

# The Impact of the Socialization of the Research-Based Mental Toughness Strengthening Model on Increasing the Knowledge of Yogyakarta Training Center Trainers

Dimiyati<sup>1</sup>, Sujarwo<sup>2\*</sup>, Herka Maya Jatmika<sup>3</sup>, Abdul Mahfudin Alim<sup>4</sup>, Muhammad Sigit Antoni<sup>5</sup>

<sup>1,2,3,5</sup>Faculty of Sports Sciences and Health, Universitas Negeri Yogyakarta Indonesia

<sup>4</sup>Vocational Faculty, Universitas Negeri Yogyakarta, Indonesia

\* Corresponding Author:

Email: [jarwo@uny.ac.id](mailto:jarwo@uny.ac.id)

---

## Abstract.

*Understanding psychological aspects is a strategic step to improve athletes' performance. However, in the process of athlete development, this psychological factor is often neglected. Therefore, knowledge regarding mental toughness needs to be provided to coaches. This Community Service (PKM) activity aims to increase the knowledge of coaches at the Special Region of Yogyakarta Regional Training Center (Puslatda DIY) regarding the psychological aspects of athlete mental toughness, as well as equip them to apply it during the training process to strengthen the athletes' mental toughness. This activity used counseling and direct education methods through material presentations and interactive lectures attended by 46 Puslatda DIY coaches. The coaches' increase in knowledge was measured using a test instrument consisting of 10 items by comparing pre-test and post-test results. The evaluation results showed a significant increase in knowledge regarding aspects of mental toughness among the coaches. This proves that the direct counseling and education program successfully and effectively increased the coaches' understanding of the psychological aspects of mental toughness.*

**Keywords:** Athlete performance, Community Service (PKM), mental toughness, psychological aspects and coaching.

---

## I. INTRODUCTION

An athlete's success or failure in a match is determined by multiple factors, including physical, tactical, technical, and psychological elements. In sports, the psychological factor is often the decisive element that separates a winner from a loser [1]. Many athletes are able to demonstrate their capabilities during practice, yet fail in competition due to psychological pressure [2]. [3] Emphasize that most coaches believe sports involve at least 50% mental preparation when competing against opponents of equal skill, and certain sports (e.g., golf, tennis, and figure skating) are consistently viewed as involving 80% to 90% psychological factors. They further note that many elite world-class athletes across various sports such as LeBron James, Drew Brees, Maya Moore, Lionel Messi, Lindsey Vonn, Danica Patrick, and Roger Federer have discussed the critical importance of mental skills in achieving peak performance [3].

Athletes, coaches, and sport psychologists consistently identify mental toughness as one of the most critical psychological characteristics associated with success in elite sport. The world's greatest athletes testify to the reality of mental

toughness every time they perform [4]. Results from a study involving ten Olympic athletes reported that mental toughness ranked as the highest psychological characteristic among numerous aspects determining their performance success [5]. Nevertheless, Bull et al. noted a lack of clear global themes in research related to the development of mental toughness, along with insufficient supporting data on how mental toughness actually develops [6].

Contemporary literature in sport psychology indicates that despite the universal recognition of mental toughness, coaches frequently encounter significant barriers in translating this understanding into systematic coaching methods. Recent literature reveals a gap between high theoretical awareness regarding the role of mental toughness and coaches' minimal operational understanding of how this psychological attribute is genuinely formed and progressively developed within athletes [7]. Consequently, many coaches remain trapped in flawed traditional training approaches interpreting mental toughness merely as physical endurance against training hardships (suffering for growth) rather than managing it as a dynamic psychological skill [8].

This coaches' limited understanding is exacerbated by a lack of theoretical consensus and accessible, evidence-based practical guidelines for field practitioners. Several systematic reviews have found that mental toughness training programs implemented by coaches are often speculative and carry a high risk of methodological bias due to a scarcity of up-to-date scientific references [7, 8]. Without a deep psychological understanding of the interplay among environmental factors, emotional regulation, and social support, coaches frequently fail to identify the unique psychological profile required by each athlete to sustain optimal performance under extreme pressure [8].

