



# Associations between Resilience and the Rehabilitation's Beliefs among Injured Student-Athletes: Mediating Role of Social Support

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## Abstract

**Introduction:** Given that adolescent athletes possess distinct biological and psychological characteristics compared to adults, identifying the factors that influence their beliefs regarding rehabilitation and recovery from injuries could yield valuable insights for coaches, athletes, rehabilitation specialists, and parents.

**Objective:** This study was designed to explore the associations between resilience and the rehabilitation's beliefs among student-athletes with considering the mediating role of social support.

**Methods:** This study employed a descriptive-correlational survey design utilizing structural equation modeling. The sample comprised 127 high school students with injury (35 females), aged 16-18 years. The Connor-Davidson Resilience Scale, Sports Injury Rehabilitation Beliefs Survey and Multidimensional Scale of Perceived Social Support were used for measuring resilience, rehabilitation beliefs, and social support, respectively. Structural equation modeling was used for data analysis.

**Results:** Males had significantly higher height and weight than females ( $P < 0.001$ ). The findings indicated a significant direct correlation between resilience and rehabilitation beliefs ( $P < 0.001$ ). Additionally, perceived social support was found to have a direct and significant relationship with rehabilitation beliefs ( $P < 0.001$ ). Furthermore, perceived social support significantly mediated the relationship between resilience and rehabilitation beliefs ( $P < 0.001$ ). The model fit assessment suggested that the proposed research model exhibited a good fit.

**Conclusion:** This research indicates that resilience and social support are valuable psychological assets that individuals can leverage, potentially enhancing the rehabilitation process for sports injuries and contributing positively to the overall well-being of athletes.

**Keywords:** Athletic Injuries, Psychological Resilience, Social Support, Rehabilitation, Adolescent

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## 1. Introduction

Sports injuries encompass any physical harm sustained during athletic activities or exercise (1). Such injuries may involve bones, muscles, ligaments, tendons, and various soft tissues. Timely recognition and intervention for sports injuries are crucial to avert long-term issues and facilitate a swift and thorough recovery (2,3). Injuries are recognized as a significant threat and risk within the realm of sports, and a lack of awareness regarding the various types and causes of injuries contributes to an increase in their occurrence. It is crucial to improve comprehension of the causes and processes underlying injuries in athletes, alongside the development of strategies aimed at preventing injuries and minimizing risks. This is especially important for young athletes, who exhibit unique physical, movement, and psychological traits (4,5). This necessity has been emphasized within the field of sports medicine. Effective management is vital for enabling athletes to return to their sport safely while preserving their performance standards (6,7). Historically, there was a greater focus on physical

fitness, with psychological factors receiving comparatively less attention (1,3,5,8). However, contemporary perspectives acknowledge the importance of mental skills as a critical component influencing athletic performance. These mental skills can be effectively taught to any healthy individual, thereby facilitating success in sports endeavors (9,10).

One of the less explored psychological factors in the context of sports injuries is resilience. Resilience can be described as the capacity to navigate challenging situations or to adapt to them (11). It encompasses an individual's ability to maintain health and to withstand and persevere through difficult and perilous circumstances, ultimately emerging stronger from these experiences (12,13). Resilience is characterized by the capability to manage stress effectively and the propensity to recover swiftly and efficiently following an accident or injury. Research showed that individuals who exhibit resilience possess distinct traits, such as social competence, problem-solving abilities, a forward-thinking mindset, and self-direction (14). It has also been shown that personality attributes, including cognitive toughness and personal



adaptation styles, serve as supportive mechanisms that foster resilience in the face of traumatic events (11,13,15,16). It can therefore be inferred that resilience is a crucial factor in the recovery process from sports injuries.

