

Subjective Performance and Athletic Mental Energy Status in Professional Athletes: One Linear Correlation Matrix and Analysis

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ABSTRACT:

Comprehensive psychological and physical components depend upon performance status for professional athletes. In directly, subjective performance and athletic mental energy level are one of mediator role to peak and optimal performance. The purpose of this study was examined between subjective performance and athletic mental energy relationship on professional athletes (ie., olympic, international and national levels). We hypothesis was positive correlation between subjective performance and athletic mental energy in professional athletes. Professional athletes (n= 118) responded two scales during 1 week training and competition season time. The performance status among subjective performance and athletic mental energy resulted moderate level relationship ($p<0.01$). Sub-dimensions were investigated positive correlation among subjective performance scale ($p<0.05$; $p<0.01$). To correlation matrix analyze responses has been included positive correlations ($p<0.05$; $p<0.01$). These findings support performance prediction to diversity sport branches and respond to additional psychological factors linked to sport engagement and

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greater performance level. The multiple direction for two-scale may be role of sport performance in professional athletes.

Keywords: Performance status, subjective performance, athletic mental energy, professional athletes.

1. Introduction

Energy term is work capacity of most form consists of kinetic, chemical, solar, nuclear and in our investigation type can mental energy (Giancoli, 2009, İslam, Ceylan and Öztürk, 2023). Energy specifically have expression emotional mood, mental and physical activity capacity (Sindik, Botika ve Fiskus, 2015). But, 'mental energy' did not definition, this direction limitation noted on attention and mental effort are prevalent account (İslam et al., 2023; O' Connor, 2006). The mental energy used for neuron activation in physical and biological processes, assessing mood and motivation (Sindik et al., 2015). The mental energy have been emerged to superior accomplishment in individual consideration and concentration area (Lykken, 2005). Its are multiple areas, but relationship athletic performance on sport psychology reports for example, Nideffer (1985) noted to centralization on skills obtained from energy, this focusing seen in World record has man javelin. The results can be positive correlation on mental energy and performance level in other athletes, this role exhibits one individual detection on validity and reliability measurement (Shieh et al., 2023; Loehr, 2005).

Mental energy provided that superior performance, to obtain physical training, adjust sport management based on high energy, concentration, confidence etc., on long term performance (Lu et al., 2018). Yıldız et al (2020) athletic mental energy scale explained on 6 factor sub-dimensions are untiredness, confidence, motivation, vigor, concentration, and calm as psychological dimensions. Human cognitive tasks to using, mental energy quantity evaluates during tasks attitude to mental attention increases, that is task performance high and mental volume can promote athletic performance

(Wang et al., 2021; Shenhav et al., 2013; Chuang et al., 2022). This condition can be explain on physical and mental condition of high level athletes are 8 properties; a) inner calm, b) high concentration, c) confidence, d) focus on now, e) many energetic, f) extraordinary awareness, g) happen on control, h) low concentration (Garfield ve Bennet (1984). By sport trainer has been used in mental energy is athletes to detect individual differences and some factors such as sport type, training and competition characteristics, athlete development, gender and age related time and phase (Sindik et al., 2015). Singh, Arora ve Boruah (2024) professional athletes detected on relationship of sport performance and athletic mental energy. Professional athletes perform between mental training and mental energy, it this role sport relation action adherence skill, therefore, can be positive element to stress manage and performance protection (İslam, 2022; Singh et al., 2024). In this direction, high mental energy of athletes than low mental energy assume to further sports performance, training and competition participation, and demonstrating consistency and experiencing prosperity (Singh et al., 2024). To athletic achievement, it is known that performance characteristics maintain potential performance relationships. It that is predictive performance with respect to sport and competition factors can be influence athletic performance and physical performance status. The closely these connections between athletic mental energy and subjective performance has reported highly expectations, according to a studying as the athletic mental energy noted that considering competitive performance level (Singh et al., 2024). Loehr (2005) has been reported to athletic mental energy predictions detected how it can be on relationships, what is factor, increased status, type of training

condition, decreased athletic performance level in sport settings, influenced personal and environmental factors related to mental and physical training. Lu et al (2018) indicated in athletes can regulate to performance level in athletic setting as individual and psychological factors modify mental training. Basely athletic mental energy adjusted to assess each responses elicit on training or competition, given that priority to frequency it is consists of confidence, motivation, vigor, concentration and calm.