The impact of this deficit in understanding is profound on athletes' long-term mental well-being and performance consistency. Recent research emphasizes that well-integrated psychological skills can mitigate the risk of burnout through proper stress appraisal restructuring [9]. However, because coaches often overlook structured psychological developmental aspects and focus solely on physical and tactical components, athletes' full potential fails to be holistically optimized. Therefore, the elite sports world requires an urgent paradigm shift to equip coaches with valid and tested sport psychology literacy. Collaborative efforts between sport psychologists and coaches are an absolute prerequisite so that the understanding of mental toughness does not stop at mere rhetoric of achievement, but transforms into measurable, systematic, and safe psychological interventions for athlete development [7; 10].

Based on the aforementioned review and to complement information regarding the vital importance of psychological aspects such as mental toughness, our community service team prior to the departure of the Yogyakarta Special Region (DIY) National Sports Week (PON) contingent to the XXI PON in Aceh and North Sumatra in 2024, conducted a study on mental toughness among these athletes and submitted recommendations to KONI DIY based on the findings. A wealth of information and

discoveries regarding the mental toughness of DIY PON athletes was uncovered. It is an obligation for academics to disseminate this information to stakeholders involved in athlete development, particularly coaches across various sports disciplines throughout the DIY region.

Disseminating the findings of research on mental toughness as planned is of significant importance for coaches, given their central position in enhancing athletes' mental toughness. However, according to [11], in practical field implementation, many coaches still do not fully understand it due to remaining constraints at the conceptual level. This lack of conceptual consistency in mental toughness studies may be related to differing interpretations. They further state that the conceptualization of mental toughness and its development are inherently grounded in the practical work of coaches with athletes in the field. Coaches are key factors in an athlete's life for developing mental toughness [12]. As an increasing number of coaches and athletes link sports achievement to mental toughness [13], there is a growing demand from athletes and coaches for procedures to develop mental toughness [13]; nevertheless, scientific attention and research generated regarding this psychological aspect of mental toughness remain limited [14].

This background motivated the community service team to conduct a Community Service (PkM) activity in the form of research findings dissemination, leading to the formulation of the title mentioned above: "Socialization of a Research-Based Mental Toughness Strengthening Model for Sports Coaches in the Special Region of Yogyakarta." The practical objective to be achieved following the implementation of this PkM program is an increase in knowledge and understanding among sports coaches in DIY regarding the crucial importance of the psychological aspect, specifically athlete mental toughness, in improving the athlete development process and performance.

## II. METHODS

The design of this Community Service (PkM) activity took the form of direct counseling and education. This method was implemented through the delivery of material and interactive lectures to DIY regional training center (Puslatda) coaches to build a theoretical understanding of the importance of the psychological aspect of athlete mental toughness. The participants consisted of 46 Puslatda DIY coaches representing 36 sports disciplines (names and types of sports attached). The implementation of this community service activity followed a systematic and rigorous four-stage procedural framework designed to ensure validity, reliability, and measurable impact on the participating coaches: Stage One: Preparation Phase: (1) Needs Analysis: Conducting initial field observations and informal interviews with coaches and Puslatda DIY management, specifically the DIY KONI board, to identify specific psychological barriers faced by athletes and gaps in current coaching strategies, (2). Handbook & Material Development: Developing a coach-led mental

toughness strengthening guidebook for field training (book attached), translating empirical research findings into practical, applied training materials tailored for regional-level coaches (proof of research report attached), (3) Instrument Preparation: Preparing data collection instruments, particularly validated pre-test and post-test questionnaires designed to quantitatively measure coaches' conceptual and practical understanding of the mental toughness framework, (4) Logistical & Administrative Coordination: Securing institutional permits, coordinating schedules with the National Sports Committee of Indonesia (KONI) DIY, and preparing training facilities and learning media.

