Physical Activity in Children
ISSN: 2783-5391

Original Article

Relationships between Resilience with Psychological Wellbeing among Adolescent Athletes during the COVID-19 Pandemic: Mediating Role of Distress Tolerance

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Received: 08 September, 2025; **Revised:** 09 December, 2025; **Accepted:** 17 December, 2025; **Published**: 26 December, 2025.

Abstract

Introduction: The COVID-19 pandemic has been a significant source of anxiety and discomfort, influencing individuals' capacity to manage distress effectively. It had, also, a profound impact on adult's athletes, however, its effects on youth athletes remained unclear.
Objective: The aim of this study was to explore the relationships between resilience with psychological wellbeing (PWB) among adolescent athletes during this pandemic with considering the mediating role of distress tolerance.
Methods: This research employed a descriptive-correlational approach utilizing structural equation modeling. A sample of 115 male athletes, aged between 15 and 17, was selected through convenience sampling. The Connor-Davidson Resilience Scale, Psychological Well-Being Scale, and The Distress Tolerance Scale were applied to measure the research variables, and the data analysis was performed using Smart PLS statistical software version 4, with a significance threshold set at 0.05.
Results: The results revealed a significant positive structural relationship between resilience and PWB (b=0.617), as well as between resilience and distress tolerance (b=0.728). Furthermore, a significant positive correlation is observed between distress tolerance and PWB (b=0.547). Notably, distress tolerance acts as a significant mediating variable in the relationship between resilience and PWB (b=0.398).
Conclusion: These findings indicate that this pandemic adversely affected adolescent athletes, highlighting the potential role of resilience and distress tolerance in enhancing PWB. It is essential for sports psychologists, coaches, and trainers to implement strategies aimed at fostering resilience and improving distress tolerance among adolescent athletes to support their mental health and overall PWB.

Keywords: Adolescent, Athletes, Mental Health, Psychological Resilience, COVID-19

How to Cite: Dana A. Relationships between Resilience with Psychological Wellbeing among Adolescent Athletes during the COVID-19 Pandemic: Mediating Role of Distress Tolerance. Phys. Act. Child. 2025;2(2):9-14. 10.22034/pach.2025.545986.1068

1. Introduction

COVID-19, the disease caused by the novel coronavirus SARS-CoV-2, was first identified in Wuhan, China, in December 2019 (1). The World Health Organization declared it a global pandemic on March 11, 2020, leading to widespread public health measures aimed at curbing the virus's transmission (2). These measures had significant repercussions for public health, particularly concerning psychological well-being (PWB) (3). During the initial phase of this pandemic, many individuals reported heightened mental distress, with increased rates of depression and anxiety (4-6). Furthermore, the impact on youth under 17 was alarming, as studies indicated that one in four children experienced elevated levels of depression, while one in five faced increased anxiety, with these rates being double those observed before this pandemic (7,8). PWB effects of restrictions were not uniform across all demographics; elite adult athletes, for instance, faced unique challenges as this pandemic led to the abrupt cancellation of sporting events, adversely affecting both their physical and PWB (9-11).

The lockdowns had a great influence not only on adults but also on youth athletes, specifically those aged 17 and younger, affecting both their physical and PWB (12,13). Before this pandemic, a significant number of youths regularly participated in organized sports, which are known to enhance physical health, reduce symptoms of depression and anxiety, and improve overall quality of life (14,15). However, the closure of organized youth sports leagues due to public health measures deprived youths of these crucial benefits (16). This sudden disruption led to a decline in physical activity, hindered social interactions, and challenged personal identity, ultimately resulting in negative consequences for their PWB (17-19). PWB of youth athletes seems to be more significantly impacted by restrictions compared to that of adult athletes, because youth athletes possess fewer physical and psychological resources to cope with unexpected changes, which heightens their vulnerability (20,21). Unlike adult athletes, who have accumulated experience in managing unforeseen challenges, youth athletes often lack the necessary athletic and real-world experiences to cultivate emotional control (22).

