Mental Imagery: Competitive Anxiety Control in Karate Kumite Athletes

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Info Artikel

Abstract

This study aimed to test the effect of mental imagery training on the competitive anxiety of karate Kumite athletes. One of the benefits of mental imagery is that it can improve the athlete's ability to control psychological symptoms such as anxiety. So that athletes can show their best performance during the game. This research used quantitative methods with an experimental approach, _the pretest-posttest control and an experimental group design_. The population used West Java regional karate athletes, totalling 42 athletes. Using purposive sampling techniques, the samples consisted of 15 Bandung Karate Club Kumite athletes and 15 Kei Shin Kan Kumite athletes. Data were obtained using The Hogg Eco-Anxiety Scale. Based on the results of the data analysis obtained, the average experimental pretest of 25.20 and posttest of 20.00 showed a decrease in the anxiety of Kumite athletes after being given imagery training. In addition, the N-Gain scores in both groups show decreased pressure in Kumite athletes. However, the N-Gain score in the experimental group was lower than the control group (-23.60 < 3.56), and in the t-test on the N-Gain value, the score obtained the Sig. Value (2-tailed) was $0.005 < \alpha = 0.05$. So it can be concluded that imagery training affects the competitive anxiety of Kumite athletes, and there are significant differences in effectiveness in applying imagery training with conventional exercises.

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INTRODUCTION

The sport of martial arts has popularity in the world of sports today. Karate occupies one of the most popular martial arts sports at the regional and international levels (Imamnazarovich, 2021). Varied techniques and speed in a fraction of a second to score points are exciting elements in this martial arts sport (Georgios, 2016). The karate match class number Kumite is a physical contact battle. The Kumite athlete controls the attack towards the opponent on the face area (*Jodan*), so only a light touch does not cause injury. However, unlike when attacks are carried out on areas of the body (*Chudan*), such as the abdomen and back, Kumite athletes can launch attacks with strength/ power (Tabben et al., 2013). Specific criteria that have been set need to be met to score points. A technique is assessed if the technique launched has a good shape, the right timing, readiness (*Zanshin*), and the correct distance, and is shown with enthusiasm accompanied by loud shouting (Dewan Wasit PB FORKI, 2020).

Therefore, an athlete must control anxiety during the game because it will significantly affect his competitive performance (Yane, 2016). This event is called competitive anxiety, where athletes have difficulty focusing on the planned strategy and feel anxious about their abilities when competing (Ramis, Torregrosa, Viladrich, & Cruz, 2017). Significant adverse impacts will appear if the athlete's competitive anxiety control is not good enough, such as fear of the opponent being faced and worrying about

people's negative perceptions if they experience failure. It will undoubtedly be detrimental because the athlete's peak performance cannot be optimized (Purnamasari, Febriani, & Kusnandar, 2020). Instead, the positive impact will be seen with reasonable competitive anxiety control because the athlete is in a stable state of mind. So the athlete can effectively show confidence, motivation, and concentration toward the designed strategy (Effendi, 2016).

To have reasonable competitive anxiety control, mental imagery training is one of the skills an athlete must have (Komarudin, 2015). Imagery is a representation of the self that generates strength from within one's perspective by recreating experiences in their mind that appear to be simple life (Jose & Joseph, 2018). So then, mental imagery training is a process of visualizing the experience of motion on the thinking power obtained from the results of athlete training (Riyadi, Sartono, & Komarudin, 2019). Because mental imagery training is widely applied to elite athletes, and many studies have proven it because it is one of the efforts to increase concentration in athletes and control competitive anxiety against the draft strategies that have been compiled (F. Hidayat, Subarjah, & Komarudin, 2019). In addition, imagery training aims to improve strategy when going to the game (Irmansyah et al., 2019).

Among them are; (1) *Vividness*, describing the experience of motion involving the five senses, (2) *Multisensory*, experiencing the experience of self-motion, seeing motion, or hearing sounds to be then realized in actual

motion, (3) *Controllability*, visualizing the motion to be shown, (4) *Internal or External Perspective*, internal perspective refers to the experience of motion visualized through the view of the athlete while the external perspective is to see the impression video of the appearance of an athlete, (5) *Mastery Rehearsal*, visualizing the best motion experience or achievement with full optimism in thinking power, and (6) *Coping Rehearsal*, visualizing the success of the moving experience to overcome errors that occur. Therefore, these aspects can bring out positive things that can support competitive anxiety control in athletes (Nopiyanto et al., 2021).

