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Aggression level and self-efficacy in karate practitioners as a leisure-time motor activity

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Abstract

Aim. The investigation of aggressiveness and self-efficacy in karate practitioners as a leisure time activity, as well as in people practicing other types of leisure motor activities.

Material and method. The study was carried out on a sample of 45 people (19-51 years old), almost half of whom practiced karate as a leisure activity. The participants answered two questionnaires on aggression and self-efficacy. Data were also collected on the number of hours practiced over a week. Statistical analyses were performed using descriptive statistics, difference (t test, U test) and correlation (Spearman) tests.

Results. The level of aggression is significantly lower in karate as a leisure activity compared to other study participants. Analysis of gender differences revealed that female participants have higher levels than male participants for anger and hostility, verbal aggression and physical aggression, and for self-efficacy male practitioners have slightly increased levels compared to female participants. Through correlation analysis statistically significant relationships were reported between anger and verbal aggression, hostility and verbal aggression, respectively. The data analysis was completed with the interpretation of marginally significant differences according to the number of hours practiced per week, so that it was observed that the higher the level of self-efficacy, the more hours of karate practiced per week by the participants.

Conclusions. Karate practitioners (as a leisure-time motor activity) are better able to control their reactions and emotions compared to those practicing other leisure motor activities.

***Key words**:* self-efficacy; aggression; karate; leisure-time.

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Introduction

Motor leisure activities are exercises and physical activities that are carried out during leisure time and aim to improve well-being through relaxation and recreation. These activities aim to maintain physical and mental health, improve quality of life and develop social relationships. Leisure motor activities take place outside an organized competitive and/or training setting and can be classified into the following categories (Caspersen et al., 1985): sports activities (team games and/or individual sports, outdoor activities - hiking, cycling, jogging, swimming), adventure activities (mountaineering, rafting and extreme sports); games and play activities (movement games for children and adults).

Preferences for leisure time motor activities differ by gender, e.g. women usually choose fitness activities, aerobics, dancing, etc., while men usually prefer contact sports (Eccles et al., 1991). In view of the benefits of these types of activities, there should be programs at local and national level to carry them out, as well as investments in infrastructure so that the healthiest possible lifestyle can be promoted (Nielsen et al., 2010).

The concept of self-efficacy refers to a person's confidence in his or her actions to achieve certain goals. Self-efficacy has a major impact on how a person thinks, acts and behaves in different situations. People with high levels of self-efficacy set ambitious goals and make a sustained effort to achieve them, unlike those with low self-efficacy who avoid challenges and may give up easily (Bandura, 1977). Albert Bandura (1977) outlined four fundamental sources of self-efficacy:

- mastery experiences - the development of self-efficacy is positively influenced by personal achievements, which increase confidence in one's own abilities;
- vicarious experiences - successful role models provide motivation and inspiration;
- social persuasion - social support has a major positive contribution to self-confidence;
- physiological and emotional states: physical states and emotions influence the perception of reality and reactions to it; calmness and optimism increase self-efficacy, while stress and anxiety decrease self-efficacy.

The impact of self-efficacy on behavior manifests itself through several mechanisms (Pajares, 1996):

- activity and task selectioners with high levels of self-efficacy choose harder tasks and activities;
- effort and persistence - high levels of self-efficacy lead to increased levels of effort and persistence in different activities;
- thinking and emotions - people with high self-efficacy are more optimistic and positive thinkers and overcome obstacles more easily;
- both academic and professional performance are directly proportional to the level of self-efficacy so that performance both at school and in the workplace is closely linked to confidence in one's abilities, leading to a higher likelihood of success.

The development of self-efficacy can also be achieved through leisure time motor activities, as the beneficial effects of practicing physical exercise are known in cognitive, affective and personality levels (see Predoiu & Predoiu, 2022). Self-efficacy has applicability in multiple domains. For example, in the field of education, teachers can use modern and effective methods and techniques in the teaching/assessment process in order to develop students' self-efficacy. A high level of self-efficacy positively influences health status, as well as the behaviors that lead to it - exercise, diet and the body's response to medical treatment (Maddux, 1995). In the organizational-managerial field, leaders should stimulate the level of self-efficacy of employees, for example by assigning difficult tasks and providing adequate support, thus increasing the level of performance as well as employee satisfaction (Stajkovic & Luthans, 1998). Also, an essential goal of psychotherapy is to increase self-efficacy by modifying dysfunctional thoughts and increasing self-confidence (Luszczynska & Schwarzer, 2005).

