

# Effects of Imagery Training and Self-Talk towards State Anxiety and Archery Performance

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**Abstract** This study examined the effects of imagery training and instructional self-talk towards cognitive state anxiety, somatic state anxiety, self-confidence and archery performance of the Sports School Malaysia Pahang (SSMP) athletes in 2019. This study used a quasi-experimental design. The instrument consisted of Sport Imagery Ability Measure Questionnaire (SIAM), Belief in Self-Talk Questionnaire (BSQ) and Revised Competitive State Anxiety Inventory-2R (CSAI-2R), and archery performance scores were considered as well. A total of 45 participants were randomly distributed into three experimental groups: Imagery (I) (n = 15), Imagery and Self-Talk (IST) (n = 15) and Self-Talk (ST) (n = 15). All groups underwent a six-week intervention of eighteen sessions, three times a week for one hour. Two Way Mixed MANOVA revealed significant differences between the three intervention groups. Imagery and Self-Talk (IST) group had a significant effect on decreasing state anxiety and increasing self-confidence as well as archery performance scores over two-time periods (pre and post-test). Such a result opens the way to the idea that, Imagery and Self-Talk (IST) group showed a better effect than study groups (ST) and (I). Factors that reduce state anxiety, increase self-confidence and archery performance, and explain the acceptance of interventions over one method will produce a more positive effect on participants. Imagery and instructional self-talk intervention can be used as a reference for sports psychology coaches to improve archery performance among athletes.

**Keywords** Imagery, Instructional Self-Talk, State

Anxiety, Archery Performance

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## 1. Introduction

The interaction between state anxiety and athletic performance is subjective because it depends on the athlete's interpretation of the environment [1]. [2] described the performance of mental skills visualization and managing negative self-talk was trained and implemented using local male and female recreational golfers should be measured to show the results of sports performance to athletes and stated that implementation of mental training interventions showed that performance of athletes improved. Coincidentally, some sports psychology practitioners emphasize mental skills training is important in tandem with the physical training practices often performed by athletes and suggest that mental skills training should be incorporated into physical training practice [3], [4] and resistance training [5]. According to [6], Psychological Skill Training (PST) refers to psychological techniques such as goal setting, imagery, self-talk, and relaxation in improving psychological skills and traits, namely motivation, focus, and self-confidence collectively. Therefore, the mental training program is one form of training that needs to be implemented apart from physical, technical, and tactical training programs.

Imagery is the process of rehearsing the shadow of a physical activity symbolically in the mind [7]. According

to [8], athletes can benefit from imagery training to reinforce, detail, explore, and recall new or old sports skills and for specific purposes such as sports strategies, tactics and techniques, and recovery in sports. Whereas, self-talk prescribed in the intervention was instructional self-talk. Instructional Self-Talk is defined as an internal conversation that occurs either silently or loudly automatically or strategically to stimulate, direct, respond and evaluate actions [9], [10]. Through the use of instructional self-talk, athletes can interpret thoughts and emotions, direct or improve themselves, improve performance as well as learn motor skills.

Meanwhile, [11] explained state anxiety factor is an emotion that will affect the performance of athletes as a whole as well as present traits such as feelings of nervousness, fear anxiety, and physiological awakening. Indirectly, information processing systems such as perception, decision-making ability, concentration problems, and response selection. [12] explained archery is a sport that requires movement and strength of the upper body as well as endurance. According to [13] archery, sport involving shooting arrows with a bow either at an inanimate target or in hunting.

Thus, studies in the field of psychology are necessary as every athlete needs certain psychological skills to cope with tense situations during competition. The main focus of the study on national sports school in Pahang (SSMP) archery athletes implies that the purpose of the study was to examine if the participants have psychological problems and indirectly help improve performance.

### 1.1. Problem Statement

Stress while facing difficult situations causes athletes to lose focus on a particular skill behavior. According to [14], the decline in performance is due to the occurrence of stress that affects the motivational factors, focus, level of state anxiety and also contributes to resulting factors muscle tension. Mental toughness was “hardiness” transposed into a more sport-specific setting with the additional inclusion of confidence. Therefore, mental toughness is required in sporting events that involve concentration. In 2021, Tan described despite being touted as medal hopefuls for the national contingent, Malaysian archers had fallen short of expectations in the past editions of the Olympics Rio 2016 and it looks unlikely that the outcome is going to be any different this time around in Tokyo 2021. The inconsistent achievements of national archery athletes are the driving force behind this study. The National Archery Association of Malaysia (NAAM) pursuit of the country’s maiden Olympics medal has just gotten a lot trickier following their failure to qualify for the men’s team event. This study coincides with a report from the National Archery Association Malaysia (NAAM), national governing body for archery in Malaysia that runs archery activities more experienced during competitions.