It was found that elite athletes use confidence management by delving into imagery skills, and it is proven that this finding many elite athletes take advantage of it (Hagan, Pollmann, & Schack, 2017). For example, the performance of football athletes showed a significant increase after being given imagery training (F. Hidayat et al., 2019). However, previous studies have not treated the imagery training method as a treatment for competitive anxiety. Therefore, there is a need

for competitive anxiety control, especially in young athletes. So here, researchers are interested in applying the mental imagery training method to the competitive anxiety control of Kumite athletes in karate. Because based on what has been explained in the background, utilizing mental imagery skills can reduce the impact of an athlete's competitive anxiety.

METHODS

The method used in this research is experimental. Trying something and systematically observing what happens to the two conditions is a simple idea underlying this research (Fraenkel, Wallen, & Hyun, 2012). Applying the research design *The pretest-posttest control and experimental group design* of the experimental group received treatment. In contrast, the control group did not, so differences could be seen between the two groups (Cohen, Manion, & Morrison, 2018). The design can be represented as follows:

Table 1 The pretest-posttest control and experimental group design

Experimental	RO_1	X	O_2
Control	RO_3		O_4

The population in this research was 42 West Java regional athletes in the sport of karate who would face the National Championships with the classification of junior to senior athletes. This research consisted of 15 Bandung Karate Club (BKC) Kumite number athletes and 15 Kei Shin Kumite number athletes with sampling

techniques applied using *Purposive sampling* (Fraenkel et al., 2012). The first research procedure was carried out before being given treatment, namely, athletes filling out the anxiety scale to find out the level of anxiety of each athlete.

The instrument in this research used the *HEAS-13* anxiety scale test (Hogg, Stanley, O'Brien, Wilson, & Watsford, 2021). In addition, *Kolmogorov Smirnov's* normality test and *Levene's Test for Equality of Variances* were carried out for homogeneity tests on the N-Gain score. The data were analyzed using IBM SPSS 25 (Statistical Product and Service Solutions) applications. The data were distributed normally and homogeneously, so a T-test can be carried out to determine the effect of mental imagery training on the competitive anxiety of Kumite athletes.

FINDINGS AND DISCUSSION

Findings

In this research, data were obtained through pretests and posttests from the anxiety scale instrument consisting of 13 statements with high validity and reliability. The HEAS-13 anxiety scale can assess how anxious people are during significant events or situations (Hogg et al., 2021). With the mental treatment of imagery, the athletes in the experimental group underwent training for 16 meetings. The treatment given to athletes is in the form of exercises to describe a technique or deal with specific situations. The athlete is instructed to concentrate on paying attention to and imagining the patterns of his ultimate technique (Komarudin, 2015).

Table 2 Anxiety scale analysis

Theme	Sample Percentage	Representative Citations
Emotional Experiences		
Concerns	72,7%	"Anxious", "nervous"
Anger	66,7%	"Frustrating"
Sadness	30,3%	"Sad"
Powerlessness	36,4%	"Helpless"
Fear	51,5%	"Fear"
Hopelessness	33,3%	"Desperate"
Stress	60,6%	"Pressure"
Interference		
Mood and emotionality	36,4%	"Affects my mood and becomes very anxious."
Daily routine activities (for example, exercise, sleep)	27,3%	"I am nervous about going out to practice"
Concentration and thinking capacity	30,3%	"I have a hard time concentrating."
Ability to learn and practice	18,2%	"Affects my practice or learning activities."
Anxiety	21,2%	"I have become more irritable."
Social interaction (for example, relationships with other people)	9,1%	"Affects my relationships with family and friends."

A research (Hogg et al., 2021) presented the results of the first analytical study by including seven initial items on the anxiety scale. The purpose is to capture how far participants experience negative affective symptoms when facing significant changes in the situation. The result of this significant change is the process of the appearance of competitive anxiety (Kumbara, Metra, & Ilham, 2019). Thus, researchers asked athletes an open question about the issue of how competitive anxiety can impact their daily activities.

The pretest and posttest scores were obtained using the SPSS 25 application for further analysis. Then find out the anxiety value of the first athlete using pretest data, while the posttest data is used to find out the athlete's anxiety value after being given.

Treatment. Finally, an N-Gain score test was conducted to determine the effectiveness of the experimental group given mental imagery training and the control group with conventional training against athletes' competitive anxiety in Kumite karate.

