



Health and Injury Development in Table Tennis Players: A Literature Review

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Abstract

Athletes' and coaches' lack of knowledge about health and injury progression is also a major factor in the occurrence of injuries among table tennis athletes. The purpose of this study was to identify common injury patterns, risk factors that influence injury progression, and effective injury prevention and management strategies. The method of this study was a literature review regarding the development of health and injuries in table tennis players obtained from sciencedirect, Eric, and Google Scholar. Data analysis techniques were conducted by citing studies from around the world, identifying common injury patterns, risk factors that influence injury development, and effective injury prevention and management strategies. Key findings highlighted the importance of a holistic approach that encompasses physical, mental and social aspects in maintaining optimal health and performance for table tennis athletes. This study also emphasizes the need for integration of recent findings in research to support innovation in injury prevention strategies.

Keywords: Table Tennis; Athlete Health; Sports Injuries; Literature Review

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A. Introduction

The sport, especially table tennis, has grown so fast that it has become popular in many communities around the world including in Indonesia (Rachman et al., 2017). Many educational institutions offer table tennis training to their students because of the bright prospects in the world of sports (Prasetyo et al., 2021). The regeneration of players in Indonesia has not been able to manage its assets even though improving health or physical fitness is a way to fill leisure time (Prasetyo et al., 2021).

This is due to the limited number of people, managers, and coaches who have the necessary experience to improve achievements in the game of table tennis. There are also limitations in the financial resources needed for the development and progress of table tennis. There are also limitations in the facilities that can be used for the advancement of the sport. Finally, there are limitations in the coaching provided by the government or the community to hold tournament championships in table tennis games (Junaidi et al., 2018).

Table tennis is a game in which players use a small ball called ping pong and a bat made of a rubberized bet on a table specially designed for the game (Hariyanto & Firmansyah, 2020). Table tennis, also

known as "ping pong," is a type of sports game played by two people for singles and two pairs of doubles players-boys, girls, or mixed-played on a table with a court bordered by a net (Permatasari, 2017). According to the number of players, table tennis is the most famous sport in the world. The game requires players to think quickly and precisely. It is no surprise that table tennis players are very prone to injuries. Players and athletes fear injury the most, but there are also players who are lucky to have minor injuries (As, 2020).

To exercise properly, one must also have a good physical condition so that they can perform sports activities without fatigue (Kurniawan et al., 2020). Conversely, if a person does not have good physical condition, they will find it difficult to perform sports activities without fatigue. Physical condition is a whole combination of parts that cannot be separated, both in improvement and maintenance. This means that every aspect must be improved in an effort to improve physical condition (Lestari et al., 2019) To excel in sports, an athlete must have good physical condition. To reach the highest level of their ability, athletes must perform systematic and programmed exercises.

In the game of table tennis also requires the completeness of a good physical condition in order to reach the peak of its

performance (Ridha & Rachman, 2023). Because, not only good techniques but the components of physical condition in athletes are also determinants of an athlete's achievement. With this, attention is not only focused on mastering the techniques and skills in the game, but the physical component needs attention.

In addition to physical condition, injury is also one of the factors that need to be considered by table tennis athletes. Injuries can have a negative impact on the achievements of table tennis players or athletes, such as disrupting performance, physical and mental conditions (Prasetiyo et al., 2021). Injuries can occur during training or competition and can be caused by several factors, such as: (1) excessive stress during training, (2) incorrect application of tactics or techniques, (3) incorrect application of techniques during falls, (4) lack of warm-up, stretching, or cooling. Injuries sustained by a player or athlete can lead to decreased performance, trauma, psychological disturbance, physical decline, and even permanent disability or even death (Ridha & Rachman, 2023).

Based on a review of literature from various parts of the world related to the development of health and injuries in table tennis athletes, several significant problems were revealed. One of the main problems is

that injuries often occur to parts of the body that are frequently used in repetitive movements, such as the wrist, elbow and shoulder (Shintya et al., 2024). These injury patterns can impair athletes' performance and negatively impact their quality of life off the court. In addition, the literature review also highlighted various risk factors that can lead to injuries in table tennis athletes, including improper playing techniques, excessive training intensity, lack of adequate warm-up, and lack of adequate rest between training sessions and matches (Ilham et al., 2024). With a deeper understanding of these injury patterns and risk factors, more effective prevention strategies can be designed to improve the health and performance of table tennis athletes.

(Durahim et al., 2022) reveals that every human activity, including sports activities, is fraught with the risk of injury. (Rahmat Sanusi, 2020) There are many possible injuries in sport, with the highest percentage being sprain, strain and dislocation of the ankle and knee. Injured athletes usually do not realize they are injured and continue to push themselves to do the training or finish the match. (Over use) continuous or excessive use of muscles and (overtraining) excessive training forcing themselves to train beyond their limits to achieve targets can also be a cause

of injury. On the other hand, Athletes' and Coaches' lack of knowledge about injuries is also a big factor in causing injuries.