Stage Two: Initial Evaluation (Pre-Test): Baseline Measurement: Before any intervention was delivered, all participating Puslatda DIY coaches completed a pre-test in print format. Objective: This step established an empirical starting point regarding coaches' initial understanding of structured mental toughness psychological aspects, ensuring a valid point of comparison for post-intervention analysis; Stage Three: Socialization Implementation: (1) Interactive Presentation: Presenting core concepts of the research-based mental toughness model, highlighting theoretical foundations, psychological resilience indicators, and empirical evidence from sports science, (2) Workshop and Practical Simulation: Engaging coaches in focused group discussions, case studies, and simulation exercises where they practiced translating psychological concepts into actionable coaching drills (e.g., goal setting, confidence regulation, and attentional focus to cope with pressure), and (3) Q&A and Reflection: Providing an open consultative forum allowing coaches to discuss specific psychological challenges within their respective sports (martial arts, team sports, and individual events).

Stage Four: Final Evaluation and Reflection (Post-Test & Follow-Up): (1) Final Measurement: Immediately following the socialization session, participants completed a post-test using the exact same instrument as the pre-test to measure knowledge acquisition; (2). Data Analysis: Applying descriptive and paired comparative statistical analyses to evaluate the statistical significance of the knowledge enhancement, and (3) Program Evaluation: Collecting qualitative feedback via evaluation sheets regarding the clarity, relevance, and ease of implementation of the model to refine future dissemination efforts. The instrument used to measure the increase in knowledge was specifically developed in the form of pre-test and post-test questionnaires consisting of 10 items. Example questions included: "What is meant by mental toughness in athletes?", "In the process of developing mental toughness, the primary role of the coach is...", and "Athlete mental toughness is characterized by the 4C concept. Which of the following choices encompasses these dimensions?". Each question provided 3 options, and respondents selected the single most appropriate alternative. A correct answer received a score of 10, while an incorrect answer received a score of 0, resulting in a maximum total score of 100 for all correct answers and 0 for all incorrect answers, yielding a score range between 0 and 100. The data analysis technique used to determine the difference in knowledge regarding mental toughness aspects between the

respondents' pre-test and post-test scores employed a paired data approach. This was conducted through descriptive analysis, consisting of mean score comparisons and percentages to observe the magnitude of actual change, as well as inferential analysis using a Paired Sample t-Test to examine whether the score differences were statistically significant.

### III. RESULT AND DISCUSSION

#### Result

Overview of community service activities implementation

The mental toughness socialization program for athlete coaches of PON DIY was successfully held for a full day from 08:30 to 15:30 WIB at the Main Meeting Room on the 2nd floor of KONI DIY. The program was attended by 46 coaches representing 36 regional training center (Puslatda) sports, the majority of whom hold national coaching certificates. The delivery method combined interactive lectures, case study video screenings, and group discussions, which successfully captured high interest and enthusiasm from the participants. This was evidenced by a 100% attendance rate from the beginning to the closing ceremony, as well as active participation reflected in numerous questions directed to all speakers throughout the event. This high level of participatory engagement not only demonstrates that the socialization material is relevant to practical field needs, but also serves as credible empirical evidence that the theoretical substance was well-received and deeply reflected upon, confirming that this intervention was implemented validly, transparently, and with a tangible impact on enhancing the professional capacity of the participants.

#### Pre-Test and Post-Test Results

Based on the data analysis of the pre-test and post-test results regarding coaches' knowledge of mental toughness derived from 10 questionnaire items with a score range of 0 to 100 the following data was obtained.

|                |         | Age     | Pre_Test | Post_Test |
|----------------|---------|---------|----------|-----------|
| N              | Valid   | 46      | 46       | 46        |
|                | Missing | 0       | 0        | 0         |
| Mean           |         | 44.76   | 58.91    | 85.43     |
| Median         |         | 45.00   | 60.00    | 90.00     |
| Mode           |         | 55      | 70       | 80        |
| Std. Deviation |         | 11.939  | 24.425   | 11.871    |
| Variance       |         | 142.542 | 596.570  | 140.918   |
| Range          |         | 49      | 80       | 40        |
| Minimum        |         | 25      | 20       | 60        |
| Maximum        |         | 74      | 100      | 100       |
| Sum            |         | 2059    | 2710     | 3930      |

**Fig 1. Statistical Test Results**

A significant increase occurred in the mental toughness knowledge of 46 Puslatda DIY coaches after participating in a Community Service (PkM) activity consisting of counseling and direct education through interactive lectures, case study video screenings, and group discussions; where the mean score jumped from 58.91 (*pre-test*) to 85.43 (*post-test*), an increase of 26.52 points, while the standard deviation sharply decreased from 24.43 to 11.87, proving that the material was delivered effectively, transforming the coaches' initial understanding from the lower-middle category to very good, while simultaneously achieving homogenization where participants' scores became much more uniform and clustered at a high level.

