

Sport Coaching and Development Policy: A Case Study in Rock Climbing Sports

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ABSTRACT

This study aims to provide an idea to the government that the importance of rock climbing should be developed in every city / district. With the aim of the government, it must be able to develop a rockclimbing sport because rock climbing has many benefits for those who do it. Rock climbing is a sport that develops due to the large number of enthusiasts only to improve physical condition, psychology or enthusiasts in achieving achievements, improving the physical condition that can be achieved in rock climbing such as increased strength, power, flexibility, balance and hand eye coordination. Psychological improvement is seen from the increase in self-confidence, motivation and concentration. In the current decade, Indonesian rockclimbing athletes have made an extraordinary history because they have been able to compete with other countries in every championship / event by getting gold medals, for this sport infrastructure does not require expensive equipment or extensive field because this sport is only need a climbing wall and climbing equipment that the price is still affordable. This research method uses literature review. The articles used in this literature review are articles obtained using 3 databases of Taylor and Francis, Google Scholar and Science Direct which support the research. It is hoped that this research can provide a clear picture for the government in making rock climbing development policies in every city / district.

Keywords: climbing sport; development policy; sport coaching

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INTRODUCTION

Sports as a means of improving fitness. Sports activities that have a purpose, such as training the body to maintain physical and spiritual health. With regular exercise will provide benefits to maintain a healthy body. The benefits of exercise can help someone to improve blood circulation, increase self-confidence, improve brain performance to the maximum because the supply of oxygen to the brain can circulate smoothly. The benefits of exercise are not only beneficial for physical health, but at the same time improve mental health such as helping breathing, speeding up the digestive system and helping get rid of digestive problems, neutralizing depression, increasing capacity to work and leading an active life, helping burn fat and overcome obesity, can help overcome problems with appetite, tighten leg, thigh and back muscles and make sleep better (Draper, 2010). The benefits of exercise can also prevent diseases including heart disease, type 2 diabetes, osteoporosis, forms of cancer, obesity and injuries. Participation in exercise is also known to reduce depression, stress and anxiety,



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improve self-confidence, energy levels, sleep quality, and the ability to concentrate. Public awareness to exercise contributes to the development of individuals and communities that are smart, healthy, skilled, resilient, competitive, prosperous, and dignified (Prasetyo, 2013).

Awareness of the importance of exercise must always be fostered by the government towards the community, although sports require self-awareness but the government must be able to encourage sports so that sports become a culture of life for people in cities and villages. This means that the government must be able to issue policies on the importance of exercising by building sports facilities and facilities, community development by exercising will have a positive impact on changes in the soul and mentality of the community itself. Policies taken by the government in sports development are based on the importance of sports for people's lives in running the wheels of life and sports development will help in the development of society nationally, sports development policies can improve the quality of Indonesian human beings as a whole if based on the development of society at large as participants in sports activities but in reality it is still not fully sports development in the country of Indonesia is carried out evenly (Ma'mun, 2019) although sports development policies have been implemented in Indonesia, 2019) Although sports development policies have been echoed by the government from several decades of leadership changes, this is the government leader who has a big share to continue to evaluate policies in national sports development to date (Ma'mun, 2019), because sports development cannot be done instantly, it must go through a process of policies of central and regional leaders who are highly committed to sports development so that there is evenly distributed sports coaching in each region (Prasetyo, et al., 2018). The number of sports activities makes the government must be specific in carrying out sports development. Sports development based on community interest, motivation and achievement in doing sports, because health sports can be done by itself by the community but sports for achievement the government must strive to be able to build supporting infrastructure for sports achievements. At this time the sport of achievement that is advancing rapidly with high achievement is the sport of rock climbing, rock climbing which has benefits for health but also in providing achievements for those who do it. Rock climbing is a sport that prioritizes flexibility and body strength, ingenuity and skill both using equipment and not in getting around the cliff itself by utilizing rock defects. This definition emphasizes that anyone who does rock climbing must have good physical and mental conditions. Rock climbing is a sport whose development is very rapid at this time, especially in Indonesia, seeing the number of enthusiasts in doing rock climbing activities which are very much starting from children, adolescents, adults and parents plus championships that are often held resulting in enthusiasts for rock climbing sports increasing. In Indonesia, rock climbing sports have incised many medals in national or international championships, this should be a concern for policy makers in the development of rock climbing sports in each region. The sport of rock climbing provides benefits for the perpetrator because it will increase aspects such as physical condition of strength, flexibility, coordination and power, increasing mental self-confidence, honesty and cooperation. Many studies have been conducted to see the factors of physical conditions that increase from rock climbing sports, such as increasing arm muscle power and abdominal muscle power (Yusuf, 2016), increasing arm muscle power and hand strength in rock climbing (Ronaldo Wijaya, Tono Sugihartono, 2017), looking at the motion analysis of rock

