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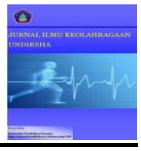

# The Acute Effect of Imagery and Touchpad Training on Improving The Performance of Paragliding Athletes

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***ABSTRAK***

*Kurangnya kombinasi latihan fisik dan mental mengakibatkan atlet paralayang kurang fokus, percaya diri, kurang mendapatkan hasil akurasi yang baik. Tujuan utama penelitian ini untuk mengetahui latihan perumpamaan Dan papan sentuh terhadap peningkatan performa atlet paralayang nomor akurasi di jawa tengah. Metode yang digunakan ialah kuantitatif desain satu kelompok pre-test post-test. Populasi 14 atlet pelatda paralayang dan teknik penarikan sampel menggunakan pengambilan sampel total 14 atlet paralayang. Pre-test dan post-test melakukan akurasi terbang 3 kali dengan poin dihitung akumulasi. Instrument penelitian yaitu skytronik diameter 22-centimeter. Hasil utama penelitian terdapat perbedaan signifikan poin dari sebelum dan sesudah latihan. Kesimpulannya ialah latihan imagery dan touchpad dapat meningkatkan performa atlet paralayang nomor akurasi di jawa tengah.Implikasi penelitian in adalah implikasi Penelitian ini menunjukkan bahwa kedua metode ini memiliki implikasi signifikan dalam meningkatkan performa atlet.*

**ABSTRACT**

Lack of a combination of physical and mental training results in paragliding athletes lacking focus and confidence and not getting good accuracy results. The main aim of this research is to find out about exercise parable And touchpad towards increasing the performance of paragliding athletes in accuracy numbers in Central Java. The method used is quantitative one group pre-test post-test design. The population was 14 regional paragliding athletes and the sampling technique used total sampling 14 paragliding athletes. The pre-test and post-test carry out flying accuracy 3 times with points calculated as accumulated. The research instrument is skytronik 22-centimeter diameter. The main results of the study were significant differences in points before and after exercise. The conclusion is that imagery and touchpad training can improve the performance of paragliding athletes in accuracy numbers in Central Java. The implications of this research are implications This research shows that these two methods have significant implications in improving athlete performance.

## 1. INTRODUCTION

Using a specially made parachute, paragliding is an adventure (extreme) sport that can be done alone, in pairs, or with the presence of a pilot. First introduced in 1940, paragliding experienced a surge in popularity after the 1980s. Until then, the equipment and design are perfect. Because equipment for this sport is easier to obtain and more economical than other air sports, and does not require airports or other logistical assistance, this sport is becoming increasingly popular throughout the world (Canbek et al., 2019; Wulandari et al., 2022). One important component of paragliding's growth is the annual national championships held every year. In 2000, paragliding experienced significant progress when it was included in PON (National Sports Week) in Batu, Malang, East Java. There are also other international events that participants take part in. At least three of these multi-event events make paragliding a sport that ultimately helps the Indonesian sports industry realize its goals (Canbek et al., 2019; Paralayang, 2023). At the Asian Beach Games (ABG) in Bali in 2008, Indonesian paragliders managed to bring home seven gold medals from eight competitions. Of the twelve medals contested at the SEA GAMES Puncak, Bogor, in 2011, he won ten gold medals. Of the six gold medals he won, he took home two medals at the 2018 Asian Games. His achievements in paragliding were also seen in the single paragliding

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championships held between 2010 and 2019, where a number of Indonesian competitors finished third in the famous knock-down event. .

Competition is increasing due to the rapid development of paragliding in Indonesia. In fact, almost every province has its own paragliding athletes, one of which is Central Java. The more athletes there are, the more competition there will be in each championship (Corrado et al., 2020; Paradigling, 2017) The importance of physical, mental, technical and tactical training makes athletes better prepared for championships. However, the characteristics of paragliding are not only those factors, but also due to natural conditions such as wind, wind speed, weather, thermal, and so on. This sometimes makes athletes unable to master accurate numbers (Hall et al., 2016; Stringer, 2023).

Accuracy is a number that is used as a competition parameter by selecting the smallest point (zero). To reach this point requires high concentration and skill to master any condition. Several studies state that imagery training can improve the performance of athletes in open and closed sports (Arvinen-Barrow et al., 2019; Corrado et al., 2019; Simonsmeier et al., 2020), individual/team sports and non-contact sports. There are very few studies that provide training for accuracy, especially in paragliding. Very few studies have provided accuracy training, especially in paragliding. By carrying out this research, it is hoped that special research will emerge regarding paragliding. Therefore, this researcher provided imagery training and touchpad training to paragliding athletes with accuracy figures so they could find out whether they had a good influence on accuracy results.

