



Karate Game: Using a Playful and Participatory Approach to Enhancing Children's Social and Motor Perception during the Developmental Age

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Abstract

Objectives. The study aimed to evaluate the effects of sport-specific educational proposals in school-age sports, currently used in planning of sports activities, such as game-based karate training, on social interactions and improving perceptions of one's motor skills.

Materials and methods. The sample consisted of 34 children from the Comprehensive Institute "Matilde Serao" in Ortona, Chieti, attending the third classes of the Primary School, in the school year 2023/2024. The method used was based on the Karate Sport Game protocols in conjunction with the dissemination of the ethical principles inherent to the martial arts. A questionnaire was developed for the purpose of assessing the learners' levels of satisfaction, as well as the perceptions they had about themselves and in relation to others during this training intervention.

Results. In the post-implementation evaluation of the educational proposals' results, it was shown that 94.1 % of participants had a positive experience engaging in the Game-Karate activities, 82.3 % reported feeling significantly supported by the Instructors during the project, and 94.1% were very satisfied with the activities. The application of the Chi-Square test revealed two significant relationships with respect to the concept of opportunity for interaction with all peers. The first pertained to the participants' overall satisfaction with the karate instructional project ($p = 0.006$), while the second concerned the concept of improving teamwork ($p = 0.006$).

Conclusion. The findings indicate that Karate Game had a beneficial impact on the participants' emotional sphere, involvement, perceived improvement in motor skills, and group dynamics. In addition, the significant relationships found underscore the importance of social interaction and collaboration in the context of physical activity. These results suggest that playful and participatory approach to the training process in Karate classes can be a valuable resource for the comprehensive development of children's personality and motor skills during the developmental age.

Keywords: martial arts, personality, motor skills, innovative methodologies, perceptions, relationships.

Introduction

Motor development, plays a key role from the earliest years of a person's life, as it forms the foundation on which the physical, cognitive and social skills needed to meet challenges

and adapt effectively to the world around them are built. It is important to point out that during the 8-10 age group, children go through a critical stage in motor development, characterized by significant progress in fundamental motor skills (Raiola et al, 2022). This period is crucial for the formation of basic motor skills that will influence their physical well-being and participation in physical activities throughout their lives (D'elia et al, 2023). According to developmental psychologist Robert Kail, during this period,

children become more adept at coordinating complex movements and controlling their balance (Kail, 2000). In addition, during school age children show significant improvements in fine motor skills, with greater speed and accuracy in hand-eye coordination tasks (Piek et al, 1999). Physical improvements must go hand in hand with age-appropriate psychological development (Di Domenico et al, 2023). The main components certainly include optimal psychophysical balance, defined as a long-term goal (Raiola et al, 2023). Positive signs can also be observed in students with socialization problems through the adoption of sports interventions. Such signs can be easily verified during activities (D'Isanto et al, 2022). These include the martial arts, which, with their disciplined approach and inherent values of respect, self-discipline and perseverance, offer fertile ground in the motor and psychological development of practitioners (Altavilla et al, 2022). Karate, in particular, combines precise and coordinated movements with a philosophy of personal growth and self-improvement, promoting the idea of an environment in which each individual can grow and improve. Through Karate, motor skills can be acquired, skills can be developed, and new skills can be introduced into learners, which can be used to enrich overall intelligence in order to put them to use in all activities throughout the developmental years. Numerous studies have highlighted the effectiveness of Karate as a means of improving children's physical and mental health (Chaabène et al, 2017). These researches have shown that regular practice of Karate leads to significant improvements in cardiorespiratory endurance, muscular strength, and flexibility in children (Altavilla et al, 2022). In addition, balance control and motor coordination, fundamental aspects of physical development during childhood, are promoted with this discipline. What makes this sport an exceptional educational tool is its planetary cultural conception, aimed at the improvement of the person and not a part of the person, or a particular type of individual. Children can find in the Master a reassuring point of reference that gives them the tools to relate to others correctly or to become aware of their own potential. In order to make the practice of sports, of a martial discipline, more rewarding, it is possible to adapt it, creating a work environment that offers more stimulation to learners and that proposes personal and group challenges in a fun context. This is where playful activity comes in. Play is an instinctive, comprehensive and fun activity. The word play, before bringing physical components into play, activates the cognitive aspect and problem solving skills in the playful and relational environment (Di Domenico et al, 2023). The play component in Karate is still underestimated, but when applied it finds significant benefits in practitioners' learning at the psychophysical level. There is still a tendency to adopt traditional, repetitive and often boring approaches that are not in line with the expectations of modern generations and fail to produce optimal results. These young people are accustomed to the interactivity of new technologies and to receiving immediate feedback tailored to their specific needs (D'elia et al, 2021). In the context of teaching Karate to children, a significant impairment of motor skills and abilities emerges, as well as a negative impact on their psychological and relational sphere, aspects that need to be resolved from childhood (D'Isanto et al, 2022). In addition, there is limited use of alternative teaching methodologies

compared to the traditional approach, and play certainly helps to improve movement components by providing a suitable motivational context.

