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Validation of a Self-Discipline Questionnaire for Athletes

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Abstract

This study aims to modify and validate a self-discipline questionnaire for application among athletes in Indonesia. The questionnaire was adapted from the self-discipline scale originally developed by Sal (2022) for university students. This study employed a quantitative research design using a factor analysis approach. The population consisted of coaches and athletes from Central Java Province, representing three types of sports: individual, team, and combat sports. The sample included 30 coaches for the validity test and 265 athletes selected through purposive sampling, based on the criteria of being active athletes and having achieved at least a regional championship. These athletes were then subjected to Exploratory Factor Analysis (EFA). The findings identified two self-discipline dimensions for athletes in Indonesia: Training in a Plan (TIP) and Attention (ATTN). The results of the validity test using Aiken's V indicated that each item scored above 0.8. The EFA results showed a KMO-MSA value of 0.691 (>0.50) and a significant Bartlett's Test of Sphericity ($p < 0.001$). Additionally, the anti-image correlation, communalities, and rotated component matrix revealed factor loadings above 0.50 for all 18 indicator items. Therefore, the modified self-discipline questionnaire for Indonesian athletes demonstrates validity and high factor loadings for each indicator. Future studies are encouraged to expand the sample and include athletes from various provinces across Indonesia, as well as to incorporate more complex analytical methods, which could enhance the questionnaire's reliability and credibility.

Keywords: *self-discipline, sports psychology, sports questionnaire, sports evaluation*

Introduction

Improving athlete performance is not only determined by physical and technical conditions but also by supporting psychological factors, one of which is self-discipline (Podlesny, 2023). Self-discipline is a crucial aspect that helps athletes remain consistent in training, follow nutritional plans, and adhere to established competition strategies (Cropley et al., 2020). Therefore, accurately measuring athletes' self-discipline is essential to support the development of their full potential.

Self-discipline is one of the fundamental pillars supporting an athlete's success. It plays a vital role in helping athletes manage their time and sustain the commitment required to train consistently and participate in competitions, while also fulfilling other responsibilities such as education or work (Pujianto et al., 2024). The ability to manage time efficiently and prioritize different aspects of life can determine the quality and effectiveness of the training undertaken (Sembiring et al., 2023).

Previous studies also show that self-discipline helps athletes maintain consistency in their training (Zhao et al., 2023 & Sahabuddin et al., 2023). This consistency is critical for developing skills and enhancing physical strength according to the demands of their sport. Self-discipline also supports athletes in recovery and self-care, such as maintaining a proper diet, getting sufficient rest, and following routines that prevent injury (Edouard et al., 2022, Abdhi et al., 2024 & Sevindik Aktaş, 2024). This component is vital not only for sustaining peak performance but also for ensuring a long, injury-free athletic career.

Beyond the physical aspects, self-discipline also plays a significant role in coping with pressure and setbacks. Competitive sports often place athletes in high-stress situations that can cause mental and emotional strain (Yusup et al., 2024). Athletes with strong self-discipline are better equipped to handle such situations, use failures as learning opportunities, and maintain the motivation and focus needed to achieve long-term goals (Pujianto et al., 2024).

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Previous studies have developed instruments such as the "Development of an Academic Self-Discipline Questionnaire for University Students," which targets student populations (Sal, 2022). However, there is a need to adapt these tools to fit the sports context, considering the significant differences in demands and environments between athletes and students. Therefore, designing such tool based on previously validated self-discipline instruments is crucial to developing a tool that is both valid and reliable for measuring self-discipline in athletes across various sports.

Hence, this research aims to validate a self-discipline questionnaire developed based on previous tools, and adapted to be suitable for athletes in Indonesia. The study is important because its findings are expected to assist coaches and sports psychologists in identifying athletes' levels of self-discipline, which can then inform the development of more targeted and effective psychological interventions (Budnik-Przybylska et al., 2022). Furthermore, the outcomes of this study have the potential to be applied in athlete development programs at both amateur and professional levels. This research may contribute not only to academic literature but also may have significant practical implications in sports.