Support factors and vulnerability serve as mediating variables that influence the relationship between independent risk factors and dependent variables. Numerous studies have examined the support factors associated with resilience, identifying three primary categories: psychological skills and attitudes, familial and community support, and external support systems (16-18). Research indicates that individuals with elevated levels of supportive factors tend to perform effectively even in high-stress situations (12,14,15). Resilience is characterized not merely by passive endurance in the face of threats or stressors; rather, a resilient individual actively engages with their environment (19). The concept of resilience encompasses two critical elements: first, individuals encounter a traumatic incident or event, and second, they exhibit adaptability in response to challenges, striving to restore their normal functioning. Such individuals possess the capacity to heal from psychological traumas and navigate through adversities (18,20). Therefore, it can be inferred that resilience is a significant factor in the recovery process from sports injuries.

In addition to psychological factors such as resilience and personality, two significant variables merit further exploration: rehabilitation beliefs and social support. Rehabilitation beliefs reflect an individual's assessment of the effectiveness of rehabilitation programs in facilitating the complete recovery of injured athletes and their successful reintegration into sports (8). It is posited that when individuals identify a significant threat and susceptibility to health concerns, coupled with the perception that treatment is both efficacious and valuable, their dedication to adhering to the treatment regimen is expected to enhance. Additionally, studies have indicated a relationship between beliefs regarding rehabilitation and compliance with sport-injury rehabilitation programs (8,21,22).

Social support is recognized as a significant resource for individual coping, positioned within the coping resources framework (23). It serves as a crucial factor influencing the interplay between stress and injury, either independently or in conjunction with other coping mechanisms (24). As an essential intervening variable, social support enhances the development of more effective anatomical models and aids in identifying individuals who may be susceptible to illness or injury (23,25). Its relevance extends to various psychological and physical health dimensions. Social support encompasses both material and emotional assistance provided by relatives to individuals facing stressful or challenging situations, and it can be categorized into two types: received and perceived support (24,26,27). Not all interpersonal relationships qualify as sources of social support; rather, they must be recognized by the individual as appropriate and accessible resources to fulfill their needs (28). The nature of the support offered may sometimes be misaligned or unsuitable, highlighting the importance of the individual's perception of the support received. Perceived social support is particularly vital in mitigating stress-related challenges (24,29). The concept is defined as a mutual

exchange of resources involving a minimum of two individuals, where both the giver and the receiver recognize the transaction, aimed at enhancing the well-being of the recipient. Various individuals, including family members, partners, friends, teammates, coaches, and other important figures in an athlete's life, can act as essential sources of social support (25,27,28,30).

The significance of psychological and social factors, including resilience and social support, in the recovery process of athletes from sports injuries is well recognized (21,22,24,26,27). There is a notable lack of research addressing these dimensions in adolescent athletes. Considering that adolescent athletes exhibit unique biological and psychological traits in contrast to adults, understanding the factors that shape their beliefs about rehabilitation and recovery from injuries may provide significant insights for coaches, athletes, rehabilitation professionals, and parents. Therefore, this study aims to investigate the relationships between resilience and beliefs about rehabilitation among student-athletes, while also examining the mediating effect of social support.

## 2. Methods

This study employed a descriptive-correlational survey design utilizing structural equation modeling.

### 2.1. Participants

The focus was on high school student-athletes, with data gathered from both male and female participants engaged in regional and national competitions. Participants were selected through purposive sampling methods. The sample comprised 127 high school students, including 92 males (72.4%) and 35 females (27.6%), all aged between 16 and 18 years. The athletes participated in a variety of sports categorized into team, combat and other. Specifically, 87 students were involved in team sports, 25 in combat sports, and 15 in other sports. The physical injuries sustained by participants were confirmed by professionals from the Sports Medicine Federation, and participation in the study was entirely voluntary. Of the participants, 63.2% indicated that their injuries limited their sports participation to less than a month, while 36.8% reported being unable to return to their activities for more than a month. The criteria for inclusion in the study were as follows: 1) participants must be high school athletes who have sustained injuries; 2) participants should not have any major mental health conditions that necessitate treatment; and 3) consent must be obtained from both the athlete and their parent. The criteria for exclusion comprised: 1) non-completion of the questionnaires; and 2) a lack of willingness to continue participating in the study.