Aggression involves the existence of behaviors (that can be generated by many causes) and manifestations which can cause discomfort to others. Aggression can manifest itself verbally and/or through physical violence. Psychology studies aggression in order to understand the reasons, manifestations and ways to manage it. This study is essential for creating useful solutions to encourage prosocial behaviors and reduce violent manifestations in society. In 1939, Dollard et al. presented aggression as a reaction to frustration. Thus, any obstacle that hinders the accomplishment of a goal or the satisfaction of a need can cause frustration, which in turn can cause aggressive behavior. Bandura (1977) proposed social learning theory, which emphasizes that aggression is a behavior learned through observation and imitation. Children (but also adults) can learn aggressive behaviors by observing and imitating role models, such as parents, friends, or other notorious people. Moffitt (1993) talks about the effect of trauma and negative experiences, aspects that significantly influence aggression. In addition, group factors such as peer pressure may increase the likelihood of aggressive behavior (Sampson & Laub, 1993). It appears that high testosterone levels are associated with a greater predisposition to aggressive behavior. In addition, a predisposition towards aggression may be caused by brain dysfunctions in certain areas, such as the amygdala (emotional center) - see Craig and Pepler (2003). Emotion regulation and aggressive behavior may be influenced

by chemical imbalances in neurotransmitters such as serotonin (Fishbein, 2001). Last but not least, living conditions such as noise, crowdedness, hostile situations and lack of resources can cause stress and aggressive behaviors (Tremblay, 2000).

Aggression can manifest itself in one of four forms: anger, verbal aggression, hostility and physical aggression (or combinations of these) - see Buss and Perry (1992). Also, other three factors of aggression were emphasized: foul play, go-ahead and assertiveness (Makarowski et al., 2021). Silva (1983) mentions hostile and instrumental aggression (see, also, Kerr, 2005). Instrumental aggression is used, for example, to intimidate the opponent in order to gain a psychological advantage (these are all firm technical-tactical actions within the limits of the rules/game). For example, in karate, a competitor could hit the opponent in a regulation manner, or could execute harsher procedures to intimidate the opponent, without necessarily hitting the target (this type of aggression is used in competition strategies). Hostile aggression may be generated by anger or frustration and is manifested by actions that deliberately cause suffering or injury to the opponent. For example, in karate, one competitor hits the other after the referee's signal to stop the match (unsportsmanlike behavior includes any intentional action that is contrary to the rules of the competition for the purpose of unfair advantage). Aggression thus manifests itself in various forms in all branches of sport, from non-contact sports to combat sports, and has many causes (Tenenbaum et al., 1997).

Among the causes and factors that can lead to aggressiveness in sport are: individual factors (high level of competitiveness, impulsivity - see Gill & Williams, 2008); previous experiences, such as belonging to disadvantaged and violent environments (Fields et al., 2008); environmental factors (e.g., the pressure to win generated by the expectations of coaches, parents, spectators or sponsors, inadequate and insufficient training infrastructure and facilities); competitive context (traditional rivalries between athletes and/or teams, the stakes of competition, especially in the final stages of the contest - Jones et al., 2005).

In martial arts, aggression can have several valences. In a self-defense situation, due to inexperience, the reaction to attack may be disproportionate. At the same time, in competition, an added aggressiveness and determination can determine the winner. It seems that anger, at a higher level facilitates performance, in combat sports (Wargo et al., 2007). In general, in sport (including martial arts) aggression is instrumental and usually applauded, being within the boundaries of the game (Cashmore, 2008).

Materials and method

Purpose

The aim of this paper is to investigate the level of self-efficacy and the level of aggression in karate practitioners (as a leisure motor activity), as well as in people practicing other types of leisure time motor activities.

Objectives

- to identify the level of self-efficacy and aggression (physical, verbal, anger and hostility) in people practicing different leisure time motor activities;
- knowledge of aggression factors specific to karate (as a leisure activity);
- highlighting the links between the examined aggression factors and the level of self-efficacy of the participants in the study.