Resilience is essential in protecting individuals from common PWB challenges, such as depression and anxiety, especially during this pandemic (23). It encompasses a range of psychological and adaptive characteristics that enable people to cope with difficult and stressful circumstances (24). Studies indicate that resilience, along with associated traits like effective stress management, optimism, and a positive outlook, is linked to a reduced prevalence of psychological health disorders during public health emergencies (25,26). Nevertheless, the relationship between resilience and PWB during this pandemic has been explored, it has received less attention among athletes. Given that the psychological capabilities of athletes, particularly adolescent athletes, differ from those of non-athletes (27), it is essential to investigate the connection between resilience and PWB in this group during this pandemic. Therefore, the primary aim of this research was to examine the relationship between resilience and PWB in adolescent athletes during this pandemic.

In addition, the underlying mechanisms that explain resilience's protective effect against PWB issues remain unclear. One potential factor that may influence the relationship between resilience and mental health is the distress tolerance. Emotional distress tolerance plays a significant role in how individuals respond to negative emotions following stressful events (28). It is defined as the capacity to manage adverse emotional states; this construct may stem from various cognitive or physiological processes (29). It encompasses a range of dimensions, including the ability to endure emotional discomfort, the assessment and acceptance of one's emotional state, and the strategies employed to regulate emotions and alleviate distress (30). Individuals with low distress tolerance often struggle to manage their emotions under stress, leading them to seek immediate relief through maladaptive behaviors that ultimately fail to address their negative feelings (28,30).

The psychological effects of stressful events, such as this pandemic, are influenced by an individual's capacity to tolerate distress, which shapes their perception of adversity (31,32). Those with low distress tolerance often view distress as intolerable and may either avoid confronting it or become excessively fixated on it, hindering their ability to function effectively (33). Research indicates that low distress tolerance correlates with negative emotional states, difficulties in emotional regulation, and maladaptive coping mechanisms, such as substance use (31,33,34). Additionally, low distress tolerance is associated with symptoms of Post-Traumatic Stress Disorder, including the avoidance of distressing memories and intrusive recollections of traumatic experiences (35). This pandemic has been a significant source of anxiety and discomfort, influencing individuals' capacity to manage distress effectively (36). This ability to cope may be closely linked to how people perceive COVID-19 as a serious threat to their health. Hence, it can be assumed that distress tolerance may act as a mediator in the relationship between resilience and PWB in adolescent athletes during this pandemic. The second aim of this study was, therefore, to explore the mediating role of distress tolerance in the relationship between resilience and PWB in adolescent athletes during this pandemic. In total, the aim of this study was to explore the relationships between resilience with PWB among adolescent athletes during the COVID-19 pandemic with considering the mediating role of distress tolerance.

2. Methods

2.1. Design and Participants

This study utilized a descriptive-correlational design with structural equation modeling (SEM), focusing on a cohort of 115 male athletes aged 15 to 17. Participants were required to be high school students actively involved in sports clubs, free from any physical or mental health issues, and not on any special medication. Those who did not meet these criteria or failed to complete the questionnaire were excluded from the analysis. By utilizing G*Power the sample size was determined to be 110 respondents, assuming the following parameters are accurate. The input values include an effect size (f^2) of 0.15, a significance level (α) of 0.05, a desired power ($1-\beta$) of 0.95, and a total of two predictors. The research adhered to ethical guidelines set forth in the Declaration of Helsinki. Prior to the study, comprehensive information regarding its aims and methods was shared with both participants and their parents, and written consent was obtained from all parties involved.

2.2. Measurements

2.2.1 Resilience

The Connor-Davidson Resilience Scale (37), consisting of 10 items, was employed to assess resilience levels in adolescent athletes. Each item is evaluated on a 5-point Likert-type scale, yielding a total score that ranges from 0 to 40 points, where higher scores reflect greater resilience. The scale's reliability is supported by a Cronbach's alpha coefficient of 0.94.

2.2.2. Psychological Well-Being

To evaluate PWB, a standardized questionnaire comprising 18 items was utilized (37), targeting various dimensions of well-being. This tool is structured around three specific dimensions, each featuring tailored questions to assess different aspects. Participants respond using a six-point Likert scale, where ratings range from strongly agree (6) to strongly disagree (1), with certain items (1, 3, 4, 5, 9, 10, 13, 17) scored in reverse. The cut-off score for this instrument is established at 63, calculated as the average of the minimum (18) and maximum (108) possible scores. The questionnaire demonstrates high reliability, evidenced by a Cronbach's alpha exceeding 0.91.

