

Comparing Practice and Research: Evaluating Training, Mental Preparation, and Recovery in Elite Fencers

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ABSTRACT

Fencing is a high-skill sport requiring exceptional concentration, speed, reaction time, and endurance. Like all sports, fencers face both physical and mental setbacks, including injuries and performance-related stress. This study examined whether elite fencers are aware of how to recover from setbacks and adequately prepare for tournaments and practices. National-level fencers aged 13 to 50+ were surveyed regarding their warm-up routines, common injuries, nutrition, and supplement use. Results indicated that while athletes generally follow effective physical warm-up routines, they lack structured mental preparation strategies to optimize focus during competition. Injury patterns largely aligned with existing research, showing the hips and knees as the most commonly strained areas, along with shoulders and wrists; however, some fencers reported core strains not previously documented. Nutritional habits revealed that athletes prioritize high-protein and carbohydrate-rich meals for performance, but supplement use was primarily aimed at muscle growth rather than addressing fencing-specific injury prevention, such as joint health and muscle recovery. These findings highlight gaps between current practices and research-based recommendations, emphasizing the need for integrated mental preparation and targeted nutrition to enhance performance and reduce injury risk among elite fencers.

Introduction

Coping with setbacks has been a major component of all sports to determine an athlete's athletic performance and their mental resilience. In competitive sports, success is not only determined by athleticism or mastery, but also by the athletes ability to manage adversity, recover from failures, and maintain focus under pressure. (Mei et al., 2025). For national level fencers, who compete at the highest levels, coping mechanisms for physical injuries and mental blocks become a critical tool for success. Setbacks in fencing are physical injuries that disrupt training and competition or

mental blocks that create low-confidence, slow reaction time, and anxiety. (Roi & Bianchedi, 2008)

Fencing is a combat sport that combines speed, strategy, and precision. This requires athletes to maintain exceptional physical conditioning and a strong mental focus. Fencing is often described as a “physical chess”, as it demands rapid decision making, technical executions and to react to an opponent's movements within a fraction of a second. (Wagstaff, 2025). Training at a national level involves intensive training to build agility and endurance, as well as technical drills and tactical practice.

Many high level fencers neglect or are unaware of proper recovery and warmup routines or fail to recognize early signs of physical strain. Others might focus primarily on physical conditions while overlooking the importance of mental preparation. Ineffective warm-up practices or poor psychological readiness can increase the risk of injury, fatigue, and performance anxiety.(Everhart et al., 2020). Later on, if these issues are not resolved properly, these effects will shorten the athletes career, lower the chances for the athlete to qualify for events, or force the athlete to quit and leave competition altogether.

This research is to examine the routines and recovery practices of national-level fencers, with a particular focus on their warm-up methods, mental preparation strategies, and injury recovery processes. The findings from this study aim to evaluate whether these athletes are engaging in effective and evidence-based approaches to physical and mental preparation. By identifying gaps or inefficiencies in current practices, this research seeks to provide practical, data-driven recommendations to help fencers optimize their performance, prevent injuries, and enhance overall recovery.

Method

Participants

Participants were 35 fencers in Northern Virginia, USA, ranging in ages from 13 to over 50, including both male and female athletes. All participants regularly compete at the national level.

Materials

The survey contained 11 questions based on mental preparation, warm-up routines, and common injuries.

Mental Preparation Based Question Example:

What does your mental preparation look like before a tournament?

Warm-up Routine Based Question Example:

What does your warm-up routine look like?

Common Injuries Based Question Example:

What are common injuries you've experienced?

The google form is shown below:

https://docs.google.com/forms/d/e/1FAIpQLScKr-F4BmjroBG_Doag0BWgmaw24a3fwPfdFQ-En5FPPmOF1A/viewform

Additional research was made to compare what the athletes do compared to the correct way from the research. Research came from interviews with coach Dr. Abdollah Serajian, who holds a Ph.D. in Neuromuscular Exercise Physiology, as well as pubmed, google scholar, and google. A recommended article "*The Science of Fencing: Implications for Performance and Injury Prevention.*" This source emphasized that fencing performance is influenced by physical conditioning, reaction time, psychological resilience, and external factors. It also provided solutions, training routines, and guidance on both injury prevention and recovery strategies tailored for elite fencers.