climbing sports many muscles that can work in rock climbing sports such as arm muscles, shoulder muscles, back muscles and leg muscles (Nugroho, 1999) this convinces that rock climbing has an impact on improving the physical condition of the culprit. So with the many benefits obtained from rock climbing, the government must be serious in handling this sport, including the existence of correct and directed coaching, coaching that is carried out from the start of coaching coaches, athletes and administrators so that this sport is carried out regularly and systematically (Abadi, 2016).

LITERATURE REVIEW

A Brief History of World Sport Climbing

In 1492, a group of Frenchmen, under the leadership of Anthonie de Ville, tried to climb the cliffs of Mount Aigulle in the Vercors Massif area. It needs to be clarified exactly what their goal was. Still, it's clear that until a few decades, people who climbed the rock cliffs of the Alps were chamois hunters, a type of mountain goat, so they climbed because they were forced to by their livelihood, more or less similar to the downloaders of cave swallow nests on the cliffs of East Kalimantan or Karang Bolong in Central Java. Then, in 1878, a team led by Clinton Dent succeeded. In 1910, Karabiner, for the first time in use in mountaineering, was introduced by climbing climbers from Munich, West Germany, favoured by its users in the fire brigade; in 1937, Bill Murray turned a long climbing stick into an ice axe, scanning the birth of the modern ice stick.

Furthermore [in 1938, a joint West German and Austrian team finally climbed the Eiger North Wall in Switzerland. Who was rewarded with an Olympic gold medal by Hitler? This death wall had previously claimed quite a few victims and continues to do so today.

The 1930s were the golden years of climbing in the Alps. From small and medium cliffs to the highest peaks, World War II's climax caused the climbing frequency to decline, but after the end of World War II, there was a huge impact on the creation of the Alpine climbing scene.

However, the end of the World War had a major influence on creating and procuring climbing equipment that became more readily available. In the 1970s, when American climbers developed climbing techniques that are still used today in rock climbing, most of the people who dominated the development of this sport were American and British climbers who then used the same techniques, which were previously categorized according to their respective countries. Other than that, it also played a role in developing this sporting activity in France, which offers climbing techniques that lead to pure sport. Pure sport. In 1972, rock climbing was included in the Olympic schedule for the first time. Olympic schedule. Although not as a competed sport, it was demonstrated at the Munich Olympics. In 1980, the development of rock climbing became more widespread in Europe, America, and Asia. And Asia, thus making it independent of its parent (mountain climbing) and forming its form as a pure sport (source: catalogue LPDN CATALOG)

Development of Sport Climbing in Indonesia

In Indonesia, rock climbing has been known since the 60's. Where several Nature Lovers associations/groups were established. University of Indonesia and Wanadri, which has roots in mountain climbing activities. Mountain climbing. In 1975, rock

climbing activities were done as a whole and separately. At that time, several people were recognized as milestones in the revival of Indonesian rock climbing, including Harry Suliztiarto, Agus Resmonohadi, Heri Hermanu and Deddy Hikmat. Resmonohadi, Heri Hermanu and Deddy Hikmat began training on the cliffs of Citatah, West Java. Citatah, West Java. In 1988, the Ministry of Youth and Sports. In cooperation with the French Cultural Center (CCF), three professional French climbers were invited: Patrick Bernhault, Jean-Baptiste Tribout, Corrine Lebrune, and a technical climbing instructor, Jean Harau. Technical Climbing instructor Jean Harau later inspired the establishment of the FGTI. In 1989 the FEDERATION OF PANJAT TEBING GUNUNG INDONESIA (FPTGI) and through a pledge issued by around 40,000 people from PA associations in Jakarta, Bandung, Padang, Medan, Semarang, Yogyakarta, Surabaya and Ujung Pandang at the Monas monument on April 21, 1988. on April 21, 1988. In 1992, the FPTGI then changed its name only to the Federation of Indonesian Rock Climbing Federation (FPTI) FPTI was recognized as a member of the Union Internationale des Associations d'Alpinisme (UIAA), which accommodates rock climbing and mountain international rock and mountain climbing organizations. UIIA is a world sports organization responsible for all world sports activities, including the Olympics. World sports activities, including the Olympics. In 1994, FPTI was officially recognized as the parent sport of rock climbing by KONI (Indonesian National Sports Committee).