Research questions

1) What are the differences between karate practitioners (as a leisure-time motor activity) and people practicing other leisure-time motor activities in terms of aggressiveness and self-efficacy?
2) What is the level of aggression (anger, hostility, verbal and physical aggression) and self-efficacy of karate (as a leisure-time motor activity) practitioners, by gender?
3) What correlations exist between aggression factors and self-efficacy levels in karate practitioners, as well as in people practicing other leisure-time motor activities?
4) Do the levels of aggression and self-efficacy vary significantly in karate (as a leisure-time motor activity) practitioners, depending on the number of hours of training per week?

Participants

Forty-five people participated in the study: 11 between 19 and 25 years old; 21 between 26 and 50 years old, and 13 over 51 years of age. 20 of the study participants practiced karate as a leisure-time motor activity (9 girls and 11 boys), while 25 people (10 girls and 15 boys) practiced other leisure-time motor activities (fitness, rugby, soccer, dancing, jogging, table tennis or basketball).

Instruments

1) Buss & Perry Aggression Questionnaire (Buss & Perry, 1992)

The Aggression Questionnaire developed by A. Buss and M. Perry measures physical aggression (PA), verbal aggression (VA), hostility (O) - the cognitive component of human behavior, and anger (F) - the emotional component of behavior. Four scores are thus obtained according to the 4 scales of aggression mentioned above. The score for each scale is represented by the sum of the participant's responses for the specific items.

The response modalities are: (5) Extremely characteristic to me, (1) Extremely uncharacteristic to me, (4) Usually characteristic to me, (2) Usually uncharacteristic to me, respectively (3) Neither characteristic nor uncharacteristic to me. In the case of two questions the scoring is reversed, in other words: 1 becomes 5, 5 becomes 1, 2 becomes 4, 4 becomes 2 (3 points still remains 3 points). Example items: "I sometimes lose my temper for no good reason" (Anger factor), "I tell my friends straight out when I disagree with them" (Verbal Aggressiveness), "I wonder why I sometimes get so angry about things" (Hostility factor), "I get so angry that I destroy things" (Physical Aggressiveness).

2) General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995)

The scale provides information about a person's level of self-efficacy. The general self-efficacy scale has 10 items and correlates with the optimism, confidence and satisfaction a person feels in the work he/she does. The response modes are: (4) Totally True, (3) Moderately True, (2) Somewhat True and (1) Not True. Examples of items: "If someone opposes me, I can find the means and ways to get what I want" or "I can solve most problems if I make the necessary effort". The final score is the sum of the answers to the questionnaire items.

Procedure

The study was conducted between November 2023 and March 2024. The questionnaires in this research were administered online via google forms. Ethical principles were ensured: informed consent was obtained, participants had the possibility to withdraw from the study at any time, data were treated confidentially, anonymity was ensured.

Quasi-experimental model

The dependent variables are the participants' scores on self-efficacy and the four factors of aggression. The variable that plays the role of the independent variable is the belonging to one of the two groups: karate practitioners (as a leisure motor activity) and people practicing other leisure-time motor activities.

Results

Using the t-test for two independent samples, we analyzed whether there are significant differences between karate practitioners and people practicing other leisure motor activities (fitness, rugby, soccer, dancing, jogging, table tennis or basketball), in terms of aggressiveness and self-efficacy. Since $p > 0.05$ (Levene's test), the condition of homogeneity of variances is met. Also, the Skewness and Kurtosis values are within the range +/-1.96 (the investigated groups do not deviate from the normality condition - Predoiu, 2020).