2.2.3. Distress Tolerance

The Distress Tolerance Scale (DTS) was utilized to assess the distress tolerance levels among adolescent athletes (38). This self-report instrument comprises 15 items that evaluate various aspects of distress tolerance, including an individual's capacity to endure distress, their subjective evaluation of emotional situations, the extent to which negative emotions capture their attention, and their strategies for managing distress. The scale is divided into four subscales: tolerance, which measures emotional endurance; appraisal, which assesses the acceptability of emotional situations; absorption, which gauges the interference of negative emotions with functioning;

and regulation, which evaluates efforts to mitigate distress. Responses are rated on a 5-point Likert scale, where higher scores reflect greater distress tolerance. In this study, the overall score was used to determine participants' distress tolerance, and the scale's reliability was confirmed with a Cronbach's alpha of 0.90.

2.3. Procedure

An online informational session was held before the research protocol was implemented to inform potential participants about the study's aims and methodologies. Questionnaires were distributed via Google Forms to adhere to health regulations. Data collection took place from May to July 2022, coinciding with global social distancing measures and the closure of schools and sports clubs.

Because data were collected through online participation, several factors may have influenced the quality and accuracy of responses. Participants may have completed the survey in uncontrolled environments, potentially leading to distractions or reduced attention when responding. Differences in access to technology, internet stability, or device type could also have affected engagement with the questionnaire. Additionally, the lack of in-person supervision may have increased the likelihood of rushed or less thoughtful responses. Acknowledging these factors is important, as they may have introduced variability or subtle response biases in the study's findings.

2.4. Statistical Analysis

Descriptive statistics, including mean and standard deviation (SD), were utilized to illustrate the study's variables. The Kolmogorov-Smirnov test was applied to determine the normality of the data distribution (all $p>0.05$). Furthermore, the Pearson correlation test was executed to analyze the relationships among the research variables. SEM was conducted using the Smart PLS statistical software version 4 at a significance level of 0.05. SEM was used because it allows for the simultaneous examination of multiple relationships among the key psychological constructs - resilience, distress tolerance, and PWB. SEM is particularly suitable for this study as it can model both direct and indirect effects, making it possible to test the hypothesized mediating role of distress tolerance within a single comprehensive framework. Additionally, SEM accounts for measurement error through the use of latent variables, providing more accurate and reliable estimates compared to traditional regression techniques. This makes SEM an appropriate and robust analytical approach for analyzing complex psychological interactions among adolescent athletes.

3. Results

Table 1 presents the attributes of resilience, PWB, and distress tolerance in adolescent athletes. The skewness and kurtosis values for all variables fall within the range of -2 to +2, confirming that the data meets the criteria for normal distribution.

Table 1. Description of Research Variables.

	Mean	SD	Skewness	Kurtosis
Resilience	26.45	3.27	0.287	0.663
Psychological Well-Being	59.27	5.34	- 0.927	- 0.127
Distress Tolerance	42.84	4.16	- 1.17	- 0.109

The results of the Pearson correlation test presented in Table 2 indicate significant positive relationships among research variables. Specifically, there is a significant positive correlation between resilience and PWB ($p<0.001$, $r=0.637$) and distress tolerance ($p<0.001$, $r=0.769$). Additionally, a significant positive relationship exists between distress tolerance and PWB ($p<0.001$, $r=0.587$). These findings support the validity of the assumption of a linear relationship among the variables. The variance inflation factor (VIF) values for the research variables were all below the critical threshold of 10, suggesting that multicollinearity is not a concern among them. Consequently, the research model was executed using Smart PLS statistical software, and the results were analyzed accordingly.

Table 2. Pearson Correlation Matrix among the Research Variables.

	1	2	3
1. Resilience	-		
2. Psychological Well-Being	r=0.637 p<0.001	-	
3. Distress Tolerance	r=0.769 p<0.001	r=0.587 p<0.001	-

The results of the path analysis conducted using Smart PLS software, as illustrated in Table 3 and Figure 1, reveal a significant positive structural relationship between resilience and PWB ($T=6.897$, $b=0.617$, $p=0.000$), as well as between resilience and distress tolerance ($T=7.874$, $b=0.728$, $p=0.000$). Furthermore, a significant positive correlation is observed between distress tolerance and PWB ($T=5.412$, $b=0.547$, $p=0.000$). Notably, distress tolerance acts as a significant mediating variable in the relationship between resilience and PWB ($T=4.174$, $b=0.398$, $p=0.000$).

