How Does Training Frequency Affect Athletes' Performance in The Paragliding Cross-Country Championship?

Shidiq Landung Rihwatomi[1], Nur Amin[2], Ika Nilawati[3], Aristiyanto[4], Eky Septiani[5], Nicky Prayogo[6]

[1]Sport Science Department, Universitas Ngudi Waluyo, sidikbtg2864@gmail.com
[2]Sport Science Department, Universitas Ngudi Waluyo, nuramin@unw.ac.id
[3]Sport Science Department, Universitas Ngudi Waluyo, ikanilawati@ unw.ac.id
[4]Sport Science Department, Universitas Ngudi Waluyo, aristiyanto@ unw.ac.id
[5]Sport Science Department, Universitas Ngudi Waluyo, ekyyabcd@gmail@gmail.com
[6]Sport Science Department, Universitas Ngudi Waluyo, nickyprayogo39@gmail.com
Email Correspondence: ekyyabcd@gmail.com

Article Info

Article History
Submitted, 2025-11-27
Accepted, 2025-12-27
Published, 2025-12-31

Keywords: Athletes, Paragliding, Performance, Trining Frequency

Abstract

Cross-Country is one of the competition event in the paragliding sport that requires the ability to read the wind, utilize thermals and maintain appropriate training frequency. The purpose of this study is to determine whether there is a relationship between training frequency and the distance of athletes flying in the cross-country championship. This study is a descriptive correlation with a cross-sectional approach. The sample in this study consisted of all athletes who participated in the Iinernational Paragliding Cross Country Championship in Telomoyo, Indonesia, totaling 18 people with a total sampling technique. The instruments used in this study were a questionnaire to determine the frequency of training and avionics (Vario and GPS) to determine the distance of athletes flying. The results of this study was that there was a significant relationship between training frequency and the distance of athletes flying with p value of 0.01. The conclusion of this study is that training frequency is one of the factors that influence athletes to be able to fly far using a parachute.

Introduction

Paragliding is a type of aerospace sport that uses a simple aircraft without a main rigid structure. This sport allows pilots to soar from heights such as hills or mountains, utilizing updrafts (thermals) to maintain altitude and reach the greatest possible flight distance (Whittall, 1995). Paragliding can be done for recreational purposes, but it has also developed into a prestigious competition event. The development of this sport has accelerated since it was first included as a sport at the 2000 Pekan Olahraga National (PON), held at Gunung Banyak, Batu, East Java. Since then, various paragliding events have emerged in Indonesia, ranging from district, provincial, national, and international levels.

In paragliding, there are two main categories that are usually competed in: landing accuracy and cross-country (XC). Landing accuracy competitions require pilots to land as accurately as possible on a target point with a diameter of 22 cm. Meanwhile, cross-country (XC) competitions challenge pilots to fly as far as possible from the takeoff point, past the waypoint, and reach the finish line. In this category, pilots are required to master thermal skills, navigate accurately, plan launch times precisely, and be able to maintain composure while flying among many other gliders (Whittall, 1995). To achieve optimal results in XC competitions, various supporting factors are required. One of the main factors that affect flight distance is wind direction. When facing headwind conditions (wind from the front), the flight distance tends to be shorter than when flying with a tailwind (wind from behind), because a tailwind can increase cruising speed and extend the range (Pagen, 1992).

In addition to wind direction, the type of parachute used also significantly influences flight performance in paragliding. Paragliding parachutes are classified into several types: EN-A, EN-B, EN-C, and EN-D, each with varying characteristics and difficulty levels. The EN-A type parachute is the safest and highly recommended for beginner pilots. This parachute is commonly used in precision landing competitions due to its high stability and relatively simple control system. The EN-B type is designed for more experienced pilots, offering higher flight speeds and sharper maneuverability. This parachute is ideal for pilots with at least 30 hours of flight time, including 10 hours in thermal conditions. Furthermore, the EN-C type parachute is intended for intermediate pilots with sufficient dynamic skills and experience. Pilots using this

Corresponding author:
Eky Septiani
ekyyabcd@gmail.com

parachute are advised to fly regularly, at least 10 hours per week, to maintain and improve their flying skills. The EN-D type is the highest-performance parachute and is intended only for professional pilots with extensive flying hours, approximately 200 hours per year. This type of parachute offers high speed, highly sensitive response, and demands precise control, especially in extreme flying conditions (Kaniamos, 2012).

