

Journal of Israeli Olympic Science

December 2023



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The Olympic Committee of Israel



Coaches and Coaching



Sports Medicine



Events and Results



Elite Sports

Journal Introduction



Dear Readers,

We are delighted to announce the launch of the 13th edition of the Journal of Israeli Olympic Science by the Olympic Committee of Israel, in collaboration with the Elite Sports Department of Israel and the Medical Committee of the Olympic Committee of Israel. In 2023, Olympic sports in Israel reached unprecedented heights, with Israeli athletes securing 19 medals at the World and European Championships, including four gold medals at the World Championships. As we enter 2024, new challenges arise for Olympic sports in Israel, such as maintaining international achievements and meeting Olympic criteria for athletes yet to secure their spot in the upcoming Paris Games.

Regrettably, on October 7, 2023, Israel faced a brutal war imposed by the terrorist organization Hamas, disrupting daily life and impacting the preparation of Olympic athletes. Despite these challenges, the Olympic Committee of Israel is dedicated to supporting our national athletes, ensuring their training continuity, addressing mental struggles, and facilitating their safe participation in international competitions.

In our ongoing effort to preserve resilience in the face of these challenges, the Olympic Committee of Israel and its strategic partners continue to pursue scientific activities and engage in innovative ventures aimed at enhancing performance. The current issue of the Journal of Israeli Olympic Science features the following activities:

Dr. Ariel Fisher describes a multi-system approach and the use of wearable sensors to improve performance and prevent injuries among elite Israeli athletes. The Olympic Committee in Israel formulated guiding regulations for the employment of professionals in the fields of medicine and allied professions, as outlined in **Muli Epstein's** article. **Dr. Sigal Ben-Zaken** examines the intersection between genetics and sports, highlighting limitations and ethical issues. **Muli Epstein** and **Jordan Har Lev** present the training and professionalization paths of the medical and scientific personnel of the Olympic Committee of Israel. **Dr. Einat Haikin Herzberger** discusses the unique challenges faced by accomplished female athletes, addressing the balance between managing their careers and preserving fertility. **Dr. Andrea Morez**, a physician and Olympic swimmer, explores the relationship between mental health and the quality of life and achievements of Israeli athletes. **Dr. Daniela Cohen** discusses the use of a mindfulness technique adapted to sports performance of Olympic sailors. **Ori Abulafia** and **Prof. Dan Nemet** present a study aiming to examine the necessity and frequency of performing blood tests among athletes aged 21 and older. Physiologists **Idan Harat** and **Dr. Rotem Kislev-Cohen** write about physiological characteristics across age and at different competitive levels in accomplished judokas.

The attached PDF file is an interactive document of the current issue. By moving the cursor over the respective active links and clicking on them, you can access the full articles, as well as YouTube clips and websites expanding on the contents of the journal.

Best wishes for a pleasant reading

Gili Lustig

CEO of the Olympic Committee of Israel

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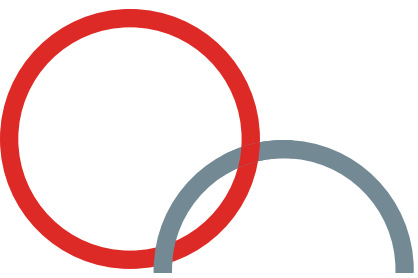
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Sports Medicine



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Utilizing Bio-Motion and Wearable Sensors to Enhance Performance and Prevent Injury in Elite Israeli Athletes: A Multi-System Approach

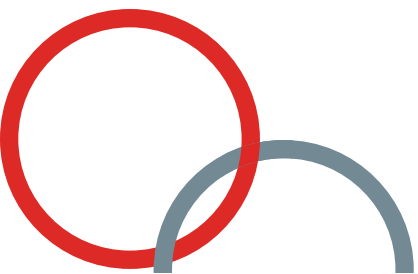
Employing a multidisciplinary approach and using cutting edge technology, the Technion BioMotion Lab in collaboration with the Olympic Committee of Israel, integrate biomechanics, biochemistry, and psychology, aiming to prevent injuries and optimize performance.

The slogan of the Olympic Games – faster, higher, stronger – was originally coined by the French Count Pierre de Coubertin. Nevertheless, in Israel, which is renowned as the startup nation, we have broadened this expression by incorporating the words “smarter” and “more accurate.”