Method

Research Procedure

This research is quantitative in nature and employs a factor analysis approach. Specifically, Exploratory Factor Analysis (EFA) was used to validate a self-discipline questionnaire that was adapted for athletes based on a questionnaire originally developed for students. The adaptation process involved modification of the questionnaire items to suit the context and needs of athletes, considering their unique daily activities, mental demands, and physical conditions, which differ significantly from non-athlete populations (Banville et al., 2000).

The research process followed several key stages. First, a literature review and analysis were conducted to adapt existing questionnaire items to the context of performance sports, followed by translation into Indonesian. Second, the modified items were tested through a Focus Group Discussion (FGD) to obtain initial feedback on item clarity and relevance. The FGD involved five sports lecturers with expertise in sports psychology. Based on the FGD outcomes, the questionnaire was refined before distribution to a larger sample. Third, the refined questionnaire was validated by coaches representing different types of sports. This stage aimed to evaluate the precision and accuracy of the questionnaire for use with athletes, particularly in assessing self-discipline levels. The results of this validation were re-evaluated before the questionnaire was administered to athletes. Fourth, data were collected from athletes across various sports to be used in EFA.

Research Population and Sample

The population of this study comprised coaches and athletes from Central Java Province in Indonesia, all with experience in various types of sports. The first sample consisted of coaches who served as validators, and the second sample consisted of athletes whose responses were analyzed using EFA. The study included 15 sports categorized into three groups: 1) Team sports: football, basketball, volleyball, handball; 2) Individual sports: badminton, swimming, athletics, tennis, gymnastics, archery; and 3) Combat sports: boxing, karate, taekwondo, judo, pencak silat.

The first sample included 30 coaches, with two coaches representing each sport. The coach characteristics were as follows: age 40–51 years, coaching experience of 23.7 ± 4.2 years, a minimum of a bachelor's degree in sports, and possession of an active national coaching license. The athlete sample for EFA consisted of 265 athletes: 24 from football, 28 from basketball, 26 from volleyball, 22 from handball, 16 from badminton, 18 from swimming, 23 from athletics, 17 from tennis, 14 from gymnastics, 16 from archery, 11 from boxing, 15 from karate, 13 from taekwondo, 10 from judo, and 12 from pencak silat. The athlete characteristics were: age 18–25 years, training experience of 10.7 ± 9.3 years, competitive experience of 9.1 ± 5.7 years, and national-level achievements within the last two years, as evidenced by a competition certificate.

Instrument

The instrument development process was conducted in the first and second stages outlined in the research procedure. In the first stage, the researchers conducted a literature review and chose to adapt the questionnaire developed by Sal (2022), titled "Development of an Academic Self-Discipline Ques-

Table 1. Modified Self-Discipline Questionnaire for Athletes

Training in a plan	I wake up at the same time every day to maintain my workout routine
	I repeat my training techniques after each session and prepare beforehand
	I don't let my training decisions be dictated by emotions
	I follow my own structured workout schedule
	I use my training time effectively to optimize performance
	I train various aspects of fitness and technique in a structured manner
	I stay fully focused during training sessions and avoid distracting thoughts
	I can decline social invitations that conflict with my training schedule
	I resist using social media during training even when I feel tempted
Attention	I am mentally and physically prepared before each training session
	I organize my training space to be free from distractions
	I eliminate all distractions before starting practice
	I know what I need to accomplish before each practice session begins
	I do not use social media during training
	I distance myself from distractions to practice effectively
	I understand the best ways to improve my physical and technical skills
	If I reach a training goal early, I may end the session to prevent burnout
	I maintain focus during training even in the presence of distractions, boredom, or fatigue

tionnaire for University Students". Following this, the questionnaire was translated and modified following procedures outlined by (Putro et al., 2025), who successfully adapted the Talent Development Environment Questionnaire (TDEQ-5) into Indonesian population. The translation process involved two linguists and one sports science lecturer with academic proficiency in English. After translation, the questionnaire was modified to reflect the conditions of athletes in sports training. In the second stage, the modified questionnaire was tested through an FGD to collect revisions and suggestions. The resulting modifications based on FGD feedback are presented in Table 1.

In Table 1, the questionnaire consists of two indicators: Training in a Plan (TIP) and Attention (ATTN). Each indicator includes 9 statement items, totaling 18 items in the questionnaire.