A crucial aspect of cross-country (XC) flying is the ability to optimally utilize thermals. Thermals, or updrafts, significantly influence long-distance flight performance (Rzucidlo, 2009). To recognize and utilize thermals effectively, an athlete requires sufficient flying experience and consistent and continuous training. In this regard, training intensity plays a crucial role. Intensity reflects the magnitude of the physical load the body experiences during training and is a key indicator in the application of the overload principle. Some parameters commonly used to measure training intensity include heart rate, maximal oxygen volume (VO_2 max), and lactic acid levels in the body (Saghiv & Sagiv, 2020). A good training program is one that balances volume and intensity. If training volume is high, intensity should be reduced, and vice versa. The right combination of the two will result in significant performance improvements. Successful athletes are individuals who have undergone a well-designed, long-term training program (Bompa & Buzzichelli, 2019). In addition, paragliding athletes are required to have good knowledge about good intake in preparing sufficient energy during the competition (Amin, 2018) as well as the permitted drink content as an effort to avoid the use of prohibited substances (Amin et al., 2021).

One international event showcasing the development and achievements of paragliding in Indonesia is the IPXC Telomoyo Cup 2025, held in the Gunung Gajah tourist area of Semarang Regency. This competition is part of the international event calendar and has succeeded in attracting the attention of professional athletes, both domestic and international. The IPXC (International Paragliding Cross Country) Telomoyo Cup did not just appear out of nowhere, but rather is a continuation of various paragliding events that have previously been held in the Telomoyo area and its surroundings. Since the early 2010s, this area has begun to be recognized as one of the best paragliding spots in Indonesia due to its favorable geographical conditions and the presence of stable and challenging thermals. With support from the aerospace federation, local government, and paragliding community, this event continues to improve in terms of quality of implementation and number of participants each year. The IPXC Telomoyo Cup is now not only a test of long-distance (XC) flying skills, but also an important indicator in assessing the effectiveness of training and athlete readiness for world-class competition. Through this event, many athletes have demonstrated optimal achievement of the results of a structured training program, particularly in terms of training intensity and mastery of cross-country flight techniques. This makes the IPXC Telomoyo Cup 2025 the right platform to further examine the relationship between training intensity and athlete flying performance, particularly in the cross-country category.

Several previous studies, including those conducted by Diantono and Indardi (2022), found that training frequency was not related to paragliding athletes' landing accuracy at the National Sports Week in Papua. Another study by Sahri et al (2020) found that wind direction was related to landing accuracy. However, cross-country competitions have not been widely studied. Based on the above background, the researchers were interested in examining the relationship between training frequency and paragliding athletes' flight distance during the International Paragliding Cross-Country Championship in Telomoyo.

Methods

This type of research uses a literature review method that is structured in stages to identify, evaluate, and synthesize previous research findings regarding aromatherapy methods in reducing labor pain. The unit of analysis for this research is national & international journals that discuss aromatherapy methods for labor pain. Contains a description of the participants/subjects involved in the research search, the research location and the time of the research conducted. This Literature Review uses a systematic search. From relevant journals on Google Scholar, PubMed, IJM and so on, which meet the inclusion and exclusion criteria. Inclusion criteria: national journals and international journals with keywords method, aromatherapy and labor pain, published within a 5-year period (2020 - 2025). Exclusion criteria: journals using foreign languages other than English and Indonesian We used the thematic synthesis method to extract related evidence and systematically convert it to a descriptive review using a narrative approach.

Results and Discussion

This research was conducted on Mount Telomoyo in 2025 on paragliding athletes who participated in the International Paragliding Cross Country Telomoyo Cup championship. Championship participants come from various countries. This is because the participants are competing to improve their international rankings.

Table 1. Characteristic of Athletes in International IPXC Telomoyo Cup 2025

Variable	Min	Max	Mean ± SD
Aged (years)	20	45	29.5 ± 7.6
Flying Distance (meter)	759	2654	1912 ± 634.9
Licence	PL 2	Master Tandem	PL 2
Frequency	Low	Hight	Moderate

Based on the table above, it can be seen that most athletes have a PL2 pilot license and have an average age of 29 ± 7,6 SD. Meanwhile, the average flight distance produced is 1912 ± 634,9 SD and most athletes train with moderate frequency.

