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Towards developing a comprehensive injury prevention protocol for Kendo: The necessity of research and a tool for Kendo in Mexico

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Abstract
Injury prevention is essential to ensure consistent training, safe practice, and long-term development in Kendo. Practitioners who train within a structured, safe, and scientifically informed framework are more likely to improve performance, remain motivated, and sustain their involvement in the discipline. Without proper prevention strategies, injuries become a major barrier, often leading to stagnation, dropout, or long-term limitations, the focus of this research, faces these challenges both in Japan and Mexico, but under very different circumstances. In Japan, Kendo is deeply embedded in education and culture, producing high levels of technical and competitive excellence. In Mexico, however, Kendo remains a developing discipline, hindered by limited resources, scarce high-level instructors, and a lack of systematic coaching methods. One major issue is the absence of accessible injury prevention protocols tailored to practitioners' needs, leading to recurrent injuries, poor physical preparation, and loss of motivation. As in other growing sports, these factors ultimately affect retention and progression, limiting both individual and national development. This research therefore explores the most common injuries in Kendo and examines preventive strategies. By addressing injury prevention as a core element of training, this study seeks to provide a foundation for sustainable growth in Mexican Kendo while also contributing to the broader international Kendo community.

Keywords: Kendo, Japan, Mexico, injury, prevention, performance

1. Introduction
1.1 Kendo and its History
1.1.1 A Brief Overview of Kendo
1.1.1.1 What is Kendo?
The International kendo federation defines kendo as a type of athletic contest in which practitioners wear kendogu (protective armor; Kendo Bōgu (防具)) and use shinai (bamboo swords) to strike each other. It is more than just a physical activity; Kendo is a budo (martial way) that aims to forge the mind and body of practitioners. Through continued keiko (practice), Kendo facilitates the development of character, discipline, and respect. The ultimate goal is not only to improve in the sport but to cultivate personal growth and a deeper understanding of oneself and others (Kendo, N.D.) [2].

To understand how kendo became the martial art it is today, we certainly have to look at the past, within the intricate history of Japan, however for practical purposes of this research, which does not intend to focus on historical aspects in depth, an effort has been made to summarize these data, trying to leave only those aspects that are considered essential to understand the evolution that kendo has faced throughout its existence and possibly to help understand what it will face in the future inside and outside of Japan (Kendo, N.D.) [2].

1.1.1.2 Origins of Nihonto and Kenjutsu
Kendo's roots trace back to the Heian period (794-1185) with the development of the *nihonto* (Japanese sword), distinguished by its curved blade and *shinogi* ridges.

This sword became a central element of samurai culture. During the Muromachi Shogunate (1392-1573), the turmoil of the Onin War led to the emergence of various swordsmanship schools (*kenjutsu*), which advanced both combat techniques and sword forging (The History of KENDO, n.d.) [9].

1.1.1.3 Edo Period (1603-1867)
The 18th century marked significant innovations in protective gear and training methods, including the introduction of the *shinai* (bamboo sword) and *kendo-gu* (armor). These advancements led to the formalization of kendo as it is practiced today (The History of KENDO, N.D.) [9].

1.1.1.4 Development of Kendo Equipment
The 18th century marked significant innovations in protective gear and training methods, including the introduction of the *shinai* (bamboo sword) and *kendo-gu* (armor). These advancements led to the formalization of kendo as it is practiced today (The History of KENDO, N.D.) [9].

1.1.1.5 Meiji Restoration and Decline of Kenjutsu (1868)
The Meiji Restoration resulted in the decline of *kenjutsu* as the samurai class was abolished. Despite this, traditional swordsmanship experienced a revival in the late 19th century, culminating in the establishment of the Dai-Nippon Butokukai in 1895 (The History of KENDO, N.D.) [9].

1.1.1.6 Post-War Revival and Global Expansion
Following World War II, kendo was temporarily banned but saw a resurgence in 1952 with the creation of the All Japan Kendo Federation (AJKF, https://www.kendo.or.jp/en/). Today, kendo is deeply integrated into Japanese education and culture, with millions of practitioners worldwide. The International Kendo Federation (FIK, https://www.kendo-fik.org/), founded in 1970, has further expanded kendo's reach, now encompassing over 60 countries (as of October 2021), participating in global events (The History of KENDO, N.D.) [9].