### 2.2. Measurements

#### 2.2.1. The Connor-Davidson Resilience Scale

The Connor-Davidson Resilience Scale, comprising 10 items, was utilized to evaluate the resilience levels among athletes. Each item is rated using a 5-point Likert-type scale, resulting in a single-factor score that can range from 0 to 40 points, with higher scores indicating enhanced resilience. The reliability of the scale was demonstrated with a Cronbach's alpha coefficient of 0.96.

### 2.2.2. Sports Injury Rehabilitation Beliefs Survey (SIRBS)

The SIRBS (32) assesses an individual's beliefs about rehabilitation following a sports-related injury. This instrument consists of 19 items that evaluate five dimensions of rehabilitation beliefs, specifically focusing on threat appraisal (which encompasses susceptibility and severity) and coping appraisal (including treatment efficacy, self-efficacy, and the perceived value of rehabilitation). Respondents indicated their level of agreement with each statement on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). The reliability of the survey, as measured by Cronbach's alpha, was determined to be 0.92.

### 2.2.3. Multidimensional Scale of Perceived Social Support (MSPSS)

The Multidimensional Scale of Perceived Social Support (MSPSS) was utilized to assess the perceived social support in athletes who have sustained injuries. This instrument consists of 26 items that explore four key dimensions of social support: emotional, informational, tangible, and esteem. Participants evaluated their experiences on the MSPSS through a 4-point Likert scale (1 = never, 4 = always), reflecting the frequency of social support received from important individuals during difficult times. The reliability of this scale, as measured by Cronbach's alpha, was determined to be 0.90.

### 2.3. Data Analysis

Data analysis was performed utilizing SPSS-26 and Lisrel software. Descriptive statistics, such as means and standard deviations, were applied to characterize the variables. Independent t-tests were used to assess gender differences in demographic data. To examine the relationships among the variables, a Pearson correlation test was conducted. Additionally, a structural equation modeling approach was adopted to investigate the structural relationship between resilience and rehabilitation beliefs, while considering the mediating role of social support. The significance level was set at  $P < 0.05$ .

### 3. Results

The research included a cohort of 127 high school student athletes, consisting of both male and female individuals. Participants' ages varied from 16 to 18 years, with a mean age of  $17.06 \pm 0.35$  years. The average age for male participants was recorded at  $17.02 \pm 0.36$  years, whereas female participants had a mean age of  $17.09 \pm 0.33$  years ( $P=0.785$ ). Notably, males demonstrated significantly higher height and weight measurements in comparison to their female counterparts ( $P < 0.001$ ). Nevertheless, no significant differences were observed between the genders concerning body mass index (BMI) (refer to Table 1).

**Table 1.** Demographic Data of the Participants.

	Boys	Girls	Gender Differences
Age (years)	$17.02 \pm 0.36$	$17.09 \pm 0.33$	$t=0.128$ $P=0.785$
Height (m)	$1.75 \pm 0.05$	$1.62 \pm 0.04$	$t=6.967$ $P < 0.001$
Weight (kg)	$64.42 \pm 3.54$	$54.52 \pm 2.25$	$t=7.968$ $P < 0.001$
BMI	$21.00 \pm 0.78$	$20.08 \pm 0.55$	$t=0.108$ $P=0.805$

Descriptive statistics are illustrated in Table 2. The findings indicate that, overall, the level of resilience exceeds the average. Additionally, beliefs regarding rehabilitation and perceived social support were found to be at a moderate level. Normality tests confirmed

that all variables followed a normal distribution (all  $P > 0.05$ ). Furthermore, the outcomes of independent t-tests demonstrated that there were no significant differences between male and female participants across all study variables.

**Table 2.** Descriptive Data.

	Resilience	Rehabilitation's Belief	Perceived Social Support
Mean	32.47	49.41	53.59
SD	3.14	5.48	6.63
Skew	-0.808	-0.715	-1.028
Kurt	0.562	0.947	1.078

Bivariate relationships between resilience, rehabilitation's belief and perceived social support are demonstrated in Table 3. Results revealed significant direct relationship between resilience and

rehabilitation's belief ( $P < 0.001$ ). Moreover, perceived social support was directly and significantly associated with rehabilitation's belief ( $P < 0.001$ ).