The data analysis (Table I) shows significant differences between karate practitioners (as a leisure-time motor activity) and people who perform other leisure-time motor activities in terms of physical aggression ($p = 0.012$). Karate practitioners show a significantly lower level of physical aggressiveness ($M = 15.8$, $SD = 4.32$) compared to the other study participants ($M = 20.2$, $SD = 6.35$). The effect size is $d = 0.79$, showing a strong difference between the two groups in terms of physical aggressiveness. To investigate the existing differences between karate practitioners according to gender, the Mann-Whitney (U) test was used. The results in Table II capture significant differences between karate practitioners (as a leisure time motor activity) according to gender ($p = 0.014$ - anger and $p = 0.004$ - hostility, respectively). Females scored significantly higher on anger and hostility ($M_{anger} = 16.6$, $SD = 5.32$; $M_{hostility} = 20.8$, $SD = 5.57$) compared to male participants ($M_{anger} = 11.2$, $SD = 2.96$; $M_{hostility} = 13.4$, $SD = 3.83$). In Figure 1 we can see that female practitioners have a slightly higher level of verbal aggression (VA) and physical aggression (PA) than males. At the same time, we observe an increased difference in anger (F) and hostility (O) for female practitioners compared to male practitioners, and a slightly increased difference in self-efficacy (A) for male practitioners compared to female practitioners.

Table I. Independent T Test– karate vs. other leisure motor activities

		Statistic	df	p	Effect size	
Self-efficacy	Student's t	0.690	43.0	0.494	Cohen's d	0.207
Anger	Student's t	-1.621	43.0	0.112	Cohen's d	-0.486
Verbal aggression	Student's t	-1.718	43.0	0.093	Cohen's d	-0.516
Hostility	Student's t	-0.601	43.0	0.551	Cohen's d	-0.180
Physical aggression	Student's t	-2.640	43.0	0.012	Cohen's d	-0.792

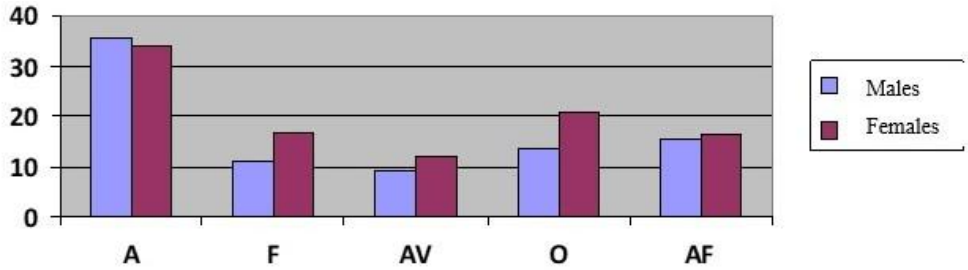

Figura 1. Results for karate participants – aggression and self-efficacy by gender

Tabel II. Karate practitioners – U test by gender

		Statistic	p
Self-efficacy	Mann-Whitney U	41.0	0.540
Anger	Mann-Whitney U	17.0	0.014
Verbal aggression	Mann-Whitney U	28.0	0.106
Hostility	Mann-Whitney U	11.0	0.004
Physical aggression	Mann-Whitney U	47.0	0.879

Correlation test (Spearman correlation) was applied to check whether there are significant associations between aggression factors and self-efficacy level in karate practitioners, as well as in people practicing other leisure time motor activities. There are significant positive correlations between different factors of aggression ($p < 0.05$) (Table III):

- a significant relationship ($p = 0.024$, $r^2 = 0.25$) between anger and verbal aggression (as anger level decreases, verbal aggression decreases);
- a significant association ($p = 0.013$, $r^2 = 0.29$) between anger and hostility (as anger level decreases, less hostility is expressed);
- a significant correlation ($p = 0.010$, $r^2 = 0.31$) between verbal aggressiveness and hostility (lower levels of hostility are related to lower verbal aggressiveness).

Tabel III. Spearman correlation – aggression and self-efficacy, karate practitioners

		A	F	AV	O	AF
A	Spearman's rho	—				
	p-value	—				
F	Spearman's rho	-0.119	—			
	p-value	0.618	—			
AV	Spearman's rho	-0.136	0.502	—		
	p-value	0.569	0.024	—		
O	Spearman's rho	0.029	0.543	0.562	—	
	p-value	0.905	0.013	0.010	—	
AF	Spearman's rho	-0.124	0.317	0.310	0.298	—
	p-value	0.603	0.173	0.183	0.202	—

Note: A – self-efficacy, F - anger, AV – verbal aggression, O – hostility, AF – physical aggressio

The effect size (r^2) reveals strong relationships between the variables: verbal aggressiveness and hostility, anger and hostility and anger and verbal aggressiveness, respectively.