Purpose of the research – evaluate how sport-specific educational proposals in school-age sports, currently used in planning sports activities such as game-karate, influence perception in social interactions, while also improving perception of one's motor skills (Raiola et al., 2023).

Materials and Methods

Study Participants

The sample of this study includes 34 children of the Istituto Comprensivo "Matilde Serao" in Ortona, in the province of Chieti, attending the third grade of the Primary School in the school year 2023/2024. The group of learners is heterogeneous, in gender, socioeconomic status of origin and physical-athletic condition. The learners have had prior experience in various sports, but few have previously practiced Karate.

Study Organization

The participants underwent 40 structured sessions of one hour each of Karate Game, carried out over a period of 5 months, using Karate sports game methodologies, in accordance with FIJLKAM guidelines. The courses are performed on a square of rubber mats preferably 10x10 meters, divided into 5 lanes of 2 meters wide. There must be guaranteed 1 meter of space for turning to the next lane. In each course the element is repeated if the athlete does not perform the exercise as prescribed. The training sessions are designed to improve motor patterns, motor skills and abilities by promoting martial arts values. All activities will have a bottom up approach from the bottom up rather than top down from the top down. With this methodology, the learner will be placed at the forefront in self-determination during the activities, highlighting their strengths and reinforcing their weaknesses; the teacher's role will be to guide, push and monitor the activities. The training protocols of each lesson are structured in an activation phase, in the study of basic Karate techniques, providing specific workouts that make the learners acquire the physical characteristics required for the sport, the playful part with the courses, a part dedicated to fighting skills and finally, the final cooldown phase. This is briefly described in Table 1.

These exercises within the educational proposal are adapted according to the experience level and specific needs of the participants, ensuring that a balance between challenge and fun is maintained during the Karate Game sessions. A questionnaire was developed and submitted to the participants at the end of the educational intervention, consisting of 8 questions, with 4 structured responses, all represented in Table 2.

Statistical analysis

Following the responses to the questionnaire from the sample considered, a descriptive statistical analysis was carried out; only then were the data analyzed by performing a Chi Framework analysis to understand whether or not there were significant relationships between the qualitative variables, using the statistical software JASP.

Table 1. Educational proposal of lessons

Neuro-muscular activation	Dynamic warm-up to prepare muscles and improve flexibility
Techniques basic karate	Introduction of kicks, punches and parries
Reaction and agility drills	Exercises that improve learners' agility and responsiveness, including footwork, circuit exercises involving quick movements, change of directions, and exercises that require fast reaction times
Body coordination, stability and balancing exercises	Aimed at improving eye-hand coordination, balance and stability. Included are exercises with moving targets, precision drills and exercises involving the use of equipment such as medicine balls or stability cushions.
Specific playful-motor exercises	Adoption of games calibrated to indirectly improve motor skills and abilities specific to karate such as capture flags, poison ball, 1 2 3 star. FIJILKAM Protocol: Combined Game Sport.
Exercises for learning combat	Application of Karate techniques towards moving targets, balloon bags, in a controlled environment, taking advantage of all the technical-tactical peculiarities that the sport requires.
Cooldown	Each training session is concluded with a cooldown and stretching exercises to relax the muscles and reduce the risk of injury.

Table 2. Questionnaire

Questions	Answer 1	Answer 2	Answer 3	Answer 4
1) How much fun did you have participating in Karate Sports Game activities?	Very	Somewhat	A little	Not at all
2) Did you feel that through play your motor skills improved?	Very	Somewhat	A little	Not at all
3) Did you have the opportunity to interact with all your teammates?	Very	Somewhat	A little	Not at all
4) Did you feel your teamwork improved during the project?	Very	Somewhat	A little	Not at all
5) Were the instructions for the game activity clear and easy to follow?	Very	Somewhat	A little	Not at all
6) Did you feel supported by the Instructors during the project?	Very	Somewhat	A little	Not at all
7) Do you feel that the project positively promoted Karate values (respect, integrity, honor)?	Very	Somewhat	A little	Not at all
8) What is your overall level of satisfaction with the Karate instructional project?	Very	Somewhat	A little	Not at all

