






Risk Factors and Preventive Strategies of Musculoskeletal Injury among Hapkido Athletes: Indonesian Coaches' Perceptions and Practices

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Abstract. Given the rising popularity of Hapkido in Indonesia, this research aimed to evaluate the coaches' perspective on the risk factors and preventive strategies for musculoskeletal injuries among Indonesian Hapkido athletes. The study was a cross-sectional survey of 44 Indonesian Hapkido coaches. Data analysis was conducted using descriptive statistical methods to understand the perception of the coaches on the risk factors of musculoskeletal injuries and the injury prevention strategies practiced by coaches in Indonesia. The findings of this study indicated that the three most risk factors of injuries were insufficient warm-up (36%), lack of experience (18%), and incorrect techniques (18%), while the three most prevalent preventive measures practiced by coaches were ensuring sufficient warm-up (35%), employing safety equipment (33%), and implementing a proper training program (25%). In conclusion, this study highlights the importance of effective warm-up routines, refining techniques, utilizing safety gear, and developing well-structured training plans as strategic preventive measures for musculoskeletal injuries among Indonesian Hapkido athletes.

Keywords: Hapkido, Coaches' Perspective, Musculoskeletal Injuries, Preventive Strategies, Indonesia.

1 Introduction

Hapkido, a martial art that originated in Korea, is characterized by its combination of strikes, joint locks, and throws. Like other martial arts and combat sports, Hapkido embodies heightened musculoskeletal injury susceptibility due to intense physical demands during training sessions and competitions. Several studies have provided some information regarding injuries to Hapkido athletes worldwide.

A study conducted on Hapkido athletes in Korea reported that the most common sites of injuries were in the head and lower limbs, and the most common injuries were minor and moderate [1]. Similarly, also showed that injuries to the upper and lower limbs were also the most common among martial mixed art athletes, with injuries to the knee and ankle being the most common injuries to the lower limbs [2]. The study also shows that overtraining and lack of warm-up before practice or compe-

tion are significant risk factors for injury among martial mixed art athletes. Furthermore, another study also showed that injuries to the upper and lower limbs were the most common in Hapkido athletes during competition, followed by injuries to the head and neck. Common injuries include bruises, dislocations, broken bones, and injuries to muscles or ligaments [3]. Head and neck injuries are severe and fatal if not treated quickly and appropriately [4,5]. Those studies highlight the high risk of musculoskeletal injuries among Hapkido athletes. Understanding the risk factors and preventive strategies, thus, are required for minimizing the musculoskeletal injury risk among Hapkido athletes.

Studying the coaches' perceptions of the risk factors and preventive measures for is essential for preventing musculoskeletal injuries [6]. Their perception and practices offer valuable insights as coaches know firsthand the challenges in Hapkido training and competition. Thus, their insights are expected to explain factors contributing to musculoskeletal injuries. By understanding these causes, targeted interventions can be formulated to address the root issues, thus reducing injury risks [7]. Moreover, coaches are pivotal in shaping athletes' training routines, techniques, and safety awareness. Their perspectives on preventive measures encompassing warm-up protocols, technique refinement, and protective gear can impact athletes' safety during training and competition. Coaches' knowledge informs evidence-based practices that can be integrated into training curricula, instilling injury prevention as a foundational aspect of athlete development [8].

The coaches' perceptions are also expected to offer a localized perspective that acknowledges the specific conditions and challenges prevalent within the Indonesian context since cultural, environmental, and contextual factors can influence injury causation and prevention strategies [9]. Therefore, understanding this local context can contribute to the formulation of targeted preventive strategies, align with local conditions, enhance athlete safety, and elevate coaching practices among Hapkido training practices in Indonesia. Therefore, this research evaluated the coaches' perspective on the causes and preventive strategies for musculoskeletal injuries among Indonesian Hapkido athletes

2 Method

2.1 Study Design

The study was cross-sectional observational research targeted at Indonesian Hapkido coaches from various regions in Indonesia.