It is essential to training or competitive performance can evaluate on performance level by detected status and processes (Süleymanoğlu et al., 2025), furthermore, sport condition and program during, athletes strategies has regulated by subjective analysis through physiological, technical, tactical, psychological and environmental status in order to achieve complex approaches (Singh et al., 2024). Considering athletes that has also been conceptualized as subjective feelings about performance capacities to accomplish tasks in sport performance (Wang et al., 2021), consequently, mental resources complete to tasks on that required mental efforts given that physical and mental tasks proposed for cognitive capacity, following this statements able to physical performance status to concept of mental energy comprises emotional factors such as vigor, tirelessness and calm etc., and cognitive factors such as motivation, concentration and confidence etc. (Cuang et al., 2022). In one study, significant differences were observed in national athletes in the sub-dimensions of athletic mental energy such as motivation, vigor, and concentration, as well as in vigor with sports experience, in the states of vigor, motivation, fatigue resistance, concentration, and mental preparation, and in the sub-dimensions of fatigue resistance and calmness (Tathisu et al., 2022). In this regard, mental energy assessments conducted based on the characteristic and psychometric properties of athletes can be variable (Tathisu et al., 2022). The motivation sub-dimension is also considered a vital component of mental energy, and the relationship between motivation and peak performance in sports psychology has been emphasized emotional components of athletic

mental energy such as vigor, calmness, and tirelessness have been found to be positively associated with athletic performance, well-being, and positive mental states (Singh et al., 2024; Tathisu et al., 2022). Mental energy is not only related to our psychological experiences but has also been connected to all our training and experience in mental processes (İslam, 2022). İslam (2022) observed a positive relationship between mental training and athletic mental energy in professional national rugby players. In directly seen between sports courage, mental training, and athletic mental ability, athletic mental energy played a full mediating role in sport-related behaviors, therefore, it is condition in accordance with the principles of positive psychology, mental energy encompasses positive elements that can help athletes manage stress arising from maintain their performance (Singh et al., 2024).

More components are essential to validate these components. Sports performance evaluation is a fundamental structure for the athlete and team in the training process, and a support for the coach. In this regard, theories, techniques, and methods for playing different sports and motor activities and applications, and methods related to performance evaluations are used (Raiola, D'elia, and Altavilla, 2018). Sports performance is also a set of factors dependent on various sustained sustainabilities; according to these factors, different contributions are supported in determining performance, and these can be separated as beautiful, qualitative, and temporal (D'Isanto et al., 2019). Its a product that is possible from two perspectives and aims to achieve high performance; quantitative and qualitative (Altavilla and Raiola, 2018), to analyze the factors of failure in sports, different methods exist that represent one or more aspects (qualitative and quantitative) and aim to change one or more objective and subjective variables that are somehow shown by sports performance (D'Isanto et al., 2019). The assessment can often be influenced by personal experiences, specific endurance and privileged feelings, opinions, and prejudices related to the sporting event (Lariviere, Godbout, and Lamontagne, 1991). Assessment

can be carried out as a systematically applied process to determine the variation of various distributions based to sports performance. The aim of athlete assessment is to provide useful information for determining and controlling training or determining the amount of sport (D'Isanto et al., 2019). In particular, individual performance assessment, which evaluates players, has the advantage of being a measure that can be tested among players independently of their performance and has the ability to measure athletic performance individually (within subjects) (Terry, 1995). Furthermore, a systematic literature review by Saw et al. (2016) has indicated that individual performance assessment is more accurate than objective measures in the evaluation of athletes.

Subjective (individual) measures, particularly those measuring mood disturbance, perceived stress, and recovery, as well as stress indicators, have superior features and fragmentation of responses compared to objective measures (Saw et al., 2016). The characteristics of subjective methods are supported by: (1) whether they are specifically designed for athletes, (2) they assess a single construct or multiple constructs, and (3) the constructs are based on stressors or resulting events. Assessing multiple constructs has been highlighted as better able to reflect athlete specific performance capacities. A broader performance profile can also address different situations and responses, capturing both training and non-training stress (Saw et al., 2016). Researchers are increasingly interested in predicting performance levels by enhancing athlete mental capacities. The predicted adjustments, changes, and repair/improvement studies of such profiles have theoretical and practical implications.