Table 3. Results of questionnaire responses

Questionnaire	Very	Somewhat	A little	Not at all
1) How much fun did you have participating in Karate Sports Game activities?				
Frequency	25.0	7.0	2.0	0
Percentage	73.4	20.7	5.9	0
2) Did you feel that through play your motor skills improved?				
Frequency	17.0	13.0	4.0	0
Percentage	49.9	38.3	11.8	0
3) Did you have the opportunity to interact with all your teammates?				
Frequency	32.0	2.0	0	0
Percentage	94.1	5.9	0	0
4) Did you feel your teamwork improved during the project?				
Frequency	32.0	2.0	0	0
Percentage	94.1	5.9	0	0
5) Were the instructions for the game activity clear and easy to follow?				
Frequency	30.0	4.0	0	0
Percentage	88.3	11.7	0	0
6) Did you feel supported by the Instructors during the project?				
Frequency	34.0	0	0	0
Percentage	100.0	0	0	0
7) Do you feel that the project positively promoted Karate values (respect, integrity, honor)?				
Frequency	31.0	3.0	0	0
Percentage	91.1	8.9	0	0
8) What is your overall level of satisfaction with the Karate instructional project?				
Frequency	32.0	2.0	0	0
Percentage	94.1	5.9	0	0

Results

After the questionnaire was administered, the results shown in Table 3 were found.

The results showed that, to question 1 'How much fun did you have participating in Karate Sports Game activities?' 94.1 % answered very, 5.9 % answered somewhat, none answered a little, and none answered not at all. To question 2 'Did you feel that through play your motor skills improved?' 49.9 % answered very, 38.3 % somewhat, 11.8 % a little. To question 3 'Did you have the opportunity to interact with all of your teammates?' 94.1 % answered very, 5.9 % somewhat. To question 4 'Did you feel your teamwork improved during the project?' 94.1 % answered very, 5.9 % somewhat, none answered a little or not at all. To question 5 'Were the instructions for the game activity clear and easy to follow?' 88.3 % answered very, 11.7 % somewhat, none a little or not at all. To question 6 'Did you feel supported by the Instructors during the project?' 100 % answered very. To question 7 'Do you feel that the project positively promoted Karate values (respect, integrity, honor)?' 91.1 % answered very, 8.9 % somewhat, none a little or not at all. To question 8 'What is your overall level of satisfaction with the Karate instructional project?' 94.1 % answered very, 5.9 % somewhat, none a little and not at all. Following the Chi-Square analysis, two significant relationships were found among the qualitative variables. The first relationship relates to question 4 'Did you feel your teamwork improved during the project?' and question 3 'Did you have the opportunity to interact with all your teammates?' where a $p=0.006$ was found. This is shown in the Table 4 and Table 5.

Table 4. Contingency table between question 4 and question 3

3. Did you have the opportunity to interact with all your teammates?	4. Did you feel your teamwork improved during the project?		
	Somewhat	Very	Total
Somewhat	1	1	2
Very	1	31	32
Total	2	32	34

Table 5. Chi-Squared Analysis

Chi-Squared Tests	Value	df	p
χ^2	7.471	1	0.006

Table 6. Contingency table between question 8 and question 3

3. Did you have the opportunity to interact with all your teammates?	8. What is your overall level of satisfaction with the Karate instructional project?		Total
	Somewhat	Very	
Somewhat	1	1	2
Very	1	31	32
Total	2	32	34

Table 7. Chi-Squared Analysis

Chi-Squared Tests	Value	df	p
χ^2	7.471	1	0.006

Next, the second relationship found was between question 8 'What is your overall satisfaction level with the Karate instructional project?' and question 3 'Did you have the opportunity to interact with all your teammates?', resulting in $p = 0.006$. The whole can be observed in Table 6 and Table 7.

Discussion

From the responses provided by the participants in the questionnaire, an overall positive picture emerges regarding the experience with the Karate Game. In particular, from the results that emerged, it is evident that the Karate Sports Game elicited a positive impact on their emotional state. This indicates that the playful approach adopted helped to make the experience enjoyable and engaging for the children, fostering a positive and motivating learning climate. An interactive and dynamic environment was created in which children could actively participate (Altavilla et al, 2022). This type of involvement promotes experiential learning, in which we improve through action and direct experience, rather than through mere observation or passivity. In this setting, participants learned informally, without feeling pressured or judged. The environment also encouraged exploration and experimentation, allowing everyone to acquire new skills naturally and gradually. A series of progressive challenges were created, adapted to the skill level of the sample. This allowed the components to experience a sense of success and satisfaction when they overcame difficulties, encouraging them to persevere and improve despite the obstacles they encountered. Interaction and collaboration with peers was promoted during the activity, developing important social skills such as communication, sharing and conflict management. Another significant finding was the strong consensus regarding improved game skills and the perceived improvement in teamwork. These findings suggest that Karate Game not only promoted the development of motor skills, but also promoted collaboration and cooperation among participants, thus helping to strengthen group dynamics (D'Isanto et al, 2024). Also interesting is the observation that the instructions for the game activities were considered clear and easy to follow by the vast majority of participants (Esposito et al, 2024). This indicates an adequate level of communication and support from the instructors, who facilitated active participation and understanding of the proposed activities. In addition, previously conducted studies, (Lakes et al, 2004), analyzed the impacts of Karate on children's cardiorespiratory function and flexibility, showing significant improvements in both domains. This supports the idea that Karate may not only contribute to motor development but also to the general well-being of children (D'Elia et al, 2023). The promotion of moral and social values through Karate has been investigated by research highlighting the role of martial arts in promoting social values. Aspects, also reinforced by the significant relationships found in the present study. The significant relationships found among the qualitative variables, particularly regarding improvement in teamwork and overall