Sport by KONI (Indonesian National Sports Committee) 1996. Since then, rock climbing sports have been included in PON. Climbing has developed into a global sport with growing popularity. Climbing policies are crucial to provide direction and support for developing athletes, facilities, and competition structures. This theoretical review will explain the various policies that can support the growth and improvement of achievements in sport climbing. the policy development program in sport climbing includes: 1) Athlete Development. Athlete Coaching and Development Program: This policy should include a holistic coaching program involving technical, physical, and mental training. Coaching athletes from an early age to the professional level can create a bridge of continuity of development; 2) Talent Identification and Selection: An effective system for identifying and selecting potential talent is an important factor in the success of sports climbing. Policies should include objective and comprehensive evaluation methods.

With its unique challenges, sport climbing has attracted the interest and enthusiasm of athletes worldwide. Athlete development in this sport requires a holistic approach involving technical, physical and mental aspects. A narrative of athlete development in sport climbing can begin with the journey of a dedicated athlete and the support of a strong coaching and development system. An aspiring climbing athlete may begin their journey by discovering an interest in rock climbing, attracted by the challenges of altitude, endurance, and technical expertise. In this phase, the athlete's development begins with an introduction to the fundamentals of the sport, such as proper climbing techniques, safe use of equipment, and an understanding of climbing etiquette. As the athlete deepens their basic skills, the next stage involves being introduced to different types of climbing, such as bouldering, lead climbing, and speed climbing. In this development, athletes gain more in-depth experience and knowledge of the dynamics of each type of climbing, creating a strong foundation for versatile abilities.

Physical aspects are an intensive focus in the development of climbing athletes. Strength, speed, agility and endurance training are particularly important in responding

to the sport's unique demands. Coaches and fitness experts play a key role in designing training programs that suit athletes' individual needs, helping them develop the core strength, muscular endurance, and flexibility needed to excel in various climbing situations. Mental toughness is an integral part of climbing athlete development. Athletes need to learn to overcome fear of heights, develop high focus, and build resilience to the pressures of competition. Psychological training and mental mentoring help athletes manage stress, improve concentration, and strengthen their resilience in facing challenges. Athlete growth does not happen in isolation; it involves the critical role of coaches and coaching staff. A committed climbing coach not only provides technical guidance but also understands the athlete's individual needs, provides encouragement, and assists in the athlete's career planning. It is also important to create an environment that supports athlete development. Good climbing facilities, accessibility for different age groups and ability levels, and well-organized tournaments and leagues are key elements in creating a thriving sports climbing ecosystem.

With a structured approach, strong support from coaches and coaching staff, and full commitment from athletes, the athlete development process in sport climbing becomes a journey to the pinnacle of brilliance. Well-developed athletes prove their physical and technical abilities and illustrate the indomitable spirit, courage in the face of challenges, and love for the sport that motivates them to reach the pinnacle of achievement.

Facilities and Infrastructure

1. **Facility Development:** Policies should include strategies to build and refurbish climbing facilities that meet safety and technical standards. This includes climbing walls, ropes, and practice areas.
2. **Accessibility and Affordability:** Policies also need to ensure accessibility and affordability of climbing facilities, enabling participation from all walks of life and potential athletes from all backgrounds. In a sports area dedicated to climbing, the facilities and infrastructure must be carefully designed to provide an optimal experience for climbing enthusiasts. Careful design of facilities and infrastructure in sport climbing areas is essential for several fundamental reasons to provide an optimal experience for climbing enthusiasts: a) **Safety:** Carefully designed facilities ensure that the safety of climbing enthusiasts is a top priority. Adequate climbing walls, safety equipment, and health guarding systems can prevent injuries and accidents during climbing activities. b) **Appropriate Challenges:** Carefully designed facilities allow for various difficulty levels, so beginners and experts can find a challenge that suits their skill level. This creates a satisfying and thrilling experience for every climbing enthusiast. c) **Comfort and Support Facilities:** The thoughtful design includes support areas such as lounges, cafes and restrooms. These facilities provide comfort for visitors before, during, or after their climbing session. Thus, the experience is not just limited to climbing activities but also includes aspects of socializing and relaxing. d) **Integration with the Environment:** Facility design should respect and integrate with the surrounding environment. This includes appropriate site selection, maintenance of natural ecosystems, and efforts to reduce the negative environmental impacts of these sports activities. e) **Education and Training:** Good infrastructure supports education and training. There are spaces for seminars, workshops, and educational programs that can enhance the knowledge and skills of climbing enthusiasts regarding climbing techniques and safety. f)

