



## Sports and Psychological Resilience: The Key Role of Sports for Children

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META ANALİZ

### Abstract

This study was conducted to evaluate the impact of sports on enhancing psychological resilience in child athletes using the meta-analysis method. Meta-analysis is a method that systematically integrates existing research findings to statistically analyze general trends and effects. The study demonstrates that sports strengthen children's ability to cope with stress, enhance their self-confidence, and improve their emotional regulation capacity. It has been determined that sports activities contribute to the development of problem-solving, teamwork, and resilience skills. Moreover, team sports have been observed to exert a stronger influence on resilience compared to individual sports by reinforcing social support mechanisms. Furthermore, the findings highlight the importance of adopting appropriate pedagogical approaches within sports environments. The necessity of designing sports programs that take into account age groups, individual needs, and social contexts to support children's resilience development is emphasized. In addition to providing individual benefits, sports are also presented as a tool that fosters societal well-being. Future research is recommended to focus on designing sustainable sports programs tailored to children's age and developmental needs. Additionally, active participation in sports activities should be encouraged. Research on the role of sports in child development strongly suggests that these activities not only contribute to children's physical health but also play a crucial role in supporting their psychological well-being.

**Keywords:** Sports, Psychological Resilience, Child Athletes, Resilience Development.

## Spor ve Psikolojik Dayanıklılık: Çocuklar için Sporun Anahtar Rolü

### Özet

Bu çalışma, çocuk sporcuların psikolojik dayanıklılığını geliştirmede sporun etkisini meta-analiz yöntemiyle değerlendirmek amacıyla gerçekleştirilmiştir. Meta-analiz, mevcut araştırma bulgularını sistematik bir şekilde birleştirerek genel eğilimleri ve etkileri istatistiksel olarak analiz etmeyi amaçlayan bir yöntemdir. Araştırmada, sporun çocukların stresle başa çıkma becerilerini, öz güvenlerini ve duygusal düzenleme kapasitelerini güçlendirdiğini göstermektedir. Spor etkinliklerinin problem çözme, takım çalışması ve zorluklarla mücadele becerilerini geliştirdiği belirlenmiştir. Takım sporlarının, bireysel sporlara kıyasla sosyal destek mekanizmalarını güçlendirme yoluyla dayanıklılık üzerinde daha güçlü bir etkisi olduğu gözlemlenmiştir. Ayrıca bulgularda, spor ortamlarında uygun pedagojik yaklaşımların benimsenmesinin önemini ön plana çıkarmaktadır. Çocukların dayanıklılık gelişimini desteklemek için spor programlarının yaş grupları, bireysel ihtiyaçlar ve sosyal bağlamlar dikkate alınarak tasarlanması gerekliliğinin yanı sıra sporun yalnızca bireysel faydalar sağlamakla kalmayıp, toplumsal refahı destekleyen bir araç olduğu ortaya konulmaktadır. Gelecekteki araştırmaların, çocukların yaş ve ihtiyaçlarına uygun, sürdürülebilir spor programlarının tasarımına odaklanması önerilmektedir. Ayrıca çocukların spor etkinliklerine aktif katılımı teşvik edilmelidir. Sporun çocuk gelişimindeki rolüne dair yapılan araştırmalar, bu etkinliklerin çocukların sadece fiziksel değil, aynı zamanda psikolojik sağlıklarını da

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desteklediğini güçlü bir şekilde ortaya koymaktadır.

**Anahtar kelimeler:** Spor, Psikolojik Dayanıklılık, Çocuk Sporcular, Dayanıklılık Gelişimi.

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## **Introduction**

The purpose of this study is to examine the impact of sports on the development of psychological resilience in child athletes using the meta-analysis method. The significance of this research lies in its evaluation of the role of sports in enhancing psychological resilience among child athletes, aiming to determine whether sports serve as an effective method in this process and contributing to the existing literature.

Psychological resilience is defined as individuals' ability to effectively cope with inevitable aspects of life, such as stress, challenges, changes, and pressure (Fletcher & Sarkar, 2012). For children, in particular, psychological resilience holds critical importance as a part of their emotional and social development. Sports emerge as a powerful tool in fostering this resilience. Scientific studies have demonstrated that physical activities not only improve children's physical health but also enhance their mental health, self-confidence, and stress management skills (Connaughton et al., 2008).