In line with this research, according to [15] ‘target panic’ is a disorder of either mental disorder, archery technique or

anxiety among archers. This problem results in archers having control problems and sudden loss of concentration [16], classifies ‘target panic’ into three types, namely premature release, premature hold and a combination of the two. This is a psychological problem that is often experienced by archery athletes resulting in athletes being disturbed in performing archery routines [17]. This is a major psychological-related problem that has been identified as causing inconsistent performance of archery athletes during competitions. Nevertheless, according to a study conducted [18], [19], [20], a combination of mental and physical training is better if athletes practice it often as opposed to just practicing physical training alone.

### 1.2. Objectives Study

The main objectives of the study were to identify differences in imagery abilities, self-talk, cognitive state anxiety, somatic state anxiety, self-confidence and archery performance between Imagery (I), Imagery and Self-Talk (IST) and Self-Talk (ST) before and after an intervention.

## 2. Methodology

### 2.1. Participants

A total of 45 archery athletes from a national sports school in Pahang participated in the study. All athletes participated in the age Imagery (I) ( $M = 15.6$ ,  $SD = 1.76$ ), Imagery and Self-Talk (IST) ( $M = 15.4$ ,  $SD = 1.84$ ) and Self-Talk (ST) ( $M = 14.6$ ,  $SD = 1.18$ ) and did not have any underlying injuries for the last six months before the study was conducted. and have undergone a screening test that all study participants must answer Sport Imagery Ability Measure Questionnaire (SIAM) as well as obtaining a moderate to high score of 150 to 400 and Belief in Self-Talk Questionnaire (BSQ) in determining imagery abilities and self-talk consumption.

Researchers distributed research instruments namely respondent demographic information questionnaire (Athlete SSMP), Sport Imagery Ability Measure (SIAM) and Belief in Self-Talk Questionnaire (BSQ) and Competitive State Anxiety Inventory-2R (CSAI-2R) used to see levels of cognitive anxiety, somatic anxiety and self-confidence 30 minutes before the archery score was recorded. All study participants completed a set of archery trials of six ends in the actual score test session with an open distance of 70 meters with a target face diameter of 122 cm. Therefore, the study group was divided into three Imagery (I), Imagery and Self-Talk (IST) and Self-Talk (ST) after undergoing the study intervention for six weeks the results of the study were recorded.

### 2.2. Instrumentation

The reliability of the Sport Imagery Ability Measure

(SIAM) questionnaire has been reported in previous study [21] and is found to be reliable. The questionnaire was translated into the Malay language [20] with the Cronbach alpha reliability coefficient of  $r = 0.80$ . In addition, translated Belief in Self-talk Questionnaire (BSQ) [22] [23] was used to assess belief in the effectiveness of self-talk. BSQ contains eight items measuring two constructs namely the extent to which they agree or disagree with statements about positive self-talk beliefs to improve performance (4 items) and the extent to which they agree or disagree with statements about negative self-talk beliefs to lower or impair performance (4 items). BSQ has a validity coefficient of  $r = 0.95$  and a reliability value of  $0.88$  [23].

In addition, Revised Competitive State Anxiety Inventory-2 / CSAI-2R was used to measure state anxiety in pre-test and post-test before archery performance. CSAI-2R questionnaire has been reported in previous study by [24] and is found to be reliable. The questionnaire was translated into the Malay language by [23]. CSAI -2R

contained 17 items measuring three constructs encompassing five items of cognitive state anxiety, the validity of which was  $.79 - .83$ . Seven items measuring somatic state anxiety showed validity  $.82 - .83$  and five items measuring self-confidence showed validity  $.087 - .97$ . Athletes must complete a set of trials six ends in archery performance score.

### 2.3. Data Analysis

Data obtained was analysed using Statistical Package for Social Sciences (SPSS) version 23.0. Based on the objectives of the study, descriptive data (weight, height, age and highest achievement represents state, national or international) was measured using means and standard deviations. Meanwhile, inferential statistics were used to identify significant differences i.e. Two Way Mixed MANOVA analysis. The significant value setting used in this study was  $p < 0.05$ .

