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ATHLETIC MENTAL ENERGY AND SPORTS ENGAGEMENT AS MEDIATED BY STUDENT-ATHLETE SATISFACTION

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Abstract:
This study delved into the well-being of 300 college athletes in the Davao Region, focusing on the interplay of Athletic Mental Energy (AME), Athlete Satisfaction (AS), and Sports Engagement (SE). The study adopted a stratified sampling approach, selecting participants from key state institutions, providing context-specific insights into the college athlete experience. Carried out in state colleges, including Davao Occidental and Davao del Sur, the research employed a population sample of 43 student-athletes for pilot testing, utilizing meticulously validated questionnaires with expert input. Findings showed a moderate AME level coupled with high athlete satisfaction and robust sports engagement. Correlation analyses unveiled positive connections among AME, AS, and SE, while regression analysis underscored AS as a partial mediator in the AME-SE relationship. Aligned with Engagement Theory and Locke's Range of Affect Theory, the study accentuated the intertwined nature of cognitive, emotional, and behavioral facets in athlete engagement. Practical implications encompassed the integration of mental resilience programs and the enhancement of leadership and coaching training. The study's outcomes contributed to a nuanced understanding of and avenues for optimizing the holistic development and satisfaction of college athletes. Furthermore, the research aligned with Sustainable Development Goal 3 (Good Health and Well-being), emphasizing the imperative of holistic well-being in educational settings.

Keywords: college athletes, athletic mental energy, athlete satisfaction, sports engagement, engagement theory, Davao Region, Philippines

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1. Introduction

Recently, the challenge of athlete sports engagement has grown (Brison & Geurin, 2021). Athletes face obstacles, including physical injuries, mental health issues, and external factors like financial instability (Huml *et al.*, 2019). They understand the root causes and provide comprehensive solutions to maintain athlete engagement and well-being in sports (Vella *et al.*, 2020). The need for robust support systems is a key factor contributing to these issues. Athletes, under immense pressure to perform, may need proper support, leading to a decline in their engagement and well-being (Silva & Casas, 2020; Gerlach, 2018).

In a study by Taibah University, Saudi Arabia, Sayyd *et al.* (2020) highlighted the multifaceted nature of athlete engagement, extending beyond physical activity to include dedication, teamwork, and mental resilience. This comprehensive approach influences individual and team performance, emphasizing the importance of holistic training, nutrition, recovery, and mental preparation. Athlete sports engagement is crucial for enhancing physical and mental well-being and fostering fitness, skill improvement, and competitiveness. This commitment also contributes to teamwork, discipline, and overall athlete development. Similarly, Gula (2023) identified challenges in athlete sports engagement among junior high school athletes in the Eastern Visayas Regional Athletic Association, focusing on privileges, practice venue distance, transportation, and equipment availability. In Western Mindanao State University, Zamboanga City, Bondoc Jr. (2023) emphasized a significant issue in athlete sports engagement, urging attention to variations in motivation based on gender and experience for improved inclusivity and success in community sports programs.

Further delving into the importance of sports engagement, it becomes crucial to extend the exploration of the engagement concept to athletes participating in diverse levels of competition. Previous studies have underscored that achieving expert performance is intricately linked to prolonged and systematic engagement in deliberate practice within a specific domain (Martins *et al.*, 2014). Consequently, investigating the role of engagement among athletes at various competitive levels becomes vital in comprehending their motivations for skill mastery and sustained dedication to their respective sports (Fernandes *et al.*, 2013). This nuanced examination offers insights into the multifaceted dynamics that drive athletes across different levels of competition, contributing to a more comprehensive understanding of the factors influencing their performance and commitment.

Moreover, the relationship between mental energy and sports engagement is pivotal for varsity athletes, requiring exceptional dedication and time investment for success. The social dimension of self-concept, shaped by experiences, relationships, and active sports participation, is central to athletes' lives (Schaeperkoetter *et al.*, 2017). Mental energy and toughness are foundational in engagement across various sports disciplines, influencing decision-making, composure under pressure, and problem-solving skills (Gürer *et al.*, 2019). The significance of mental energy becomes evident as it encompasses

internal and external competition, fostering unwavering confidence and effective coping mechanisms amid challenges (Scheadler *et al.*, 2021). This intricate relationship highlights how psychological factors, particularly mental resilience and a strong commitment to the sport, are essential for holistic well-being and achieving ultimate success in competitive sports.

Furthermore, physical training often overshadows athlete mental energy, a crucial determinant of performance and satisfaction. This mental dimension significantly influences an athlete's focus, decision-making, and motivation during training and competitions (Chiou *et al.*, 2020). Techniques like mindfulness practices and positive self-talk contribute to cultivating mental energy effectively, thereby enhancing performance and satisfaction. Moreover, athlete satisfaction is vital for long-term success, fostering commitment, motivation, and resilience (Hao *et al.*, 2022). High satisfaction derives from accomplishments, positive relationships with coaches and teammates, and a supportive environment valuing their efforts. Recognizing and optimizing athletes' mental energy and satisfaction are essential for a successful sports environment, urging coaches, trainers, and athletes to prioritize mental well-being alongside physical training, ensuring a holistic approach to athletic development (Rani & Lakshmi, 2022).