Statistical Analysis

This study utilized two stages of data analysis. The first stage involved a validity test based on the evaluations of 30 coaches. The validation was calculated using Aiken's V formula (Lewis. R. Aiken, 1985), as shown in Figure 1. The second stage applied Exploratory Factor Analysis (EFA) using SPSS version 27 (George & Mallery, 2021). EFA was selected to assess construct validity using multiple fit indices as indicators. An item was considered valid if the following conditions were met: 1) The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO-MSA) value exceeded 0.50 (i.e., KMO > 0.50); 2) The Bartlett's Test of Sphericity was significant at $p < 0.05$; 3) The Communalities (extraction values) were adequate; 4) The Anti-Image Correlation matrix values were satisfactory; and 5) The Rotated Component Matrix loading values exceeded 0.50 (Watkins, 2018). The questionnaire employed a 4-point Likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly Agree.

$$\text{V Aiken's: } \frac{\sum s}{n\,(c-1)}$$

S : r – lo
Lo : lowest rating score
C : highest rating score
r : the score given by the assessor

FIGURE 1. Aiken's V Formula

Results

The results of this study correspond to the fifth stage of the research procedure. After data collection was completed, the research proceeded through two main stages of analysis: (1) a validity test conducted by coaches and (2) an Exploratory Factor Analysis (EFA) conducted on data from athletes. Accordingly, the results are presented in two subsections: the instrument validity test performed by 30 coaches and the EFA test conducted with responses from 265 athletes.

Instrument Validity Test

The first stage of data analysis aimed to assess the precision and accuracy of the self-discipline instrument before it was administered to athletes. This validation was conducted by 30 expert coaches using Aiken's V formula. The results of this validity test are presented in Table 2.

To understand the Aiken's V value for each indicator in Table 2, the ΣS is obtained from the score given by each assessor (on a scale of 1 to 4), minus the lowest score in the scale (i.e., 1), and then summed across all assessors (in this study, n = 30 coaches). Meanwhile, n(c−1) is calculated by multiplying the number of assessors (n) by the difference between the highest and lowest scale values (4−1), resulting in 30 × 3 = 90. Aiken's V value is then de-

Table 2. Aiken's V Validity Test Results

Indicator	ΣS	n(c-1)	Aiken's V	Description
TIP 1	74	90	0.822	Valid
TIP 2	75		0.833	Valid
TIP 3	77		0.856	Valid
TIP 4	73		0.811	Valid
TIP 5	77		0.856	Valid
TIP 6	76		0.844	Valid
TIP 7	75		0.833	Valid
TIP 8	77		0.856	Valid
TIP 9	74		0.822	Valid
ATTN 1	77		0.856	Valid
ATTN 2	76		0.844	Valid
ATTN 3	73		0.811	Valid
ATTN 4	74		0.822	Valid
ATTN 5	77		0.856	Valid
ATTN 6	78		0.867	Valid
ATTN 7	76		0.844	Valid
ATTN 8	75		0.833	Valid
ATTN 9	73		0.811	Valid

rived using the formula ∑S / n(c−1). Based on the results presented in Table 2, Aiken's V values for all indicators are greater than 0.8. Therefore, all 18 indicators in the self-discipline questionnaire are considered valid (Susiono et al., 2024 & Wedi et al., 2024).

Exploratory Factor Analisis (EFA)

Following validation by coaches, the instrument was then tested using Exploratory Factor Analysis (EFA) with a sample of 265 athletes. The analysis was conducted using SPSS version 27.

Table 3. KMO and Bartlett's Test Results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**0.691**
Bartlett's Test of Sphericity	Approx. Chi-Square	2414.070
	df	153
	Sig.	<0.001

As shown in Table 3, the KMO value exceeds the minimum threshold of 0.50, indicating sufficient sampling adequacy. Additionally, Bartlett's Test of Sphericity is significant ($p < 0.05$), which confirms that the dataset is suitable for factor analysis. The specific test of MSA (Measure of Sampling Adequacy) in each indicator was explained in anti-image corelation.