Sports have the potential to expand children's social support networks, develop teamwork skills, and increase their capacity to handle emotional challenges. In team sports, children learn to collaborate, solve problems, and act in solidarity, while individual sports provide an environment that rewards self-discipline, goal-setting, and personal effort. In this context, sports equip children with the ability to be more resilient in stressful situations and to transform challenges into opportunities (Ungar, 2008).

However, it should not be overlooked that sports alone may not suffice in developing psychological resilience in child athletes, and this process needs to be effectively guided. Without the use of appropriate training methods and pedagogical approaches in sports environments, negative effects of sports may also arise. Therefore, understanding the impact of sports on children's psychological resilience requires scientifically grounded approaches to optimize this effect and minimize potential risks (Wagstaff et al., 2012).

This study aims to provide a more comprehensive understanding of how sports influence children's psychological resilience by synthesizing the existing theoretical and

empirical knowledge in the literature. Additionally, it investigates strategies to enhance the resilience of child athletes and the factors that may be effective in this process. Within this scope, the psychological benefits that sports can offer to children at both individual and societal levels will be discussed in detail.

In conclusion, this study is expected to serve as a valuable guide for educators, coaches, and policymakers who aim to enhance children's psychological resilience. Moreover, by contributing to the literature on the effects of sports on child development, it seeks to address existing gaps and propose new avenues for research in this field.

### **The Concept of Psychological Resilience**

Psychological resilience refers to an individual's capacity to adapt to challenging life conditions and emerge stronger by learning from these experiences (Masten, 2001). This concept encompasses both the individual's intrinsic motivation and the skills developed through interactions with environmental resources. Psychological resilience represents the positive adaptation demonstrated by individuals in the face of stressful events and their potential for growth during such processes (Luthar et al., 2000).

The literature emphasizes that psychological resilience is not an innate trait but rather a process that can be learned and developed (Southwick et al., 2014). It is suggested that individuals can enhance this capacity during childhood through family support, secure attachment relationships, and positive learning experiences (Rutter, 2006). Additionally, psychological factors such as mental flexibility, emotional regulation, and problem-solving skills are noted to have a resilience-enhancing effect (Connor & Davidson, 2003).

### **The Importance of Psychological Resilience**

Psychological resilience plays a crucial role in both individual well-being and social adaptation. Individuals with high levels of psychological resilience can develop more effective strategies to cope with stress, maintain healthy relationships, and exhibit a stronger attitude toward life's challenges (Bonanno, 2004). During periods of intense stress, such as traumatic events, natural disasters, or economic crises, psychological resilience has been shown to serve as a fundamental tool for safeguarding individuals' mental health (Masten & Narayan, 2012).

The importance of psychological resilience is increasingly recognized across various fields, including education, work life, and sports. Research in sports sciences, in particular,

highlights that athletes' levels of psychological resilience significantly influence their performance and stress management capacities (Fletcher & Sarkar, 2012). In this context, it is recommended that strategies aimed at enhancing resilience be prioritized not only in athletes' physical preparation processes but also in their psychological training.

### **Sports and Psychological Resilience**

The psychological effects of sports on individuals have long been a central focus of research. These studies reveal that sports activities serve as a significant tool for enhancing individuals' psychological resilience (Fletcher & Sarkar, 2012). Sports help individuals develop stress management skills, improve their emotional regulation capacities, and strengthen their ability to cope with challenges (Bennis & Pachur, 2007).

Psychological resilience in the context of sports can also be defined as the athlete's ability to maintain consistency and performance in the face of physical and mental demands (Galli & Vealey, 2008). Stressful situations encountered by athletes during training, competitions, and challenging conditions push them to develop their resilience. For instance, the effort to achieve shared goals in team sports allows athletes to benefit from social support mechanisms, which further enhances psychological resilience (Morgan et al., 2015).

### **Mechanisms Through Which Sports Enhance Psychological Resilience**

The resilience-enhancing effects of sports are generally achieved through the following mechanisms:

*Coping with Challenges:* Situations such as competition, failure, and intense physical effort encountered by athletes foster their problem-solving and stress management skills (Fletcher & Sarkar, 2012). This, in turn, helps individuals enhance their psychological resilience not only in sports but also in their daily lives (Sarkar & Fletcher, 2014).