The intricate relationship between athlete satisfaction and sports engagement is multifaceted. Athlete satisfaction is influenced by experiences in the sport, including coaching quality, team dynamics, and competitive success (Hu *et al.*, 2023). Support and resources, such as facilities and sports medicine access, also contribute to satisfaction. Conversely, sports engagement is shaped by the athlete's motivation, enjoyment, and sense of belonging within the athletic community (Podlog *et al.*, 2015). External factors like social support, financial incentives, and recognition opportunities also play a pivotal role. Understanding this relationship requires considering individual experiences, perspectives, and broader social, cultural, and environmental factors (Bovenko, 2021).

The existing literature identifies challenges in athlete sports engagement, emphasizing obstacles like injuries, mental health issues, and financial instability. While studies in Taibah University and the Eastern Visayas Regional Athletic Association highlight the multifaceted nature of athlete engagement, a gap exists in understanding variations in motivation based on experience in community sports programs. The importance of mental energy in sports engagement is acknowledged, yet the literature does not explore effective strategies to optimize mental energy alongside physical training. Adding to this context, there is a considerable research void, specifically investigating the role of athlete satisfaction in influencing the relationship between athlete mental energy and sports engagement within the local setting, particularly among PASUC athletes in Region XI. This gap necessitates a comprehensive examination to fill this void, exploring the intricate dynamics of athlete satisfaction, mental energy, and sports engagement. Addressing this unexplored territory not only aims to bridge an existing gap but also offers valuable insights for coaches, athletes, and sports management professionals, reinforcing the urgency and significance of this comprehensive exploration for athletes' holistic development and success.

2. Literature Review

The reviewed literature provides comprehensive insights into the variables central to the study: athletic mental energy, sports engagement, and athlete satisfaction. Athletic mental energy is the independent variable, encompassing confidence, motivation, concentration, tirelessness, composition, and Vigor (Fontana *et al.*, 2023). The study recognizes the multifaceted nature of mental energy, from biological processes to mood and cognitive functions, emphasizing its positive associations with optimal athletic performance (Chiou *et al.*, 2020).

The first indicator, confidence, is crucial for athletes to swiftly refocus attention on relevant cues and recover from distractions, distinguishing successful from unsuccessful athletes (Torralba, 2020). Motivation, another indicator, reflects the capacity for physical and mental work, assessed through self-reported feelings of energy (Peng *et al.*, 2020). Concentration, the third indicator, is integral for athletes to focus on task-relevant information and avoid distractions, with optimal arousal levels ensuring quality attention (Sheehan *et al.*, 2018).

Motivation, characterized by an athlete's drive and determination, plays a crucial role in sustaining effort and commitment towards training and competition. Lonsdale, Hodge, and Jackson (2017) explored the multifaceted nature of motivation in sports, highlighting the significance of intrinsic and extrinsic motivational factors in shaping athletes' engagement and persistence. Their findings complement those of (Juezan & Osorno, 2022), suggesting that motivation is a complex interplay of internal desires and external rewards, influencing athletes' psychological well-being and performance outcomes in the Davao Region.

The affective component of tirelessness is explored and linked to peak performance experiences and flow, emphasizing the importance of athletes' resilience and emotional stability (Sheehan *et al.*, 2018). Composed, as an indicator, signifies calmness, comfort, and low anxiety, associated with peak performance experiences and flow (Rice *et al.*, 2016). Vigor, the final indicator, measures mental energy, but its definition and measurement remain unspecified, highlighting a research gap in the conceptualization of mental energy in sports (Sheehan *et al.*, 2018).

Moreover, the study acknowledges the significance of understanding the psychological underpinnings of mental toughness, a potential umbrella term for multiple dimensions, including self-efficacy, buoyancy, success mindset, optimistic style, context knowledge, emotion regulation, and attention regulation (Thom *et al.*, 2020). Mental toughness is considered a personal capacity that enables consistent high-level performance despite challenges and stressors, emphasizing its importance in achieving success in sports (Hofmeyer *et al.*, 2020).

Exploring sports engagement and athletic identity in the context of elite sprinters in Croatia is a pioneering endeavor, shedding light on crucial aspects of sports psychology that significantly influence athletes' success and overall well-being. Athletic engagement (AE) is an enduring, stable sports experience associated with positive effects

and cognitions related to an individual's involvement in a sport (Guillen & Martinez-Alvarado, 2014). This construct, often linked to flow and inversely correlated with burnout, offers valuable insights into the complexities of human behavior in sports and serves as a framework for promoting positive sports experiences.

Athletic identity, another pivotal aspect, reflects the strength and exclusivity an individual identifies with the athlete role, influencing their self-concept and participation in various life activities (Babic *et al.*, 2017). The study underscores the relevance of exploring engagement concepts across different levels of competition, acknowledging the potential impact of systematic engagement on skill mastery and continued sports practice (García *et al.*, 2023).