Notable mental conceptualization used before competition, then relation of mental energy definitions can be support subjective performance relationships evaluated that mental energy in different sports can be important on relationships such as competition and training condition. In this direction, professional athletes have correct mental energy in order to performance level status assumption elicited

from psychology and physical performance to greater performance achievement. The aim of the research was to examine the relationship between professional athletes' athletic mental energies and their subjective performance levels.

2. Methodology

Participant

Professional athletes of study determination, according priority sample for exact population preferred exact test linear correlation (Pearson correlation) computed to G. power analysis program (3.1.9.7). Two variable required two tail t-test for low, moderate and high correlation were determined on sample group $n=118$; actual power 0.95, then to H1 assumption was 0.50 moderate effect size to two variable statistic test condition (Whitley & Ball, 2002). The maximum population for Pearson correlation test preferred to mean and standard deviation determined, as it power analysis acceded power 0.95 and provided α -error probability 0.05 in significant values ($P<0.05$). The experimental design for football, wrestling, swimming, volleyball, basketball, fitness, taekwondo, hockey, ski, tennis, kickboxing, badminton, gymnastics, athleticism, judo branches were responded mental energy and subjective performance scales. To ensure all participants initiated the study were required to complete 2 scale measurement. Participants were assessed properties were age, gender, height, body mass, performance type (professional, national, olympic etc.) Assessment of participants were included characteristics; age 16.99 (4.51) y, gender women=26 and men=92, height 172.61 (9.63) m, body mass 64.86 (12.59) kg, sport year 6.36 (4.25) y and performance type (professional=73, national=21 and olympic=24). The scales was performed under the direct supervision of research specialists. For this study protocol permission acceded on Akdeniz University Ethic Committee No: 189.

Qualitative approach

The research approaches act on data collection and analysis techniques to establish confirmability, dependability, credibility and transferability also explored to ethical considerations such as methodological choice

with subjective experience of professional athletes. To contribute experience cleared quantitative directions. In qualitative research used scales to predict performance status as conceptualizing offered unique application. The sections elicited on defining characteristics of qualitative research such as properties of professional athletes. Professional athletes were formed on research practice and performance type as highest level of performance status from options: professional, national and olympic (McNeil, Phillipsi, and Scoqqin, 2024). According professional athletes responded on multiple scales consist of athletic mental energy and subjective performance over 1 month on competition season.

Data Collection

The contribution of experiences clarifies quantitative orientations. In qualitative research, 2 scales were used to test athletic mental energy and subjective performance. The sections were described descriptive characteristics such as age, height, weight, training year, and performance level of participation in sports, such as years of competition. Athletes were informed about research practice and qualitative methods. Performance levels of athletes were considered as the highest performance level among the options; a) professional, b) national, c) olympic (McNeil et al., 2024). Athletic Mental Energy scale: The scale consists of 18 items on a 6-point likert scale. Cronbach Alpha factors were determined to total scale (0.95). Validity and reliability were tested, and it has a correlation of 6 factors (Lu et al., 2018). The scale was also developed by Yıldız et al., 2020 (Yıldız et al., 2020). Subjective

Performance scale: This scale consists of 6 questions on a single factor used to determine the performance level of athletes. When the questions are responded, they are leveled from 1 (unsatisfied) to 10 (completely satisfied) (Nahum et al., 2016). The scale was administered within 1 week or 1 month after the sports environment and competition.

Statistical analysis

The research analyses was resolved mean, standard deviation, normality distribution and bivariate correlation test for professional athletes. The normality assumption was predicted on psychometric properties, athletic mental energy and subjective performance scales, it is assumed to normal distributed. These scale data resolved on Pearson correlation coefficient and pairwise correlation variables are recorded significant variable. To use techniques highlighted relationship between variables resolved to linear correlation. To quantify athletic mental energy and subjective performance relationships were calculated on r-value and significant values were determined on $p < 0.05$; $p < 0.001$ (Bland & Altman, 1986). To statistical analysis resolvment, used statistic program SPSS. 24. Statistical graphic pearson'r headmap used on JSAP. 97.