satisfaction with the project, highlight the importance of social interaction and collaboration in the overall experience of the participants. These results underscore the effectiveness of the Karate Game in promoting not only motor skills, but also values such as respect, integrity, and honor, which are fundamental to the martial arts.

Conclusion

The present study investigated the effectiveness of structured Karate Game sessions in the motor development and psychosocial well-being of participants. From the results from the questionnaire responses, it is clear that Karate Play is a highly positive approach to engage children in physical activities, improve motor skills, and promote key martial arts values such as respect, integrity, and honor. The wide participation and positive feedback from participants indicate that the design had a significant impact on their experience, both in terms of improved emotional state and involvement during the sessions and perceived improvement in motor skills and group dynamics. In addition, the significant relationships found between some qualitative variables, such as improved teamwork and overall satisfaction with the project, highlight the importance of social interaction and collaboration in the proposed activity. These results suggest that this educational methodology represents not only an opportunity for children's motor and physical development, but also a valuable context for the promotion of social and emotional values and skills, crucial for their future well-being and success. Ultimately, Karate Game is presented as an important educational and training resource, capable of combining fun, learning and the promotion of positive values, thus contributing to the complete development of personality and motor, cognitive and emotional development during developmental age. However, it is important to consider that this study involved a specific sample, and further research may be needed to confirm and deepen these findings.

Conflict of interest

The authors declare that there is no conflict of interest.

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Карате-гра: застосування ігрового та партисипативного підходу щодо покращення соціальної та рухової перцепції дітей у віковому періоді розвитку

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Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; E – збір коштів

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Мета дослідження. Метою дослідження було оцінити вплив специфічних для спорту освітніх пропозицій у шкільному віці, які наразі використовуються при плануванні спортивних заходів, таких як заняття з карате із застосуванням ігрової моделі тренувального процесу, на соціальну взаємодію та покращення рівня сприйняття власних рухових навичок.

Матеріали та методи. Вибірка складалася з 34 дітей із Загальноосвітнього інституту «Матильда Серао» в Ортоні, провінція К'єті, які навчалися у третій класі початкової школи у 2023/2024 навчальному році. В основу методу було покладено протоколи спортивних ігор з карате в поєднанні з популяризацією етичних принципів, притаманних бойовим мистецтвам. Було розроблено опитувальник з метою оцінки рівня задоволеності учнів, а також їхнього власного сприйняття та ставлення до інших під час проведення цієї тренувальної інтервенції.

Результати. Оцінка результатів освітніх пропозицій, що проводилася після завершення реалізації проекту, показала, що 94,1 % учасників мали позитивний досвід участі у заняттях з карате із застосуванням ігрової моделі, 82,3 % повідомили, що відчували значну підтримку з боку інструкторів під час проекту, а 94,1 % учасників залишилися дуже задоволеними заняттями. Використання критерію хі-квадрат виявило два значущі взаємозв'язки щодо концепції можливості взаємодії з усіма однолітками. Перший був пов'язаний із загальною задоволеністю учасників навчальним проектом з карате ($p = 0,006$), тоді як другий стосувався концепції покращення командної роботи ($p = 0,006$).

Висновок. Результати дослідження вказують на позитивний вплив карате-гри на емоційну сферу учасників, рівень залученості, відчутне поліпшення рухових навичок та групову динаміку. Крім того, встановлені значущі взаємозв'язки підкреслюють важливість соціальної взаємодії та спільних дій у контексті фізичної активності. Отримані результати свідчать про те, що застосування ігрового та партисипативного підходу в процесі тренувальних занять з карате може виступати в якості цінного ресурсу щодо комплексного формування особистості та рухових навичок у дітей впродовж вікового періоду розвитку.

Ключові слова: бойові мистецтва, особистість, рухові навички, інноваційні методики, сприйняття, взаємозв'язки.

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