The increase in the average mental toughness knowledge score of the Puslatda DIY coaches from 58.91 at the pre-test stage to 85.43 at the post-test proves the effectiveness of the applied intervention methods. The combination of interactive lectures, case study video screenings, and group discussions successfully triggered a significant cognitive leap for the 46 participating coaches. Substantially, the pre-test score of 58.91 indicated a crucial initial understanding deficit among coaches regarding modern sports psychology concepts.

The surge to 85.43 indicates that the Community Service (PkM) method was able to bridge complex academic theories into practical knowledge that is easily absorbed and applied within regional-level coaching environments. These findings are closely related to the multidimensional mental toughness theoretical model, particularly the 4Cs framework developed by [13], which encompasses Control, Commitment, Challenge, and Confidence. The education provided successfully expanded the coaches' understanding that mental toughness is not a static innate trait, but rather a psychological construct that can be enhanced through systematic theoretical understanding.

From a pedagogical perspective, the effectiveness of this intervention is supported by [15] andragogy theory and [16] experiential learning cycle. The interactive lecture approach combined with audiovisual case studies facilitated the critical reflection process of adults, enabling coaches to connect theoretical material with real-world experiences on the sports field. A comparison with prior literature shows consistent results, indicating that structured sports psychology interventions targeting coaches consistently deliver a positive impact on their psychological literacy [12]. As emphasized by [3], enhancing coaches' mental capacity is an absolute prerequisite before they can effectively transfer these psychological skills to their mentored athletes.

Furthermore, the use of case study video playback media in this PkM activity reinforces contemporary physical education research findings that emphasize the importance of problem-based learning. In line with [17] findings on multimedia learning theory, interactive visual approaches prove to be superior in building memory retention and contextual understanding compared to the conventional one-way lecture methods frequently used in traditional training. Moreover, the integration of video-

based case studies significantly enhances participants' cognitive engagement, as emphasized by [18] in sports professional education literature, stating that real-life case simulations effectively bridge the gap between theoretical knowledge and practical application in the field.

From a theoretical standpoint, the findings enrich academic literature concerning the significance of regional, community-based sports psychology interventions in Indonesia. The empirical data confirms that disseminating sports science through a community service framework effectively accelerates scientific literacy among grassroots sports practitioners.

Practically, these results necessitate the institutionalization of mental toughness education within the mandatory training curricula for regional sports training center coaches. Regional Indonesian National Sports Committee administrators must view sports psychology preparation not merely as an optional supplement, but as a fundamental pillar of long-term athlete development management.

Despite these valuable insights, the study acknowledges key methodological constraints. The evaluation primarily measures cognitive knowledge levels via written assessments rather than evaluating long-term behavioral changes within actual training environments. Furthermore, because the sample size is restricted to 46 coaches within the Yogyakarta Special Region, generalizing these findings to different cultural contexts and sports disciplines outside this region requires caution.

Addressing these limitations, future longitudinal research programs are strongly recommended to evaluate the tangible impact of enhanced coaching knowledge on the psychological performance of athletes.

#### **IV. CONCLUSION**

The socialization activity for the research findings on mental toughness packaged as a community service program utilizing counseling methods, interactive lectures, case study video screenings, and group discussions had a significantly positive impact. This is evidenced by the enhanced understanding of the 46 Yogyakarta Special Region regional training center coaches, demonstrated by a surge in the average score from 58.91 (pre-test) to 85.43 (post-test).