*Goal Setting and Motivation:* Sports provide individuals with motivation to achieve specific goals. During this process, individuals develop self-discipline and gain flexibility in pursuing challenging objectives (Deci & Ryan, 2000).

*Social Support:* Social support provided through team sports or individual sports strengthens athletes' emotional regulation skills. It enables them to be more resilient during crises (Bennis & Pachur, 2007).

*Mindfulness and Self-Regulation:* Increasing levels of mindfulness during training and competitions, along with the ability to regulate oneself in stressful situations, supports psychological resilience in athletes (Birrer et al., 2012).

### **The Effects of Sports on Different Groups**

The impact of sports on psychological resilience is not limited to professional athletes. Studies conducted on amateur athletes, young individuals, and even the elderly demonstrate that regular sports activities enhance resilience. For example, research on young athletes highlights the critical role of sports in developing self-confidence and resilience (Neely & Holt, 2014). Similarly, physical activity has been found to improve the quality of life and strengthen psychological resilience in older adults (Windle et al., 2011).

Sports serve as an effective tool for enhancing psychological resilience. The resilience skills developed through sports enable individuals to become more resistant to challenging life conditions. Therefore, promoting sports activities and integrating them into individuals' lives represents a significant step toward improving the overall psychological well-being of society.

### **The Different Effects of Sports Disciplines on Psychological Resilience**

Sports disciplines are regarded as important tools for developing physical, emotional, and mental resilience in individuals. However, each sport discipline differs in its effects on psychological resilience. These differences stem from the nature of the sport, the dynamics of individual or team participation, the level of competition, and the mental skills required (Nicholls et al., 2010).

*Individual Sports and Psychological Resilience:* Individual sports require athletes to focus on improving their performance. This focus helps athletes develop self-awareness, motivation, and stress management skills (Jones et al., 2002). For example, endurance sports such as marathon running and triathlons enable individuals to build psychological resilience against challenging conditions that demand prolonged physical effort (Howells & Fletcher, 2015).

Another significant effect of individual sports is that failures or mistakes are directly attributed to the athlete's performance. This fosters self-criticism and the ability to learn from mistakes, thereby strengthening resilience (Galli & Vealey, 2008).

*Team Sports and Psychological Resilience:* Team sports require athletes to work within group dynamics. These sports enhance empathy, cooperation, and the use of social support mechanisms. The impact of team sports on psychological resilience is further strengthened by the presence of social bonds and support systems (Morgan et al., 2013).

In team sports, relying on and supporting teammates while facing challenges contributes to individual resilience. For instance, sports such as football and basketball, which involve intense physical and psychological demands in competitive settings, enhance resilience. Additionally, the commitment to team success helps maintain athletes' motivation (Bennis & Pachur, 2006).

*The Psychological Effects of Strength and Contact Sports:* Strength sports (e.g., weightlifting, wrestling) and contact sports (e.g., boxing, rugby) help athletes develop not only physical resilience but also mental toughness. Due to the competitive nature of these sports, athletes are compelled to cope with high-stress situations. Contact sports, in particular, enhance physical and emotional resilience, enabling athletes to respond quickly to sudden stressors (Mussel, 2010).

*Sports Requiring Mental Focus:* Mental resilience is often associated with sports that prioritize concentration and strategic thinking. For example, sports such as chess and archery enhance athletes' ability to sustain attention for long periods and make calm decisions under stress. These sports help develop emotional regulation and mental flexibility (Birrer et al., 2012).

*The Importance of Differences Between Sports Disciplines:* Each sport discipline supports psychological resilience through different mechanisms. For instance, endurance sports test individuals' physical and mental limits, while team sports strengthen social resilience and cooperation. Therefore, personal needs and resilience-building goals should be considered when selecting a sport discipline (Sarkar & Fletcher, 2014).

The effects of sports disciplines on psychological resilience vary depending on the nature of the sport and the individual's interaction with it. This diversity among sports disciplines offers individuals a broad range of opportunities to develop resilience in different domains. This variety provides a comprehensive perspective for research examining the psychological health effects of sports.