**Table 1.** Analysis of differences between Pre-test and Post-test Study Groups

Variables	Group	PRE		POST		Sig.
		M	SD	M	SD	
Imagery Abilities	I	1820.33	69.14	2326.67	90.99	.00
	IST	1621.33	68.64	3405.33	93.11	.00
	ST	1722.11	66.81	2638.67	65.30	.00
Self-Talk	I	20.00	1.55	23.73	1.62	.00
	IST	21.00	1.58	36.20	2.07	.00
	ST	22.00	1.60	28.73	1.72	.00
Cognitive State Anxiety	I	13.13	1.54	13.93	1.60	.00
	IST	12.80	1.51	9.86	1.40	.00
	ST	12.73	1.53	10.13	1.43	.00
Somatic State Anxiety	I	27.30	1.42	12.80	1.33	.00
	IST	26.93	1.39	11.93	1.27	.00
	ST	27.13	1.40	12.30	1.30	.00
Self-Confidence	I	7.87	1.40	8.93	1.78	.00
	IST	7.87	1.40	18.40	1.12	.00
	ST	9.80	1.55	12.80	1.47	.00
Archery Performance	I	254.73	21.65	271.40	34.96	.153
	IST	257.53	31.82	287.93	29.24	.011
	ST	256.53	51.72	280.00	29.13	.047

Significant  $p < 0.05$

\*M: Mean

\*SD: Standard Deviation

### 3. Results

Objectives of the study were to identify differences in imagery abilities, self In terms of height, mean and standard deviation of the respondents Imagery (I) had height (M = 160.1, SD = 7.72) and the respondents Imagery and Self-Talk (IST) were (M = 156.6, SD = 6.45) while for the group Self-Talk (ST) namely (M = 165.4, SD = 12.79). Next, mean and standard deviation of the weight of the respondents Imagery (I) (M = 65.2, SD = 13.22) and Imagery and Self-Talk (IST) were (M = 56.00, SD = 10.25) while Self-Talk (ST) is (M = 69.06, SD = 19.34). In terms of the highest achievement, total respondents of the study representing state, national and international respondents representing the state are a total of 1 person representing (2.2 %) and respondents representing the national are a total of 27 people representing (60.0 %) and respondents representing the international are a total of 17 people representing (37.8 %).

The main objectives of the study were to identify differences in imagery abilities, self-talk, cognitive state anxiety, somatic state anxiety, self-confidence and archery performance between Imagery (I), Imagery and Self-Talk (IST) and Self-Talk (ST) before and after an intervention. There was a significant interaction between the intervention group and the Multivariate Test's test,  $F(12,74) = 41.05$ ,  $p = .000$ ; Wilk's Lambda = 0.17.

Table 1 summarizes differences aspects of imagery ability, self-talk, cognitive anxiety, somatic anxiety, self-confidence and archery performance between the Imagery (I), Imagery and Self-Talk (IST) and the Self-Talk (ST) based on pre-test and post-test scores.

### 4. Discussions

Objectives of the study were to identify differences in imagery abilities, self-talk, cognitive state anxiety, somatic state anxiety, self-confidence and archery performance between Imagery (I), Imagery and Self-Talk (IST) and Self-Talk (ST) before and after an intervention. The present study investigated the observed changes in the values of pre- and post-variables after going through the intervention period. The findings of the study showed that there were differences between Imagery (I), Imagery and Self-Talk (IST) and Self-Talk (ST).

Therefore, the difference in pre-and-post-scores was used as a benchmark for the effectiveness of the intervention Imagery and Self-Talk (IST) showed significant changes when compared to other treatment groups. However, in terms of archery performance, all treatment groups have no significant difference because all athletes are national sports school in Pahang having similar skill levels to each other. Coincidentally, the Imagery and Self-Talk (IST) that received the interventions from more than one method has shown changes compared to the different treatment groups. The findings of this study are supported by [25] an athlete's performance can be influenced in positive ways by what and how they think

would increase the athlete's motivation, confidence and feelings of control as well as their sense of self-efficacy.

In fact, according to [26] study diverse psychological skills training (PST) creates mental strength, self-esteem and positive effects. Supports the principles of psychological skills training (PST) and encourages practitioners and coaches to implement and work collaboratively during its implementation. Positive psychology promotes optimal functioning amongst healthy individuals, helping individuals who fall within normal parameters surpass boundaries and flourish. Consistent with the as above, [6] there are changes to the study results after athletes undergo interventions that exceed one method such as athletes can deal with negative emotions, overcome state anxiety, improve self -skills and produce more efficient and accurate responses. This finding also emphasizes the main function of psychological skills training such as imagery and instructional self-talk is to overcome cognitive state anxiety, somatic state anxiety, and increase self-confidence during competition, and encourage athletes to remember all tasks and focus while performing skills.