Table 3 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest Experiment	15	18	34	25,20	5,609
Post-test Experiment	15	17	26	20,00	2,928
Pretest Control	15	17	34	24,47	4,955
Post-test Control	15	17	42	25,20	8,351
Valid N (listwise)	15				

Based on table 2, the results of a descriptive analysis of the anxiety data of karate athletes showed the lowest score of 17 and the highest score of 42. Furthermore, the average results of the experimental group at the time of the pretest were (25.20) and at the time of the posttest, (20.00). Meanwhile, the

The average result of the control group at the time of the pretest was 24.47 to 25.20 at the time of the posttest. It shows a decrease in the results of anxiety values in the experimental group and a significant difference between the experimental group's and the control group's posttest.

Table 4 Descriptive Statistics

Class	Mean	Std. Deviation
Eksperimen	-23,60	24,48
Kontrol	3,56	24,75

It can be seen in table 3 that the results of the descriptive analysis of the average N-Gain score of the experimental class of (-23.60) are smaller than the control class, which averages (3.56). It shows that using.

Imagery exercises in the experimental group are more effective than conventional exercises in the control group. Because in the experimental group, there was a decrease in anxiety in athletes.

From the results of the T-test analysis in

the experimental group that received mental imagery treatment, a calculated value (4.437) > table (1.761) and a sig value (0.001) < 0.05, so it can be concluded that there is a difference in

the average results of the experimental pretest with the experimental posttest. It shows that mental imagery training influences the competitive anxiety of karate athletes

Table 5 Paired Samples Test

	Paired Differences							
				95% Confidence Interval of the Difference				Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
Pretest Experiment - Post-test Experiment	5,200	4,539	1,172	2,687	7,713	4,437	14	,001

The results of the T-test analysis in table 5 obtained the value of Sig. (2-tailed) N-Gain data is 0.005. Because the sig value < $\alpha = 0.05$, H0 is rejected, so it can be concluded that

there is a significant difference in effectiveness in applying mental imagery training with conventional training to competitive anxiety athletes in karate.

Table 6 Independent Samples Test

N-Gain Score	Levene's Test for Equality of Variances		t	df	Sig. (2-tailed)
	F	Sig.			
Equal Variances Assumed	,001	,979	-3,021	28	,005

Discussion

The research results in the experimental group that was given the treatment showed that mental imagery could reduce athletes' anxiety levels. It follows the research (Barnabas, 2015), which states that mental skills are as much needed in sports as having good physical skills. Furthermore, the results of his research show that taekwondo athletes who use mental imagery can improve their performance in competing. Several theories support the improvement of athlete performance by using mental imagery (Komarudin, 2015) put forward following:

This theory occurs when the athlete uses imagery exercises to produce muscle contractions when describing specific techniques. The technique is done spontaneously without us realizing it, also known as "*muscle memory*".

This theory, known as the "*mental blueprint*", can help the athlete more easily design a particular technique that they will perform. This results from imagery exercises that form specific patterns or codes so that the athlete's reflexes are better trained and performance will improve.

This theory explains that a network of stimulus and response occurs when performing imagery exercises. For example, the athlete's

memory of a specific technique that he imagines becomes a stimulus and will then be responded to overcome the situation. Such as the occurrence of muscle tension in the time leading up to the game due to the sound of the audience.

This theory views imagery practice as self-regulation in mastering the skills of managing strategies, planning, and controlling anxiety during competitions. For example, the athlete is confident in his preparation for the game and describes his success.

Some of the theories proposed above are the function of imagery exercises that can facilitate athlete performance. Because in the context of sports, competitive pressure can trigger the anxiety of an athlete. If the anxiety pressure caused is high, it will impact the performance and concentration of athletes who decrease to face their opponents when competing (Hasanah & Refanthira, 2020). However, athletes with high anxiety have a negative influence during specific situations. For example, when approaching a game, athletes think that the competition to be faced is pressure, so it causes high anxiety (Palazzolo, 2020). Athletes in the experimental group had higher anxiety scores at the pretest time but were then able to lower them due to mental imagery training. It was achieved because, in the experimental group that used imagery training, athletes underwent training for 16 meetings, so this training was effectively used to control anxiety in the experimental group.

The imagery training provided includes an introduction to imagery mental training.

First, the athlete observes and carefully imagines specific patterns of motion in training (Multisensory). Then the athlete describes the movement experience in detail. It can be done through self-talk so that the athlete can get to know more deeply his abilities (Vividness). After that, the athlete can practice the experience of such movements or techniques. When the training session is over, the athlete can reflect on the video showing his best performance in the match (Controllability). Next, the athlete can imagine and re-describe the victories achieved (Mastery Rehearsal). Then reassure athletes that they can perform confidently in the next game they will face (External Perspective). In this session, the athlete corrects the mistakes that previously occurred and describes the exact motion for the mistakes (Coping Rehearsal). The last session is an evaluation related to the exercises that have been carried out.