## **The Contribution of Sports to Children's Stress Coping Skills**

Children's stress coping skills hold a significant place among the life skills acquired at an early age. Stress coping is defined as the capacity of individuals to manage challenging life events or stressors encountered in daily life (Lazarus & Folkman, 1984). Literature frequently emphasizes that sports activities play an effective role in the development of these skills during childhood. Beyond supporting children's physical and mental health, sports contribute to the development of their emotional regulation and problem-solving abilities (Fraser-Thomas et al., 2005).

*The Impact of Physical Activity on Emotional Regulation:* Physical activities help children cope with stress by reducing levels of stress hormones such as cortisol (Penedo & Dahn, 2005). Regular physical activity has been shown to increase the endorphin hormone in children who engage in sports, thereby supporting emotional regulation processes (Dishman et al., 2006). This effect enables children to respond more calmly and balancedly when confronted with challenging situations.

*Social Support in Stress Coping:* Team sports encourage children to build social connections and adapt to group dynamics. Social support gained through sports helps children feel less isolated in stressful situations and strengthens their stress management skills (Smith, 2003). Particularly, emotional support from coaches and teammates allows children to handle difficulties more effectively (Gould et al., 2007).

### *The Impact of Sports on Children's Problem-Solving Skills*

*Competition and Stress Management:* Sports enable children to acquire strategic thinking and problem-solving skills both at individual and team levels (Holt et al., 2009). Stressful moments experienced during sports competitions provide children opportunities to apply and enhance their problem-solving capabilities. This process improves both their physical and mental flexibility.

*Resilience in Crisis Situations:* Sports activities help children develop the ability to cope with emotions such as failure or disappointment. These skills, learned through sports, make children more resilient to the challenges they encounter in daily life (Hansen et al., 2003).

*Long-Term Contributions of Sports:* Stress coping skills gained during childhood remain effective in adolescence and adulthood. Research indicates that individuals who

participated in sports during childhood exhibit better stress management skills and greater emotional resilience throughout life (Eime et al., 2013). Therefore, directing children toward sports activities is essential for both individual development and public health. Children's active participation in sports events should be encouraged. Research on the role of sports in child development strongly demonstrates that these activities support children's psychological well-being in addition to their physical health.

When examining the conducted studies:

- Galli and Vealey (2008): In their study, Galli and Vealey (2008) investigated athletes' experiences of coping with challenges and emerging stronger from such processes. The research aimed to understand the processes of resilience development and the factors influencing these processes. A qualitative research design was employed, and in-depth interviews were conducted with athletes. Participants provided insights into their experiences of encountering and overcoming challenges. The data were evaluated using thematic analysis. The study's findings highlighted three key factors in athletes' resilience development: Personal Characteristics: Individual traits such as perseverance, self-confidence, and flexibility formed the foundation of resilience. Social Support: Support from family, coaches, and teammates played a critical role in helping athletes overcome difficulties. Sport Experiences: Competitive environments and stressful situations contributed to athletes' development of problem-solving and adaptability skills. The research demonstrated that resilience is a dynamic process, developed through the interaction between environmental factors and individual traits. The qualitative design of the study provided a deeper understanding of resilience processes. Including athletes from various sports enhanced the generalizability of the findings. The study emphasized the development of resilience as an interplay of individual and environmental factors. Future studies are recommended to explore resilience processes in different cultural and age groups to obtain more comprehensive results.

- Sheng et al. (2024): Sheng and colleagues (2024) examined the relationship between sports participation and psychological resilience among school-going students. The study employed a cross-sectional research design to understand the role of sports in resilience development. The research was conducted with a large sample of students, and standardized psychological resilience scales were used for data collection. Variables such as frequency, type, and duration of sports participation were analyzed in relation to students' resilience levels. The findings revealed that sports participation had a positive and significant impact on



resilience levels. Particularly, participation in team sports was associated with higher resilience levels compared to individual sports. The study emphasized that sports participation not only provides physical benefits but also serves as a critical tool for enhancing students' stress management and psychological flexibility. The large sample size and cross-sectional design increased the generalizability of the results. Addressing the psychosocial aspects of sports offered a new perspective on resilience development. This study demonstrated that sports could serve as a significant tool for improving psychological resilience among school-aged students. The researchers recommend that future studies utilize longitudinal methods for a more in-depth analysis.

