.B.; Smith, B.D. Refining the Architecture of Aggression: A Measurement Model for the Buss–Perry Aggression Questionnaire. *J. Res. Pers.* **2001**, *35*, 138–167. [[CrossRef](#)]
26. Gerevich, J.; Bácskai, E.; Czobor, P. The generalizability of the Buss-Perry Aggression Questionnaire. *Int. J. Methods Psychiatr. Res.* **2007**, *16*, 124–136. [[CrossRef](#)]
27. Bernstein, I.H.; Gesn, P.R. On the dimensionality of the Buss/Perry Aggression Questionnaire. *Behav. Res. Ther.* **1997**, *35*, 563–568. [[CrossRef](#)]
28. Diamond, P.M.; Magaletta, P.R. The Short-Form Buss-Perry Aggression Questionnaire (BPAQ-SF). *Assessment* **2006**, *13*, 227–240. [[CrossRef](#)] [[PubMed](#)]
29. Blomqvist, T. Self-Control and Aggression Amongst Mixed Martial Arts Practitioners. *J. Martial Arts Res.* **2019**, *2*, 1–12. [[CrossRef](#)]
30. Zdebska-Biziewska, H. Osobowość w klatce. In *Kultura Fizyczna a Osobowość. Akademia Wychowania Fizycznego w Warszawie*; Dziubiński, Z., Jankowski, K.W., Eds.; Salezjańska Organizacja Sportowa Rzeczypospolitej Polskiej: Warszawa, Poland, 2017.
31. Piepiora, P.; Szmajke, A.; Migasiewicz, J.; Witkowski, K. The karate culture and aggressiveness in kumite competitors. *Ido Mov. Cult. J. Martial Arts Anthropol.* **2016**, *16*, 41–47.
32. Hamdan, J.L.; Rath, M.; Sayoc, J.; Park, J.-Y. A brief descriptive outline of the rules of mixed martial arts and concussion in mixed martial arts. *J. Exerc. Rehabil.* **2022**, *18*, 142–154. [[CrossRef](#)] [[PubMed](#)]
33. Kaluzny, R.; Kalina, G. Change of the actions declared in simulated situations involving interpersonal aggression. *Arch. Budo Sci. Martial Arts Extrem. Sport.* **2015**, *11*, 221–228.
34. Sąddecka, D.; Janusz, M.; Sochacka, K. 25 years of activity by the OYAMA Sports Club in Rzeszow. *Ido Mov. Cult. J. Martial Arts Anthropol.* **2019**, *19*, 15–24.
35. Antonowicz, D.; Grodecki, M. Missing the goal: Policy evolution towards football-related violence in Poland (1989–2012). *Int. Rev. Sociol. Sport* **2018**, *53*, 490–511. [[CrossRef](#)]
36. Kossakowski, R. Where are the hooligans? Dimensions of football fandom in Poland. *Int. Rev. Sociol. Sport* **2017**, *52*, 693–711. [[CrossRef](#)]
37. Kossakowski, R.; Besta, T. Football, Conservative Values, and a Feeling of Oneness with the Group: A Study of Polish Football Fandom. *East Eur. Polit. Soc. Cult.* **2018**, *32*, 866–891. [[CrossRef](#)]
38. Martinkova, I.; Parry, J.; Wagner, W. The Contribution of Martial Arts to Moral Development. *Ido Mov. Cult. J. Martial Arts Anthropol.* **2019**, *19*, 1–8. [[CrossRef](#)]
39. Goll, A. *Kreowanie wizerunku mieszanych sztuk walki w mediach*. In *Przedsiębiorczość i Zarządzanie*; Społeczna Akademia Nauk: Warszawa, Poland, 2014.
40. Kalina, R.; Jagiełło, W. *Zabawowe Formy Walki w Wychowaniu Fizycznym i Treningu Sportowym*; AWF Warszawa: Warszawa, Poland, 2000.
41. Kostorz, K.; Sas-Nowosielski, K. Aggression Dimensions among Athletes Practising Martial Arts and Combat Sports. *Front. Psychol.* **2021**, *12*, 696943. [[CrossRef](#)] [[PubMed](#)]
42. Steyn, B.J.; Roux, S. Aggression and psychological well-being of adolescent Tae Kwon Do participants in comparison with hockey participants and a non-sport group psychology. *Afr. J. Phys. Health Educ. Recreat. Danc.* **2009**, *15*, 32–43.
43. Skelton, D.L.; Glynn, M.A.; Berta, S.M. Aggressive Behavior as a Function of Taekwondo Ranking. *Percept. Mot. Ski.* **1991**, *72*, 179–182. [[CrossRef](#)] [[PubMed](#)]
44. Boostani, M.; Boostani, M. Investigation and comparing aggression in athletes in non- contact (swimming), limited contact (karate) and contactable (kickboxing) sport fields. *J. Combat Sport. Martial Arts* **2012**, *3*, 87–89. [[CrossRef](#)]
45. Rotter, I.; Kotwas, A.; Kemicer-Chmielewska, E.; Watral, A. Aktywność fizyczna jako czynnik redukujący zachowania agresywne u młodzieży w wieku gimnazjalnym. *Pomeranian J. Life Sci.* **2018**, *61*, 444–447. [[CrossRef](#)]
46. Leończyk, W. *Oyama Karate. Styl Stulecia*; Słupski Klub Oyama Karate, Słupsk: Słupsk, Poland, 2014.

47. Nosanchuk, T.A.; MacNeil, M.L.C. Examination of the effects of traditional and modern martial arts training on aggressiveness. *Aggress. Behav.* **1989**, *15*, 153–159. [[CrossRef](#)]
48. Reynes, E.; Lorant, J. Competitive Martial Arts and Aggressiveness: A 2-yr. Longitudinal Study among Young Boys. *Percept. Mot. Ski.* **2004**, *98*, 103–115. [[CrossRef](#)]
49. Breitschuh, S.; Schöne, M.; Tozzi, L.; Kaufmann, J.; Strumpf, H.; Fenker, D.; Frodl, T.; Bogerts, B.; Schiltz, K. Aggressiveness of martial artists correlates with reduced temporal pole grey matter concentration. *Psychiatry Res. Neuroimaging* **2018**, *281*, 24–30. [[CrossRef](#)]
50. Lamarre, B.W.; Nosanchuk, T.A. Judo—The Gentle Way: A Replication of Studies on Martial Arts and Aggression. *Percept. Mot. Ski.* **1999**, *88*, 992–996. [[CrossRef](#)]
51. Gauthier, J. Ethical and Social Issues in Combat Sports: Should Combat Sports Be Banned? In *Combat Sports Medicine*; Springer: London, UK, 2009; pp. 73–88.