As in the case of karate practitioners, we can observe significant positive correlations between different factors of aggression ($p < 0.05$), also, in the case of people practicing leisure motor activities such as: fitness, jogging, rugby, soccer, dancing, table tennis or basketball. People having a lower score in anger also have lower values for verbal aggression ($p < 0.001$), physical aggression ($p = 0.010$), as well as in the case of hostility ($p = 0.007$). Also, people with lower verbal aggressiveness are less hostile ($p = 0.002$) and less physically aggressive ($p < 0.001$) (Table IV).

Tabel IV. Spearman corelation – aggression and self-efficacy (other leisure motor activities: fitness, jogging, rugby, soccer, dancing, table tennis, basketball)

		A	F	AV	O	AF
A	Spearman's rho	—				
	p-value	—				
F	Spearman's rho	-0.084	—			
	p-value	0.689	—			
AV	Spearman's rho	-0.071	0.675	—		
	p-value	0.736	< .001	—		
O	Spearman's rho	-0.274	0.526	0.589	—	
	p-value	0.185	0.007	0.002	—	
AF	Spearman's rho	-0.012	0.506	0.733	0.543	—
	p-value	0.956	0.010	< .001	0.005	—

Note: A – self-efficacy, F - anger, AV – verbal aggression, O – hostility, AF – physical aggression

Last but not least, we examined (Table V) how the levels of aggression and self-efficacy vary in karate practitioners (as a leisure-time motor activity), depending on the number of hours of training per week. We note that karate practitioners with 1-2 hours and 3-4 hours per week form a single group in the statistical analysis ($n = 8$), due to the small number of participants ($n = 5$, 3-4 hours/week, respectively $n = 3$, 1-2 hours/week). The results in Table VI reveal marginally significant differences ($p = 0.052$) in self-efficacy between individuals practicing at least 5 hours of karate per week as a leisure-time motor activity and those practicing 1-2 hours and 3-4 hours of karate per week, respectively. Participants with at least 5 hours/week scored higher on self-efficacy being, therefore, more self-confident.

Tabel V. Descriptive statistics karate practitioners– 1-2 hours/week and 3-4 hours/week *vs.* more than 5 hours/week

	No of hours / week	A	F	AV	O	AF
N	1-2 and 3-4 hours	8	8	8	8	8
	more than 5 hours	12	12	12	12	12
Mean	1-2 and 3-4 hours	31.9	12.6	10.1	16.4	16.0
	more than 5 hours	36.4	14.3	10.6	16.9	15.8
Std. error	1-2 and 3-4 hours	1.55	1.43	0.875	2.81	1.67
	more than 5 hours	1.02	1.58	1.07	1.28	1.23
Median	1-2 and 3-4 hours	30.5	12.5	11.0	13.5	14.5
	more than 5 hours	37.5	13.0	9.00	16.0	15.0
SD	1-2 and 3-4 hours	4.39	4.03	2.47	7.95	4.72
	more than 5 hours	3.53	5.48	3.70	4.42	4.25
Range	1-2 and 3-4 hours	12	10	6	21	14
	more than 5 hours	12	18	12	15	15
Minimum	1-2 and 3-4 hours	28	8	7	8	9
	more than 5 hours	28	9	6	10	9
Maximum	1-2 and 3-4 hours	40	18	13	29	23
	more than 5 hours	40	27	18	25	24

Note: A – self-efficacy, F – anger, AV – verbal aggression, O – hostility, AF – physical aggression

Tabel VI. Inferential statistics karate practitioners – 1-2 hours/week and 3-4 hours/week *vs.* more than 5 hours/week (U test)

		Statistic	p
A	Mann-Whitney U	22.5	0.052
F	Mann-Whitney U	39.5	0.533
AV	Mann-Whitney U	46.5	0.938
O	Mann-Whitney U	37.5	0.439
AF	Mann-Whitney U	44.5	0.816