Availability of Equipment and Technology: A carefully designed facility provides the latest equipment and technology to ensure a better experience. This can involve innovative climbing holds, paths, and the latest safety systems. g) Visitor Management: The facility's design includes an effective visitor management system to avoid crowds and ensure every visitor can enjoy the facility unhindered. Through careful planning and design, a sports climbing area can be a safe, challenging and fun place for all fans of the sport.

3. Competition System. Leagues and Competitions: The development of sport climbing needs to be supported by a structured competition system, including leagues and tournaments at various levels. Policies can detail formats, qualifications, and incentives to increase competitiveness. Integration in National and International Sports Calendar: Climbing needs to be integrated into the national and international sports calendar with policy support to support athletes' participation in events and championships.
4. Rock Climbing Safety and Ethics. Safety Standards: Policies should include high safety standards in rock climbing to protect athletes and fans of the sport. This involves strict regulations regarding equipment, safety procedures, and facility maintenance. Ethics Education: Climbing ethics education and enforcement needs to be implemented in the policy to ensure the ethical behaviour of athletes, coaches, and fans in the sport.
5. Coach Empowerment. Training and Certification: The policy should support the training and certification of climbing coaches. This is to ensure that coaches have adequate technical skills and training methods. Recognition and Rewards: A recognition and reward system for successful coaches in developing athletes and achieving high performance can be an important part of a coaching policy.

This theoretical review identified important aspects to consider in developing a sport climbing coaching and development policy. By detailing measures for athlete development, facilities, competition systems, safety, ethics, and coach empowerment, this policy can provide a strong foundation for the sustainable growth of sport climbing.

METHODS AND MATERIALS

This study uses the literature review method, with an evaluation of one or more pieces of literature to help researchers gather insights from similar or related research results and assess these works in terms of their relevance to the research question of interest (Fraenkel et al., 2023). The eligibility of articles determined in this study is by setting standard keywords such as; 1) rock climbing sport policy, 2) rock climbing sport development, and 3) studies that examine rock climbing related sports. The time span of the articles studied in this study starts from 2013 to 2023. Furthermore, articles were collected through a search using Publish or Perish software, then identified resulting in 92 articles. Furthermore, article screening was carried out first through the title, abstract, and research findings resulting in 64 articles. From the screening results obtained, only 12 articles were in accordance with the theme of this research need. The techniques and instruments used to synthesize the articles in this literature review used a synthesis matrix. The synthesis matrix is a research tool used by researchers in literature reviews to organize, identify gaps, and analyze information from various sources in a systematic and organized manner (Subakti et al., 2021).

RESULTS AND DISCUSSION

The results of the collection of articles in discussing sports policies and development, especially rock climbing sports, obtained articles on sports development policies that have been implemented in several decades of leadership in Indonesia where the policy has changed according to the existing leadership, the government's sports development policy has a strategic role in the formulation of sports development policies, this is supported by the government's concern in the field of sports (Ma'mun, 2019b). Sports policies that have been formulated by the government from year to year with the concept of sports development policies tailored to the country's conditions at that time, the concept of policies that start from problems and challenges in the field of sports which formulate about cultivating sports in the community, then changes in policy formulations lead to fostering the field of sports achievement by making sports a community culture, creating a healthy active lifestyle among students and society (Ma'mun, 2019a).

Sports policies that have been built from starting to cultivate sports in the community lead to government policies to promote sports achievements by issuing special policies and general policies where the target of these policies is to improve athletic performance, the factors that become the potential for the development of achievements are a very large young generation, cooperation between agencies at the central and regional levels in fostering athletic achievements, but this also experiences obstacles due to the regeneration of athletes where there is low public interest in exercising, poor training centers, and community support for athletes is still relatively small (Harahap, 2018).