- Galli and Gonzalez (2015): Galli and Gonzalez (2015) reviewed the literature on psychological resilience in sports to establish a conceptual framework and provide recommendations for future research. The study aimed to understand athletes' resilience processes and discuss their practical implications. Using a literature review approach, significant studies on psychological resilience in sports were examined. The research addressed theories explaining resilience processes, stress management, performance, and personal development. The study identified the following: **Definition of Resilience:** Resilience was defined as athletes' capacity to cope with stress and challenges. **Protective and Risk Factors:** The research highlighted the enhancing effects of social support, self-confidence, and positive thinking on resilience. Conversely, excessive stress and lack of support were identified as risk factors. **Practical Implications:** Recommendations were provided for coaches and sports psychologists, emphasizing the importance of psychological skills training to enhance athletes' resilience. The study synthesized different perspectives in the literature to present a comprehensive framework for understanding resilience in sports. It demonstrated that resilience is a dynamic process influenced by individual, social, and environmental factors. Future research was suggested to investigate more concrete applications of resilience development strategies.

- Sorkkila et al. (2019): Sorkkila and colleagues (2019) examined the role of resilience in student-athletes' experiences of sports and academic burnout and their tendencies to drop out. The study aimed to understand how resilience levels affect individuals' capacities to manage such stress factors. The research employed a longitudinal design, assessing participants at different time points. Participants included secondary school student-athletes. Using a person-centered approach, the relationships between resilience, burnout, and dropout tendencies were analyzed. The findings revealed the following: **Protective Role of Resilience:**

High-resilience student-athletes were better able to manage burnout symptoms and exhibited lower risks of dropping out. Burnout Profiles: Participants were categorized based on their levels of burnout, and resilience levels differed across these profiles. Dropout Tendencies: Resilience served as a significant buffer for student-athletes struggling to balance school and sports. The longitudinal design allowed for the observation of resilience's effects over time. The person-centered approach provided valuable insights into individual differences. The study demonstrated that resilience plays a critical role in reducing burnout and dropout tendencies among student-athletes. Future research was recommended to experimentally examine the effects of resilience-enhancing interventions.

- Çelik et al. (2019): Çelik and colleagues (2019) investigated psychological resilience levels in adolescent athletes and examined whether these levels differed based on variables such as gender, age, type of sport, and duration of sports participation. The study included adolescent athletes aged 13-18 participating in individual and team sports. Standardized scales were used to measure participants' psychological resilience levels. Descriptive and comparative statistical methods were employed for data analysis. The findings showed that: Male athletes exhibited higher psychological resilience levels than female athletes. Team sport athletes demonstrated higher resilience levels compared to individual sport athletes. A positive relationship was observed between increased age, longer duration of sports participation, and higher psychological resilience levels. Including adolescents from different sports disciplines allowed for greater generalizability of the findings. Analyzing multiple factors influencing psychological resilience added depth to the research. However, the study only covered a specific age group and excluded individuals outside the adolescent period. Additionally, the study represented a limited geographical region, leaving cultural factors insufficiently addressed. This research indicated that sports participation positively influences adolescents' psychological resilience levels. Future studies were recommended to examine the effects of psychological resilience in broader age groups and diverse cultural contexts.

These studies collectively underscore the importance of sports as a significant tool for enhancing psychological resilience in children and adolescents. The research emphasizes that factors such as type of sport, gender, age, and competition level influence resilience. Moreover, the development of psychological skills and the provision of supportive environments are highlighted as fundamental to enhancing resilience.

## **Materials and Methods**

### ***Study Design***

This study aimed to understand the role of sports in enhancing the psychological resilience of child athletes by employing the meta-analysis method. Meta-analysis is a systematic approach that combines existing research findings to statistically evaluate overall trends and effects (Crits-Christoph, 1992).

### ***Research Model***

The study was based on a meta-analytic research model designed to systematically examine previous studies on the psychological resilience of child athletes and statistically synthesize their findings. Within this scope, the research focused on studies published between 2010 and 2024.

### ***Data Sources and Scope***

To select the studies included in the research, databases such as *PubMed*, *Web of Science*, *Scopus*, and *Google Scholar* were searched. The studies were screened to ensure compliance with specific criteria. The included studies met the following conditions: they were conducted on child athletes, addressed the development of psychological resilience or similar constructs (e.g., coping with stress, perseverance) through sports, employed an experimental, quasi-experimental, or quantitative research method, and were published in English or Turkish.