Discussions

This paper examined the levels of self-efficacy and aggression (physical, verbal, anger and hostility) in people practicing different leisure time motor activities. Data analysis revealed that karate practitioners show a lower level of aggressiveness than people practicing other leisure motor activities. Significant differences were observed in the case of physical aggression, which means that karate practitioners are better able to control their reactions and emotions compared to those practicing other leisure motor activities. Martial arts by its very nature functions as a complete educational system and is suitable for all people regardless of age. For example, judo practitioners have reported lower levels of aggression compared to practitioners of team sports (Stanković et al., 2022). Each martial art has its own code of ethics whereby all practitioners learn and apply respect, discipline and self-control (see Predoiu et al., 2024; Twemlow et al., 2008; Predoiu et al., 2022). All these are found throughout the duration of training and lead to channeling aggression in the most positive way possible. Moreover, literature emphasized that practicing combat sports reduce aggression' levels (Steyn & Roux, 2009).

Comparing karate practitioners (as a leisure-time motor activity) by gender in terms of their level of aggression and self-efficacy, we obtained important differences between the two groups. Females scored significantly higher in anger and hostility compared to male participants. Thus we observe that although both groups are karate practitioners, and practicing this motor activity leads to a lower level of aggression, the management of reactions still varies by gender.

Investigating the correlations between aggressiveness factors and self-efficacy level, in the case of karate practitioners, a significant relationship is observed between: anger level and verbal aggressiveness (the lower the level of anger, the lower the verbal aggressiveness); anger and hostility (the lower the level of anger, the lower the hostility); verbal aggressiveness and hostility (the lower the level of hostility, the lower the verbal aggressiveness). As in the case of karate practitioners, we can also observe significant positive associations between the different factors of aggressiveness in people practicing other leisure motor activities (fitness, jogging, rugby, soccer, dancing, table tennis or basketball). Thus, people with lower anger also have lower values for verbal aggression, physical aggression and hostility. People with lower verbal aggression are also less hostile and less physically aggressive.

Carefully analyzing the correlations we notice that the physical aggressiveness of karate practitioners is not significantly influenced by the other factors of aggression (verbal aggression, anger and hostility). On the other hand, in the case of people practicing other leisure time motor activities, physical aggressiveness is significantly related to the level of anger, hostility and verbal aggressiveness. The literature mentions that regular training in combat sports (martial arts), conducted under the guidance of a coach/teacher who apart from the technical and physical side is attentive to educational aspects and compliance with the rules, significantly reduces the level of hostility (Kostorz & Sas-Nowosielski, 2021). During martial arts training it is mandatory that physical aggression is controlled in view of the potential danger derived from the execution of specific procedures. Thus, in training, controlled aggression can stimulate the development of physical and mental skills and at the same time contribute to improving self-efficacy and discipline. In karate, for many years, aggression has been controlled through physical exercises specific to Kihon, Kata and Kumite training. These are practiced through rigorous repetitions resulting in increased self-efficacy (Funakoshi, 1975). Martial arts competitions are in fact an organized setting in which aggressiveness is tested through procedures within the regulations that maintain the safety of the athletes, so martial arts are in fact the way of personal development of each practitioner and that transforms aggressiveness into a controlled method to achieve victory.

Last but not least, were observed marginally significant differences in self-efficacy between people who allocate at least 5 hours per week and those who practise karate 1-2 and 3-4 hours per week, respectively. Individuals who spent more hours per week practicing this motor activity (karate) had a higher self-efficacy score, thus being more confident in their own strengths, compared to those who spent fewer hours. In other words,

practising karate more frequently and for longer periods of time (as a leisure time motivational activity) helps to increase self-efficacy.

Understanding how karate and other motor activities can influence self-efficacy and aggression provides valuable information for parents, educators, teachers, coaches and sports psychologists in designing and implementing programs to educate and support individual development.

Conclusion

Karate practitioners (as a leisure-time motor activity) showed a lower level of physical aggression than people practicing other leisure motor activities. Females scored significantly higher in anger and hostility compared to male karate practitioners. Physical aggression was significantly linked to the level of anger, hostility and verbal aggression in people practicing leisure time motor activities such as: fitness, rugby, soccer, dancing, jogging, table tennis or basketball, but in the case of karate practitioners this link was not emphasized. Also, people who spent more time practicing karate (as a leaisure-time activity) registered a higher self-efficacy.

Authors' Contribution

The last author has an equal contribution to the publication as the first author.

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