

CASE STUDY

Psychological analysis and intervention strategies for sports performance in a youth baseball pitcher

Análisis psicológico y estrategias de intervención para el rendimiento deportivo en un lanzador juvenil de béisbol

Maybel Matos 

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Abstract The study analyzed the psychological profile of a youth pitcher from the Sancti Spiritus, Cuba baseball team, aiming to identify his psychological strengths and weaknesses and design intervention strategies to optimize his sports performance and overall development. A single-case approach was used, applying validated tools such as the Eysenck Personality Inventory, the State-Trait Anxiety Inventory, the Sports Motivation Test, and the Volitional Qualities Test, complemented by interviews, direct observation, and projective techniques. Results indicated emotional stability and strength volitional qualities but revealed deficiencies in competitive aggressiveness and diversification of personal interests. The positive relationship with the coach was identified as a protective factor, although strengthening team cohesion was recommended. The study highlighted the importance of psychological assessment to enhance performance and foster the holistic development of young athletes, emphasizing the need for personalized interventions addressing both individual aspects and group dynamics. Despite its limitations, such as focusing exclusively on one participant, the findings provided a solid basis for future research and applications in youth sports psychology.


Keywords sports psychology, psychological assessment, youth athletes, sports performance, personalized interventions.

Resumen El estudio analizó el perfil psicológico de un lanzador juvenil del equipo de béisbol de Sancti Spiritus, Cuba, con el objetivo de identificar sus fortalezas y debilidades psicológicas y diseñar estrategias de intervención para optimizar su rendimiento deportivo y desarrollo integral. Se utilizó un enfoque de caso único, aplicando instrumentos validados como el Inventario de Personalidad de Eysenck, el Inventario de Ansiedad Estado-Rasgo, el Test de Motivos Deportivos y el Test de Cualidades Volitivas, complementados con entrevistas, observación directa y técnicas proyectivas. Los resultados indicaron estabilidad emocional y cualidades volitivas destacadas, pero evidenciaron deficiencias en agresividad competitiva y diversificación de intereses personales. La relación positiva con el entrenador se identificó como un factor protector, aunque se recomendó fortalecer la cohesión grupal. El estudio subrayó la importancia de la evaluación psicológica como herramienta para potenciar el rendimiento y fomentar el desarrollo integral de los atletas juveniles, destacando la necesidad de intervenciones personalizadas que aborden tanto aspectos individuales como dinámicas grupales. A pesar de sus limitaciones, como el enfoque exclusivo en un participante, los hallazgos proporcionaron una base sólida para futuras investigaciones y aplicaciones en el ámbito de la psicología del deporte juvenil.

Palabras clave psicología del deporte, evaluación psicológica, atletas juveniles, rendimiento deportivo, intervenciones personalizadas.

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 Maybel Matos
maybel255@gmail.com

Universidad de Córdoba, España.

Introduction

Sports psychology has evolved significantly in recent decades, consolidating itself as an essential discipline for the comprehensive development of athletes (Martínez et al., 2021). It is not limited solely to improving physical performance but also encompasses critical aspects such as motivation, emotional self-regulation, pressure management, and group cohesion (Weinberg & Gould, 2020). In youth sports, the importance of psychological intervention is even more evident, as young athletes face particular challenges related to their personal, social, and competitive development (Buitrago, 2020).

Several recent studies have highlighted the positive impact of psychological strategies on sports performance (Asensio-Hernández & Martín, 2022; Sánchez-Romero, 2021). Implementing psychological training programs strengthens key skills such as concentration, resilience, and decision-making under pressure. Likewise, research by Sánchez-Romero (2021) indicates that interdisciplinary approaches, which combine psychology with technical preparation, are crucial to maximizing the potential of youth athletes (Rodríguez & Muñoz, 2023).

The case in question occurs in a highly competitive sport such as baseball, where the interaction between physical, technical, and psychological factors is decisive for success. Particularly in this discipline, the capacity for emotional self-regulation and the ability to maintain concentration is fundamental, given that pitchers face high levels of pressure and require precise control of their actions in fractions of a second (del Monte, 2020).

This article addresses the psychological evaluation of a pitcher from the youth baseball team of Sancti Spiritus, Cuba. This study analyzes the athlete's personality characteristics that influence his performance during the competition stage. The main objectives include identifying his psychological strengths and weaknesses and designing personalized intervention strategies that optimize his mental preparation for sport.