#### **V. ACKNOWLEDGMENTS**

Appreciation is extended to the funding institution, the Directorate of Research and Community Service of Yogyakarta State University (DRPM UNY), and the management of the Yogyakarta Special Region National Sports Committee (KONI DIY) for their full support of this activity.

#### **REFERENCES**

- [1] Brewer, B. W. (2009). Handbook of sports medicine and science, sport psychology. John Wiley & Sons.

- [2] Endo, T., Sekiya, H., & Raima, C. (2023). Psychological pressure on athletes during matches and practices. *Asian Journal of Sport and Exercise Psychology*, 3(3), 161–170. <https://doi.org/10.1016/j.ajsep.2023.07.002>
- [3] Weinberg, R. S., & Gould, D. (2019). Foundations of sport and exercise psychology (7th ed.). Human Kinetics.
- [4] Gucciardi, D. F., & Gordon, S. (2009). Development and preliminary validation of the Cricket Mental Toughness Inventory (CMTI). *Journal of Sports Sciences*, 27(12), 1293–1310. <https://doi.org/10.1080/02640410903242306>
- [5] Gould, D., Dieffenbach, K., & Moffett, A. (2002). Psychological characteristics and their development in Olympic champions. *Journal of Applied Sport Psychology*, 14(3), 172–204. <https://doi.org/10.1080/10413200290103482>
- [6] Connaughton, D., & Hanton, S. (2009). Mental toughness in sport: Conceptual and practical issues. In S. Mellalieu & S. Hanton (Eds.), *Advances in applied sport psychology: A review* (pp. 317–346). Routledge.
- [6] Connaughton, D., Hanton, S., & Jones, G. (2010). The development and maintenance of mental toughness in the world's best performers. *The Sport Psychologist*, 24(2), 168–193. <https://doi.org/10.1123/tsp.24.2.168>
- [7] Stamatis, A., et al. (2020). Developing and training mental toughness in sport: A systematic review and meta-analysis of observational studies and pre-test and post-test experiments. *BMJ Open Sport & Exercise Medicine*, 6(1), e000747. <https://doi.org/10.1136/bmjsem-2020-000747>
- [8] McCarthy, P. (2025). The hard truth about mental toughness in sports: What some coaches get wrong. Dr. Paul McCarthy Research & Consulting.
- [9] Zhang, Z. (2026). Mental toughness as a mediator between sports psychological skills and reduced sense of accomplishment. *Frontiers in Psychology*, 16, Article 1677985.
- [10] Hsieh, Y.-C., et al. (2024). Mental toughness as a mediator between sports psychological skills and athletic burnout: A buffering model approach. *Frontiers in Psychology*, 15, Article 1350000. <https://doi.org/10.3389/fpsyg.2024.1350000>
- [11] Gucciardi, D. F., & Gordon, S. (2011). *Mental toughness in sport: Developments in theory and research*. Routledge Taylor & Francis Group.
- [12] Gucciardi, D. F., Hanton, S., & Fleming, S. (2015). Are mental toughness and mental health mutually exclusive? *International Review of Sport and Exercise Psychology*, 9(1), 1–21. <https://doi.org/10.1080/1750984X.2015.1107810>
- [13] Clough, P., Earle, K., & Sewell, D. (2002). Mental toughness: The concept and its measurement. In I. Cockerill (Ed.), *Solutions in sport psychology* (pp. 32–43). Thomson Learning.
- [14] Thelwell, R., Weston, N., & Greenlees, I. (2005). Defining and understanding mental toughness in soccer. *Journal of Applied Sport Psychology*, 17(4), 326–332. <https://doi.org/10.1080/10413200500313600>
- [15] Knowles, M. S., Holton, E. F., & Swanson, R. A. (2020). *The adult learner: The definitive classic in adult education and human resource development* (9th ed.). Routledge.
- [16] Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall.
- [17] Mayer, R. E. (2020). *Multimedia learning* (3rd ed.). Cambridge University Press.

- [18] Schmidt, H. G., Rotgans, J. I., & Yew, E. H. (2019). The process of problem-based learning: What works and why. *Medical Education*, 53(3), 233–243. <https://doi.org/10.1111/medu.13754>.