The Olympic Committee of Israel and the Technion have established a notable partnership that emphasizes the integration of Olympic sports with research, development, and innovation to improve performance. This partnership has yielded numerous projects in recent years to enhance the performance of Israel’s Olympic athletes. The collaboration is based on three pillars: athlete biomechanics, equipment characterization, and the interaction between athletes and their equipment.

Several faculties and laboratories at the Technion are involved in these projects. In the Technion BioMotion Lab, research focuses on the intricate interactions between



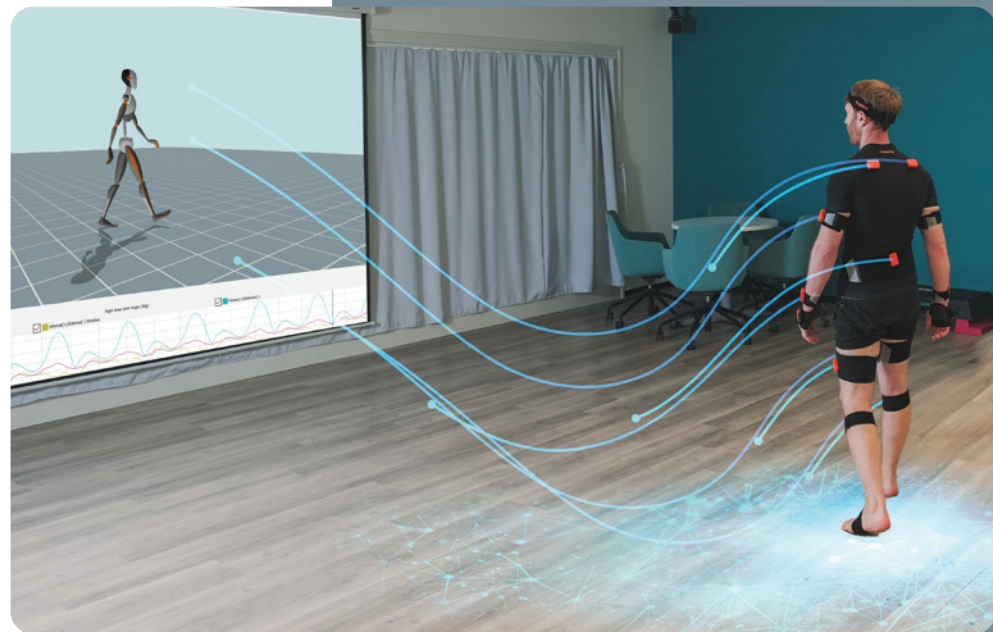
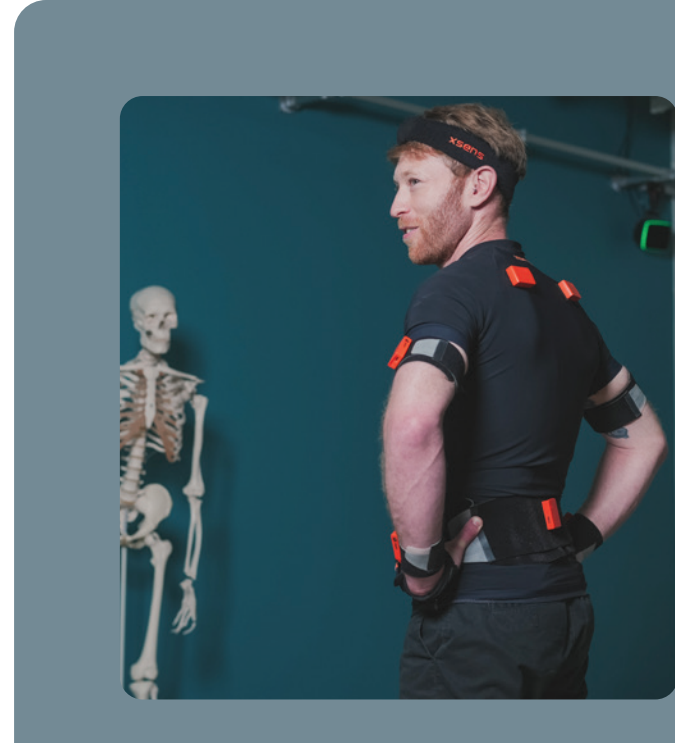