1.2 History of Kendo in Mexico
The following information is derived from an investigation conducted by PhD. Arno Burkholder de la Rosa, shared through personal communication on July, 2024, in Mexico City, Mexico. And, is presented in (Figure 1). *Origin*-Kendo in Mexico began in 1882, aligning with the start of Japan-Mexico diplomatic relations. Early dojos, like "Club Atlético Internacional," appeared in the 20th century, and Kendo gained traction during Japan's visit for Mexico's Independence centennial. However, the Mexican Revolution and WWII stop its growth. Revival efforts in the 1950s tied Kendo to the rise of Judo, Karate, and Taekwondo. By the 1970s, two major groups emerged, leading to the first National Kendo Championship in 1980 and the formation of the Mexican Kendo Association in 1981. Mexico debuted internationally at the 1982 World Kendo Championship in São Paulo. *Direction* -The Mexican Kendo Federation (FMK, https://kendomex.com/), established in 1985, has since promoted Kendo through training, exams, and national championships. Mexico has participated in 10 World Championships, including Seoul (1988), Tokyo (2015), and Milan (2024), as well as multiple Latin American championships, showcasing its growing presence in the sport.

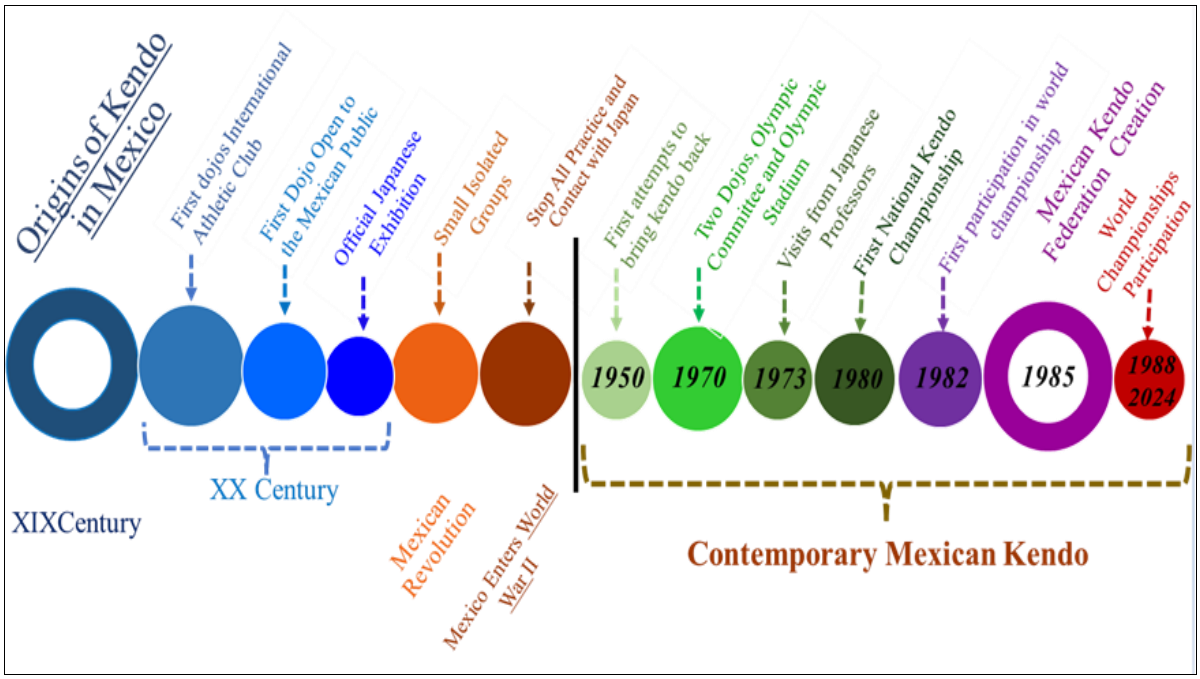

Fig 1: The Mexican Kendo Timeline

1.2.1 Origin
The origins of Kendo in Mexico trace back to 1882, coinciding with the establishment of diplomatic relations between Japan and Mexico and the arrival of Japanese diplomats. Early in the 20th century, the first dojos, including the notable "Club Atlético Internacional" in Mexico City, emerged. Kendo was further popularized by exhibitions held during the Japanese delegation's visit for Mexico's Independence centennial. However, the Mexican Revolution (1910) and subsequent turmoil, along with the disruption caused by World War II, hindered the widespread practice of Kendo. Efforts to revive Kendo began in the early 1950s, linked closely to the rise of other martial arts like Judo, Karate, and Taekwondo. By the early 1970s, two significant Kendo groups were established: one at the Olympic Stadium Gymnasium in Ciudad Universitaria, led by Professor Guillermo Hoffner, and another at the Mexican Olympic Sports Center (CDOM) founded by Alberto Breamuntz. The

first National Kendo Championship in Mexico was held in 1980, leading to the formation of the Mexican Kendo Association in 1981. This development allowed Mexico to debut in international competition at the Fifth World Kendo Championship in São Paulo, Brazil, in 1982.