Vigor, the first indicator of sports engagement, encapsulates physical, mental, and emotional energy, emphasizing resilience and dedication during sports activities. Defined as a positive mental state characterized by vigor, dedication, and absorption, engagement is deemed an optimum state in sports and contributes to athletes' overall well-being (Feng *et al.*, 2023). Dedication, the second indicator, signifies strong involvement, enthusiasm, inspiration, pride, and challenge in the task at hand. Lastly, absorption occurs when athletes are entirely focused on the task, perceiving time to pass quickly, reflecting a state of optimum engagement (Zrnić *et al.*, 2021).

The study draws parallels between student engagement in educationally purposeful activities and Astin's theory of involvement, emphasizing the impact of involvement on student learning and personal development (Moreno, 2020). The Seven Principles for Good Practice in Undergraduate Education further underscore the importance of student-faculty contact, cooperation among students, active learning, prompt feedback, time on task, communication of high expectations, and respect for diverse talents and ways of learning (Sayyd *et al.*, 2020).

Examining student athletes' experiences with student-faculty interaction, peer interaction, participation in student groups, and academic-related activities, the study aligns with the National Survey of Student Engagement (NSSE). It highlights the role of such experiences in shaping college outcomes (Harry, 2023). The literature review explores the multifaceted impact of athletic participation on student learning, personal development, satisfaction with the college experience, and various outcome variables, revealing diverse findings across studies (Peng *et al.*, 2020).

Athletic satisfaction (AS) is a vital construct in sports psychology, reflecting a positive affective state resulting from a complex evaluation of the structures, processes, and outcomes associated with the athletic experience (Hao *et al.*, 2022). AS essentially gauges how content or happy athletes are with their sports involvement, aligning with the paramount purpose of the National Collegiate Athletic Association to prioritize student–athletes' experiences. Although research on AS is still evolving, related studies on job satisfaction highlight its relevance to organizational outcomes valued by athletic teams (Gucciardi *et al.*, 2015).

For instance, job satisfaction, a concept parallel to AS, has been linked to greater commitment, lower intentions to quit, increased job performance, and more

organizational citizenship behaviors. Similarly, research on AS indicates its role in player motivation, social loafing, athlete-related turnover, and overall emotional well-being. The study recognizes the impact of environmental variables, such as leadership style, coach qualities, team cohesion, communication, player participation, and success, on athlete satisfaction (Tisna & Darmawan, 2020).

Furthermore, the athlete's intrinsic motivation, self-concept, and self-satisfaction are pivotal in determining success. The study emphasizes the importance of athletes' inner drive, mental and physical toughness, and practice consistency (Agarwal *et al.*, 2023). Self-satisfaction contributes significantly to performance, highlighting the athlete's intrinsic motivation and its positive relationship with outcomes (Krasnoff *et al.*, 2020).

Athlete satisfaction is a key outcome variable that influences various psychological aspects and connects with leadership behavior, individual/team performance, and social agents' approval (Aquino & Reyes, 2022). The literature discusses the multidimensional measurement of athlete satisfaction, including instruments like the Sports Satisfaction Inventory (SSI) and Athletic Satisfaction Questionnaire (ASQ) (Moreno, 2020).

The correlation between variables underscores the significance of athletic mental energy, sports engagement, and athlete satisfaction. Mental energy, as an individual's ability to sustain focus and resist distractions, contributes to sports engagement, ultimately leading to success. The interconnectedness of mental energy, motivation, and satisfaction is highlighted, emphasizing the role of personal drive and positive perceptions in athletes' performance. The study's variables, including athletic mental energy and sports engagement, provide valuable insights into the relationship and the mediating role of athlete satisfaction among college student-athletes.

3. Material and Methods

This chapter discloses the research respondents, materials and instruments, and design and procedure.

3.1 Research Respondent

The selection of respondents for this study, involving 300 student-athletes from selected state colleges in the Davao Region, was executed through a systematic random stratified sampling design. This method categorized the target population into distinct strata based on relevant characteristics such as college affiliation or sports specialization, ensuring a comprehensive representation of the diverse student-athlete community. Participants were randomly chosen within each stratum to minimize bias and enhance the study's generalizability.

Adherence to stringent inclusion and exclusion criteria was paramount. The study exclusively focused on student-athletes, deliberately excluding individuals without athletic experiences or those not identifying as athletes. Furthermore, withdrawal criteria were established to safeguard the participants' autonomy. Students who were not athletes or lacked prior athletic experiences were intentionally omitted from the study,

and participants were granted the freedom to withdraw their participation at any stage, reinforcing the ethical considerations and respecting the rights of the individuals involved. This approach aimed to maintain the integrity of the study and uphold ethical standards throughout the research process.

4. Materials and Instrument

Two sets of questionnaires were adapted from different authors and validated by experts on questionnaire construction. The experts' comments were properly taken and incorporated into the instrument's finalization. The adopted standardized questionnaires were validated in contents, as they were tested and proven by the author, and the questionnaires were modified to classify the questions. The questionnaires were designed in a very comprehensive form with the help of expert validators to provide the respondents with ease and comfort in answering each question and understanding the study's objective. A pilot study among thirty student-athletes from private colleges was conducted.