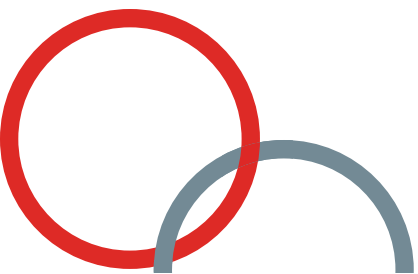
Sports Medicine

biomechanics, biochemistry, and structural changes that affect musculoskeletal joint pathologies. More specifically, investigation concentrates on developing personalized, non-invasive, wearable devices and sensor technologies to capture vast datasets of bio-signal data related to human motion and performance.

This multimodal approach aims to address critical knowledge gaps concerning athletes at risk of injury by identifying early warning signs of injury. Additionally, the Fischer BioMotion lab's research seeks to enhance sports performance, assess the effectiveness of treatments, prevent joint and muscular pathologies, and improve rehabilitation. Machine learning algorithms, biomechanical modeling and biochemical sensors are employed to develop predictive models for the early detection and prevention of joint pathologies based on unique multimodal datasets collected in collaboration with the Israeli Olympic teams.

To date, the laboratory team has collaborated with both female and male Israel Olympic Windsurfing teams and recently began working with elite-level rhythmic gymnasts. We are also developing biochemical sensing capabilities for continuous monitoring of biomarkers in marathon runners and plan to expand to other sports groups in the future. One of our studies employs markerless motion tracking and wearable sensors to gather real-life data and analyze the performance of elite windsurfers. We collect data on the Olympic team using action cameras and wearables during windsurfing training sessions, and use an algorithmic flow to synchronize, process, and analyze the sensor data and videos using markerless motion tracking. The results of this study will help quantify data-driven sports performance metrics for multiple athletes in real-life scenarios. We are also conducting a study on elite rhythmic gymnasts who are more susceptible





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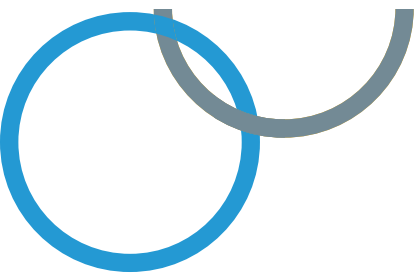
to injuries such as stress fractures due to excessive training regimens and loads from a young age. This study involves a longitudinal analysis using markerless motion capture, bone and inflammation biomarker measurements, and self-reported questionnaires to track biomechanics, quantify biological changes, and monitor the gymnasts' well-being. The interdisciplinary approach will explore the interplay between biomechanical, biochemical, and psychological variables. The results of this study will help understand the associated risks of stress fractures and mitigate injury rates while improving the performance of elite gymnasts.

Our goal is to extend our research to other sports teams in the future, making science and engineering more accessible to elite athletes and coaches, and bridging the gap between real-life athletic scenarios and cutting-edge science and engineering capabilities. To achieve this, we employ advanced technologies such as motion capture and wearable sensors to gather real-life data and analyze athlete performance. The findings will be significant in enhancing sports performance and preventing injuries and could potentially lead to the development of early diagnosis and prevention strategies for stress fractures in elite athletes. By adopting a multi-system analysis approach that integrates biomechanical, biochemical, and psychological variables, we aim to enhance our understanding of these complex issues and contribute to injury prevention and performance enhancement for elite athletes.



IWGA





The Olympic Committee of Israel

Guiding Regulations for Employing Professionals in the Fields of Medicine and Ancillary Services

Comprehensive guidelines have been formulated for recruiting and managing professionals in medicine, physiotherapy, massage, nutrition, physical development, and mental guidance, aiming to set an 'Olympic Standard.' The guidelines, developed collaboratively with experts, establish a matrix-based support model for various sports, ensuring qualified personnel recruitment, professional management, and continuous excellence in scientific-medical care for Israeli Olympic athletes.

Throughout each Olympic cycle, Israeli Olympic athletes receive ongoing scientific and medical support that includes highly qualified professionals in the fields of medicine, physiology, physiotherapy, massage, psychology, nutrition, and the development of physical abilities.