Exercise instructions in carrying out imagery training, in the opinion of Syer & Connolly; Setyobroto 2001: 144 (in Komarudin, 2015, pg. 92). It begins with relaxation. It can be done in a sitting position as comfortably as possible and by closing your eyes. Then take a deep breath and exhale slowly. Once the body is relaxed, the athlete imagines every motion experience related to the five senses. Finally, it will train athletes to describe a movement or skill and what they should do in a particular situation.

Research by (Kristina, Riyoko, Perabunita, & Daryono, 2022) showed the influence of mental imagery training on the

self-confidence of futsal athletes. It is proved by the increase in athletes' confidence in the face of the game due to mental imagery training as a therapy for athletes. By being given mental imagery training for 12 meetings, futsal athletes experienced an increase in score from the average confidence during the pretest of 71.67 to 92.5 in the posttest.

(Munroe-Chandler & Guerrero, 2017) says that mental imagery is a process of recreating the entire experience in one's mind. They noted that mental imagery is often used to achieve specific results because it can improve the performance of athletes. Mental imagery has cognitive and motivational functions that occur at a general and specific level. The *Cognitive General* (CG) function describes the plan or strategy to be carried out, such as karate Kumite athletes' offensive and defensive strategies. The *Cognitive Specific* (CS) function describes more specific skills, such as the *kisame-zuki* punching technique in karate. The *Motivational General* (MG) function describes the level of emotion and performance, such as being aware and having the presence of mind when you are about to receive an opponent's attack. The *Motivational Specific* (MS) function describes certain goals that athletes will achieve, such as winning a gold medal at a championship.

CONCLUSION

Based on the findings of research and discussions that have been presented related to data on the effect of imagery training on competitive anxiety control, it can be concluded that there are significant differences

in effectiveness and athletes who are given better imagery mental training treatment compared to athletes with conventional training. The t-test on the n-gain score shows a sig value of $0.005 < \alpha = 0.05$, and H_0 is rejected. It can also be seen from the average n-gain test results of the scores of the two groups, where the average score in the experimental group was (-23.60), and in the control class, it was (3.56).

It can be seen from the average results of the experimental group at the pretest, 25.20 to 20.00 during the posttest. Furthermore, imagery exercises showed a decrease in anxiety in the assessment group. Therefore, it can be proved that at the time of the t-test, the experimental group had a sig value (0.001) less than the probability value of (0.05).

It is hoped that coaches and athletes can regularly apply imagery training to control the anxiety that arises in athletes. Furthermore, imagery training can be combined with physical exercise and technique so that athletes are more accustomed to doing so. Then for the results of this study, readers will get the information so that it can be a reference to start doing imagery exercises because it has many benefits for the athlete's mentality.

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REFERENCES

Cohen, L., Manion, L., & Morrison, K. (2018). *Research Methods in Education* (8th ed.). New York: Routledge.

Dewan Wasit PB FORKI. (2020). *Peraturan Pertandingan*. 84. Retrieved from https://drive.google.com/file/d/1XiJbRMf3U-DOqn6pPEofA3L6jvcNDeFV/view?usp=sharing

Effendi, H. (2016). Peranan psikologi olahraga dalam meningkatkan prestasi atlet. *Nusantara (Jurnal Ilmu Pengetahuan Sosial)*, *1*, 27.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How To Design and Evaluate Research in Education* (8th ed.). New York: McGraw-Hill.

Georgios, Z. (2016). Image evaluation of karate athletes. *Journal of Physical Education and Sport*, *16*(3), 850–856. https://doi.org/10.7752/jpes.2016.03134

Hagan, J. E., Pollmann, D., & Schack, T. (2017). Elite Athletes ' In-event Competitive Anxiety Responses and Psychological Skills Usage under Differing Conditions. *Journal Frontiers in Psychology*, *8*(December), 1–11. https://doi.org/10.3389/fpsyg.2017.02280

Hasanah, U., & Refanthira, N. (2020). Human Problems : Competitive Anxiety in Sports Performers and Various Treatments to Reduce It. *Education and Humanities Research*, *395*, 144–148. https://doi.org/https://dx.doi.org/10.2991/assehr.k.200120.031

Hidayat, F., Subarjah, H., & Komarudin. (2019). Pengaruh Audiovisual Training Dan Imagery Training Terhadap Performa Bermain Sepak Bola. *Jurnal Ilmu Keolahragaan*, *18*(2), 1–3.