3. Results

The relationships among athletic mental energy and subjective performance were investigated by using bivariate correlation. Table 1 displays a significant positive association among these properties and scales.

Table 1. Inter-correlation, mean, standard deviation on athletic mental energy and subjective performance

Variables	M	SD	1	2
Athletic mental energy (AME)	82.88	(13.40)		0.401**
Subjective performance	39.65	(9.90)	0.401**	

Note: M: Mean, SD: standard deviation, $p < 0.05$ * $p < 0.001$ **

The descriptive statistics and relationships among athletic mental energy and subjective performance were investigated by using bivariate correlation. Table 2 displays a significant positive association among the scales.

Table 2. Descriptive statistics and correlations among athletic mental energy and subjective performance

Variables	M	SD	1	2	3	4	5	6
Untiredness	15.63	(2.11)						
Confidence	14.82	(2.40)	0.546**					
Motivation	16.13	(2.15)	0.456**	0.591**				
Vigor	13.43	(3.54)	0.505**	0.653**	0.483**			
Concentration	13.29	(3.04)	0.346**	0.665**	0.374**	0.582**		
Calm	13.88	(3.36)	0.362**	0.439**	0.308**	0.414**	0.397**	
Subjective performance	42.79	(11.45)		0.365**	0.281*	0.309**	0.289*	0.383**

Note: M: Mean, SD: standard deviation, $p < 0.05$ * $p < 0.001$ **

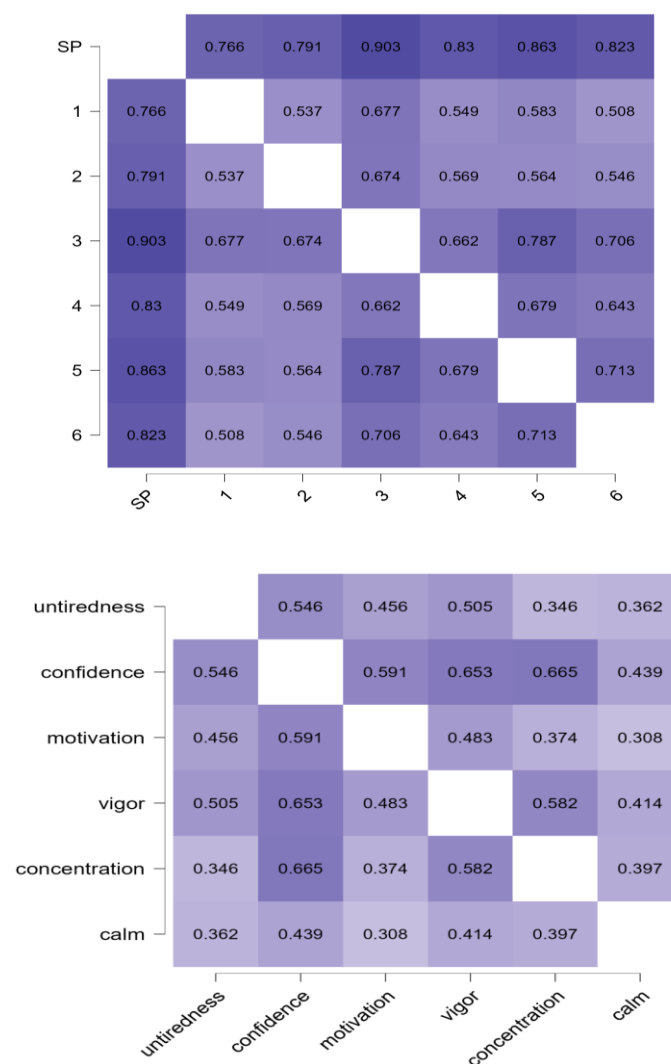


Fig 2. The correlation matrix to subjective performance and AME

Note: Pearson's heatmap graphic seen in subjective performance items; 1) How satisfied are you with your athletic performance this week?, 2) To what extent did you contribute to the team's success this week?, 3) To what extent were your abilities truly showcased this week?, 4) To what extent did you contribute to improving the performance of the players around you this week?, 5) How satisfied are you with your performance in challenging moments this week?, 6) How satisfied do you think the coach was with your performance this week?, The athletic mental energy scale sub-dimensions given as untiredness, confidence, motivation, vigor, concentration, calm.