The novelty of this research lies in the integration of two training approaches that have not been widely explored simultaneously in this sporting context. Although imagery training has been recognized as an effective technique for improving athlete performance, its combination with modern technology such as touchpads offers a more interactive and adaptive approach. This research not only explores the impact of each method, but also analyzes the synergy between mental visualization and technology-based training, thereby providing new insights into how to improve athletes' technical and mental abilities. These findings could potentially pave the way for the development of more comprehensive and evidence-based training programs, which could be applied in a variety of other sporting disciplines. The aim of this research is to identify and analyze the impact of the two training methods simultaneously on athlete performance. This research aims to evaluate how effective imagery training is in increasing concentration, confidence and visualization of flight techniques, as well as how using a touchpad as an interactive training tool can improve athletes' motor skills and responsiveness. Additionally, this research aims to assess the synergy between the two methods in the context of paragliding training, with the hope of producing recommendations that can be implemented by coaches and athletes to significantly improve their competitive performance.

## 2. METHOD

This research uses a quantitative design with one group pre-test and post-test. The research population was 14 athletes participating in national training in 2024. The sample used is the total sample with. The research sample consisted of 14 senior paragliding athletes from Central Java aged 19–41 years. Data collection included height, weight, BMI, age, and gender. This tool uses Skytronic with a diameter of 22 centimeters. Pre-test and post-test data using three paragliding events. The research procedure began with selecting a sample of paragliding athletes who met the inclusion criteria. After that, a pre-test is carried out to measure the athlete's initial achievements in certain aspects, such as flight skills and level of focus, using valid and reliable measuring instruments. Next, the athlete will undergo an intervention consisting of imagery training and use of a touchpad for a certain period, for example four weeks, with a consistent training frequency. After the intervention was completed, a post-test was carried out using the same method to measure changes in athlete performance after following the training program. Data obtained from the pre-test and post-test will be analyzed using appropriate statistical techniques, such as the t test to determine the significance of differences between the results before and after the intervention. It is hoped that the results of this analysis will provide an overview of the effectiveness of the combination of imagery and touchpad training in improving the performance of paragliding athletes.

Imagination training involves imagining long endings by controlling emotions so as not to force them and training the coordination of the mind, eyes, hands and feet. This exercise involves taking deep breaths for 5 minutes. The next exercise is a touchpad exercise by focusing your feet on point 0 of the pad for 1 minute, alternating between the right and left feet.

Analysis used parametric statistics, Shapiro-Wilk normality test, and t test. Analyzes were performed using IBM SPSS Statistics for Macintosh, Version 27.0. Armonk, NY: IBM Corp, with a significance level of 0.05.

## 3. RESULT AND DISCUSSION

### Result

Starting from age, height, weight, BMI, and MHR. The average age of the sample is 27.6, range 19-41 years, with a body weight of 64.5 kg, an average height of 1.67 meters, the sample has an average BMI in the normal category based on WHO and has an average heart rate maximum 192.3 according to age. The results in table 1 show that there is no significant difference, p > 0.05. Participant characteristics are presented in Table 1.

**Table 1.** Participant Characteristics

| | Means | SD | P |
|---|---|---|---|
| Age (years) | 27.6 | 5.6 | 0,494 |
| Height (m) | 1.67 | 0,05 | 0,064 |
| Weight (kg) | 64.5 | 9.5 | 0,489 |
| IMT (kg/m2) | 23.3 | 2.06 | 1.000 |
| MHR (bpm) | 192.3 | 5.6 | 0,494 |

Notes. MHR – maximum heart rate, BMI – body mass index

The athlete ran the accuracy number three times, then the points were accumulated with an average of 25.4±7.1, and imaging and touchpad exercises have been performed. After that, perform accuracy flights three times, and the points accumulated with a result of 10.2 ± 4.3 have an effect size of 2.4. There was a significant acute change when the exercise was done once with these results, namely p<0.05. The pretest and posttest results from the imagery and touchpad exercises are presented in Table 2.

**Table 2.** Pretest-Posttest Paragliding Accuracy

| | Means | SD | P | IS |
|---|---|---|---|---|
| Pre-test accuracy | 25.43 | 7.154 | 0,000 | 2.4 |
| Post-test accuracy | 10.21 | 4.388 | | |

Notes. SD – Standard Deviation, p value, ES – Effect Size

An image of a touchpad device with a diameter of 22 centimeters, and in the middle of the circle there is a central point with a value of 0 is presented in Figure 1.