Cronbach alpha was used to check the validity of the questionnaire with the following measures: athletic mental energy, sports engagement, and athlete satisfaction. Cronbach's alpha consistency coefficient customarily ranged between zero and one. However, there was no lower limit to the coefficient. The closer the Cronbach's alpha coefficient was to one, the larger the internal constancy of the items in the scale (Gliem & Gliem, 2003). Moreover, Darren and Mallery (1999) postulated the following rules of thumb in measuring the reliability of the questionnaire using Cronbach's alpha: if the result was greater than or equal to 0.9, it was excellent; greater than or equal to 0.8 was good; greater than or equal to 0.7 was acceptable; greater than or equal to 0.6 was questionable; greater than or equal to 0.5 was poor, and greater than or equal to 0.4 was unacceptable.

Three research instruments were used in this study—the first research instrument measured athletic mental energy. The research instrument on athletic mental energy was adopted from the Measuring Athletic Mental Energy (AME): Instrument Development and Validation survey by Lu *et al.* (2018). The Athletic Mental Energy questionnaire had six domains: confidence, motivation, concentration, tirelessness, composure, and vigor. The variables were measured on a five-point Likert-type scale of 1 to 5, anchored with "never manifested" to "always manifested." The ranges for the means of the athletic mental energy survey questionnaire and the corresponding verbal descriptions are presented in the table below.

The Range of Means for assessing athletic mental energy is categorized into five numerical values with corresponding verbal descriptions and interpretations. A numerical value between 4.20 and 5.00 is labeled as 5, indicating a very high level, signifying that athletic mental energy is consistently manifested. Falling within the range of 3.50 to 4.49, a numerical value of 4 denotes a high level, suggesting that athletic mental energy is often manifested. Ranging from 2.50 to 3.49, a numerical value of 3 is associated

with a moderate level, indicating that athletic mental energy is sometimes manifested. Within the range of 1.50 to 2.59, a numerical value of 2 signifies a low level, suggesting that athletic mental energy seldom manifests. Lastly, a numerical value between 1.00 and 1.49 is marked as 1, representing a very low level and implying that athletic mental energy never manifests.

The second research instrument measured the level of sports engagement of college student-athletes. Sports engagement had three main indicators: vigor, dedication, and absorption (Guillen & Martinez-Alvarado, 2014). The variables for interpersonal support were rated based on how they "always practiced" and "never practiced" on the statements, and all answers were given on a 5-point scale. The ranges for the means of the interpersonal support questionnaire and the corresponding verbal descriptions are presented in the table below.

The assessment of sports engagement utilizes a Range of Means with corresponding numerical values, verbal descriptions, and interpretations. A numerical value between 4.20 and 5.00 is designated as 5, indicating a very high level, signifying that the respondent always practiced the item related to sports engagement. Falling within the range of 3.40 to 4.19, a numerical value of 4 denotes a high level, suggesting that the respondent repeatedly practiced the item related to sports engagement. Ranging from 2.60 to 3.39, a numerical value of 3 is associated with a moderate level, indicating that the respondent sometimes practiced the item related to sports engagement. Within the range of 1.80 to 2.59, a numerical value of 2 signifies a low level, suggesting that the respondent seldom practiced the item related to sports engagement. Lastly, a numerical value between 1.00 and 1.79 is marked as 1, representing a very low level and implying that the respondent never practiced the item related to sports engagement.

The third research instrument measured the level of athlete satisfaction. The variables for athlete satisfaction were measured on a five-point Likert-type scale of 1 to 5, anchored with "strongly disagreed" to "strongly agreed." The ranges for the means of the athlete satisfaction survey questionnaire and the corresponding verbal descriptions are presented in the table below.

The evaluation of athlete satisfaction employs a Range of Means, each associated with numerical values, verbal descriptions, and corresponding interpretations. A numerical value falling between 4.20 and 5.00 is denoted as 5, representing a very high level. In this context, it signifies that the respondent consistently manifested the item related to athlete satisfaction. Within the range of 3.40 to 4.19, a numerical value of 4 indicates a high level, suggesting that the respondent often manifested the item related to athlete satisfaction. Ranging from 2.60 to 3.39, a numerical value of 3 is linked to a moderate level, signifying that the respondent occasionally manifested the item related to athlete satisfaction. In the range of 1.80 to 2.59, a numerical value of 2 signifies a low level, indicating that the respondent infrequently manifested the item related to athlete satisfaction. Lastly, a numerical value between 1.00 and 1.79 is designated as 1, representing a low level and conveying that the respondent never manifested the item related to athlete satisfaction.

4.1 Design and Procedure

The deliberate selection of a correlational design with mediation analysis for this study proves fitting for uncovering the relationships among athletic mental energy, sports engagement, and athlete satisfaction. Correlational designs are well-suited for investigations aiming to understand associations and patterns of covariation between variables without experimental manipulation, aligning seamlessly with the study's objective to unravel the dynamics within these key constructs. The mediation analysis enriches the research design by providing a structured approach to investigate how athlete satisfaction mediates the relationship between athletic mental energy and sports engagement, allowing for a nuanced exploration of the underlying mechanisms and pathways. Guided by Cohen *et al.* (2003), Baron and Kenny (1986), and MacKinnon (2008), the application of mediation analysis elevates the research design, offering a sophisticated perspective on the relationships under investigation. It enables the study to move beyond mere correlation exploration and delve into the intricate dynamics involved, aligning seamlessly with the study's objective of comprehensively exploring the interrelationships between athletic mental energy, sports engagement, and athlete satisfaction.