Table 3. Structural Model Coefficients and Values for the Direct Path.

Direct Path	b	T-Value	p-Value
Resilience => Psychological Well-Being	0.617	6.897	0.000
Resilience => Distress Tolerance	0.728	7.874	0.000
Distress Tolerance => Psychological Well-Being	0.547	5.412	0.000
Indirect Path			
Resilience => Psychological Well-Being => Distress Tolerance	0.398	4.174	0.000

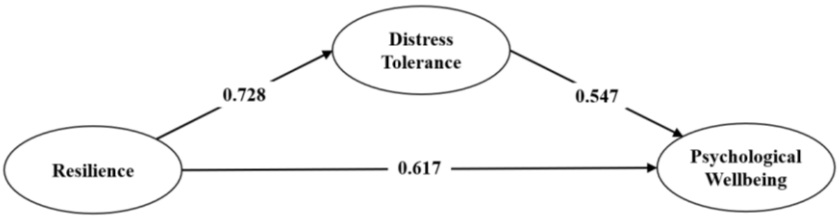

Figure 1. Standardized Coefficients of Paths.

The Stone-Geisler Q2 index values were all positive, indicating a high-quality structural model. This model demonstrates robust predictive capabilities for the endogenous latent variables, with an R2 value of 0.37 for resilience, signifying that it explains 37 percent of the variance in this variable. Furthermore, the SRMR value of 0.076 is below the acceptable limit of 0.08, and the goodness of fit index (GOF) for the overall model is 0.38, exceeding the minimum requirement of 0.36. Collectively, these findings indicate that the model exhibits a strong fit.

4. Discussion

This study aimed to investigate the relationships between resilience and PWB among adolescent athletes during the COVID-19 pandemic, with a focus on the mediating role of distress tolerance. The findings indicated a significant positive structural relationship between resilience and PWB, as well as between resilience and distress tolerance. Additionally, a significant positive correlation was found between distress tolerance and PWB. Importantly, distress tolerance emerged as a significant mediating factor in the relationship between resilience and PWB. These results align with previous research (23,24,31,33,34), suggesting that resilience enhances PWB in adolescent athletes during this pandemic, with distress tolerance serving as a crucial mechanism in this dynamic.

This research revealed that higher resilience levels are significantly linked to higher PWB among adolescent athletes during this pandemic, underscoring resilience's critical role in safeguarding adolescents against mental health challenges stemming from pandemic-related stress. This aligns with previous findings that indicate resilience is inversely related to depression and anxiety (23-25). One possible explanation is that resilient adolescent athletes are better equipped to handle psychological distress, often exhibiting positive attitudes and optimistic outlooks in the face of adversity (27). Previous studies suggested that resilient youth possess beneficial intrapersonal traits, such as effective life management skills, self-efficacy, and a sense of competence (24,26). Consequently, resilience may serve as a protective factor against the adverse effects of emotional distress, even when individuals are confronted with stressors (23). Therefore, it is essential to implement programs aimed at enhancing resilience among adolescent athletes, as these initiatives could play a vital role in preventing mental health disorders during crises like this pandemic.

These findings align with the sport resilience model (39). According to the model, athletes facing adverse situations undergo an agitation process marked by a spectrum of negative emotions and mental challenges. This agitation, while initially distressing, can lead to positive outcomes by enhancing the athlete's psychological resilience, thereby equipping them to better handle future stressors (40). Consequently, resilience not only aids in effectively managing stress but also fosters an athlete's capacity to navigate subsequent challenges in their sport, ultimately promoting their overall well-being. As a result, elite athletes who demonstrate resilience are likely to possess greater resources for coping with stress and facilitating recovery.