**Figure 1.** The Bearing is 22 Centimeters in Diameter

### Discussion

From the research results, it was found that there were changes that occurred before imagery and touchpad training were given to paragliding athletes with accuracy figures. This happens because imagery training is a mental exercise that optimizes the imagination process (Habacha et al., 2020; Short et al., 2019), which uses all five senses. The series of imaging training processes does not only stop at the imagination process, but continues at the movement execution stage (Short et al., 2019; Simonsmeier et al., 2020). In this imagery training process, each group will be taught to visualize or visualize precise paragliding techniques. Other research also states that athletes use imagery training more often when

approaching a competition (Arvinen-Barrow et al., 2019; Corrado et al., 2019). Imagery training carried out after a competition period is more likely to lead to injury recovery or burnout (boredom). Through imagination exercises, he can imagine these moments and at the same time imagine how he can maintain his concentration (Hall et al., 2016; Pearson et al., 2017). Apart from improving concentration, imagery training can also increase athletes' self-confidence, control emotions and improve skills (Arvinen-Barrow et al., 2019; Stringer, 2023).

Apart from imagery, touchpad training in this case is an exercise in coordinating the mind, eyes, hands and feet (Haryanto & Amra, 2020; Latif et al., 2019). So you have more accuracy but also more skill so that coordination can run well. This exercise has more influence on the results of paragliding accuracy. So that imagery training combined with touchpad training has an acute positive effect on the performance of paragliding athletes in terms of accuracy figures. With this ongoing training, it is hoped that it will have an even better effect on the performance of paragliding athletes in Central Java. In this study, the findings regarding the acute effects of imagery training and use of a touchpad on improving the performance of paragliding athletes show results that are consistent with several previous studies. The results showed that imagery training significantly increased athletes' focus and self-confidence, findings from previous research which suggested that visualization can help athletes overcome pressure and improve their performance (Ebrahimzadeh et al., 2020; Yahya Suryaditya et al., 2024). In addition, the use of a touchpad as an interactive training tool has proven to be effective in improving motor skills, which goes hand in hand. Other research findings reveal that interactive technology can accelerate learning of sports techniques (Jasmine, 2014; Wang Et Al., 2019)

However, this research also found that the synergy between the two methods provided a stronger effect compared to using each method separately. These findings support the view that a multimodal approach to training can provide better results, as research findings suggest that a combination of various training techniques can improve an athlete's overall skills and performance. Thus, the results of this study not only confirm the importance of both methods in training paragliding athletes, but also highlight the need for an integrative approach to achieve optimal performance, which forms the basis for the development of future training programs (Machida et al., 2017; Yuniti, 2019.)

Research shows that these two methods have significant implications in improving athlete performance. Imagery training, which involves visualizing flight techniques and strategies, has been proven to improve athletes' mental focus and self-confidence, so they can better deal with the pressure of competition(Aguss & Yuliandra, 2020; Humaedi et al., 2023; Pokhrel, 2024). Meanwhile, the use of the touchpad as an interactive training tool allows athletes to train simulatively, improving their motor skills and responsiveness in real situations. The combination of these two approaches not only strengthens athletes' technical and mental abilities, but also provides a more engaging and effective learning experience. Thus, the results of this research can be a reference for paragliding coaches and athletes to adopt innovative training methods to achieve higher achievements(Nur Amin et al., 2021; Rustiawan et al., 2023). There are weaknesses in this research, namely insufficient training, few subjects studied, and no control. Limitations of this study include the limited sample size, which may impact the ability to generalize the results to the entire population of paragliding athletes. Individual variability in response to intervention is also a factor that needs to be considered, as each athlete has different backgrounds and abilities, which can influence the effectiveness of imagery training and touchpad use. In addition, the relatively short duration of the intervention may not be sufficient to observe significant changes in performance, and the measurement methods used may not cover all important aspects of paragliding performance, such as psychological factors and environmental conditions at the time of implementation. Therefore, recommendations for future research are to involve a larger sample size to increase the generalizability of the results, as well as using a variety of measuring tools to evaluate broader aspects of athlete performance. Studies with longer intervention durations are also recommended to assess long-term impacts, accompanied by more complex experimental studies, such as control groups, to compare the effectiveness of interventions. Additionally, developing a more comprehensive training program, which includes physical and mental training as well as technology, will provide a more holistic approach to improving overall athlete performance.

## 4. CONCLUSION

From the results of the research above, it can be concluded that acute image response and touchpad training can greatly influence the accuracy results of paragliding in Central Java. These outstanding results provide a reference for assessing the effectiveness of ongoing training adaptations in the future. The research results indicated that imagery training increased athletes' focus and self-confidence, while the touchpad as an interactive training tool improved motor skills and responsiveness.

The combination of these two methods provides a greater impact than using each method separately, highlighting the importance of a multimodal approach in athlete training. These findings provide a strong basis for the development of more innovative and effective training programs, and can be a reference for coaches and athletes in efforts to improve performance at the competitive level. Thus, this research contributes to the understanding of training strategies that can be adopted in the sport of paragliding and the possibility of similar applications in other sports disciplines.

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