1.2.2 Direction
The formal establishment of the FMK on October 11, 1985, marked a significant milestone, with its mission to promote Kendo through the formation of groups, instruction, grading exams, and annual national championships. Since then, Mexico has been an active participant in 10 world championships, including events in Seoul (1988), Toronto (1991), Paris (1994), Santa Clara (2000), Taipei (2006), São Paulo (2014), Novara (2012), Tokyo (2015), Incheon (2018), and Milan (2024). Additionally, Mexico has competed in Latin American championships in Quito (2010), Mexico City (2011), Medellin (2013), Merida (2014), Viña del Mar (2016), Corrientes (2017), and Cali (2018).

2. Current status of kendo in Mexico
2.1 Mexico's Socioeconomic and Health Overview
Before we go into the specific aspects and characteristics of Mexican kendo, it is important to first understand the broader context of the country itself. By gaining insight into Mexico's unique circumstances, we can better appreciate the challenges and opportunities that shape the practice of kendo. Mexico is a country of contrasts. With a land area of nearly two million square kilometers and a population of 127 million people (INEGI, 1998), it ranks as the 15th largest economy in the world. It is a young nation with an average age of 29 years and a large, labor force (Mexico Overview, 2024) [3]. However, it also faces significant challenges. Despite its economic standing, Mexico has one of the lowest minimum wages globally, ranking 89th out of 121 countries (Minimum Wage by Country 2024, N.D.) [4]. Additionally, it has the longest average working hours among the 36 OECD member nations, Japan included (OECD, 2023) [6]. From a public health perspective, the country faces alarming trends, for example 60.2% of the population reported never engaging in physical activity in 2024 (Sports and Physical Exercise Module, 2024) [8]. Obesity is a growing issue, with 37% of adults and 36.5% of school children classified as overweight or obese. Among adolescents, the prevalence is even higher, at 40.4% (Shamah-Levy *et al*., 2024) [7]. As for other non-communicable diseases, according to the Mexican Federation of Diabetes, 47.8% of adults in Mexico suffer from hypertension and 18.4% have diabetes mellitus type 2 (Mexico Statistics, 2018) [5].

2.2 Current Situation of Kendo in Mexico
This overview provides insight into the current state of kendo in Mexico, highlighting both its strengths and weaknesses within this context (Figure 2). Unfortunately, statistical information about kendo and its practitioners in Mexico is extremely limited, and there is a notable lack of official records on many key aspects. As a member of the FMK, the lead author formally requested information on various factors, including demographic data (number of practitioners, age, gender, etc.), the number of dojos (hall of practice), and national and international rankings, among others. However, the response from the Mexican Federation indicated that they currently lack reliable data to provide. That said, the current administration is actively working to establish a comprehensive and reliable database, and they have offered to share the data once their work is complete (personal communication).

Fig. 2: Current Situation of Kendo in Mexico

Statistical data on practitioners, dojos, and rankings is limited, as the Mexican Kendo Federation (FMK, https://kendomex.com) currently lacks a comprehensive database. However, efforts are underway to establish one. The federation has 13 affiliated associations, and through personal connections, it is known that Mexico has two 7th dan and six 6th dan practitioners, all of whom achieved their ranks recently. Notably, one 7th dan and all 6th dan holders are Mexican nationals. Despite organized kendo beginning in the 1970s and the federation's establishment in 1985, progress has been uneven. Many practitioners struggle to advance beyond intermediate levels, hindering the discipline's overall growth in the country.