**Table 3.** Results of Bivariate Relationships between Variables.

	1	2	3
1. Resilience	-		
2. Rehabilitation's Belief	$r=0.589$ $P < 0.001$	-	
3. Perceived social Support	$r=0.628$ $P < 0.001$	$r=0.485$ $P < 0.001$	-

Table 4 and Figure 1 present the findings from the structural equation modeling analysis. The results indicate that resilience has a significant impact on beliefs regarding rehabilitation ( $\beta=0.587$ ,  $T=5.689$ ).

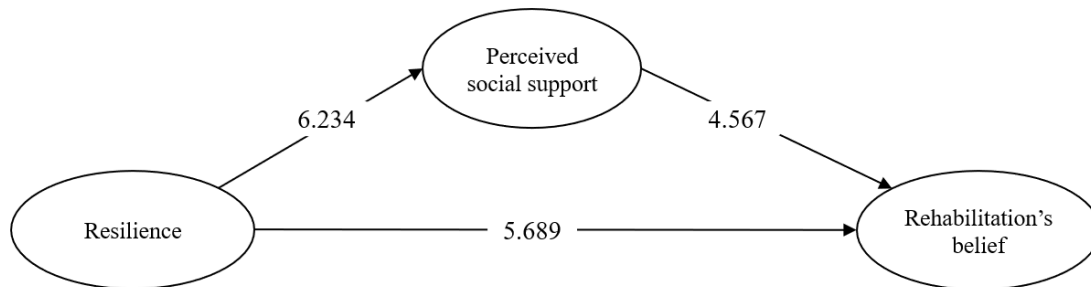
Additionally, perceived social support was found to significantly influence rehabilitation beliefs ( $\beta=0.488$ ,  $T=4.567$ ). Furthermore, perceived social support serves as a significant mediator in the relationship between

resilience and rehabilitation beliefs ( $Z=6.259, P<0.001$ ). The model fit statistics, detailed in Table 5,

demonstrate that the proposed research model exhibits a good fit.

**Table 4.** Results of Structural Equation Modelling.

Path	$\beta$	T-value
1 Resilience => Rehabilitation's Belief	0.587	5.689
2 Perceived Social Support => Rehabilitation's Belief	0.488	4.567
3 Resilience => Perceived Social Support => Rehabilitation's Belief	Z	P-value
	6.259	P<0.001



**Figure 1.** Structural Equation Modelling in the Form of T-Values.

**Table 5.** Results of Model Fit.

Index	Optimal Range	Obtained Value	Conclusion
RMSEA	<0.08	0.07	Good fit
$X^2 / df$	< 3	2.89	Good fit
RMR	Closer to 0	0.02	Good fit
NFI	>0.9	0.97	Good fit
CFI	>0.9	0.97	Good fit

**4. Discussion**

The aim of this study was to explore the associations between resilience and the rehabilitation's beliefs among student-athletes with considering the mediating role of social support. Results revealed that resilience significantly affected rehabilitation's belief. Moreover, perceived social support significantly affected rehabilitation's belief. Finally, perceived social support has significantly mediated the relationship between resilience and rehabilitation's belief. To interpret these findings, it can be stated that resilience is understood as a multifaceted process that includes elements of adversity, agitation, and favorable outcomes. By diminishing the perception of stress and enhancing recovery, resilience positively influences the agitation process, thereby improving one's capacity to confront contextual adversities (12,15,16,18). Furthermore, resilience contributes to achieving positive results in stressful situations, providing beneficial feedback to personal resources that empower athletes to tackle future challenges. Consequently, it is anticipated that resilient athletes will exhibit a more adaptive response to stress (13). Our current findings align with recent literature, which, despite employing various study designs, converges on the notion that resilience is potentially linked to a more adaptive stress response. Athletes frequently encounter a range of stressors, from everyday personal issues to specific challenges related to their sport. However, resilient individuals tend to approach these demands differently; highly successful and resilient athletes perceive these challenges as opportunities for growth to be embraced (17,19,20).

