A study of Enhancing Fencing Skills with The Impact of Special Exercises on Kinetic Response and Attack Accuracy among Young Foil Players

Reem Mohammed Abdel Wahhab [1*]

Abstract

Physical fitness might encompass mental well-being, social connections, and personal development. Engaging in fencing can contribute to a holistic approach to health and wellness. This study aimed to create specialized exercises to improve players' kinetic response and accuracy in executing cutting attacks in fencing. Using an experimental approach, the study focused on army fencing club players under 18 years old, totaling 45 participants. Sixteen students were randomly selected and divided into control and experimental groups, with each group consisting of eight players. The control group followed the coach's regular training method, while the experimental group performed special exercises. Additionally, four players were surveyed to gather further insights from the research community. The results showed that the special exercise training program significantly enhanced the participants' kinetic response speed and stabbing skills during cutting attacks in fencing. The study also found a notable correlation between kinetic response and the execution of stabbing and cutting attacks. The positive development observed in the experimental group underscores the effectiveness of the training curriculum components. The researchers recommend incorporating game-specific exercises into training programs to improve physical attributes like kinetic response, which plays a crucial role in fencing skills. They also emphasize the importance of developing arm speed to enhance performance in fencing among players and students alike.

Keywords: Fencing Skills, Physical and Mental Health, Specialized Exercises, Kinetic Response, Training Methods, Foil Weapon

Significance | This study showed an improved exercises enhancing kinetic response, vital for fencing to optimize athletes' and their healthy performance.

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Introduction

Fencing is useful for numerous benefits for physical and mental health. Physically, it develops cardiovascular health, muscle strength, and overall fitness. It also improves coordination, balance, and bone density, reducing the risk of injuries and osteoporosis. Mentally, fencing increases cognitive skills like problem-solving and concentration, working as a stress-reliever and mood enhancer. Socially, it fosters connections and camaraderie within fencing clubs or teams. Moreover, increasing fencing skills boosts self-confidence and resilience, contributing to a positive mindset and overall mental health.

Scientific research has become instrumental in the development of societies, particularly in fields like sports, aiming to leverage modern scientific theories for optimal outcomes. The rapid advancements in physical education have created new avenues for researchers, particularly in disciplines like fencing, to explore innovative approaches for acquiring and enhancing skills and knowledge. Scholars like Sabr (2005) and Alyan (2000) emphasize the importance of integrating new findings from sports sciences

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into educational and training processes to achieve optimal results. This integration ensures that training methods align with the latest developments, catering to the specific needs and age groups of athletes.

Recent years have witnessed a profound impact of scientific and technological advancements on training methodologies. Training processes have evolved to incorporate new methods and technologies, tailored to the age groups of trainees. Trainers are tasked with selecting the most effective and contemporary methods to enhance training specificity, thereby improving various aspects such as skill, physical fitness, tactics, and mental preparedness.

In fencing, the skill of executing a decisive attack holds significant importance, demanding quick execution, high technical proficiency, and physical agility. This skill involves swift movement of both the armed arm and legs, culminating in a precise touch to outmaneuver the opponent and secure victory (Hashem, Al Edhary, Radhi, & Hmeid, 2022). Emphasizing the development and mastery of such skills through scientifically informed training methods is essential for success in fencing and other sports disciplines.

The game of fencing demands a unique combination of individual effort and specialized physical attributes, characterized by swift and accurate technical and tactical movements in both offensive and defensive maneuvers. Scholars such as Salah al-Din (1988) and Jauszez Enwink (1992) have extensively studied these characteristics and their influence on kinetic performance across various fencing weapon categories. This research underscores the significance of employing specialized exercises to enhance the kinetic response and precision in executing stabbing attacks with cutting actions among Telecommunications Club players.

The research problem stems from the intricate skill requirements in fencing, which necessitate rapid and repeated body movements while maintaining balance and mobility. Effective performance hinges on the ability to adapt to changing game conditions, emphasizing the need for robust physical attributes and seamless coordination between different abilities.

Each sport, including fencing, develops distinct skills crucial for successful gameplay and personal growth (Fadil, 2012). Effective training methods are essential for refining these skills, particularly defensive and offensive maneuvers integral to fencing. Shaalan, Aboode, & Radhi (2022) stress the importance of implementing and refining modern training techniques to elevate players' skill performances.