The government must continue to strive to improve healthy living standards by issuing policies in sports development. The policy must have a powerful strategy by providing education to the public that sports are important, sports have great benefits for health and well-being, the government's goal in increasing sports development to young people, young people who can be an example in implementing a sports culture in society (King & Church, 2015), sports development policies that are carried out equally in all sports, so at this time the sport of rock climbing must become an icon in sports development because rock climbing is a strenuous activity that requires a unique combination of strength balanced with endurance and flexibility. Rock climbing requires thought and fitness. The components of fitness are muscular strength, muscular endurance, cardiorespiratory fitness, and flexibility. Muscular strength refers to the ability to produce maximal force for a single movement with a combination of strength and speed and is a measure of how quickly force can be produced through exercise. Cardiorespiratory fitness is the ability of the heart, lungs, and blood vessels to supply oxygen to working muscles and remove carbon dioxide (Kascenska et al., 2016). Therefore, physical fitness can be obtained through proper, systematic, not excessive physical exercise, and physical fitness must be owned by every human being to carry out daily activities so as not to be attacked by disease (Kascenska et al., 2016).

DISCUSSION

Rock climbing must become a new lifestyle for individuals or the wider community because of the benefits obtained from the sport, climbing activities can be done just for leisure or for achievement according to the needs of each individual, but rock

climbing as a lifestyle must be supported by the government by facilitating climbing infrastructure so that people become free to do this sport with the aim of health or achievement, rock climbing can also function as a forum for improving the community's economy (Rahikainen, 2020). The practice of climbing lifestyle produces something special social relationships, internal and external. that is, there are different community patterns, practices and representations produced by rock climbing trips as a result of their individual and collective practices and that means some social relations between communities (Rickly, 2016 rock climbing is a sport that already has a measuring tool for individuals who do it. This makes rock climbing a measurable sport and can be a sport that can produce achievements because of the existence of measuring instruments for athlete abilities, roct measuring instruments for strength and flexibility assessments can provide an assessment of the results of the performance performed, roct is a valid and reliable measuring instrument for rock climbing, this measuring instrument has a series of tests performed (Simon,et al., 2009) further measurement tools that have been researched in rock climbing are the validity and reliability of finger strength and endurance measurements in rock climbing (Michailov Et Al., 2018). Not only physical conditions that can improve from rock climbing sports but mentally there will also be an increase in athletes who do rock climbing including responsibility, honesty and self-confidence to themselves or to others this is because rock climbing sports will shape character and personality (Ken Hansen, 2013). In addition, the sport of rock climbing stimulates physiological and psychological responses for individuals who do it, such as having high fighting power in conquering a climb or climbing wall (Ken Hansen, 2013).

CONCLUSION

Government policies in sports development must continue to be improved. by seeing that the benefits of sports are enormous for national development, this sports development policy must be carried out evenly to the existing sports branches, especially to the sport of rock climbing, where rock climbing has now become a national mainstay sport in achieving achievements and has become a sport that is in demand by the community in improving health status. with this the government must strive to be able to provide and improve facilities and infrastructure for rock climbing sports in each region.

CONFLICT OF INTEREST

Author certify that there is no actual or potential conflict of interest in relation to this article.

REFERENCES

- Abadi, A. K. (2016). Pembinaan Cabang Olahraga Panjat Tebing Di Federasi Panjat Tebing Indonesia Kota Surabaya. *Jurnal Kesehatan Olahraga*, 4(4), 535-544.
- Darmawan, I. (2017). Upaya Meningkatkan Kebugaran Jasmani Siswa Melalui Penjas. *Jurnal Inspirasi Pendidikan*, 7(2), 143–154. <https://doi.org/10.21067/jip.v7i2.1700>
- Draper, N., Jones, G. A., Fryer, S., Hodgson, C. I., & Blackwell, G. (2010). Physiological and psychological responses to lead and top rope climbing for intermediate rock climbers. *European Journal of Sport Science*, 10(1), 13–20. doi:10.1080/17461390903108125