Table 4 presents values for Anti-Image Correlation, Communalities, and the Rotated Component Matrix for all 18 items. Anti-image correlation values for all items exceed 0.50, indicating that each item meets the Measure of Sampling Adequacy (MSA) requirements. Communalities (extraction values) are all above 0.50, demonstrating that each item shares a significant proportion of variance with others in the dataset. Rotated Component Matrix values show that the items successfully load onto two distinct components consistent with the conceptual dimensions: Training in a Plan (TIP) and Attention (ATTN). Each factor loading exceeds 0.50, indicating strong relationships between the items and their respective constructs.

Table 4. Exploratory Factor Analysis Test Results

Item	**Anti-image Correlation**	**Communalities**		**Rotated Component Matrix**	
		Initial	**Extraction**	**1**	**2**
TIP 1	0.551	1.000	0.838	0.799	
TIP 2	0.686		0.703	0.750	
TIP 3	0.626		0.795	0.765	
TIP 4	0.506		0.799	0.810	
TIP 5	0.789		0.709	0.798	
TIP 6	0.761		0.684	0.779	
TIP 7	0.533		0.897	0.920	
TIP 8	0.514		0.782	0.765	
TIP 9	0.717		0.785	0.783	
ATTN 1	0.649		0.788		0.747
ATTN 2	0.758		0.802		0.878
ATTN 3	0.749		0.795		0.771
ATTN 4	0.651		0.765		0.806
ATTN 5	0.585		0.804		0.844
ATTN 6	0.639		0.654		0.701
ATTN 7	0.736		0.725		0.773
ATTN 8	0.695		0.767		0.743
ATTN 9	0.687		0.725		0.843

Discussion

The findings of this study demonstrate that the self-discipline instrument, which was adapted and modified for Indonesian athletes, successfully identified two primary indicators: (1) Training in a Plan and (2) Attention. Both indicators yielded high validity and factor loading values for each item, confirming that the instrument is a reliable tool for assessing self-discipline among athletes in Indonesia. These findings align with previous research that reported similarly strong validity measures in psychological instruments used with Indonesian athletes. For example, the Psychological Skills Inventory for Sports (PSIS-R5) also demonstrated a KMO score above 0.50 and a significant Bartlett's Test result (Dimyati et al., 2023). Likewise, the Talent Development Environment Questionnaire for Indonesian basketball athletes was successfully validated using Exploratory Factor Analysis (EFA), incorporating KMO-MSA, Bartlett's Test of Sphericity, Anti-image Correlation, and Communalities (Putro et al., 2025). These studies support the conclusion that the current self-discipline instrument is appropriate for use among Indonesian athletes.

The first dimension, Training in a Plan, reflects an athlete's ability to adhere to a structured and consistent training regimen. The high factor scores for this indicator suggest that disciplined athletes tend to have a well-defined approach to training. Structured planning is essential for optimizing time, enhancing training efficiency, and maximizing performance outcomes (Latief et al., 2024). From a psychological perspective, such planning can

reduce stress and anxiety by providing clarity and a sense of control over the training process (Saniah et al., 2024). Athletes with clear training plans often feel more confident and motivated, as they can track their progress and experience a sense of achievement when reaching their goals (Utami et al., 2024; Djaba et al., 2024 & Prabowo et al., 2025). With a greater sense of control, athletes can manage competition pressure more effectively, improving their mental well-being.

In terms of performance outcomes, structured planning improves the effectiveness of training sessions by aligning them with specific performance goals, thus enhancing skill acquisition and physical conditioning (Mandan et al., 2024). Moreover, well-designed training schedules that include rest and recovery help prevent fatigue and injuries, supporting optimal performance (West et al., 2021). Planning also enables athletes to evaluate and refine their strategies based on prior performance, leading to continuous improvement (González-Ravé et al., 2022). When athletes set goals, follow structured programs, and regularly monitor progress, they can fully realize their potential and achieve better competitive results.

Furthermore, this indicator is indirectly associated with the variable of service quality. Athletes who follow structured training plans are often supported by high-quality services, such as organizational infrastructure, access to professional training, proper facilities, and guidance from experienced coaches (Prayoga et al., 2024 & Salsabila et al, 2024). High-quality services provide essential resources that help athletes implement and sustain their training programs effectively (Nugroho et al., 2023 & Prabowo, 2024). Such services often offer individualized support, ongoing monitoring, and constructive feedback (Juita et al., 2024), all of which enable athletes to fine-tune their plans for maximum efficiency and impact (Mandan et al., 2024). Therefore, service quality creates an environment conducive to effective planning, which in turn supports athletic performance.