According to the official website of the FMK, there are 13 associations affiliated with the federation. Through direct communication with members and personal connections, it is known that within the high ranks (Kodansha), there are currently two kendokas in Mexico who hold the rank of 7th

dan, along with six practitioners at the 6th dan level. Among these, one of the 7th dan holders is Mexican, as are all of the 6th dan practitioners. Notably, all of these Kodansha grades were attained in recent years, with most 6th dan holders being contemporaries who share similar training backgrounds and levels of experience. Interestingly, earlier generations have seen slowed or stagnant development in kendo, even though some individuals from these generations served as sensei's or senpai's to the current high-ranking practitioners. Organized kendo in Mexico began in the 1970s, with the FMK officially established in 1985. Over this 40-year development period, progress has been inconsistent. Many kendokas face significant challenges in advancing beyond an intermediate level of technical training, which has hindered the overall growth and development of the discipline in the country.

2.3 Challenges and Issues in Mexican Kendo Today

The consistent advancement of Kendo in Mexico faces numerous challenges, many of which are deeply rooted in the region's unique circumstances. Among the most prominent obstacles is the lack of adequate infrastructure and equipment, a universal issue in many sports. The size of the country exacerbates these issues, as transportation difficulties and limited training spaces hinder practitioner's ability to train regularly and at a high level without risks. Another significant barrier that remains on the outskirts is the lower visibility and diffusion of kendo in Mexico, which naturally results in a smaller number of practitioners. In Mexico, many kendokas begin training as adults, which affects their long-term development and competitive potential. This contrasts sharply with Japan, where most practitioners start young and benefit from a well-established support system.

Adding to these problems is the limited availability of experienced instructors. While Mexico has recently made important advances by achieving its first Kodansha ranks of 6th and 7th Dan., the overall lack of high-level masters remains a pressing concern. This absence creates deficiencies in both the theoretical and practical aspects of training. Often, practitioners will face periods of practice without any kind of methodology or planning and of course without an experienced sensei to guide them properly. This tendency leads practitioners to replicate the training methods they experienced under more senior instructors. However, they may lack of a comprehensive understanding of the theoretical, technical aspects and methodologies that create an effective practice. As a result, practitioners are at risk of developing bad habits or misinterpreting fundamental techniques. Over time, these errors can become deeply rooted, making them difficult to identify and requiring significant time, effort, and guidance to correct. This cycle not only slows individual progress but also impacts the overall progress within the country. In addition, the shortage of instructors with expertise in athletic training and sports coaching results in inadequate physical preparation, a lack of systematic training methods, and high injury rates. These factors collectively affect competitive performance and contribute to dropout rates among practitioners.

The lack of pedagogical resources further complicates the development of kendo in Mexico. Most high-quality instructional materials are available only in Japanese, limiting the ability of Spanish or English speaking practitioners to deepen their understanding of kendo's technical and cultural aspects. For this reason, the creation of pedagogical resources aimed at addressing basic knowledge gaps is considered essential. Such resources could offer beginners and group leaders a structured framework to follow, enabling them to avoid developing bad habits and build a strong foundation early in their training. Despite these barriers, the resilience and determination of the Mexican kendo community provide a foundation for progress. Establishing clear, accessible training resources and fostering the development of systematic coaching frameworks could significantly improve the quality of practice. By addressing these challenges, Mexico has the potential to bridge the gap with more advanced kendo nations and secure a brighter future for the art. With this background, the lead author embarked on the study of kendo in Japan, in context of his passion as a kendoka for 15 years and taking into account his profession as a physiotherapist in order to contribute to the development of kendo in Mexico, a long-term goal (Figure 3).