### 5. Conclusions and Recommendations

The results of the study are consistent with the findings of previous studies stating the implementation of psychological interventions more than one method to help athletes improve performance in competition as well as psychological skills training assistance will help archers to aim more accurately because they are able to control state anxiety factor. Through studies concluded apart from the physical aspect, the tactics of successful athletes in high-performance sports should improve the psychological aspect. Thus in this study, Imagery and Self-Talk (IST) group consistently showed improvement during pre-and post-study. This clearly explains the implementation of appropriate psychological training will show a positive impact on individual acceptance. Therefore, the implementation of carefully planned psychological skills training will have a positive impact [26]. In fact, the training of psychological skills such as imagery and instructional self-talk will create mental strength, self-esteem and a positive impact on the results of the study.

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### REFERENCES

- [1] Robins, T. G., Roberts, R. M., Sarris, A., "The effectiveness,

- feasibility, and acceptability of a dialectical behaviour therapy skills training group in reducing burnout and psychological distress in psychology trainees: A pilot study". *Australian Psychologist*, vol. 54, no.4, pp. 292-301, 2019. DOI: <https://doi.org/10.1111/ap.12389>
- [2] Morahan, A., Effects of Psychological Skills Training on Golf Performance, Western Carolina University, 2018.
- [3] Weinberg, R. S., & Gould, D. (2019). *Foundations of Sport and Exercise Psychology*, 7E. Human Kinetics. URL: <https://us.humankinetics.com/products/foundations-of-sport-and-exercise-psychology-7th-edition-with-web-study-guide-paper>
- [4] Williams, J. G., Odley, J. L., Callaghan, M., "Motor imagery boosts proprioceptive neuromuscular facilitation in the attainment and retention of range-of-motion at the hip joint", *Journal of Sports Science & Medicine*, vol. 3, no.3, pp. 160, 2004. URL: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3905298/>.
- [5] Khan, T. K. A., Abd Malek, N. F., Ishak, A., Mohamad, N. H., Nadzalan, A. M. Effect of imagery and video modelling on self-efficacy during resistance exercise. *International Journal of Innovative Technology and Exploring Engineering*, vol 1., no. 1, pp. 2278-3075. 2019. URL: <https://www.ijitee.org/wpcontent/uploads/papers/v9i1/A4431119119.pdf>
- [6] Grobbelaar, H. W., "Effects of a psychological skills training programme for underserved Rugby Union players", *South African Journal for Research in Sport, Physical Education and Recreation*, vol. 40, no. 1, pp. 39-53, 2018. URL: <https://journals.co.za/doi/abs/10.10520/EJCd90880bea#>
- [7] Morris, T., Spittle, M., Watt, A. P. Imagery in Sport. *Human Kinetics*, 2015. URL: [https://us.humankinetics.com/products/imagery-in-sport?\\_pos=1&\\_sid=eb6b15983&\\_ss=r](https://us.humankinetics.com/products/imagery-in-sport?_pos=1&_sid=eb6b15983&_ss=r)
- [8] Mouratidis, A., Vansteenkiste, M., Lens, W., Sideridis, G., "The motivating role of positive feedback in sport and physical education: Evidence for a motivational model". *Journal of Sport and Exercise Psychology*, vol. 30, no. 2, pp. 240-268. 2008. DOI: <https://doi.org/10.1123/jsep.30.2.240>.
- [9] Hatzigeorgiadis, A., Galanis, E., Zourbanos, N., Theodorakis, Y., "Self-talk and competitive sport performance". *Journal of Applied Sport Psychology*, vol. 26, no. 1, pp. 82-95, 2014. DOI: <https://doi.org/10.1080/10413200.2013.790095>
- [10] McCormick, A., Meijen, C., Marcora, S., "Effects of a motivational self-talk intervention for endurance athletes completing an ultramarathon". *The Sport Psychologist*, vol. 32, no. 1, 42-50, 2018. DOI: <https://doi.org/10.1123/tsp.2017-0018>