The second dimension, Attention, pertains to an athlete's capacity to maintain focus and attend to detail during both training and competition. High factor scores for this indicator affirm that attentional control is a vital element of effective self-discipline. Focused athletes tend to execute techniques more accurately and adapt strategies more effectively during competition (Utami et al., 2024). Attention also enhances an athlete's ability to absorb coaching instructions and apply them correctly (Fitrianto et al., 2024), which in turn accelerates skill development and improves training efficiency. It allows them to carry out training with precision and efficiency, which is essential for skill development and performance improvement. Furthermore, focused attention helps athletes quickly detect and correct errors, reducing the time required for improvement (Rahimi et al, 2022). It also enhances the capacity to adjust strategies in real-time during training or competition, supporting both mental and physical readiness (Park & Jeon, 2023). Thus, consistent focus not only elevates training quality but also equips athletes to perform better in competitive environments.

This indicator is also closely related to achievement motivation. Athletes with strong attention skills often possess high achievement motivation, which drives goal-oriented behavior and sustained commitment to performance outcomes (Abdhi et al., 2024). Motivated athletes exhibit greater training consistency, leading to skill mastery and strategic competence (Wijayanti et al., 2024 & Prabowo et al., 2025). Moreover, motivated athletes tend to increase consistency in training, leading to skill mastery and effective strategies (Wibowo et al., 2024). Additionally, a strong focus helps athletes make quick and accurate decisions during competition, especially in situations that demand rapid reactions (Ghanati et al, 2022). Thus, achievement motivation not only enhances focus during training but also positively impacts athletic performance, creating a positive cycle in which improved performance further motivates them to continue striving for higher levels.

This study has certain limitations, particularly regarding the population involved, which was drawn from a single province in Indonesia. As a result, the researchers acknowledge the possibility of differing questionnaire outcomes in athletes from other provinces. Therefore, future research should consider diverse populations across various regions in Indonesia. Expanding the sample size will enhance the findings' generalizability and improve the analysis's accuracy. Moreover, employing more advanced analytical methods will be essential to develop a valid, reliable, robust, and trustworthy questionnaire for broader applications.

Conclusion

The results of this study, which focused on validating a self-discipline questionnaire for athletes in Indonesia based on a previous questionnaire for students, yielded 18 valid items categorized into two leading indicators: (1) Training in a Plan and (2) Attention. The Training in a Plan indicator reflects an athlete's ability to adhere to a structured and consistent training regimen, while the Attention indicator represents the capacity to maintain focus and attend to detail during both training and competition. Both indicators demonstrated strong validity and high factor loadings, as confirmed by exploratory factor analysis, indicating that the questionnaire is a valid and reliable for measuring self-discipline among Indonesian athletes. Given its psychometric strength, this questionnaire can be used to evaluate self-discipline within athlete development and performance coaching contexts.

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Conflit of Interest

The researchers have no conflicts of interest.

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References

Abdhi, M. I., Tomoliyus, T., Sukamti, E. R., Fauzi, F., Prabowo, T. A., Maulana, A., Habibie, M., Amalia, B., & Kasanrawali, A. (2024). The Effect of Service Quality on Achievement Motivation in Kurash Sport in Indonesia: Analysis Based on Category as Moderator. *Retos*, *57*, 517–525. https://doi.org/https://doi.org/10.47197/retos.v57.105998

Banville, D., Desrosiers, P., & Genet-Volet, Y. (2000). Translating questionnaires and inventories using a cross-cultural translation technique. *Journal of Teaching in Physical Education*, *19*(3), 374–387. https://doi.org/10.1123/jtpe.19.3.374

Budnik-Przybylska, D., Huzarska, I., & Karasiewicz, K. (2022). Does Imagery Ability Matter for the Relationship Between Temperament and Self-Confidence in Team and Individual Sport Disciplines? *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.893457