Working with elite athletes requires expertise, extensive experience and an understanding of the professional needs of this exceptional population. In order to meet these challenges and to ensure the selection of staff with suitable training, academic background and appropriate skills, the Olympic Committee of Israel decided to formulate a set of guidelines to serve as the 'Olympic Standard'.

We are proud to present the guiding rules for members of the scientific-medical staff

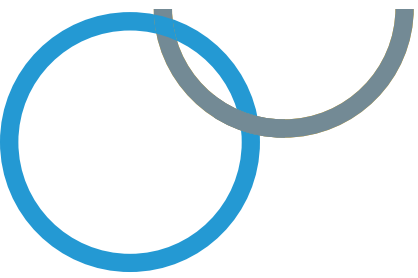


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supporting the Olympic athletes of Israel.

The guidelines in this document stem from the author's initiative, and are the product of collaborative work with the Steering Committee: **Mr. Gili Lustig, Prof. Danny Nemet M.D, M.H.A, Prof. Gal Dubnov-Raz M.D, and Dr. Osnat Fleiss-Douer Ph.D.** In addition, invaluable input was provided by the director of each of the scientific-medical support professions, along with the assistance provided by the Elite Sports Unit.

As of today, these guidelines will constitute the Olympic standard for professionals who wish to become part of the elite group of the Olympic Committee of Israel's scientific-medical support team. These regulations are aimed at ensuring optimal and responsible care for the Olympic athletes while striving for continuous excellence.

General Regulations

The Olympic Committee of Israel's new scientific-medical model of support operates in a two-dimensional matrix linking designated professionals with centralized sports (the "national team method"). Areas of research and knowledge that are included in the scientific-medical support are the following: medicine, physiotherapy, massage, nutrition, psychology, physiology, and the development of physical abilities. The vertical axis of the matrix includes all the professionals who work with a given sport. The horizontal axis of the matrix includes the professionals from a particular specialization ("fields of medicine and ancillary services").

With the expansion of the scientific-medical support for the Olympic staff, the Olympic Committee of Israel faces increasing challenges, including the following:

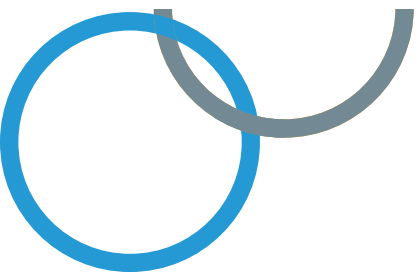
- The addition of scientific and medical services to new sport branches
- The professionalization of the therapeutic team in accordance with the specific requirements of the sport



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The Olympic Committee of Israel

- The expansion of the geographic distribution of therapists and treatment centres
- The recruitment of professional and skilled personnel
- The assignment of professionals from the diverse fields of support for activities abroad (training and competitions).

For each of the above listed scientific-medical support areas, the Olympic Committee of Israel will appoint a head of department whose role is as follows:

- To ensure the recruitment of qualified and skilled personnel
- To manage professionals under his/her responsibility
- To implement the professional policy of the Olympic Committee of Israel

In order to meet these challenges and to ensure the selection of staff with suitable training, academic background and appropriate skills, the Olympic Committee of Israel decided to formulate a set of guidelines to serve as the 'Olympic Standard'.

Guidelines have thus far been defined in six areas: medicine, physiotherapy, massage, nutrition, the development of physical abilities, and mental guidance. In future, the fields of complementary medicine, data analytics in sports and sport sciences will also be defined.

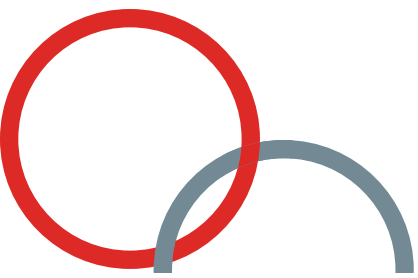
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Genetic and Sport

This article explores the intersection of genetics and sports, noting the limitations and ethical concerns surrounding genetic testing for athletic performance. Emphasizing a holistic approach and the importance of individualized consideration, the author suggests future research should delve into the interplay of biological, psychological, and cultural factors, including epigenetics, to optimize athletes' potential.