Observations and field experience have revealed a deficiency among some players in terms of kinetic response speed. The swiftness of kinetic response significantly impacts athletes' ability to execute kinetic skills with finesse and aesthetic appeal. Continuous practice and experience are essential for skill development, with structured and organized training programs facilitating optimal progress (Majeed, 1995). This research highlights the critical role of targeted exercises and systematic training regimens in enhancing players' kinetic response and skill performance levels in fencing.

We aimed to investigate how special exercises impact the development of kinetic response and the accuracy of performing stabbing with cutting attacks among foil players under 18 years old. Objectives included designing these exercises and assessing their influence on players' abilities. The hypothesis posited a positive correlation between special exercises and improved performance. The study focused on Army Club players within a specific timeframe (16/4/2023 to 18/6/2023) at the Iraqi Fencing Federation's sports hall.

Materials and Methods

Field procedures

One of the most important steps on which the success of research depends is choosing the appropriate approach to solve the problem. The method is “the method that an individual follows until he reaches a specific goal” (Akram: 1997, 19). Since scientific research has identified many approaches that are compatible with the nature of any scientific problem that requires study and research, this gives the researcher the freedom to choose the approach that is compatible with his research problem. The researcher used the experimental method because it was compatible with the nature of the research problem, and chose to design the method of two equal groups (experimental and control) with pre- and post-tests.

Community and sample research

The researcher defined the research community as Army fencing club players under (18) years of age, who numbered (45) players, and the sample included The basic training program included (16) students who were selected randomly and were divided into (8) players for the control group, in which the coach’s method was followed, and (8) players for the experimental group, to which special exercises were applied. A number of (4) players were used to conduct survey studies to search for the same research community, and for the purpose of knowing the homogeneity of the research sample in some variables related to the research, the researcher extracted the skewness coefficient for each of (chronological age, training age, Length, mass) as shown in Table (1).

Tools and devices

Data for the study were collected through various means, including Arab and foreign sources and references, personal interviews, tests, and measurements. To ensure accuracy and consistency, special forms were designed for recording test results. The tools and devices utilized during the data collection process included an electronic calculator (laptop), an electronic stopwatch, a foil weapon, fencing sign numbers, sponge mats measuring 2 meters by 1 meter, adhesive tape, and a fencing hall. These tools were essential for conducting the research effectively and obtaining reliable data for analysis.

Kinetic response test

The kinetic response test, as outlined by Majeed (1989), aims to assess an individual's ability to swiftly respond to a stimulus and move with speed. The test utilizes basic equipment such as a measuring tape, stopwatch, and a 20-meter-long, 2-meter-wide obstacle-free yard. Test procedures involve delineating the test area with three lines, each spaced 6.40 meters apart and 1 meter in length. During test performance, the tester stands poised at one end of the center line, awaiting a signal from the referee positioned at the opposite end. Upon the referee's signal, indicating a directional movement, the tester endeavors to sprint to the designated sideline, 6.40 meters away, with the referee halting the stopwatch upon reaching the correct side. The tester is afforded ten consecutive attempts, interspersed with 20-second rest intervals between each, with the attempts randomized across directions. Each attempt's time is meticulously recorded to the nearest tenth of a second.

Accuracy of stab test with cutting attack

Testing the accuracy of the stab with a cutting attack, as outlined by Abbas (2000), aims to gauge the precision of the stab motion within a fencing context. The test employs simple tools including a sign representing the legal target, marked with numbered circles (1-6), and a foil weapon. During the performance, the tester assumes a ready stance approximately 1.5 meters away from the target, poised to execute the stab motion. Upon receiving the signal, the tester swiftly attempts to touch the designated number on the target with the foil weapon. Successful attempts are recorded based on the alignment of the instruction and the actual touch location, with each successful attempt earning a score of one, while failed attempts outside the circle receive a score of zero.

Exploratory test

The exploratory experiment, conducted by the researcher on Sunday, April 16, 2023, involved a sample of four players not included in the main experiment. Its objectives encompassed several key aspects: validating the suitability of the venue, tools, devices, and research materials; organizing the auxiliary and supporting teams, including providing necessary instructions and anticipating potential challenges; assessing the readiness of the research sample to undertake the tests; determining the duration of each test; and evaluating the stress levels induced by the exercises, thereby gauging their feasibility for application to the research sample.