The data collection process adhered to ethical standards and procedural guidelines established by the University of Mindanao Ethics Research Committee (UMERC). After initiating the ethical review process by seeking permission from the College Presidents, official letters of permission were directed to the College Presidents of identified state colleges. Following a successful pilot test involving thirty student-athletes from private colleges in Davao del Sur, survey questionnaires were administered to the targeted students. The mode of data collection exclusively involved surveys administered through Google Forms, ensuring a standardized and streamlined approach. The researcher actively administered and collected the questionnaires, providing necessary information about the study's purpose to the respondents at state colleges. A systematic retrieval process was implemented after one week, allowing sufficient time to complete the survey questionnaires. The collected data underwent rigorous scrutiny, including checking, tallying, and review by a statistician, ensuring the reliability and integrity of the data collection process.

The selected statistical tools for this study serve a purposeful role in unraveling the intricacies of the relationships among athletic mental energy, sports engagement, and athlete satisfaction. Using mean as a descriptive statistic provides a snapshot of each variable's central tendencies and variations, addressing the study's goals comprehensively. Pearson r, employed as a correlation coefficient, discerns the significance of the relationship between athletic mental energy and sports engagement, shedding light on their interdependence. Regression analysis, strategically utilized, determines crucial coefficients for the Med graph, providing quantitative insights into the predictive power of athletic mental energy on sports engagement. The incorporation of the Med graph, particularly employing the Sobel z-test, represents methodological rigor in testing the mediation effect, delving into nuanced mechanisms through which

athlete satisfaction mediates the relationship between athletic mental energy and sports engagement. Together, these statistical tools contribute to the methodological depth of the study, ensuring a comprehensive and rigorous exploration of the research questions.

5. Results and Discussion

This chapter presents the results, interpretation, and analysis of the findings. Results are presented in the following order: level of Athletic Mental Energy in terms of *Confidence, Motivation, Vigor, Concentration, and Calm*; level of Athlete Satisfaction in terms of *Coach, Team Performance, and Teammate*; level of Sports Engagement in terms of *Vigor, Dedication and Absorption*, Bivariate correlation analysis of the variables, and regression analysis showing the influence of athletic mental energy on sports engagement as mediated by athlete satisfaction.

5.1 Level of Athletic Mental Energy of College Athletes

Table 1 provides a detailed analysis of college athletes' athletic mental energy levels, outlining mean scores, standard deviations, and descriptive levels for key indicators. The overall mean score of 3.27, accompanied by a standard deviation of 0.681, indicates a moderate level of athletic mental energy across assessed dimensions.

Motivation takes precedence, with a high mean score of 3.86 and a standard deviation of 0.754, highlighting a significant drive among college athletes. Vigour follows closely with a noteworthy mean score of 3.38 and a relatively low standard deviation of 0.776, suggesting a moderate yet consistent level of physical and mental vitality. Confidence and concentration both exhibit moderate mean scores of 3.15 and 3.14, respectively, with standard deviations of 0.729 and 0.824. These findings point to a balanced confidence and concentration level among college athletes, which are crucial for success in competitive sports. Tirelessness, with a mean score of 2.96 and a standard deviation of 0.939, indicates moderate endurance and resilience. Composure, with a mean score of 3.04 and a standard deviation of 0.892, reflects moderate emotional control and stability among athletes.

Table 1: Level of Athletic Mental Energy among College Athletes

Indicators	Mean	SD	Descriptive Level
Confidence	3.15	.729	Moderate
Motivation	3.86	.754	High
Concentration	3.14	.824	Moderate
Tirelessness	2.96	.939	Moderate
Composure	3.04	.892	Moderate
Vigour	3.38	.776	Moderate
Overall	**3.27**	**.681**	**Moderate**

This comprehensive evaluation underscores the well-rounded nature of college athletes' mental energy, paving the way for targeted interventions to enhance specific dimensions

and, consequently, elevate overall athletic performance. The results coincide with the statement of Thom *et al.* (2020) advocating for a comprehensive approach to mental skills development, aligning with the idea that tailored interventions targeting specific dimensions of mental energy can contribute to athletes reaching their full potential. Furthermore, Stamatis *et al.* (2020) emphasize the role of mental skills training in fostering resilience and composure under pressure. This body of research supports the notion that well-rounded interventions can enhance specific dimensions of mental energy, thereby elevating overall athletic performance.

5.2 Level of Athlete Satisfaction of College Athletes

Table 2 outlines college athletes' satisfaction levels, encompassing satisfaction towards the coach, team performance, and teammates.

The overall mean satisfaction score of 4.00, accompanied by a standard deviation of 0.679, indicates a high level of satisfaction across the evaluated dimensions.