The main objective is to explore how psychological variables, such as motivation, emotional regulation, and volitional qualities, impact the athlete's competitive performance. Through detailed analysis and standardized techniques, the aim is to provide practical tools that favor their comprehensive development in the sports field.

The psychological assessment was carried out using a series of standardized techniques, including the Eysenck Personality Inventory, the Butt Sport Motives Test, and the State-Trait Anxiety Inventory (STAI)—these tools allowed for a comprehensive diagnosis of the athlete, identifying his strengths and improvement areas. The results provide a detailed view of his psychological profile and lay the foundation for future interventions to strengthen his performance.

This work highlights the relevance of psychology in youth sports, not only as a means to achieve sporting achievements but also as a tool for young people's personal and social development. It also highlights the need to adopt personalized approaches that consider the particularities of each athlete, thus facilitating their comprehensive growth on and off the field of play.

The importance of psychological assessment in youth sports lies not only in improving competitive performance but also in its influence on the comprehensive development of athletes. Being in a training stage, youth athletes face various challenges beyond the playing field. These include constructing their identity, managing external pressure, and interacting with their social environment, which is directly influenced by their psychological and emotional state (Sabarrit et al., 2022). In this sense, the role of the sports psychologist becomes fundamental when implementing strategies that promote resilience, stress management, and intrinsic motivation (Díaz, 2022).

Furthermore, baseball, as a strategic and high-precision sport, demands specific psychological skills. The ability to make decisions under pressure, manage frustration in the face of mistakes, and sustain concentration are essential qualities that distinguish successful pitchers. Recent studies by Ríos-Garrit et al. (2021) point out that pitchers face significant emotional and cognitive overload, especially during critical moments of games, highlighting the need for adequate psychological preparation. This type of training contributes to improved sports performance and reduces the risk of burnout and stress-related injuries.

Finally, it is crucial to highlight the impact of interpersonal relationships in the sports context, especially between athletes and their coaches. According to recent research, the quality of these relationships can significantly influence athletes' motivation and commitment (Moya, 2021). An environment of trust and support facilitates the development of effective group cohesion, which is indispensable in team sports such as baseball. In this case, the study seeks to explore the relational dynamics of the athlete with his environment, evaluating how these interactions affect his performance and general well-being.

Sports psychology optimizes athletes' performance by addressing essential psychological components such as motivation, concentration, emotional self-regulation, and interpersonal relationships. These dimensions are especially relevant to youth athletes, who face the physical and technical demands of sport and undergo processes of personal, social, and cognitive development (Sabarrit et al., 2022). This stage of training requires specific interventions that consider the athlete's internal factors and the dynamics of their environment.

Personality is a key dimension in the psychological analysis of athletes, especially in disciplines such as baseball, where pressure and quick decision-making are constant. Eysenck's personality model, used in this study, allows us to identify traits such as emotional stability and introversion that are decisive for managing competitive stress. According to Ríos-Garit et al. (2021), athletes with phlegmatic temperaments tend to be more emotionally balanced but may require additional strategies to increase their aggressiveness and competitiveness in the game.

The evaluated pitcher's results on the Eysenck Personality Inventory reflect a high level of emotional stability, which allows him to remain calm in pressure situations. However, the low aggressiveness identified suggests a need to work on his response to competitive challenges. This is consistent with studies indicating that controlled aggressiveness is indispensable for high-precision sports (del Monte, 2020).

Motivation in sports is commonly divided into two dimensions: intrinsic and extrinsic. Intrinsic motivation, related to personal satisfaction and self-realization, is especially relevant in youth athletes, as it fosters their long-term commitment (Asensio-Hernández & Martín, 2022). The Sports Motives Test used in this study identified a high intrinsic motivation in the athlete, focused on achievement and cooperation, but showed deficiencies in areas such as rivalry and aggression, which are essential to compete effectively in a sport such as baseball.

Furthermore, volitional qualities, assessed through the Volitional Qualities Test, highlight perseverance, self-control, and fighting spirit. According to Paredes (2021), these qualities improve performance and contribute to developing skills to overcome adversity. In this case, the athlete demonstrated adequate volitional development, but it was recommended that specific areas be strengthened through visualization and competitive simulation techniques.

The impact of interpersonal relationships on sports performance has been widely studied. According to Moya (2021), a positive relationship between coach and athlete fosters trust, motivation, and learning. In this case, the evaluation identified a satisfactory relationship between the pitcher and his coach, constituting a protective factor for his performance. However, group dynamics within the team are also relevant. Research suggests that group cohesion can enhance performance by promoting a sense of belonging and mutual support (Buitrago, 2020).