Pre-test

On Tuesday, April 18, 2023, the researcher administered the pre-tests for the experimental group of the research sample in the communications club hall, the designated venue for the research tests. These pre-tests included assessments for kinetic response and stabbing with the cutting attack. The researcher meticulously set the parameters for the tests, encompassing factors such as timing, location, tools, and implementation methods, ensuring consistency for the subsequent post-tests.

Main experiment design

In the main experiment, the researcher meticulously prepared and structured a series of specialized exercises drawing from personal expertise and insights gleaned from interviews with sports training and fencing experts. Implementation of these exercises commenced on April 23, 2023, coinciding with a Sunday, and continued for a period of eight weeks. The regimen comprised 24 units, with three weekly sessions lasting 30-35 minutes each, focused exclusively on high-intensity interval training. Scheduled on Sundays, Tuesdays, and Thursdays, these exercises targeted the enhancement of kinetic response speed, stabbing movements, and cutting attacks, while ensuring balanced engagement across muscle groups.

Post-test

Following the completion of the special exercise regimen, the researcher, aided by assistant staff, administered the post-tests for the research sample on Sunday, June 18, 2023. These post-tests were conducted in alignment with the pre-tests, ensuring consistency in the sequence of assessments and maintaining the same testing conditions observed during the pre-test phase.

Statistical analysis

Data analysis was performed using IBM SPSS-29 (IBM Statistical Packages for Social Sciences, version 29, Chicago, IL, USA). The significance of differences between means for quantitative data was assessed using Student's t-test. Statistical significance was considered when the p-value was equal to or less than 0.05.

Results and discussion

This study demonstrated the multifaceted benefits of fencing, encompassing both physical and mental well-being, alongside the pivotal role of scientific research in shaping modern training methodologies. Fencing stands as a cornerstone for enhancing cardiovascular health, muscle strength, and cognitive skills, while fostering social connections and self-confidence. Leveraging scientific insights, researchers have pioneered innovative training approaches, as emphasized by scholars like Sabr (2005) and Alyan (2000). The study showed the importance of specialized exercises in honing kinetic response and precision, crucial for executing decisive attacks. By integrating modern training techniques and addressing skill deficiencies, fencing programs can elevate players' performance and overall development.

The examination of Table (2) reveals noteworthy disparities in both the kinetic response test and the cutting attack's stab skill between the pre- and post-tests, particularly favoring the post-tests within the control group. This improvement is attributed to the efficacy of the implemented exercises and training methodologies. Within the educational units, the instructional techniques employed by the subject teacher play a pivotal role in fostering players' physical

Table 1. The homogeneity of the research sample

Variables	Measuring unit	Mean	Median	Std. Deviations	Skewness	Result
Length	Cm	167.75	166	1.879	0.392	Homogeneous
Mass	Kg	68.813	68.5	1.663	0.355	Homogeneous
Chronological age	Year	3.12	3	1.033	0.372	Homogeneous
Training age	Year	17.8	17	0.722	0.223	Homogeneous

Table 2. The results of the pre- and post-tests of the control group in 0 week.

Variables	Measuring unit	Pre-test		Post-test		T value	Level Sig	Type Sig
		Mean	standard deviation	Mean	standard deviation			
Kinetic response	meter	2.14	1.417	3.14	0.844	2.064	0.023	Sig
Stab test with a cutting attack	repetition	7.257	0.615	8.455	0.711	3.113	0.014	Sig

Table 3. The results of the pre- and post-tests of the control and experimental groups in 1st week

Variables	Measuring unit	Pre-test		Post-test		T value	Level Sig	Type Sig
		Mean	standard deviation	Mean	standard deviation			
Kinetic response	meter	2.06	1.034	4.12	1.211	5.017	0.003	Sig
Stab test with a cutting attack	repetition	7.232	0.803	9.622	0.865	4.443	0.001	Sig

Table 4. the results of the pre- and post-tests for the control and experimental groups in 8th week