Hogg, T. L., Stanley, S. K., O'Brien, L. V, Wilson, M. S., & Watsford, C. R. (2021). The Hogg Eco-Anxiety Scale: Development and Validation of a Multidimensional Scale. *Global Environmental Change*, p. 71. https://doi.org/https://doi.org/10.1016/j.gloenvcha.2021.102391

Imamnazarovich, B. K. (2021). Karate Sports and its History. *EUROPEAN JOURNAL OF LIFE SAFETY AND STABILITY (EJLSS)*, *7*, 137–138.

Irmansyah, J., Lubis, M. R., Permadi, A. G., Wire, N., Sakti, P., Studi, P., … Mandalika, U. P. (2019). Development of exercise model imagery to improve the accuracy of floating service in beach volleyball athletes. *Jurnal Keolahragaan*, *7*(2), 162–173. https://doi.org/https://doi.org/10.21831/jk.v7i2.21837

Jose, J., & Joseph, M. M. (2018). Imagery: A review study: Its effects and benefits on sports performance and psychological variables. *International Journal of Physiology, Nutrition and Physical*

Education, *3*(2), 190–193. Retrieved from www.journalofsports.com

Komarudin. (2015). *Psikologi Olahraga* (Y. Hidayat, ed.). Bandung: PT Remaja Rosdakarya.

Kristina, P. C., Riyoko, E., Perabunita, & Daryono. (2022). The Effect of Imagery Training in Increasing The Confidence. *Jurnal Ilmu Keolahragaan*, *5*, 682–689. https://doi.org/http://dx.doi.org/10.31851/hon.v5i2.8906

Kumbara, H., Metra, Y., & Ilham, Z. (2019). Analisis Tingkat Kecemasan (Anxiety) Dalam Menghadapi Pertandingan Atlet Sepak Bola Kabupaten Banyuasin Pada Porprov 2017. *Jurnal Ilmu Keolahragaan*, *17*(2), 28. https://doi.org/10.24114/jik.v17i2.12299

Munroe-Chandler, K. J., & Guerrero, M. D. (2017). Psychological Imagery in Sport and Performance. *Oxford Research Encyclopedias*. https://doi.org/https://doi.org/10.1093/acrefore/9780190236557.013.228

Nopiyanto, Y. E., Alexon, A., Raibowo, S., Prabowo, A., Ilahi, B. R., & Widodo, L. (2021). Pengaruh Latihan Imagery terhadap Kepercayaan Diri Atlet. *Jurnal Patriot*, *3*(March), 71–81. Retrieved from http://patriot.ppj.unp.ac.id/index.php/patrio

Palazzolo, J. (2020). Anxiety and Performance. *Encephale*, *46*(2), 158–161.

https://doi.org/10.1016/j.encep.2019.07.008

Barnabas, V. (2015). The Influence of Mental Imagery Techniques on Sports Performance among Taekwondo Athletes. *EUROPEAN ACADEMIC RESEARCH*, *II*(11), 14729–14734.

Purnamasari, A. D., Febriani, A. R., & Kusnandar. (2020). Kecemasan Pada Atlet Cabang Olahraga Bela Diri (Nomor Tarung). *Physical Activity Journal (PAJU)*, *2*, 56–69. https://doi.org/https://doi.org/10.20884/1.paju.2020.vx.nx.xxxx

Ramis, Y., Torregrosa, M., Viladrich, C., & Cruz, J. (2017). The Effect of Coaches ' Controlling Style on the Competitive Anxiety of Young Athletes. *Journal Frontiers in Psychology*, *8*(April), 1–8. https://doi.org/10.3389/fpsyg.2017.00572

Riyadi, D., Sartono, H., & Komarudin, K. (2019). Pengaruh Metode Latihan Imagery terhadap Kosentrasi dan Keterampilan Bermain Sepakbola. *Jurnal Kepelatihan Olahraga*, *11*(1), 43–50. https://doi.org/10.17509/jko-upi.v11i1.16825

Tabben, M., Sioud, R., Haddad, M., Franchini, E., Chaouachi, A., Coquart, J., … Tourny-chollet, C. (2013). Physiological and Perceived Exertion Responses during International Karate Kumite Competition. *Asian Journal of Sports Medicine*, *4*(4), 263–271. https://doi.org/10.5812/asjsm.34246

Yane, S. (2016). Kecemasan dalam olahraga. *Jurnal Pendidikan Olahraga*, *2*(2), 188–194. https://doi.org/https://doi.org/10.31571/jpo.v2i2.236