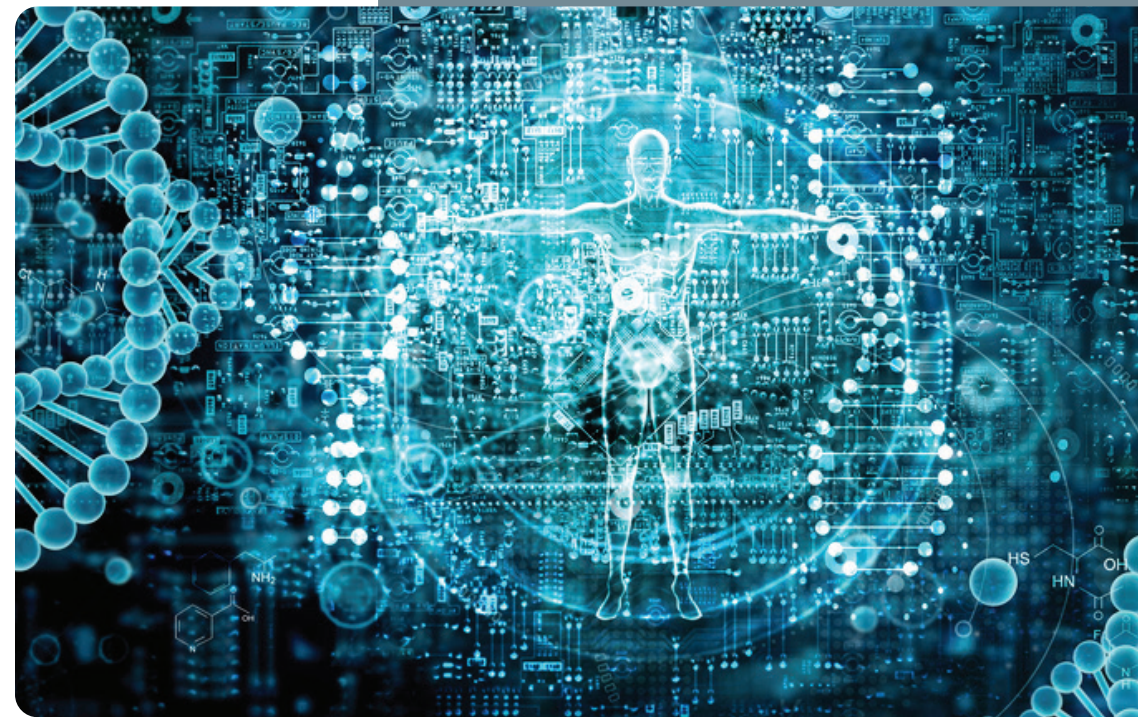
The field of sport has evolved significantly from the revival of the Olympic Games in 1896 to the present day. At the same time, genetic research has undergone significant transformations over time. Gregor Mendel's pioneering work on inheritance theory laid the foundation for future genetic discoveries. Today, our understanding of genetics has advanced immensely, encompassing the structure of DNA, the decoding of the genetic code, mapping of the human genome, and applications of genetic engineering. Meanwhile, sport has evolved into a professional and multidisciplinary domain, combining physiology, psychology, and sociology.

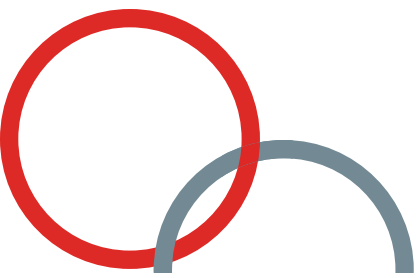
Despite these advancements, the human body remains unchanged and is believed to be nearing its physical limitations. Consequently, the law of diminishing returns has become a reality in competitive sports, leading to a relentless pursuit of new methods to enhance performance. This raises the question: How can genetics contribute to



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Sports Medicine

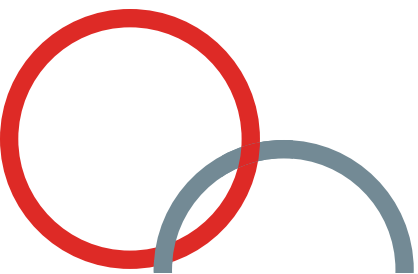
performance improvement?