Methodology

The present study employed a single-case design, focusing on the psychological assessment of a youth pitcher from Sancti Spiritus, Cuba baseball team. This approach allowed for a detailed analysis of the participant's psychological

characteristics, volitional skills, and interpersonal dynamics to identify his psychological strengths and weaknesses in sports.

The participant is a 16-year-old male athlete, identified by the initials APP, in the competitive stage of his career as a pitcher in the youth category. A pre-university student, he does not report any significant personal pathological history, although his family environment reports a history of bronchial asthma in his father. The young man lives in a functional family environment and has emotional and logistical support from his mother and brother. His primary motivation is to achieve sporting achievements, such as representing his team in national and international competitions, although he shows a limited diversification of personal interests beyond baseball.

Various validated psychological tools, such as the Eysenck Personality Inventory (EPI), were used to obtain a comprehensive participant assessment. It allowed the analysis of personality traits such as introversion/extroversion and emotional stability. State-Trait Anxiety Inventory (STAI-IDA-RE): It assessed anxiety levels as a transitory state and a stable personality trait, providing insight into their ability to handle competitive pressure. Butt's Sport Motives Test: Measures motivation in five key dimensions: sufficiency, rivalry, cooperation, aggressiveness and conflict. CR Núñez Volitional Qualities Test: He analyzed aspects such as perseverance, self-control, and fighting spirit, which are relevant to sports preparation.

Interpersonal Relationships Test with the Coach: He/she evaluated the relationship quality between the athlete and his/her coach in three dimensions: cognitive, affective, and behavioral. D. González Serra's 10 Wishes Technique: He/she identified the participant's needs, aspirations, and personal conflicts, providing information on his/her intrinsic motivation. Direct observation: He/she recorded behaviors, attitudes, and emotional responses during the work sessions. Semi-structured interviews were conducted with the participant and his/her coach to complement the quantitative data with qualitative information.

The evaluation process was carried out in three sessions over one month.

First session: Rapport was established with the athlete, and his personality was initially assessed. The Eysenck Personality Inventory and a semi-structured interview were applied to explore general psychological characteristics and background.

Second session: Cognitive, affective, and motivational processes were assessed by applying the State-Trait Anxiety Inventory (STAI) and the Sports Motives Test. In addition, the athlete's attitudes were recorded during the session through observation.

Third session: Volitional qualities, interpersonal relationships, and specific motivations were analyzed. The Volitional Qualities Test, the Interpersonal Relationships Test with the Coach, and the 10 Wishes Technique were applied in this session. The latter allowed the identification of conflicts and aspirations that had not been explored in previous sessions.

The information obtained through these tools and techniques was organized and analyzed to generate a detailed psychological profile of the participant. This profile allowed for identifying strengths and areas for improvement, guiding the design of intervention strategies focused on optimizing their sports performance and comprehensive development.

Results and discussion

The young pitcher's psychological assessment allowed us to identify a comprehensive profile of his psychological characteristics, highlighting both strengths and areas for improvement. The most relevant findings are summarized below, followed by a discussion based on the theoretical framework and recent literature. Table 1 presents the results of the psychological evaluation of the youth athlete.

The results of the Eysenck Personality Inventory indicated that the athlete has a phlegmatic temperament characterized by emotional stability, balance, and self-regulation capacity. Although he presents traits of introversion, his social adaptation in the sports field is adequate. This emotional stability is one of his main strengths since it allows him to handle

competitive pressure effectively, as demonstrated by his low score in anxiety as a state and moderate as a trait, assessed by the State-Trait Anxiety Inventory (STAI-IDARE). This supports studies such as Ríos-Garit et al. (2021), highlighting the importance of emotional regulation in sports performance.

Regarding motivation, the Sports Motives Test showed a strong inclination towards cooperation and sufficiency. However, it evidenced low rivalry and aggressiveness, fundamental to responding to competition demands in sports such as baseball. Although the athlete has a high intrinsic motivation, this imbalance limits his competitiveness in high-pressure contexts. This coincides with the approaches of Gómez et al. (2021), which underlines the importance of these dimensions in high-performance sports.

As for volitional qualities, the Volitional Qualities Test highlighted high levels of perseverance, determination, and self-control, which demonstrates his ability to overcome adversity and maintain focus on his sporting goals. However, the 10 Wishes Technique revealed a strong orientation towards specific sporting achievements, with a limited diversification of personal interests, which could represent a risk of emotional dependence on sporting success.