Cropley, B., Thelwell, R., Mallett, C. J., & Dieffenbach, K. (2020). Exploring Sport Psychology in the Discipline of Sports Coaching. In *Journal of Applied Sport Psychology* (Vol. 32, Issue 1, pp. 1–4). Taylor and Francis Inc. https://doi.org/10.1080/10413200.2019.1695295

Dimyati, Setiawati, F. A., Istiyono, E., & Ilham. (2023). Exploratory Factor Analysis of Psychological Skills Inventory for Sports in Indonesian National Athletes. *International Journal of Human Movement and Sports Sciences*, *11*(4), 699–707. https://doi.org/10.13189/saj.2023.110402

Djaba, H. S. W., Siswantoyo, Budiarti, R., Fauzi, Sukamti, E. R., Tomoliyus, & Prabowo, T. A. (2024). The Impact of Motivation on Decision-Making of Futsal Goalkeepers in Indonesia : An Analysis of Self-Confidence as Mediator. *Sport Mont*, *22*(2), 3–9. https://doi.org/10.26773/smj.240707

Edouard, P., Pollock, N., Guex, K., Kelly, S., Prince, C., Navarro, L., Branco, P., Depiesse, F., Gremeaux, V., & Hollander, K. (2022). Hamstring Muscle Injuries and Hamstring Specific Training in Elite Athletics (Track and Field) Athletes. *International Journal of Environmental Research and*

Public Health, *19*(17). https://doi.org/10.3390/ijerph191710992

Fitrianto, A. T., Prayoga, H. D., Rizky, O. B., Sutresna, N., Sinulingga, A., & Prabowo, T. A. (2024). Perspectives towards training approaches to skill achievement in swimming athletes: mixed methods. *Physical Culture, Recreation and Rehabilitation*, *3*(2), 86–93. https://doi.org/10.15561/physcult.2024.0205

George, D., & Mallery, P. (2021). IBM SPSS Statistics 27 Step by Step. In *IBM SPSS Statistics 27 Step by Step*. Routledge. https://doi.org/10.4324/9781003205333

Ghanati, H. A., Letafatkar, A., Almonroeder, T. G., & Rabiei, P. (2022). Examining the Influence of Attentional Focus on the Effects of a Neuromuscular Training Program in Male Athletes. Journal of Strength and Conditioning Research, 36(6), 1568–1575. https://doi.org/10.1519/JSC.0000000000003681

Juita, A., Tomoliyus, T., Hariono, A., Syahriadi, S., Sukamti, E. R., Fauzi, F., … Prabowo, T. A. (2024). The effect of service quality and coach competency on the motivation and achievement of Riau basketball student-athletes. SPORT TK-Revista EuroAmericana de Ciencias Del Deporte, 13, 12. https://doi.org/https://doi.org/10.6018/sportk.564821

Latief, H., Suherman, W. S., Rismayanthi, C., Alim, A., Huda, M. S., Yulianto, W. D., & Prabowo, T. A. (2024). The influence of performance in training on self-confidence of wheelchair athletes with coach-athlete intimacy as a moderating variable. *Retos*, *58*, 760–768. https://doi.org/https://doi.org/10.47197/retos.v58.103726

Lewis. R. Aiken. (1985). Three Coefficients For Analyzing The Reliability And Validity Of Ratings. *Educational and Psychological Measurement*, *45*, 131–141.

Mandan, A., Tomoliyus, T., Alim, A., Sukamti, E. R., Fauzi, F., Hariono, A., & Prabowo, T. A. (2024). The impact of service quality, family support, and coach-athlete intimacy on the achievement performance of student-athletes through motivation as a mediator. *SPORT TK-Revista EuroAmericana de Ciencias Del Deporte*, *13*, 14. https://doi.org/https://doi.org/10.6018/sportk.574101

Mandan, A., Tomoliyus, T., Alim, A., & Prabowo, T. A. (2024). The Impact of Service Quality on Self-Confidence of Wheelchair Athletes : An Analysis of Family Support as Moderator. Sport Mont, 22(2), 3–9. https://doi.org/10.26773/smj.240717

Nugroho, A., Sukamti, E. R., Sujarwo, S., Purwanto, S., Hariono, A., Ilham, I., … Abidin, N. E. Z. (2023). Exploring the athlete experience: A multidimensional study of service quality and financial factors in individual vs. team sports. Journal of Physical Education and Sport, 23(12), 3299–3308. https://doi.org/10.7752/jpes.2023.12377