Genetics, as a field of biology, explores genes, genetic differences, and hereditary traits in living organisms. All human characteristics, including psychological and behavioral traits, have underlying biological mechanisms governed by genes. Genetic variability contributes to human diversity, and specific genes can impact various aspects of performance. For example, different versions of the myosin gene, which relates to muscle flexion, can produce structurally different proteins or varying protein amounts.

In the early stages of genetic research in sport, the focus was on identifying genetic variants associated with performance variability. This led to discoveries of genetic differences in aerobic capacity, muscle mass, training responsiveness, and emotional regulation. While these studies established a clear connection between genetic profiles and sports performance, they had limitations. They did not fully elucidate the underlying mechanisms or provide reliable estimates of future success. Moreover, the term “genetic basis of sport/athletic performance” is misleading, as performance is not solely a genetic trait, but rather a complex outcome influenced by multiple factors. In the early 2000s, research efforts combined biological and molecular methods to understand cellular-level mechanisms related to athletic performance and exercise responsiveness. These studies, alongside bioinformatics research, aimed to uncover complex profiles associated with performance – an emerging field known as “sportomics.” While these studies expanded our understanding, they also raised practical, methodological, and ethical dilemmas in the sports-genetics relationship. From a practical perspective, there is a discrepancy between the pace of scientific research, which can take months or years, and the expectations of athletes, coaches, and professionals, who seek timely guidance and insights. Methodologically, the dynamic and multifactorial nature of the human body presents challenges in drawing generalized



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conclusions and recommendations. Ethically, the limited predictive power of genetic tests raises concerns regarding talent identification and development.

Considering these drawbacks, how can we optimize genetics to enhance athletic performance? Future research will continue to deepen our knowledge through genome and biomolecular studies. However, research focusing solely on the quantity of participants may limit the ability to maximize individual athletes' potential. Elite athletes, even within the same sport, should be treated as unique cases with distinct genetic and biological characteristics.

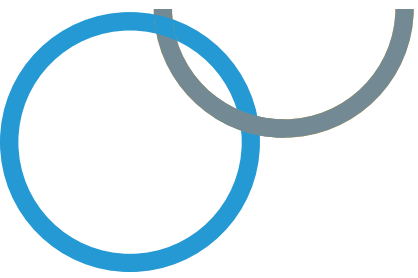
Other promising approaches involve the "exercise physiology network" paradigm, which investigates biological differences at various levels—cellular, tissue, organ, system, and whole body—in conjunction with traits and performance. Additionally, research into psychological traits associated with athletic performance should be further explored. A holistic approach, tailored to the athlete's cultural background, may be necessary. For example, investing in creativity and emotional regulation may be more relevant for basketball players in Israel, whose athletic abilities are less common.

Epigenetics, which examines gene expression, is another crucial avenue. Factors such as emotions, chemicals, and mechanics can influence genetic activity, affecting protein quantity, type, and production. Expanding research in this direction, particularly in terms of exercise responsiveness, is essential.

In summary, it could be said that the human body is a distinctly complex, dynamic and ever-changing machine, which is constantly interacting with external factors. In this regard, athletic performance is greater than the sum of its parts. The dissection of this machine would fail to grasp its complexity; on the other hand, we will not be able to comprehend its complexity without this dissection.



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The Olympic Committee of Israel

Get Ahead of the Field: Online Programs Awarded by the International Olympic Committee (IOC)

The performance and functional competence of high-achieving athletes depends upon a large number of variables and factors, including health, technical ability, mental resilience, and physiological aspects, among others. To ensure an optimal training process for maximizing competitive potential, it is imperative to provide high-achieving athletes with professional support. This encompassing framework comprises trainers, medical professionals, and individuals from related medical disciplines such as physiotherapy, nutrition, psychology, sports science, and massage.

The Olympic Committee of Israel is committed to providing its Olympic squad athletes with an extensive medical-scientific support system encompassing six key knowledge areas. Each preferred sport within the Olympic squads is accompanied by a dedicated team of medical and scientific professionals tasked with ensuring the athletes' health and fitness. This comprehensive framework involves approximately 100 medical and scientific personnel operating within a matrix structure. The vertical axis delineates sports and their respective professional teams, while the horizontal axis illustrates various scientific disciplines overseen by a professional manager.