4. Discussion

The quantitative variables considering performance status responded professional athletes, in this condition, athletic mental energy sub-dimensions and subjective performance were significant positive correlation. Appropriate linear correlation outcomes seen professional athletes' psychological and physical performance status are importantly similar results. Athletic mental energy level can be direction cognitive and physical perspectives to use increasing performance status, according to subjective performance responses supported emotional and mood factors can be use athletic mental energy level to elevate training and competition performance condition. Previous article have covered presenting and summarizing outcomes for subjective performance and athletic mental energy. It mediating role of athletic mental energy for subjective performance indicated that direct effect athletic performance associated with competitive performance ($p < 0.001$). In result of performance status and mental energy also found relationship. This study, our similarly promoted between six factors athletic mental energy and subjective performance mediate relationship and has been indirect effect subjective performance revealed through athletic mental energy (Singh et al., 2024). Similarly previous article' mean and standard deviation outcomes, elite boxers including national and international' total athletic mental energy score and vigor, motivation, concentration found statistical significant

($p < 0.05$). The linear correlation between performance level and athletic mental energy can be important apparent performance factors between training and competition. According to athletic mental energy status influence influenced sport performance level (Tatlisu et al., 2022). This studies considering that engagement in sport branches has found impact on physical and psychological conditions by various relationships indicated that training and competition leads to improvements benefits can increase sport experience refers to capacity to tasks characterized by athletes' mental energy comprising cognitive components such as confidence, motivation and concentration etc. for peak performance during optimal performance experiences. Despite the athletic mental energy being used as a measure of performance status, there is evidence that successful performance is linked vigor, untiredness, motivation and concentration, accordingly our recommended that researchers should investigate the processes and tactical approach to performance that may explain this relationships. An important starting point when considering potential mechanisms is to identify mediator variables. A mediator is defined between sport training and competition by athletic mental energy, potential performance relationship defined in these studies to proposed relationship. To date, performance relationship directly alter in studies, one research found that vigor performance was positively related to disable table tennis players, complementing these findings used to role of performance determine training and competition acts (Chuang et al., 2022). Sport specific mental energy scale used to develop relationship on performance role, the subjective performance was examined our primarily work to continue performance presentation. Furthermore, national, international and professional athletes were completed to performance scales, thus other study reported subjective performance related stress and mood experiences has demonstrated high level athletes were further score (Nicholls, Polman and Levy, 2010). Generally, subjective performance by all athlete categorize had appropriate components such as cognitive skill and efficiency, our outcomes also support

cognitive components ie., concentration and confidence, they can accomplish tasks to high level performance linking to peak performance experience (Ricketts et al., 2025). Followed this studies can help underlying 6-factor mental energy, moreover, to examine relationship between sub-dimension and subjective performance noted that professional athletes explored mediating this relationship. Athletes also completed after competing, correlation findings revealed that confidence performance was positively and significantly associated with subjective performance (Levy, Nicholls and Polman, 2011). For correlation data responses has provided linear relationship usually available studies, suggested that different properties of athletes is predictor, also may be due to professional, sport participant and competitive. Researchers have consistently demonstrated the relationship between athletic mental energy and subjective performance in athletes, further reinforcing the significance of our research in exploring the relationship to help athletes' performance status detection. The comprehensive studies were evaluated sub-dimension and total scores in our study, to collage athletes reported that overall athletic performance elevated, consequently our results

exhibited moderate level correlation similarly in other study (Juezan & Osorno, 2024). This collective data in mental energy independent in athlete satisfaction and sport engagement, thus it is recommended to conduct sport experts to lead enhancement sustain satisfaction.

5. Conclusion

This study reported the subjective performance and athletic mental energy to professional athletes, examining a correlation among sport performance and competitive performance evaluations. Athletes who responded that two scale were resulted by 1 week time training season reported positive correlation while moderate level associated with greater performance status and mental energy most important to performance evaluations. To promote successful performance may consider interventions that enhance athletes' vigor, confidence, concentration, calm and motivation to positive support performance. These findings support the subjective performance and athletic mental energy level prediction to a diverse sport contexts and respond to call for additional research on the psychology factors linked to successful sport engagement among professional athletes.

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The study is one original study.

Author Declaration

- This study is original work
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