Procedure

All participants were given the survey and filled out the survey. They would do this on their own time but on average took 2-3 minutes to complete.

Results

Warm-Up Routine:

According to the research, an optimal warm-up routine should begin with exercises that elevate heart rate, such as running. This should be followed by arm circles and shoulder rolls to loosen the upper body, and dynamic lower-body movements like high knees and butt kicks. For mobility, leg swings, walking lunges with twists, and hip openers were recommended, along with other dynamic stretches.(Afonso et al., 2024). Finally, the research advised incorporating fencing-specific drills with mental activation strategies such as visualization.(Sallam, Popa & Botea, 2022)

Survey results showed that 61.8% of participants jog to increase heart rate, and 67.6% perform dynamic stretches. However, only 8.8% reported including mental activation drills in their warm-up routine.

Injuries:

Previous research identified common fencing injuries occurring in the knees, ankles and feet, hips, leading arm (weapon arm), shoulders, and back.(South et al., 2018). In this study's survey, the leading arm was the most frequently reported site of injury (61.8% of participants). Additionally, hip injuries appeared to be more prevalent among female fencers. Interestingly, 8.8% of respondents reported core injuries, which were not noted in the referenced research as a common concern.

Nutrition:

The research recommended nutritional strategies and supplements that support joint health and muscle recovery, such as omega-3 fatty acids, iron, vitamin D, and protein-rich meals. (Lomazzi, 2024). However, survey data revealed that most fencers favored supplements associated with muscle building and energy enhancement. Specifically, 36.4% of participants reported taking electrolytes, while 39.4% used protein powder.

Discussion

The results reveal both similarities and differences between athletes' personal routines and recommended training practices. While the recommended routines provide general guidance on warming up and recovering from common fencing injuries, they lack individualized adjustments for each athlete. Nonetheless, they remain effective in preparing athletes and preventing common strains.

Survey responses highlight that many fencers struggle with recurring injuries and mental setbacks. These findings help assess whether athletes are recovering properly, maintaining effective routines, and using strategies to manage both physical and psychological challenges.

In the nutrition section, most athletes demonstrated awareness of proper dietary habits, such as consuming high-carbohydrate meals before competitions for quick energy and high-protein meals during training for recovery. However, the data suggest that athletes are not consistently using supplements that best support fencing performance. Supplements like Vitamin D, Omega-3, and Iron improve muscle repair and reduce joint inflammation which is key for preventing overuse injuries. Yet, most athletes reported using supplements focused mainly on muscle growth, indicating a gap in knowledge about nutrition and recovery strategies specific to fencing.

The findings on common injuries closely aligned with previous research, confirming that the knees and hips experience the greatest strain among fencers. This suggests that athletes primarily rely on and place repeated stress on these joints during training and competition. Recognizing

this pattern emphasizes the importance of implementing targeted warm-up and conditioning routines that focus on strengthening and stabilizing these high-risk areas. Incorporating exercises that enhance hip mobility, improve knee joint stability, and strengthen the surrounding musculature—such as the quadriceps, hamstrings, glutes, and hip flexors—could significantly reduce injury risk.

Furthermore, the appearance of core injuries in the survey, which were not identified in the prior research, highlights an overlooked area in fencing-specific conditioning. The core plays a crucial role in balance, power transfer, and posture, all of which are essential for fencing performance. Therefore, integrating core stability and strengthening exercises into warm-up and training programs could improve overall movement efficiency and injury prevention.

A proper warm-up routine is essential before any practice or competition to prevent strain or injury and to prepare both the body and mind for optimal performance. In fencing, mental readiness is particularly important, as elite fencers must rapidly assess situations, anticipate their opponent's next move, and make split-second decisions to score points. Therefore, incorporating mental preparation into the warm-up process is critical for enhancing focus, reaction time, and composure under pressure.

While most athletes are familiar with physical warm-up techniques, many overlook or lack structured methods for mental preparation. Developing a consistent mental routine can help athletes regulate nerves, reduce anxiety, and enter a focused, performance-ready state. Despite its importance, the findings suggest that many fencers remain unaware of effective strategies for mental preparation before tournaments or competitive bouts.

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