In addition, aligns with previous findings (31-33), this research revealed that distress tolerance served as a significant mediator in the relationship between resilience and PWB among adolescent athletes during this pandemic, underscoring distress tolerance's critical role in safeguarding adolescents against mental health challenges stemming from pandemic-related stress. One possible explanation is that distress tolerance significantly impacts an individual's attention, cognitive evaluation, self-regulation, and emotional well-being. This ability often leads to immediate reactions aimed at alleviating emotional discomfort when faced with adverse situations such as this pandemic (34). Resiliency fosters psychological equilibrium and enhances individuals' distress tolerance by bolstering the capacity to manage emotional responses. By promoting this psychological construct, individuals can develop greater distress tolerance, thereby improving their ability to navigate adverse stimuli and behavioral challenges (31,32). This proactive approach encourages the adoption of adaptive, problem-solving strategies, enabling individuals to endure and effectively cope with stressful and unbalanced situations such as this pandemic.

In addition, athletes' ability to tolerate distress is closely linked to their emotional regulation skills, as well as their overall PWB (14). Among athletes, PWB is closely linked to the ability to tolerate distress, as it often stems from the absence of negative emotions and a sense of life satisfaction. Individuals who can accept and manage their negative emotional states tend to experience a higher degree of well-being. Conversely, those who struggle to endure discomfort may feel frustrated and overwhelmed, leading to heightened reactions to stress (41). In contrast, individuals with strong distress tolerance perceive challenging situations more positively, maintain a greater sense of control, and report higher levels of satisfaction and success. This resilience allows them to navigate negative emotions and other psychological or physical disturbances more effectively, as they possess a realistic understanding of their capabilities (31,32). Consequently, these individuals are better equipped to handle life's inherent stresses, fostering a belief in their ability to manage events. This mastery enhances their life satisfaction and promotes positive relationships, ultimately contributing to an overall sense of well-

being. Those with higher coping abilities not only enjoy greater well-being but also experience personal growth, which involves confronting and overcoming difficult situations while developing new skills.

The study's cross-sectional research design presents a significant limitation, as data collection occurs at a single point in time, hindering the ability to establish causal relationships among resilience, distress tolerance, and PWB. This approach fails to capture the dynamic changes in athletes' psychological states throughout various phases of this pandemic. Additionally, reliance on self-report measures for all variables introduces potential biases, such as social desirability and recall bias, which may lead to inaccurate assessments of emotional states. The limited generalizability of the findings is another concern, as the sample consists solely of adolescent athletes, potentially excluding insights from non-athlete adolescents, adult athletes, and individuals from diverse competitive levels or cultural backgrounds. Furthermore, the unique psychological experiences associated with this pandemic may not translate to typical conditions or future crises, as the severity of restrictions varied among participants, affecting their responses. Uncontrolled confounding variables, including family stress, academic pressure, and pre-existing mental health issues, could also impact PWB without adequate control. Lastly, due to the fact that the convenience sampling methods was employed, selection bias may arise.

4.1. Conclusion

The findings of this research indicate that this pandemic adversely affected adolescent athletes, highlighting the potential role of resilience in enhancing PWB. These results align with numerous global studies that report increased levels of anxiety, stress, and depression among this demographic during this pandemic. Resilience and well-being are closely linked concepts that, when integrated, can significantly bolster an individual's mental and emotional health. Within this relationship, distress tolerance may serve as a mediating factor that warrants further investigation in future research. Consequently, it is essential for sports psychologists, coaches, and trainers to implement strategies aimed at fostering resilience and improving distress tolerance among adolescent athletes to support their mental health and overall PWB. These findings suggest that coaches and sport psychologists can enhance athletes' PWB by implementing targeted interventions - such as resilience training, stress-management strategies, and activities that gradually build distress tolerance.

Acknowledgments

The author is grateful to all participants who took part in this research.

Footnotes

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

Conflicts of Interest

Non to declare.

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

Ethical Approval: This study was conducted in accordance with the ethical standards outlined in the Declaration of Helsinki and received approval from the University Ethics Committee (Code: IR.IAU.SARI.REC.1401.039; Date: 17 April 2022). Informed consent was secured from both the participants and their parents.

Funding Support

This study received no grant.

Informed Consent: Informed written consent was obtained from all participants

Supplementary information accompanies this paper at doi: 10.22034/pach.2025.545986.1068

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