Park, I., & Jeon, J. (2023). Psychological Skills Training for Athletes in Sports: Web of Science Bibliometric Analysis. Healthcare (Switzerland), 11(2). https://doi.org/10.3390/healthcare11020259

Podlesny, S. (2023). STUDY OF THE DISCIPLINE "SPORTS METROLOGY" USING DISTANCE LEARNING METHODS. *SWorld-Ger Conference Proceedings*, *gec28-01*, 48–52. https://doi.org/10.30890/2709-1783.2023-28-01-008

Pujianto, D., Nopiyanto, Y. E., Wibowo, C., Kardi, I. S., Raibowo, S., Insanistyo, B., Ibrahim, Hasan, B., & Sutriawan, A. (2024). High School Student-Athletes: Their Motivation, Study Habits, Self-Discipline, Academic Support, and Academic Performance. *Physical Education Theory and Methodology* , *24*(1), 22–31. https://doi.org/10.17309/tmfv.2024.1.03

Prabowo, T. A. (2024). Athletes' Satisfaction Towards Sport Training: an Initial Investigation and Development of Questionnaire. European Journal of Physical Education and Sport Science, 11(1), 80–95. https://doi.org/10.46827/ejpe.v11i1.5365

Prabowo, T. A., Afifah, M., Cahyo, F. D., Zakaria, A., & Indarto, A. V. (2025). Self-Efficacy and Motivation Student in Physical Education Learning: Scoping Review. *Jurnal Porkes*, *8*(1), 377–389. https://doi.org/10.29408/porkes.v8i1.29743

Prabowo, T. A., Indarto, A. V., Zakaria, A., Cahyo, F. D., & Afifah, M. (2025). The effect of physical fitness on academic achievement through self-confidence in adolescents aged 16 – 18 years: a scoping review. *Physical Culture, Recreation and Rehabilitation*, *4*(1), 50–57. https://doi.org/https://doi.org/10.15561/physcult.2025.0105

Prayoga, H. D., Tomoliyus, T., Lumintuarso, R., Fitrianto, A. T., Sukamti, E. R., Fauzi, F., … Prabowo, T. A. (2024). A Case Study of Indonesian Amateur Boxing Athletes: Is There an Influence of Organizational Culture and Quality of Service on Performance through Achievement Motivation as a Mediator? Retos, 56, 63–72. https://doi.org/https://doi.org/10.47197/retos.v56.103128

Putro, K. H., Suharjana, S., Marhaendro, A. S. D., Fauzi, F., Wicaksono, D., Irianto, S., & Prabowo, T. A. (2025). Exploratory Factor Analysis on the Talent Development Environment Questionnaire (TDEQ-5) for Basketball in Indonesia. *Physical Education Theory and Methodology*, *25*(1), 156–165. https://doi.org/10.17309/tmfv.2025.1.19

Rahimi, A., Roberts, S. D., Baker, J. R., & Wojtowicz, M. (2022). Attention and executive control in varsity athletes engaging in strategic and static sports. PLoS ONE, 17(4 April). https://doi.org/10.1371/journal.pone.0266933

Sahabuddin, S., Hakim, H., Syahruddin, S., & Sofyan, D. (2023). Disciplinary Levels of Student Volleyball Athletes. *Indonesian Journal of Sport Management*, *3*(2), 242–260. https://doi.org/10.31949/ijsm.v3i2.7256

Sal, F. (2022). Development of an academic self-discipline questionnaire for university students. *Pedagogical Perspective*, *1*(2), 76–88. https://doi.org/10.29329/pedper.2022.493.1

Saniah, S., Sukamti, E. R., Chaeroni, A., Prayoga, H. D., Prabowo, T. A., Suganda, M. A., Suryadi, D., Abdullah, N. M. Bin, Gogoi, H., Poralan, P. S., Maulana, A., Habibie, M., Amalia, B., Kasanrawali, A., & Abdhi, M. I. (2024). An analysis of Indonesian student-level boxing athletes: What Effect Does Competition Anxiety Have on Self-Efficacy? *Retos*, *55*, 1030–1037. https://doi.org/https://doi.org/10.47197/retos.v55.106784