Tabel 2. The Relationship between Training Frequency and Flight Distance

Variable	Training Frequency						P Value
	Light	%	Mediun	%	Hard	%	
Flying Distance							**0.01***
<1000m	2	11.1	0	0	0	0	
1000-2000m	0	0	4	22.2	3	16.7	
>2000m	0	0	0	0	9	50	
Total	2	11.1	4	22.2	12	66.7	

*Data were analalyzed by Rang Spearmans

Based on the table above, it can be seen that there is a significant relationship between the frequency of training and the results of the athlete's flight distance with a p value of 0.01. This can be explained based on the distribution of cross-tabulation data values which explains that athletes with low training frequencies are only able to fly a distance of less than 1000 meters. Meanwhile, athletes with moderate training frequencies are able to fly a distance between 1000-2000 meters, likewise athletes with hight training frequencies are able to fly a distance of more than 2000 meters. Thus, the higher the frequency of an athlete's training, the more likely the athlete will be able to fly further. According to (Bompa & Carrera, 1932), successful athletes are individuals who have undergone a well-designed long-term training program.

This study compares with research conducted by Diantono and Indardi (2022) who found that the frequency of training was not related to the results of landing accuracy. This could be because the athletes who became respondents were athletes from the Central Java regional training center who were intensively training, where all athletes' training was the same. Therefore, the distribution of data is less. Another study was conducted by Sahri et al (2020, 2023) which stated that there is a relationship between wind direction and leg muscle strength with the results of landing accuracy of paragliding athletes.

Conclusion and Suggestion

Based on the research results above, it can be concluded that training frequency is significantly related to the flight distance of paragliding athletes. A suggestion for future research is to add other variables that are thought to contribute to the flight distance of paragliding athletes.

Acknowledgements

Authors would like to express their deepest gratitude to the committee for granting permission and to the athletes who agreed to participate in this study. They would also like to thank the enumerators who assisted with data collection, ensuring the smooth running of this study.

References

Amin, N. (2018). *Buku Ajar: Gizi Olahraga*. UNUSA PRESS.

Amin, N., Hatib, A. K., & Ramadhani, M. A. (2021). *Journal of Physical Education , Health and Sport Correlation of Knowledge Level of Drugs (Doping) with Achieve- ment of Central Java Paragliding Athletes*. *8*(2), 48–52.

Bompa, T. O., & Buzzichelli, C. (2019). *Periodization-: theory and methodology of training.* Human Kinetics.

Diantono, K., & Indardi, N. (2022). The Relationship of Exercise Frequency The Landing Accuracy Result of Central Java. *Nutrition Research and Development Journal*, *02*(02), 27–31.

Kaniamos, P. (2012). *Pocket Aviation: A Guide to Paragliding*. Panagiotis A. Kaniamos.

Pagen, D. (1992). *The Art of Paragliding.pdf*. Sport Aviation Pubns.

Rzucidlo, A. (2009). *THERMALS MAP – ASSIST FLIGHT SYSTEM Arkadiusz Rzucid ł o Knowledge base*. 85–88.

Saghiv, M., & Sagiv, S. (2020). *Introduction to Exercise Physiology* (pp. 1–31). https://doi.org/10.1007/978-3-030-48806-2_1

Sahri, S., Indardi, N., & Amin, N. (2020). *The Correlation between Wind Direction and Wind Speed with The Landing Accuracy Result on Paragliding Athletes*. https://doi.org/10.4108/eai.22-7-2020.2300306

Sahri, S., Indardi, N., Nadiyah, I. R., Amin, N., & Nilawati, I. (2023). Relationship between Leg Muscle Strength and Arm Muscle Strength with The Results of The Landing Accuracy of Paragliding Athletes. *ISPHE 2022: Proceedings of the 6th International Seminar on Public Health and Education, ISPHE 2022, 29 June 2022, Semarang, Central Java, Indonesia*, 127.

Whittall, N. (1995). Paragliding_ The Complete Guide. In *The Lyons Press* (pp. 33–35).