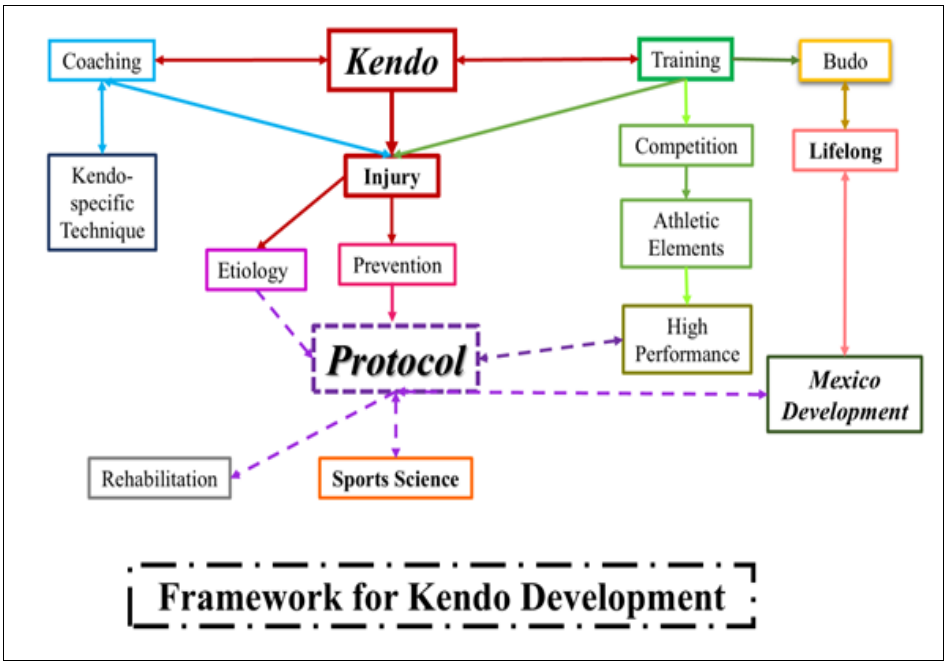

Fig 3: Framework for Kendo Development

This schematic map was created during the research project's initial phase, visualizing ideas from early discussions, advisor input, and literature reviews. At its center is Kendo, symbolizing its core role, with related elements branching out to represent its development and practice.

Left Side

- **Coaching:** Emphasizes skilled instructors teaching techniques, strategies, and discipline.
- **Right Side:** Training and Performance *Training:* Structured practice sessions to build skills, endurance, and mental strength.
- **Performance:** Applying techniques in competitions and striving for excellence.

Japan and Mexico

- **Japan:** Represents Kendo's traditional roots, influencing its techniques and philosophies.
- **Mexico:** Highlights Kendo's adaptation to a different cultural context, with unique challenges and opportunities.

Additional Elements

- **Injury Prevention:** Focuses on safety, injury causes, and recovery.
- **Budo:** Acknowledges Kendo's cultural and philosophical depth beyond sport.
- **Sport Science:** Integrates scientific principles to enhance training and performance.
- **Lifelong Learning:** Stresses continuous improvement and dedication in Kendo practice.
- **Conclusion:** This map outlines a holistic framework for Kendo development in Mexico, balancing tradition, modern methods, and regional influences. By implementing injury prevention and performance enhancement protocols, practitioners can maintain consistent training, reduce downtime, and optimize physical and mental conditioning. These efforts create a sustainable environment for Kendo's growth, enabling practitioners to reach their full potential while minimizing risks.

3. What next for Mexico kendo?

3.1 Academic Rationale and Gap in Research

For Mexico, this research ultimately aims to develop a scientifically-supported protocol to enhance the safety and performance of Mexican kendokas. Currently, no formal injury prevention protocols could be found in the literature related to Kendo training. Most of the available research primarily focuses on common types of injuries without adequately addressing preventive or treatment measures. Additionally, these studies are often published in Japanese language, making them less accessible to international practitioners. This knowledge gap leaves kendo practitioners vulnerable to injuries that could potentially be avoided. Ultimately, this not only impacts individual practitioners but also hinders the global development of kendo within a country. By creating a structured framework for safe and effective training, this study seeks to address this need and support the growth of Kendo in Mexico while fostering a deeper connection to its Japanese heritage. For Japan, this study provides valuable insights into how traditional Kendo methodologies can be adapted for international practitioners. Analysing the experiences of Mexican kendokas highlights opportunities to refine global training practices and encourages a broader dialogue on making Kendo accessible and relevant across diverse cultural contexts. Ultimately, this research seeks to bridge cultural and methodological gaps in Kendo by addressing the absence of injury prevention protocols and promoting sustainable, inclusive practices (Figure 4). In doing so, it aims to contribute to a global Kendo community that respects the art's traditions while embracing innovation, ensuring its vitality in an interconnected world.