Satisfaction towards the coach takes precedence, with a mean score of 4.03 and a standard deviation of 0.715, highlighting a high level of contentment among college athletes with their coaching staff. Similarly, satisfaction towards team performance and teammates exhibit high mean scores of 4.02 and 3.96, respectively, with standard deviations of 0.740 and 0.741. These findings suggest robust satisfaction levels with team performance and team dynamics among teammates.

Table 2: Level of Athlete Satisfaction among College Athletes

Indicator	Mean	SD	Descriptive Level
Satisfaction towards coach	4.03	.715	High
Satisfaction towards team performance	4.02	.740	High
Satisfaction towards teammates	3.96	.741	High
Overall	**4.00**	**.679**	**High**

This comprehensive evaluation underscores the high overall satisfaction experienced by college athletes, not only in terms of individual performance but also in their relationships with their coaches and teammates.

It is supported by studies suggesting that the mediation of athlete satisfaction in the relationship between role dimensions and team commitment indicates that athlete satisfaction is linked to various aspects of the athletic experience, including leadership and team dynamics. This study supports the idea that satisfaction is a complex outcome influenced by multiple factors within the team environment (Colbert, 2019). Furthermore, a literature review on factors influencing team performance across various sectors, including sports, identified that improved team function and performance are associated with leadership, supportive team behavior, communication, and performance feedback. It suggests that these factors can also contribute to athlete satisfaction in team sports (Salcinovic *et al.*, 2022).

5.3 Level of Sports Engagement of College Athletes

Table 3 delineates the level of sports engagement among the participants, focusing on indicators such as vigour, dedication, and absorption. The overall mean engagement score of 3.81 and a standard deviation of 0.730 signifies a high level of sports engagement across the evaluated dimensions.

Vigour stands out with a high mean score of 3.69 and a standard deviation of 0.838, indicating a substantial level of physical and mental energy invested in sports activities. Dedication follows closely with a high mean score of 3.98 and a standard deviation of 0.796, suggesting a strong commitment and devotion to sports pursuits.

Absorption, with a mean score of 3.75 and a standard deviation of 0.741, highlights a high level of concentration and immersion in sports-related activities. This comprehensive assessment reveals that participants exhibit notable vigour, dedication, and absorption engagement.

The high level of sports engagement observed in Table 3 suggests a positive and committed approach to sports activities, which is conducive to personal development and potentially contributes to enhanced performance in athletic endeavors. This observation is supported by existing literature, as engaging in sports is often associated with improved physical health, psychological well-being, and the development of crucial life skills such as teamwork, discipline, and goal-setting (Damrah *et al.*, 2020). Additionally, sustained sports engagement can foster a sense of commitment and perseverance, qualities deemed essential for success in athletic endeavors (Holt *et al.*, 2016).

Table 3: Level of Sports Engagement

Indicator	Mean	SD	Descriptive Level
Vigour	3.69	.838	High
Dedication	3.98	.796	High
Absorption	3.75	.741	High
Overall	**3.81**	**.730**	**High**

The literature supports that sports engagement, characterized by vigor, dedication, and absorption, plays a crucial role in athletes' psychological well-being and performance. The Sport Engagement Scale (SES), adapted from the Utrecht Work Engagement Scale (UWES) for the sports environment, effectively measures these dimensions, demonstrating significant psychometric properties (García, 2014). Vigor, reflecting athletes' physical and mental energy in sports; dedication, indicating a strong commitment to sports; and absorption, highlighting deep concentration and immersion in sports activities, are all critical components of sports engagement. These dimensions are inversely related to burnout and positively associated with positive outcomes such as better self-regulation and flow experiences (Stolarski *et al.*, 2020).

Furthermore, the SES has shown reliability and validity across different cultural contexts, including Polish Stolarski *et al.* (2020) and Spanish athletes, reinforcing its utility in assessing sports engagement globally. The positive associations between physical

activity and work engagement, including vigor and dedication, found in a large Finnish population study (ACOEM, 2022), further corroborate the importance of engagement in both work and sports settings. This body of literature underscores the significance of measuring and fostering engagement in sports to enhance athletes' performance and psychological health.

Presented in Table 4 is the bivariate correlation analysis of the variables. The relationships between the independent variable (IV) and dependent variable (DV), IV and moderator variable (MV), and MV and DV were examined.

5.4 Bivariate Correlation Analysis of the Variables of College Athletes

The correlation coefficient between athletic mental energy and sports engagement was 0.594, with a p-value of less than 0.001. This suggests a strong positive correlation between athletic mental energy and sports engagement. Consequently, the null hypothesis, which posited no significant relationship between athletic mental energy and sports engagement, is rejected.

The correlation analysis between athletic mental energy and athlete satisfaction yielded a correlation coefficient of 0.307, with a p-value less than 0.001. It indicates a moderate positive correlation between athletic mental energy and athlete satisfaction. As the p-value is below the 0.05 significance level, the null hypothesis is rejected, implying no significant relationship between athletic mental energy and athlete satisfaction.

Furthermore, the correlation coefficient between athlete satisfaction and sports engagement was 0.593, with a p-value of less than 0.001. It reveals a strong positive correlation between athlete satisfaction and sports engagement.

Thus, the null hypothesis, which proposed no significant relationship between athlete satisfaction and sports engagement, is rejected.