In addition, previous research has demonstrated a positive correlation between resilience and various recovery factors, including overall well-being, sleep

quality, physical fitness, social recovery, success, personal achievement, self-efficacy, and self-regulation (12,14,15,18). The favorable association between resilience and beliefs regarding rehabilitation can be attributed to the personal, social, environmental, and psychological resources that athletes utilize to enhance their well-being. These resources include the ability to integrate with team members, maintain self-belief in successfully executing tasks, and exert control over personal decisions, all of which are integral components of psychological resilience (11,13,17). Additionally, resilience is positively linked to recovery in general, particularly in relation to self-regulation and personal achievement. This indicates that resilient individuals are more adept at leveraging their psychological skills to prepare, motivate, and set goals for themselves, while also deriving enjoyment from their sport and fostering a sense of unity with their teams (19,20).

Furthermore, empirical research has shown that the effects of social support are more advantageous when the assistance provided aligns with the specific needs of injured athletes (23,26,29). Nonetheless, the type and extent of support required can differ based on individual, situational, and temporal factors. Studies indicate that athletes tend to favor various forms of social support at different stages of their recovery journey. In particular, injured athletes often express a heightened need for emotional support during the initial phase of rehabilitation, while the demand for informational support from medical professionals and sport-related assistance from coaches becomes more significant in the later stages of recovery (25,27,29). Furthermore, additional studies have revealed that athletes generally desire increased social support from coaching staff throughout all phases of the injury recovery process. It is noteworthy that injured athletes do not always actively pursue the social support they

require, although research in this area remains limited (30). Overall, findings suggest that the willingness to express a need for support may be influenced by factors such as gender, issues related to stigma (e.g., the athlete's own use of performance-enhancing substances), psychological challenges, and the closeness and quality of relationships with potential support providers (24,26,29). Consequently, this evidence underscores the importance of evaluating and identifying athletes' preferences and needs for social support during the rehabilitation process, ideally utilizing sport-specific assessment tools. An athlete's network of support, which includes family, partners, friends, teammates, coaches, and other significant individuals, can serve as a vital source of strength (22,24). Athletic trainers play a crucial role in the prevention, identification, management, and rehabilitation of injuries experienced by athletes. This research marks the first investigation into the connection between hope and social support, employing a composite score to assess social support levels. Future studies examining the different forms and sources of social support may deepen our understanding of injury-related challenges and contribute to the development of more personalized treatment approaches (26,27).

The present research is subject to several limitations. It concentrated solely on high school students, neglecting to account for the impact of variables such as their social and economic backgrounds. Furthermore, the study relied exclusively on questionnaires to assess the research variables, which may introduce bias associated with self-reporting measures.

#### 4.1. Conclusion

Injuries represent a significant issue within the realm of sports. Numerous prominent athletes often find it necessary to pause their activities due to injuries or, in severe cases, to permanently exit their sports careers as a result of catastrophic injuries. It is therefore crucial for coaches, athletes, administrators, athletic trainers, and other pertinent individuals to work together efficiently to mitigate the risk of sports injuries and to promote compliance with rehabilitation protocols after such injuries occur. Aligning with contemporary psychological perspectives that emphasize the importance of human strengths and capabilities in overcoming challenges, our research indicates that resilience and social support are valuable psychological assets that individuals can leverage, potentially enhancing the rehabilitation process for sports injuries and contributing positively to the overall well-being of athletes.

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#### Footnotes

**Authors' Contribution:** This study was carried out solely by the corresponding author.

**Conflict of Interests:** The researcher confirms that there is no conflict of interests in this study with any participant.

**Data Availability:** The data that support the findings of this study are openly available upon request from the corresponding author.

**Ethical Approval:** The author confirms that all steps and requirements of this study comply with ethical guidelines. Participants were informed about the characteristics of the study and gave written informed consent.

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