2.2 Research Participants

The research participant were coaches with diverse experience levels, ranging from novice to seasoned professionals. They were included to capture a comprehensive spectrum of perspectives. These coaches were actively training and mentoring Hapkido athletes, making them well-positioned to provide valuable insights into injury causation and prevention strategies. The participants were selected based on their af-

filiation with recognized coaching associations and their proven track record in coaching Hapkido athletes. Their involvement contributes to the study's objective of understanding coaches' viewpoints on musculoskeletal injury prevention in the Indonesian Hapkido context.

2.3 Data Collection and Instrumentation

The study used a structured questionnaire as the primary instrument to collect data on coaches' perceptions of the risk factors and their preventive strategies for musculoskeletal injuries among Hapkido athletes in Indonesia. The questionnaire also contained sections that explored coaches' experience levels, coaching practices, and social demographic status (i.e., age and sex)

2.4 Statistical Analysis

The data was analyzed using a descriptive quantitative approach, summarizing coaches' perceptions of the risk factors and preventive measures for musculoskeletal injuries among Hapkido athletes in Indonesia.

3 Result

Of the 50 coaches responding to the questionnaire, 44 completed the questionnaire and were in this study. Of these coaches, 34 (77%) of them were men. Their age ranged from 18 to 59 years, with an average age of 38 (SD=11.5). Table 1 illustrates the coaches' experience as well as the frequency and duration of their coaching activities per week

Table 1 Coaches' experience, frequency, and duration of coaching per week (n=44)

	Minimum	Maximum	Means	Std. Deviation
Coaching experience (year)	0.3	10	4.4	2.9
Frequency of coaching per week	1	6	3.1	1.31
Coaching duration per week	0	12	4.4	3.12

The coaches come from 15 of 34 provinces in Indonesia. The four provinces with the largest representation were Yogyakarta, West Java, Lampung, and Central Java. A total of 29 of these coaches represented one dojang; 3 coaches did not mention the dojang they represented. Meanwhile, 12 coaches represented five dojangs. Collectively they trained 1035 athletes. Of which 622 (60%) are male athletes. Most athletes came from Yogyakarta, Lampung, Central Java, West Java, and North Sumatra.

Figure 1 and Figure 2 illustrate the risk factors and preventive strategies reported by coaches.