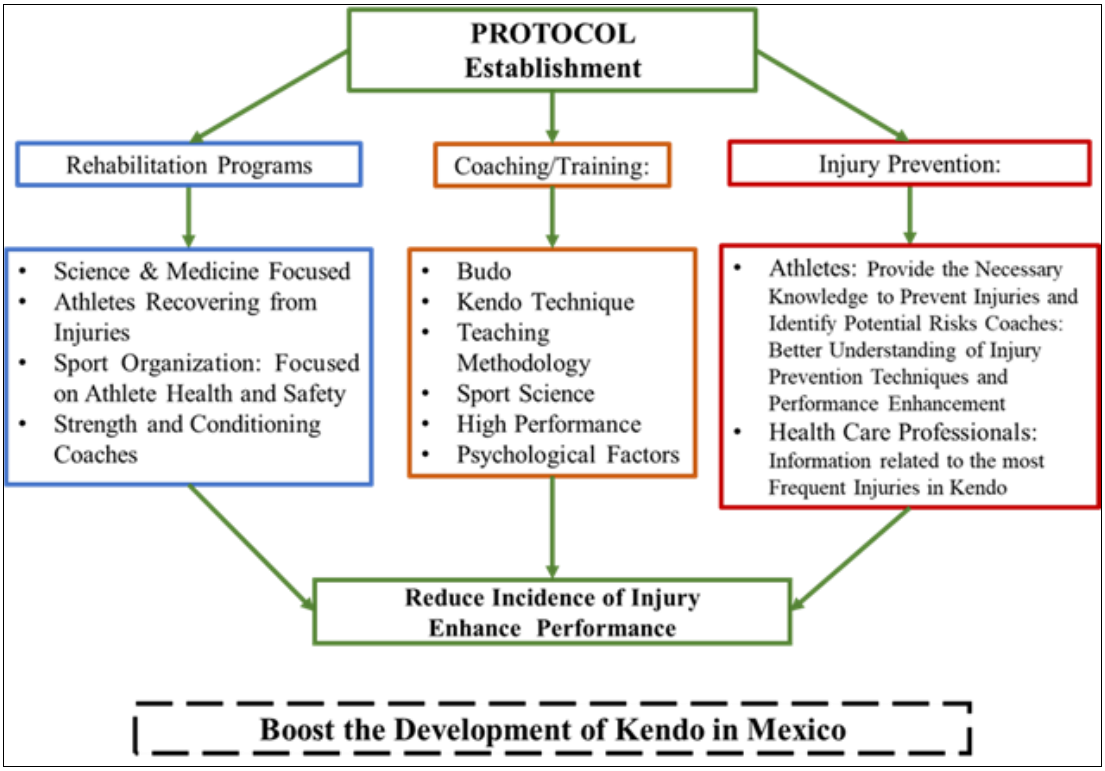

Fig 4: Simplified overview of the proposed research idea

During the conception of this project, it was decided that the primary goal of promoting the development of kendo in Mexico should encompass a comprehensive approach, integrating rehabilitation, training, and sports instruction specifically tailored for kendo. This holistic strategy is grounded in a focus on injury prevention and performance improvement, ensuring that athletes are well-prepared, safe, and capable of achieving their highest potential. Central to this approach is the integration of science and medicine, leveraging sport science principles to better understand injury prevention and performance enhancement. This scientific focus is balanced with a deep respect for the traditions of Budo, preserving the cultural and philosophical aspects of kendo. A key component is the emphasis on identifying potential risks and equipping athletes and coaches with the knowledge to mitigate these risks effectively. The project also underscores the importance of collaboration with healthcare professionals to address the most frequent injuries in kendo and develop strategies to reduce their incidence. Additionally, psychological factors are considered to support the mental and emotional well-being of athletes, further enhancing their overall performance and recovery. By combining these elements, the initiative aims to reduce injury rates, improve athlete performance, and ultimately foster the growth of kendo in Mexico, creating a thriving community of well-trained and resilient athletes.

3.2 The emerging research question and objectives

With the concept established, the purpose of this study is to develop an injury prevention protocol tailored for Mexican kendo practitioners. This protocol aims to support the growth of kendo within the country by improving the overall quality of practice and addressing the existing knowledge gaps. The research question and objectives, which will guide this study, are outlined below.

3.2.1 Research Question: Can an injury prevention protocol be tailored to the most frequent injuries in Kendo for Mexican kendokas? Can this support the development of correct Kendo practice by enhancing safety and overall quality of practice? By this consequence, will it help reduce the gap between Mexico and Japan?

3.2.2 Research Objectives

In order to fulfil the study aim, the current research will be guided by the following objectives

- **Objective 1:** Design a comprehensive protocol for Mexican kendokas that focuses on injury prevention and performance optimization. This protocol will include practical guidelines and recommendations tailored to the needs and conditions of practitioners in Mexico.
- **Objective 2:** Develop a theoretical framework to analyze the etiology of the most common injuries in Kendo, considering biomechanical, physiological, and environmental factors. This framework will serve as a foundation for evidence-based training practices.
- **Objective 3:** Investigate and assess the methodologies and characteristics of Kendo training in Japan, with a focus on their applicability to the Mexican context. This analysis will consider cultural, physical, and environmental adaptations necessary to minimize injuries and enhance performance (Figure 5).