The positive relationship with their coach, assessed by the Interpersonal Relationships with the Coach Test, is a key protective factor in their sporting development. Based on trust and mutual respect, this relationship fosters their in-

Table 1. Results of the psychological evaluation of the youth athlete

Technique	Evaluated dimension	Quantitative result	Qualitative result
Eysenck personality inventory	Introversion/extroversion and emotional stability	Extroversion: 12 Neuroticism: 9	Phlegmatic temperament, with emotional stability and slight traits of introversion.
State-trait anxiety inventory (STAI-IDARE)	Anxiety as a trait and state	Trait: 30 (Medium) Status: 29 (Low)	Moderate anxiety that is manageable in sports contexts.
Sports motives test (Butt)	Motivation in five dimensions	Total: 13	High cooperation and sufficiency, low rivalry and aggressiveness, medium general motivation.
Volitional qualities test (CR Núñez)	Perseverance, self-control and fighting spirit	Total: 70	High level of volitional qualities, highlighting perseverance and determination.
Interpersonal relationships test with the coach	Quality of the relationship	Cognitive: 6, Affective: 6, Behavioral: 8	Positive relationships are based on trust and mutual respect.
10 Wishes technique	Personal aspirations and conflicts	-	Desires focused on sporting achievements; limited diversification of personal motivations.
Direct observation	Behavior and emotional responses	-	Initially serious and reserved, he became collaborative and reflective in later sessions.

trinsic motivation and provides an environment conducive to learning. This reinforces what Moya (2021) has stated, highlighting the coach's importance as a mediator of emotional well-being and performance in youth sports.

Interpretation and Limitations

The findings confirm the relevance of the psychological dimensions assessed for the athlete's sporting performance. Emotional stability and volitional qualities emerge as significant strengths, while low competitive aggressiveness and limited diversification of personal interests are critical areas to work on. These results contribute to a comprehensive analysis of the case and emphasize the need for personalized interventions that address these areas of improvement.

Despite progress, the study has limitations, such as the exclusive focus on the psychological dimension without considering technical or physical aspects of training. In addition, the analysis focuses on a single participant, which limits the generalizability of the results. However, this single-case approach allows a deeper understanding of the interactions between psychological characteristics and the athlete's social and sporting context.

This study highlights the importance of psychological assessment in youth sports and underscores the need for strategies that integrate psychological, social, and technical dimensions. Implementing interventions aimed at improving competitive aggressiveness, diversifying personal motivations, and strengthening group dynamics could enhance the athletes' performance and contribute to their comprehensive development on and off the sports field.

Conclusions

The psychological evaluation of the young pitcher of the Sancti Spíritus baseball team allowed us to identify a comprehensive profile that highlights key strengths, such as emotional stability and volitional qualities, and areas for improvement related to competitive aggressiveness and diversifying personal motivations. These dimensions directly impact his sporting performance and comprehensive development as an athlete. In terms of personality, the participant's phlegmatic temperament and emotional stability allow him to handle competitive pressure situations, maintaining balance and self-regulation. However, low rivalry and aggressiveness reflect a limited response to competitive challenges, highlighting the need for interventions that stimulate these qualities essential to his sporting discipline. The positive relationship with their coach was a protective factor in their emotional and sporting development. This bond fosters trust and mutual respect, essential elements for the athlete's growth within the team. However, strategies promoting more effective group cohesion could benefit broader group dynamics and peer relationships. The main practical implications of this

study underline the importance of integrating sport psychology into the daily training of youth athletes. Specifically, personalized programs that work on controlled aggression and rivalry in competition and activities that stimulate the diversification of personal interests and the strengthening of interpersonal relationships within the team should be implemented. Finally, this study highlights the relevance of psychological assessment in youth sports to optimize competitive performance and promote the athlete's comprehensive development. Although the single-case approach limits the generalizability of the findings, it provides a solid foundation for future research and practical applications considering the complex interactions between psychological, social, and technical dimensions in the sporting field.

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Conflicts of interest

The author declares that she has no conflict of interest.

Author contributions

Maybel Matos: Conceptualization, data curation, formal analysis, investigation, methodology, supervision, validation, visualization, drafting the original manuscript and writing, review, and editing.

Data availability statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Statement on the use of AI

The author acknowledges the use of generative AI and AI-assisted technologies to improve the readability and clarity of the article.

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