The number of problems related to the development of health and injury in table tennis sports activities, it is necessary to have good and correct information that discusses the development of health and sports injuries in a table tennis athlete so that it can reduce the level of injury experienced by an athlete and can be an effective way to overcome sports injuries. Based on these problems, this study will define the development of health and injury in table tennis athletes based on literature reviews from various countries, so that it can be a finding to be applied to table tennis athletes in Indonesia.

B. Methods

This research will conduct a literature review. First, this research will search for relevant literature from various databases, such as sciencedirect, eric, and google scholar. To provide a broad literature framework, the literature search will concentrate on the topics of table tennis, health and injury development, and other related topics. Furthermore, the requirements for including and excluding literature from the review will be established. Year of publication, relevance

C. Result and Discussion

Result

to the research topic, and research methodology used in the publication may be part of the criteria. The literature research will remain focused on the most relevant and high-quality information with this method. This will create a strong knowledge base for an in-depth analysis of the development and injuries of table tennis athletes.

Comprehensive research objectives will be supported by these steps to ensure that the literature research will include an up-to-date and thorough understanding of the development and injuries of table tennis athletes. The analysis in this study will involve a number of systematic procedures to gain an understanding of table tennis athletes' development and injuries. First, the relevant literature will be examined to find the main issues that arise, focusing on the development and injuries of table tennis athletes. Next, an evaluation of the research methodology of the included literature will help assess the strengths and weaknesses of the research that has been conducted, providing a basis for an assessment of the reliability of the findings. This analysis will also include the identification of development and injuries of table tennis athletes in Indonesia.

Based on the results from the analysis of articles on health and injury development in table tennis players, several important findings were revealed. Firstly, there is a common pattern of injuries among table tennis players, with injuries to the wrist, elbow, and shoulder being the most commonly reported. Factors such as improper playing techniques, excessive training intensity, and lack of adequate rest and recovery were identified as the main causes of these injuries. Furthermore, the literature review also highlighted the need for more effective injury prevention strategies, including an emphasis on proper warm-up, correct playing techniques, training intensity management, and comprehensive rehabilitation. In addition, efforts to improve understanding of the risk factors that contribute to injury and strengthen multidisciplinary approaches in athlete health management are also an important focus. Thus, this literature review provides a solid foundation for the development of more holistic and effective strategies in maintaining the health and performance of table tennis players, especially Indonesian table tennis athletes.

Discussion

Health Development of Table Tennis Athletes

Based on the results of research related to the development of table tennis athletes' health reveals several important aspects, namely: to understand that athlete health is complex and involves various factors, including physical, mental, and social conditions. In the context of table tennis, physical health is a top priority, as frequent injuries can hinder athletes' performance and limit participation in training and matches.

Based on research conducted by (Li et al., 2021) highlights that table tennis players are prone to injuries to parts of the body that are frequently used in repetitive motions, such as the wrist, elbow and shoulder. The contributing factors mentioned by (Dudley et al., 2023) such as improper playing techniques, excessive training intensity, and lack of adequate rest can increase the risk of these injuries. Therefore, the healthy development of table tennis athletes should include effective injury prevention efforts, such as a good warm-up before training or matches, the use of ergonomic playing techniques, and proper management of training intensity.

In addition, according to (Shrom et al., 2023) It is also important to pay attention to the mental and social health aspects of table tennis athletes. Pressure from competition, high expectations, and physical and emotional changes that occur during adolescence can affect the mental health of

athletes. In this regard, social support from coaches, teammates, and family can play a crucial role in maintaining the mental health and well-being of athletes. Thus, the development of table tennis athlete health emphasizes the need for a holistic approach, which includes physical, mental, and social aspects. Effective injury prevention efforts and adequate social support are key to ensuring the optimal health and performance of table tennis players.

Other than the findings mentioned earlier, the results of the research conducted by (Amawi et al., 2023) also, it contributes significantly to deepening the understanding of the development of the health of table tennis athletes. Several studies highlight the importance of proper nutrition in supporting the health and performance of athletes, including energy intake, protein, and other nutrients needed for muscle recovery and regeneration. Research also indicates that effective recovery after training and competition is crucial for preventing injuries and promoting optimal physical development.

Furthermore, several studies conducted by (Lundqvist et al., 2023) have explored the influence of environmental factors, such as temperature and humidity, on the health of table tennis athletes. Unsuitable environmental conditions can increase the risk of injury and disrupt athletes' performance. Therefore, it is important to

consider these environmental factors when designing training and competition programs.