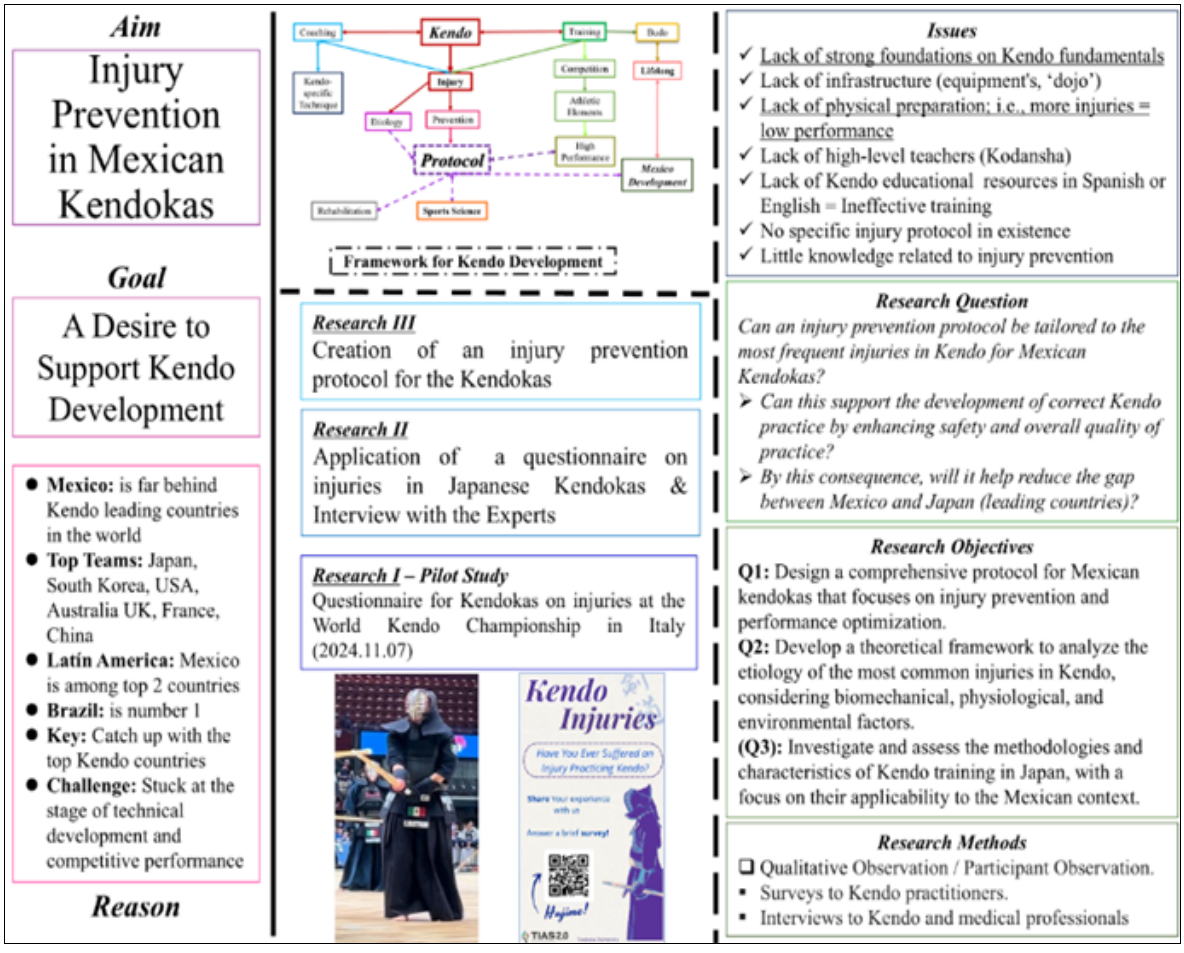

Fig 5: The Research Design

The objective of this research effort is to create an accessible and easily applicable injury prevention protocol for Mexican kendokas. This idea came from a desire to support the development and evolution of kendo in Mexico. To accomplish this goal, it was necessary to consider both my personal and professional skills in order to establish realistic possibilities within my capabilities, as well as to understand the historical context and the current state of kendo in Mexico. When we consider the performance of Mexican kendokas in international tournaments (such as the World Kendo Championship and various Latin American tournaments) as well the number of individuals holding Kodansha ranks (6th, 7th, and 8th dan), Mexico currently ranks approximately 4th in the Americas (after the United States, Canada, and Brazil, with Mexico and Chile following) and between 2nd and 3rd place within Latin America (with Brazil, Mexico, and Chile). This regional positioning is particularly relevant since the FMK is part of the Latin American Kendo Confederation (CLAK, https://clakendo.org/). Given that the contemporary history of kendo in Mexico dates back to the early 70s, it could be argued that Mexican kendo has been in a plateau that has been difficult to overcome Center up: This figure, is the schematic representation of the formulation of the original idea that eventually led to the delimitation and creation of the current research idea. This began with an interest in promoting the development of Kendo in Mexico, this leading to a comparative observation between Mexico and Japan. The focus includes the methods of teaching (coaching), the training methodology and approach, and the technical level of practitioners and instructors (professional preparation). Right: Although recent years have seen an increase in Dan ranks within the country, including the attainment of 6th and 7th dan Kodansha ranks (for the first time in Mexico's history), there remain fundamental challenges impacting kendo's growth. Among these is the difficulty of accessing a high-level, experienced master to guide students along the long path of kendo (shitei no michi). This gap has created conditions where both theoretical and practical aspects of training are lacking. In addition to this, there is a lack of knowledge regarding athletic training and coaching. These deficits lead to issues such as inadequate physical preparation, the absence of a systematic approach to coaching and training, and consequently, high injury rates, poor competitive performance, and practitioner dropout. Additionally, the challenges faced by Mexican kendo extend beyond technical training and learning. Issues such as inadequate infrastructure, transportation difficulties (as Mexico is a large country), and limited access to equipment (such as bogu and shinai) further interfere, at various levels, with the development of Mexican kendokas. In light of the previous analysis, the following research question was formulated: *Can an injury prevention protocol tailored to the most frequent injuries in kendo support the development of correct kendo in Mexico by enhancing safety and overall practice quality, and as a consequence, reduce the gap between Mexico and Japan?