Table 4: Bivariate correlation analysis of the variables

Pair	Variables	Correlation Coefficient	*p*-value	Decision on Ho
IV and DV	Athletic mental energy and sports engagement	0.594	<0.001	Reject
IV and MV	Athletic mental energy and athlete satisfaction	0.307	<0.001	Reject
MV and DV	Athlete satisfaction and sports engagement	0.593	<0.001	Reject

The correlation analysis indicates a strong positive link between athletic mental energy and sports engagement, challenging the notion of no relationship. Supported by studies like Chang *et al.* (2017) and Lu *et al.* (2020), this finding underscores the crucial role of mental energy in shaping athletes' experiences in sports, influencing participation, psychological well-being, and performance levels (Roderick, 2012). The discussion highlights the interconnectedness between mental states and sports engagement, emphasizing the significance of social support for competitive athletes (KAPLAN & Bozdağ, 2022).

In contrast, a moderate positive connection between athletic mental energy and athlete satisfaction is identified, refuting the idea of no relationship. In sports psychology literature, studies by Cowden *et al.* (2016) and Rooney *et al.* (2021) conceptualize mental energy as a key factor in enhancing athlete performance and overall satisfaction. This collective research stresses the need to address physical and mental facets for comprehensive improvements in athlete satisfaction and performance, as demonstrated by works such as those by Nagovitsyn *et al.* (2018).

Furthermore, research by Yelamos *et al.* (2019), Tušak *et al.* (2022), and Mėlinis and Vilkas (2019) establishes a strong positive correlation between athlete satisfaction and sports engagement. As evidenced by these studies, satisfied athletes demonstrate heightened commitment, motivation, and dedication to their sport, indicating a substantial link between satisfaction and engagement. Additionally, Bovenko (2021) underscores the organizational implications of athlete satisfaction, highlighting parallels with job performance and organizational citizenship behavior. These collective findings shed light on the factors contributing to athletes' commitment and enjoyment in their sporting pursuits.

5.5 Regression analysis showing the influence of athletic mental energy on sports engagement as mediated by athlete satisfaction

Presented in Table 4 are the results from a comprehensive regression and mediation analysis investigating the intricate relationships among athlete satisfaction, athletic mental energy, and sports engagement. In Step 1, the regression analysis revealed a robust and statistically significant direct effect (c) of athlete satisfaction on sports engagement ($B = 0.637$, $p < 0.01$), suggesting a substantial and independent impact. The subsequent introduction of athletic mental energy in Step 2 uncovered a positive direct effect (a) of athlete satisfaction on athletic mental energy ($B = 0.307$, $p < 0.01$), indicating a mediating role. In Step 3, the direct effect (b) of athlete satisfaction on sports engagement remained significant even after considering athletic mental energy ($B = 0.487$, $p < 0.01$). The mediation analysis in Step 4 (c') demonstrated a significant indirect effect of athletic mental energy on sports engagement through athlete satisfaction ($B = 0.487$, $p < 0.01$).

Table 5: Regression analysis showing the influence of athletic mental energy on sports engagement as mediated by athlete satisfaction

Step	Path	B	S.E.	β
Step 1	c	0.637	0.047	0.594**
Step 2	a	0.307	0.052	0.307**
Step 3	b	0.487	0.042	0.454**
Step 4	c′	0.487	0.042	0.455**

Note: **p<0.01.

While the mediation effect is evident in figure 3 shown below, the persistence of a significant direct effect implies partial mediation. This nuanced relationship underscores the dual influence of athlete satisfaction on sports engagement, both directly and

indirectly through its impact on athletic mental energy. The study thus rejects a full mediation scenario, highlighting the complex interplay of these variables in shaping athletes' engagement.

The literature consistently emphasizes the profound connection between mental energy and sports engagement. Lacy *et al.* (2020) underscore athletes' intrinsic drive, where physical activity ignites a passion for competition and achievement. Elia *et al.* (2019) highlight the independent nature of athletic mental energy, pointing to dedication and determination in athletics, regardless of external factors. Shifting the focus to mental energy, Horn's model (cited in Hacicaferoğlu & Emniyet, 2023) illustrates the role of coach behavior in shaping athletes' self-perceptions and attitudes, influencing motivation and performance. Weber's exploration of sports engagement (Matsumoto *et al.*, 2023) emphasizes the independent nature of mental energy in action during sports engagement, aligning with intrinsic motivation and self-perception. This collective body of work suggests that athletic and mental energy and intrinsic motivation form a powerful force independent of external influences, shaping athletes' dynamic engagement in sports.