Research also indicates that a better understanding of the biomechanics of table tennis movements can help prevent injuries and improve game efficiency. By analyzing athletes' body movements in detail, vulnerable areas prone to injury can be identified, and technical solutions to reduce the risk of injury can be found.

The Development of Injuries in Table Tennis Athletes

The development of injuries in table tennis athletes is an important topic that requires in-depth understanding to improve their health and performance. The results of literature reviews on injuries in table tennis athletes reveal several relevant aspects to be discussed in detail.

Firstly, injury patterns in table tennis athletes are often associated with repetitive movements required in the game (Prasetyo et al., 2021). Injuries to the wrists, elbows, and shoulders often occur due to repetitive pressure on these body parts during training and matches (Foley Davelaar et al., 2023). Factors such as improper playing technique, excessive training intensity, and inadequate rest can be the main triggers for injuries (Patel et al., 2024).

Furthermore, it is important to understand the risk factors that influence

the development of injuries in table tennis athletes. (Prasetyo et al., 2021) It reveals that players who overly focus on technical training without considering physical aspects and recovery tend to have a higher risk of injury. (Prasetyo et al., 2021) too moreover, lack of flexibility, specific muscle weaknesses, and muscle strength imbalances can also increase the risk of injury.

Furthermore, injury prevention strategies become an essential part of table tennis. Based on (Martin-Garetxana et al., 2024) It emphasizes the importance of proper warm-up before training or matches to reduce muscle stiffness and increase blood flow to injury-prone areas. Additionally, (Prasetyo et al., 2021) regular strength and flexibility exercises can help strengthen muscles and ligaments and improve joint stability, thus reducing the risk of injury.

In the context of injury management, comprehensive and timely rehabilitation is an important step to ensure optimal recovery (Rama & Qadriina, 2024). (Frank & Oscar, 2023) It shows that a rehabilitation approach involving strength, flexibility, and balance exercises, as well as the use of advanced rehabilitation technology, can accelerate the recovery process and reduce the risk of recurrent injuries.

In addition to the findings mentioned earlier, other relevant studies also contribute valuable insights into understanding the development of injuries in table tennis athletes. (Irmawati et al., 2020) highlighting the importance of biomechanical analysis in identifying movements that may potentially cause injuries in table tennis players. By studying body movements in detail, this research can identify patterns of movement that are inefficient or increase the risk of injury, as well as design safer and more ergonomic playing techniques.

Furthermore, the research also explores the influence of external factors, such as field conditions or gaming equipment, on the risk of injury in table tennis athletes. These studies indicate that factors such as slippery field surfaces, poor lighting, or poor ball quality can increase the risk of injury, and that players and organizers need to pay attention to these factors to create a safe gaming environment (Prasetyo et al., 2021).

Furthermore, (Prasetyo et al., 2021) highlighting the psychological and emotional role in the development of injuries in table tennis athletes. Stress, anxiety, and performance pressure can affect athletes' concentration and coordination, increase the risk of technical errors, and ultimately increase the risk of

injury. Therefore, stress management and psychological support can be crucial factors in injury prevention and athlete recovery after injury.

By deepening the understanding of the findings of this research, more holistic and effective injury prevention strategies can be designed for table tennis athletes. Integrating these research findings into training and injury management approaches can help improve the long-term health, performance, and well-being of athletes.

However, the discussion also has some limitations that need to be considered. First, although the literature review provides valuable insights, there is potential for selection bias, where certain studies may be discussed more than others. Additionally, some research findings may be correlational rather than causal, so interpretations of cause-and-effect relationships should be made with caution. Finally, the discussion only covers a literature review and does not highlight new research findings conducted by the authors. Thus, the information presented may not encompass all the latest relevant aspects in the field of table tennis athlete health and injury development.

D. Conclusion

Based on the presented research findings, several conclusions can be drawn regarding the development of health and

injuries in table tennis players. The health of table tennis athletes is the result of a complex interaction between physical, mental, and social conditions. Therefore, a holistic approach is necessary to maintain optimal health and performance. Patterns of injuries in the wrists, elbows, and shoulders are common among table tennis players, with factors such as incorrect playing techniques, excessive training intensity, and insufficient rest increasing the risk of injury. Effective injury prevention efforts, including proper warm-up routines, ergonomic playing techniques, and appropriate training intensity management, are key to maintaining the health of table tennis athletes. Psychological factors, such as stress and social support, also play a crucial role in the development of athlete health, while environmental factors such as playing field conditions and equipment can also affect the risk of injury. Research continues to improve understanding of the factors influencing the health and injuries of table tennis athletes, with the integration of relevant latest findings to support innovation in injury prevention and management strategies.

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F. Conflict of Interest

There is no conflict of interest in the preparation of this article.

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