* Center Down: To address this question, it was decided to analyze, through observation and interviews, the training methodology used in Japan (ranked #1 globally) and compare it with Mexico, and determine which aspects could be adapted to the Mexican context. In parallel, a theoretical framework for the etiology of the most common injuries in kendokas from both Mexico and Japan will be established using questionnaires and a review of existing literature. During the development of this research, the 19th World Kendo Championship took place in Milan, Italy, bringing together kendokas from around the world. This provided a unique opportunity to conduct a pilot study, consisting of a 20-question survey on kendo-related injuries, which was completed by 115 participants from various nationalities (excluding Japan). The survey yielded data on injury frequency, mechanisms of injury, consequences, treatment, personal opinions, and other relevant aspects. Building on the insights from this survey, the plan is to administer a translated version of this questionnaire to Japanese kendokas and conduct interviews with experts in kendo and sports science who can contribute to the success of this project. Finally, using the information gathered, this research aims to provide the necessary tools to develop an injury prevention protocol for Mexican kendokas that is both easy to implement and highly effective.

4. Challenges to the research and expected outcomes

One significant challenge is finding a Kendo expert who also possesses medical or sports science training to provide specialized guidance on injury prevention. This combination of expertise is quite rare, making it difficult to obtain precise and informed advice for this specific area of study. Another challenge involves recruiting a Japanese sample for the injury questionnaire that is equal to or larger than the sample used during the World Kendo Championships (WKC) in Milan, Italy. Achieving this will be crucial for ensuring a robust and meaningful comparison between the two datasets. A potential limitation is identifying a suitable location to observe high-level Kendo practice. Securing such a venue may be necessary to gain valuable insights and, possibly, to implement the finalized protocol effectively. However, with challenges come opportunities. It is hoped that the results of this research will contribute to the development of effective strategies to address these challenges, ultimately fostering the growth and improvement of kendo practice in Mexico. In summary, although research on Kendo-related injuries does exist, there is currently no holistic prevention protocol specifically designed for Kendo practice, as there is in other disciplines. Developing such a protocol would represent an important step forward for the Kendo community worldwide. Moreover, it could serve as a valuable tool to support and accelerate the development of Kendo, particularly in countries outside Japan.

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