Salsabila, N. A., Nasrulloh, A., Prabowo, T. A., & Chandrika, W. M. R. (2024). A Correlation Study : The Influence of Service Quality to Satisfaction at Fitness Facilities in Sleman Regency, Yogyakarta. J Adv Sport Phys Edu, 7(12), 286–293. https://doi.org/https://doi.org/10.36348/jaspe.2024.v07i12.002

Sembiring, A. P., Agung Parwata, I. G. L., & Wijaya, M. A. (2023). Tingkat Kedisplinan Atlet Cabang Olahraga Permainan pada Masa Adaptasi Kebiasan Baru. *Jurnal Ilmu Keolahragaan Undiksha*, *10*(3), 215–222. https://doi.org/10.23887/jiku.v10i3.47378

Sevindik Aktaş, B. (2024). The analysis of the relationship between respiratory functions and body compositions of alpine discipline and cross-country skiing athletes. *Turkish Journal of Kinesiology*, *10*(1), 34–40. https://doi.org/10.31459/turkjkin.1412306

Susiono, R., Sugiyanto, FX., Lumintuarso, R., Tomoliyus, T., Sukamti, E. R., Fauzi, F., Hariono, A., & Prabowo, T. A. (2024). Y Agility Test Innovation on Special Badminton Athletes for the Junior Category (U17): Validity and Reliability. *Retos*, *53*, 547–553. https://doi.org/https://doi.org/10.47197/retos.v53.103282

Utami, S. D., Alim, A., Tomoliyus, T., Budiarti, R., Prabowo, T. A., & Yusuf, N. F. (2024). Analysis of Motivation and Self-Confidence in Swimming Athletes Aged 13 – 17 Years : How Does it Influence the 50 Meter Freestyle ? *Journal of Advances in Sports and Physical Education*, *7*(6), 148–153. https://doi.org/10.36348/jaspe.2024.v07i06.005

Watkins, M. W. (2018). Exploratory Factor Analysis: A Guide to Best Practice. *Journal of Black Psychology*, *44*(3), 219–246. https://doi.org/10.1177/0095798418771807

Wedi, S., Tomoliyus, T., Fauzi, F., Gemaini, A., & Prabowo, T. A. (2024). Innovation, Validity, and Reliability of Modified Dynamic Balance Test for Karate Kata Category. *Sport Mont*, *22*(3), 3–8. https://doi.org/10.26773/smj.241004

West, S. W., Clubb, J., Torres-Ronda, L., Howells, D., Leng, E., Vescovi, J. D., … Windt, J. (2021). More than a Metric: How Training Load is Used in Elite Sport for Athlete Management. International Journal of Sports Medicine, 42(4), 300–306. https://doi.org/10.1055/a-1268-8791

Wibowo, M. S. R., Prasetyo, Y., Sriwahyuniati, C. F., Yulianto, W. D., & Prabowo, T. A. (2024). The effect of self-efficacy, social support, and achievement motivation on archery athlete's performance. Retos, 54, 348–354. https://doi.org/https://doi.org/10.47197/retos.v54.102211

Wijayanti, N. P. N., Tomoliyus, T., Alim, A., Wedi, S., Artanayasa, W., Sudiana, K., … Prabowo, T. A. (2024). The influence of coaches' behavior on achievement motivation and performance of Riau athletes. Sport TK, 13. https://doi.org/10.6018/sportk.564811

Yusup, N. F., Fauzi, F., Tomoliyus, T., Alim, A., Budiarti, R., Prabowo, T. A., & Alfredatama, I. (2024). Analysis of Stress Management in Karate Athletes: Survey in West Nusa Tenggara Province, Indonesia. *European Journal of Physical Education and Sport Science*, *11*(1), 174–184. https://doi.org/10.46827/ejpe.v11i1.5396

Zhao, K., Siener, M., Zhao, Y., & Hohmann, A. (2023). Physical fitness and motor competence performance characteristics of Chinese elite youth athletes from four track and field throwing disciplines—a cross-sectional study. *Frontiers in Physiology*, *14*. https://doi.org/10.3389/fphys.2023.1267804