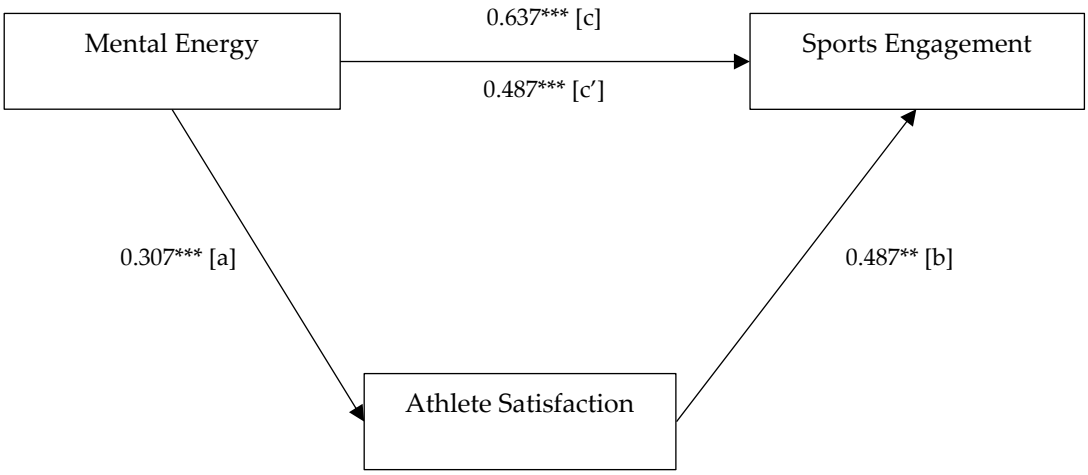

Figure 3: Results of Mediation Analysis between Variables

6.6 Mediation Analysis with Sobel Z test

Presented in Table 6 the mediation analysis provides additional insights into the nature and extent of the mediation effect in the relationships among athlete satisfaction, athletic mental energy, and sports engagement. Firstly, the Sobel z-test, yielding a statistic of 5.301007 with a p-value less than 0.05, indicates that the mediation effect is statistically significant. The indirect effect of athletic mental energy on sports engagement through athlete satisfaction is significant, supporting the notion of mediation.

Table 6: Mediation Analysis with Sobel Z test

Sobel z	5.301007, p<0.05*
Percentage of the total effect that is mediated	23.464305%
The ratio of the indirect to direct effect	0.306580
Effect Size Measures Unstandardized Coefficients	
Total	.637
Direct	.487
Indirect	.307
Ratio Index	.482

The percentage of the mediated effect is estimated at 23.46%. It indicates that almost a quarter of the relationship between athlete satisfaction and sports engagement is explained by the mediating variable, athletic mental energy. It provides a quantitative measure of the mediation effect and emphasizes the significance of athlete satisfaction's role in shaping sports engagement through its impact on athletic mental energy. The ratio of the indirect to direct effect is reported as 0.306580. This ratio provides further context to the mediation effect, indicating that the indirect effect through athlete satisfaction is approximately 30.66% of the direct effect. This ratio helps interpret the relative strengths of the direct and indirect pathways in influencing sports engagement.

In terms of effect size measures, the unstandardized coefficients provide the magnitudes of the total, direct, and indirect effects. The total effect of athlete satisfaction on sports engagement is represented by the coefficient of 0.637, the direct effect is 0.487, and the indirect effect is 0.307. The ratio index, representing the ratio of the indirect effect to the total effect, is reported as 0.482, providing a sense of the proportion of the total effect that is mediated. Overall, the results from the mediation analysis and effect size measures collectively support the presence of a significant mediation effect, shedding light on the nuanced relationships and contributing to a comprehensive understanding of how athlete satisfaction influences sports engagement through the mediating role of athletic mental energy.

7. Recommendations

The study reveals a moderate overall level of athletic mental energy among college athletes, suggesting a need for interventions to enhance mental energy and optimize athletic performance. Thus, it is recommended to conduct confidence-building workshops with sports psychologists, integrate goal-setting and positive visualization, and incorporate mindfulness experts to lead concentration enhancement programs with meditation and focus drills. Regular assessments will fine-tune these interventions for optimal impact. Furthermore, with a notably high level of athlete satisfaction indicating a positive sports environment perception, it is recommended to capitalize on these dynamics. Foster regular communication between coaches and athletes, implement team-building activities, and celebrate achievements to sustain satisfaction. Moreover, given

the high level of sports engagement, it is recommended to maintain commitment through tailored training programs, recognition of dedication, and promotion of absorption via team-building events. Periodic feedback assessments ensure alignment with evolving engagement needs.

The confirmed positive correlations among athletic mental energy, athlete satisfaction, and sports engagement emphasize their interconnected nature. To comprehensively enhance these factors, implement tailored training modules and team-building events. Conduct confidence-building workshops with role-playing and visualization, integrate concentration enhancement programs, and host team communication workshops. Organize events like adventure retreats, sports Olympics, and achievement celebrations, fostering camaraderie and recognizing accomplishments. Regular assessments through athlete feedback will ensure the ongoing effectiveness of these initiatives.

To address the partial mediation observed between athletic mental energy and sports engagement through athlete satisfaction, a specific policy recommendation is proposed: implement a comprehensive athlete well-being policy, developed in collaboration with sports psychologists, medical professionals, and athlete representatives, integrating mental health support services, regular satisfaction assessments, tailored mental fitness training, and a formal recognition system for achievements. Regular evaluations will ensure the policy's effectiveness in supporting athletes' holistic well-being, bridging the relationship between mental energy, satisfaction, and sports engagement.

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Conflict of Interest Statement

The authors declare no conflicts of interest.

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