Variables	Measuring unit	Control		Experimental		T value	Level Sig	Type Sig
		Mean	standard deviation	Mean	standard deviation			
Kinetic response	meter	3.14	0.844	4.12	1.211	2.812	0.013	Sig
Stab test with a cutting attack	repetition	8.455	0.711	9.622	0.865	3.055	0.009	Sig

attributes and skill development, echoing the sentiments expressed by Othman (1987). Furthermore, the substantial difference observed in the stabbing movement and decisive attack among the control group members can be ascribed to the repetitive nature of exercises, as advocated by Fadel and Aws, emphasizing the significance of structured training regimens (Fadel & Aws, Year). Sharaf (2000) emphasizes the role of repetitions in enhancing performance and refining movement execution, a notion reinforced by Khayoun (2002) regarding the cognitive benefits of repetitive actions. Acknowledging the foundational role of muscular strength in skill development aligns with Mosker's assertion (2008) and DeCarlo's viewpoint (2003), highlighting the imperative inclusion of strength elements in training curricula.

Turning attention to Table (3), significant discrepancies between pre- and post-tests are evident, notably favoring the post-tests within the experimental group. This reinforces the efficacy of the offensive movement executed by extending the arm, posing a constant threat to the competitor's legal target area, as elucidated by Shaker, Tuama, & Radhi (Year). Such findings underscore the importance of specialized training protocols tailored to fencing maneuvers, essential for augmenting skill performance and elevating athletes' competitive edge.

The researcher attributes the observed advancements to the efficacy of a specialized training program implemented among the research sample, resulting in notable enhancements in strength, characterized by speed and kinetic response among the players. This assertion resonates with Al-Qat's (1999) proposition that structured and scientific exercise regimes are pivotal in inducing physical and physiological adaptations essential for elevating an athlete's performance. Such specialized exercises serve as the cornerstone for both general and targeted physical preparation across various activities and skill sets, as underscored by Yasser (1997) and Fadil & Abdullah (2013). Kinetic response, a fundamental attribute in fencing, plays a crucial role in maneuvering, balance, and flow within the game, as elucidated by Abdel Khaleq (1992). The intrinsic connection between neuromuscular coordination, accuracy, and kinetic response underscores the importance of tailored training approaches aimed at enhancing skill execution. Al-Sukkari and Bariqa (2005) and Hassanein and Sobhi (1995) further emphasize the necessity of customizing training content to address specific muscle groups and performance requirements, underscoring the importance of aligning training programs with the demands of the respective sport or activity.

The researcher posits that the velocity of the armed arm and legs, indicative of the kinetic response's speed, correlates positively with the accuracy of the stab, a relationship substantiated by various sources. Abdullah underscores the pivotal role of precision in executing the incisive stab, essential for success in fencing duels where hitting the target is paramount (Salah al-Din, 1980; Al-Mandalawi & Al-Shati, 1987). Additionally, the incorporation of diverse and engaging skill exercises within training units is shown to bolster the experimental group's proficiency in stabbing techniques (Al-Mandalawi, 1990; Radhi & Obaid, 2020). Furthermore, the researcher contends that the superiority of the experimental group, as evidenced in Table (4), is attributable to the utilization of fencing-specific exercises, facilitating enhanced skill development. This underscores the necessity of adopting innovative educational and training methodologies to nurture players' capabilities effectively.

Conclusion

The implementation of a specialized training program, incorporating tailored exercises, resulted in notable enhancements in both kinetic response speed and the execution of the decisive stabbing skill in this study. It became evident that a significant correlation exists between the kinetic response and the movements associated with the stabbing and cutting attacks in fencing. The substantial progress achieved by the research sample underscores the efficacy of the training curriculum's components in fostering skill development.

The imperative of employing training programs featuring game-specific exercises to enhance crucial physical attributes like kinetic response cannot be overstated, given their pivotal role in refining fencing skills. Particularly, emphasizing the development of armed arm speed is crucial for fencing practitioners and students alike.

Moving forward, there is a pressing need for further exploration through similar studies across diverse samples and proficiency levels. Such endeavors would deepen our understanding of the interplay between training interventions and skill enhancement, ultimately contributing to the advancement of fencing practice and pedagogy.

Author contribution

R.M.A.W. designed the study, analysed data, conducted laboratory experiments, and wrote the manuscript.

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Competing financial interests

The authors have no conflict of interest.

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