- [11] Rodriguez, C., Effects of a 5-Week Mindfulness Training Program on Sport Anxiety, General Mindfulness, and Cognitive Interference on Division I Women's Volleyball Players, California State University, Fullerton, 2017.
- [12] Reddy, A. S., Musculoskeletal biomechanics simulation and EMG analysis of shoulder muscles for archery sport, (Doctoral dissertation, Texas A&M University-Kingsville), 2015.
- [13] Kolayis, E. I, Cilli M., Ertan H, Knicker A. J., "Assessment of Target Performance in Archery", *Procedia - Social and Behavioural Sciences*, vol 152, Pages 451-456, 2014. DOI: [org/10.1016/j.sbspro.2014.09.230](https://doi.org/10.1016/j.sbspro.2014.09.230)
- [14] Hanton, S., Mellalieu, S. D. (Eds.). *Advances in Applied Sport Psychology: A Review*, Routledge, (2009).
- [15] Prior, E. E., Coates, J. K., "Archers' experiences of target panic: an interpretative phenomenological analysis". *Qualitative Research in Sport, Exercise and Health*, vol. 12, no. 2, pp. 224-241, 2020. DOI: [org/10.1080/2159676X.2019.1599061](https://doi.org/10.1080/2159676X.2019.1599061)
- [16] Thomas, K., "The secret curse of expert archers". *The New York Times*,: p. D1, 2008. URL: <https://ohlonearchery.com/new/wpcontent/uploads/2015/05/The-Secret-Curse-of-Expert-Archers.pdf>
- [17] Ahmad, M. A. N., Ronny Linoby, A. F. L., Fenomena Target Panic di Kelab Memanah UiTM Pahang. In: *Prosiding KONAKA Konferensi Akademik (Sains Sosial)*, pp. 378-382, 2013. URL: <https://ir.uitm.edu.my/id/eprint/41000>
- [18] Ahmad, Y., Khalid, N. H. M., & Philip, T. G., "The effects of modality imagery training on overhead skill performance in volleyball game". *Jurnal Sains Sukan & Pendidikan Jasmani*, vol. 1, no.1, pp. 82-88, 2012. URL: <https://ejournal.upsi.edu.my/index.php/JSSPJ/article/view/677/449>.
- [19] Sani, M. H. M., & Khan, T. K. A., "Imagery: effects on conversion kick performance in rugby". *Jurnal Sains Sukan & Pendidikan Jasmani*, vol.7, no.1, pp. 53-61, 2018. URL: <https://ejournal.upsi.edu.my/index.php/JSSPJ/article/view/700/471>
- [20] Sato, N., Khan, T. K. A., Jusoh, N., "The effects of combined self-talk, imagery and video-modelling interventions on anaerobic performance, heart rate response and self-efficacy". *Jurnal Sains Sukan & Pendidikan Jasmani*, vol. 6, no. 1, pp. 1-10. URL: <https://ejournal.upsi.edu.my/index.php/JSSPJ/article/view/942/645>
- [21] Watt, A. P., Morris, T., Andersen, M. B., "Issues in the Development of a Measure of Imagery Ability in Sport". *Journal of Mental Imagery*, vol. 28, no. 3-4, 149-180, 2004. URL: <https://psycnet.apa.org/record/2005-00981-007>.
- [22] Araki, K., Mintah, J. K., Mack, M. G., Huddleston, S., Larson, L., Jacobs, K., "Belief in self-talk and dynamic balance performance". *The Online Journal of Sport Psychology*, vol. 8, no. 4, 2006.
- [23] Razak, N.A., Kesan intervensi pengurusan stres terhadap kebimbangan seketika, kebangkitan fisiologi dan prestasi atlet olahraga remaja Malaysia., Universiti Malaya, 2011.
- [24] Magnusson, J. E., van Roon, C. A., "Determining the effectiveness of personalized versus prescribed self-talk on athletic performance for elite and novice athletes". *American Journal of Applied Psychology*, vol. 1, no.1, pp. 1-6, 2013. DOI: [10.12691/ajap-1-1-1](https://doi.org/10.12691/ajap-1-1-1)
- [25] Golby, J., Wood, P., "The effects of psychological skills training on mental toughness and psychological well-being of student-athlete's". *Psychology*, 7(06), 901-913, 2016. DOI: [10.4236/psych.2016.76092](https://doi.org/10.4236/psych.2016.76092)
- [26] Shukri, N. S. M., "Electromyographical analysis and performance during bench press exercise: The influence of self-talk". *International Journal of Recent Technology and Engineering*, 8(1), 1279-1281, 2019. URL: <https://ir.upsi.edu.my/detailsg.php?det=5053>