- Fraenkel, J. R., Wallen, N. E., & Hyun, H. N. (2023). *How To Design And Evaluate Research In Education*. Published by McGraw Hill LLC.
- Harahap, I. H. (2018). Kebijakan Pemerintah dalam Meningkatkan Prestasi Atlit Nasional, *Journal of Entrepreneurship, Management, and Industry* 1(4), 189–198.
- Kascenska, J. R., Dewitt, J., Roberts, T., Kascenska, J. R., Dewitt, J., Roberts, T., ... Roberts, T. O. M. (2016). Fitness Guidelines for Rock Climbing Students Fitness Guidelines For Rock Climbing Students, 3084(January). <https://doi.org/10.1080/07303084.1992.10604140>
- Ken Hansen, M. P. (2013). Rock Climbing, (October 2014), 37–41. <https://doi.org/10.1080/07303084.2009.10598278>
- King, K., & Church, A. (2015). Questioning policy , youth participation and lifestyle sports, 34(3), 282–302.
- Lema, IR., K. D. C. (2016). Psikologi Kesehatan. Program Studi Psikologi Fakultas Kedokteran. UNIVERSITAS UDAYANA.
- Ma'mun, A. (2019a). Perspektif Kebijakan Pembangunan Olahraga dalam Era Demokrasi dan Kepemimpinan Nasional di Indonesia, 4(2), 131–146.
- Ma'mun, A. (2019b). The International Journal of the History of Sport Governmental Roles in Indonesian Sport Policy : From Past to Present Governmental Roles in Indonesian Sport Policy : From Past to Present. The International Journal of the History of Sport, 0(0), 1–19. <https://doi.org/10.1080/09523367.2019.1618837>
- Michailov, M. L., Baláš, J., Tanev, S. K., Stoyanov, H., Kodejška, J., & Brown, L. (2018). Reliability and Validity of Finger Strength and Endurance Measurements in Rock Climbing. *Research Quarterly for Exercise and Sport*, 89(2), 246–254. <https://doi.org/10.1080/02701367.2018.1441484>
- Nugroho, D. (2014). Analisis Gerak Dasar Panjat Tebing. *Jurnal Phederal Penjas*. 9(2), 1-8.
- Prasetyo, D., Damrah, D., & Marjohan, M. (2018). Evaluasi Kebijakan Pemerintah Daerah dalam Pembinaan Prestasi Olahraga. *Gelanggang Olahraga: Jurnal Pendidikan Jasmani Dan Olahraga*, 1(2), 32-41. <https://doi.org/https://doi.org/10.31539/jpjo.v1i2.132>
- Prasetyo, Y. (2013). Kesadaran Masyarakat Berolahraga Untuk Peningkatan Kesehatan Dan Pembangunan Nasional Oleh : Yudik Prasetyo Dosen Jurusan Pendidikan Kesehatan dan Rekreasi FIK UNY, 219–228. <https://doi.org/10.21831/medikora.v1i2.2819>
- Rahikainen, K. (2020). Climbing as a lifestyle sport and serious leisure in. *Leisure/Loisir*, 00(00), 1–23. <https://doi.org/10.1080/14927713.2020.1760123>
- Rickly, J. M. (2016). Lifestyle Mobilities: A Politics of Lifestyle Rock Climbing, 0101(March). <https://doi.org/10.1080/17450101.2014.977667>
- Ronaldo Wijaya, Tono Sugihartono, Y. (2017). Kontribusi Kekuatan Otot Lengan Dan Kekuatan Tangan Terhadap Kecepatan Memanjat Pada Olahraga Panjat Tebing Di Ukm Pecinta Alam Universitas Bengkulu, 1(1), 20–27.
- Saleh, M. (2019). Latihan dan aktivitas fisik untuk meningkatkan kesejahteraan psikologis. *JPOS (Journal Power Of Sports)*, 2 (1), 12-22. <https://doi.org/10.25273/jpos.v2i1.4005>
- Simon Brent, Nick Draper, Christopher Hodgson & Gavin Blackwell (2009) Development of a performance assessment tool for rock climbers, *European Journal of Sport Science*, 9(3), 159-167, DOI: 10.1080/17461390902741132
- Subakti, H., Chamidah, D., Siregar, R., Saputro, A. N. C., & Recard, M. (2021). Metodologi Penelitian Pendidikan. Yayasan Kita Menulis.
- Sukmawati, N., Selvi Melianty, Selvi Atesya Kesumawati, & Fanni Nur Rahma. (2023). The Effectiveness of Student Gymnastics in 2022 on Improving Physical Fitness: . *Kinestetik : Jurnal Ilmiah Pendidikan Jasmani*, 7(3), 788–796. <https://doi.org/10.33369/jk.v7i3.29857>

Yusuf, B. S. dan P. M. (2016). Hubungan Kekuatan Otot Lengan Dan Kekuatan Otot Perut Terhadap Kemampuan Panjat Tebing Nomor Speed Classic Dalam Cabang Olahraga Panjat Tebing Pada Atlet FPTI NTB, 2(1), 62-67. <http://dx.doi.org/10.58258/jime.v2i1.124>