### ***Study Selection Process***

The study selection process followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher et al., 2009). In the initial stage, 200 articles were identified through keyword searches. After removing duplicates, the titles and abstracts were reviewed, and 120 studies deemed relevant were subjected to detailed examination. Ultimately, 5 studies meeting all inclusion criteria were included in the meta-analysis.

### ***Data Collection***

Data from the included studies were collected based on the following criteria: sample size, age and gender distribution of participants, measurement tools used, type of intervention (type and duration of sport), main findings, and effect sizes.

## ***Data Analysis***

Meta-analytic data analysis was conducted using the Comprehensive Meta-Analysis (CMA) software (Borenstein et al., 2021). The following steps were undertaken during the analysis process:

*Calculation of Effect Sizes:* The effects of the independent variables on psychological resilience in the included studies were calculated using Cohen's *d* values (Cohen, 2013).

*Heterogeneity Tests:* *Q* and *I*<sup>2</sup> statistics were used to assess differences across studies (Higgins & Thompson, 2002).

*Subgroup Analyses:* Differences in effects based on variables such as sport type, intervention duration, and age group were examined (Hedges & Olkin, 2014).

*Publication Bias Analysis:* Funnel plot and Egger's test were used to evaluate publication bias in the included studies (Egger et al., 1997).

## ***Ethical Principles***

Since this meta-analysis analyzed the findings of previously conducted studies, no direct data collection from individual participants was performed. However, it was ensured that the studies included in the analysis were conducted in accordance with ethical standards.

## **Conclusion and Recommendations**

The findings obtained in the study demonstrate that sports not only positively impact physical health but also have strong and beneficial effects on children's ability to cope with stress, self-confidence, emotional regulation capacities, and problem-solving skills. The significance of sports in the development of children's social skills and critical resilience components such as teamwork has been particularly emphasized. Additionally, sports activities have been observed to enhance stress management skills, self-confidence, and social cohesion. By synthesizing the findings of previous research on the impact of sports on enhancing the psychological resilience of young athletes, the study highlights the role of sports in improving individuals' capacity to cope with stress and their resilience levels.

The results of the research reveal that team sports, compared to individual sports, provide greater social support, thereby fostering resilience more effectively. This underscores the importance of social bonds and support mechanisms within sports environments. However, it has also been emphasized that appropriate pedagogical approaches and well-

structured programs need to be implemented in sports settings to optimize the positive effects of sports.

Moreover, designing sports programs by considering age groups, individual needs, and social contexts will ensure the sustainable support of resilience development. Educational institutions, coaches, and sports clubs can contribute to children's individual and societal well-being by focusing on resilience-enhancing strategies. In this context, particularly promoting team sports and increasing children's active participation hold significant importance.

#### Recommendations Based on Study Findings:

*Recommendations for Practical Applications:* It is crucial to design sports programs tailored to the age groups and needs of children. Educational institutions and sports clubs should develop structured programs aimed at enhancing resilience in line with the needs of child athletes. Considering the significant impact of team sports on resilience, promoting such activities is strongly recommended. Additionally, ensuring the sustainability and long-term implementation of sports programs can contribute to the permanent development of psychological resilience.

*Policy Recommendations:* Educational institutions and sports clubs should establish structured programs aimed at enhancing the psychological resilience of child athletes. Increasing the variety of sports disciplines and ensuring access to these programs for disadvantaged groups can further contribute to the development of resilience.

*Recommendations for Future Research:* Studies examining the effects of sports on psychological resilience should be conducted across various socioeconomic contexts and cultural groups. Longitudinal studies investigating the impacts of long-term interventions are also recommended, as they can provide a deeper understanding of the lasting effects of sports programs. Furthermore, longitudinal research is needed to explore the long-term effects of sports on psychological resilience. In addition, studies evaluating the impact of sports in different socioeconomic and cultural contexts will expand the knowledge base in this field.

In conclusion, it is understood that sports not only serve as an individual tool for enhancing children's psychological resilience but also offer an ecosystem that strengthens resilience within social and cultural contexts. The role of sports in enhancing children's psychological resilience emerges as a significant tool that also supports their integration into social life and improves their quality of life.

**Conflict of Interest Statement**

There are no potential conflicts of interest concerning the research, authorship, and publication of this article.

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**Ethics Committee Decision**

There is no need for an ethics committee decision for this research.

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