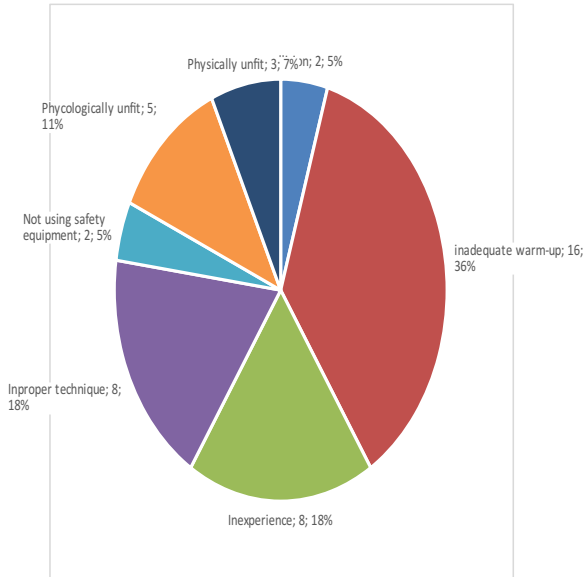


Figure 1. The injury risk factors reported by coaches

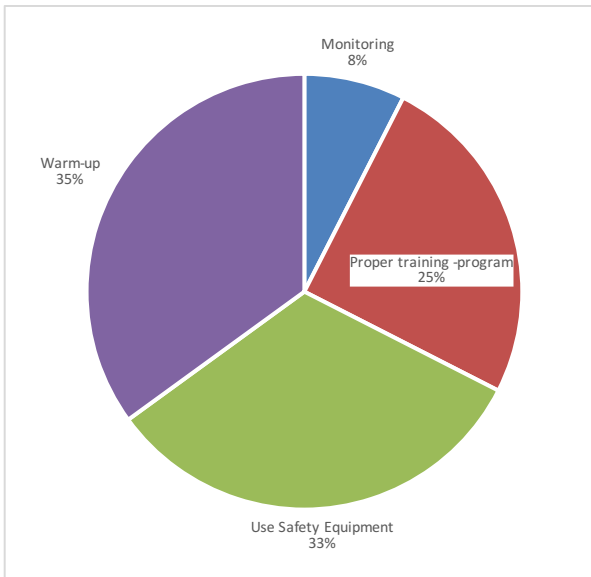


Figure 2. The preventive measures reported by coaches

As illustrated in Figure 1 and 2, the three most common injuries were inadequate warm-up, lack of experience, and inadequate techniques, while the three most common preventive measures were ensuring adequate warm-up, using safety equipment, and conducting a proper training program.

4 Discussions

The findings of this study offer valuable insights into Indonesian Hapkido coaches' perceptions regarding the causes of musculoskeletal injuries among Hapkido athletes in Indonesia, as well as their views on effective preventive measures. The analysis revealed that coaches identify inadequate warm-up as a significant contributor to injuries. Moreover, lack of experience and improper techniques were key to injuries. These findings underscore the critical role of proper warm-up routines, gradual skill development, and mastery of techniques in injury prevention. In terms of preventive measures, coaches emphasized proactive strategies. Ensuring sufficient warm-up exercises emerged as a primary concern for coaches, aligning with their recognition of inadequate warm-up as a major injury cause. Additionally, most coaches emphasized the use of safety equipment, highlighting its role in minimizing injury risks during training and competition. Moreover, coaches acknowledged the significance of well-structured training programs.

This study completed findings from previous studies reporting factors that influence the occurrence of injuries in Hapkido athletes are reported to include the athlete's experience, age, gender, and level of competition. The results showed that athletes who were more experienced and older had a lower risk of injury, while younger and new to the sport had a higher risk of injury [2]. In addition, the study also shows that female athletes have a higher risk of injury than male athletes. Besides that, the study also showed that physical and psychological fatigue levels can affect the risk of injury in the Hapkido athletes [2]. The results showed that athletes who feel more physically and psychologically tired have a higher risk of injury during the competition [10,11]. Regarding injury prevention, several studies have shown that adequate warm-up before practice or competition can help reduce the risk of injury in Hapkido athletes. Adequate warm-up can increase body temperature and prepare muscles and joints for training or competition [12,13], thus reducing the risk of musculoskeletal injury.

This study provides valuable insights into coaches' perceptions of musculoskeletal injury causes and preventive measures among Hapkido athletes in Indonesia. However, this study was not without limitations. The cross-sectional design captures a single point in time and does not offer insights into the dynamic nature of coaches' perceptions over time. The reliance on self-reported data introduced the possibility of response bias, where coaches may provide socially desirable answers. Additionally, the findings were specific to the context of Hapkido in Indonesia and might not be generalizable to other martial arts or geographical settings. Future research endeavors could address these limitations and expand the knowledge in this area. Longitudinal studies that follow coaches' perceptions over time could provide a deeper understanding of how these views evolve and impact injury prevention practices. Qualitative studies could delve into coaches' practical challenges in implementing preventive measures and provide a more nuanced understanding of their experiences. Moreover, comparative studies across different martial arts and regions could explain variations in coaches' perceptions and strategies.

5 Conclusion

This study highlights the importance of effective warm-up routines, refining techniques, utilizing safety gear, and developing well-structured training plans as strategic preventive measures for musculoskeletal injuries among Indonesian Hapkido athletes. The identified risk factors and preventive measures offer a roadmap for targeted interventions, fostering safer training environments for Indonesian Hapkido Athletes. It is recommended for future research include qualitative studies to explore coaches' experiences in implementing preventive measures and longitudinal studies to quantify the impact of such measures on injury rates.

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