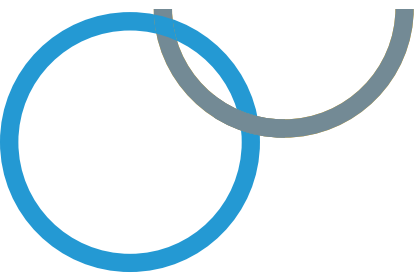
To ensure the selection of staff members possessing adequate training, academic backgrounds, and requisite qualifications, the Olympic Committee of Israel has formulated guiding regulations for their recruitment (See the article "Guiding Regulations for Employing Professionals in the Fields of Medicine and Ancillary Services" in this issue).

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The Olympic Committee of Israel

Integral to athletes' mental health and personal safety is the assurance of safeguarding in sports. The Olympic Committee of Israel is committed to providing appropriate training to professionals in this area, aligning with the policy and code of ethics of the Olympic Movement. To enhance professionals' knowledge and practical skills, unique study programs from the Medical and Scientific Commission and the International Olympic Committee are employed.

In 2022-2023, seven professionals who work closely with the athletes of Israel's Olympic squads were certified by the International Olympic Committee after completing their studies in Sportsoracle's online programs:

IOC Certificate: Safeguarding Officer in Sport - Danna Nahman, Ori Keidar

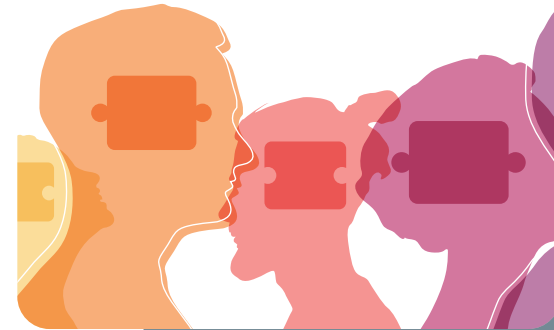
This program equips participants who safeguard athletes from all age groups against harassment and abuse in sports, with the knowledge and skills required to serve as Safeguarding Officers/Focal points for their respective sport organizations.

IOC Diploma in Mental Health in Elite Sport - Tomer Gutman

This one-year program is aimed at sports medicine physicians or other physicians who work with athletes, and licensed practitioners who are qualified to provide mental health services.

IOC Diploma in Sports Nutrition - Tamar Ashlagi-Amiri, Ben-El Berkovich

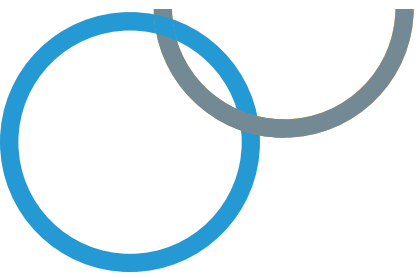
A two-year distance learning program in sports nutrition. Students who successfully complete the program are eligible to graduate with the International Olympic Committee's Diploma in Sports Nutrition.



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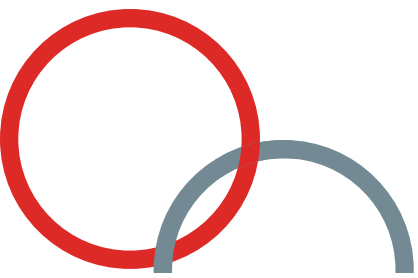
IOC Diploma in Physical Therapies – Yossi Blayer, Alon Yehiel

A two-year distance learning program in Sports Physical Therapies, offering participants eligibility for the International Olympic Committee's Diploma in Sports Physical Therapies upon successful completion.

The Olympic Committee of Israel expresses gratitude to Olympic Solidarity for awarding scholarships to the participants. These certified professionals are actively applying the acquired tools in their work with Olympic staff, sharing knowledge within the medical-scientific community to positively impact a broader circle of athletes.



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Beyond the Finish Line: Fertility Preservation in Female Athletes

The article explores the unique challenges female athletes face in balancing sports careers and fertility. While strenuous physical activity may impact menstrual irregularities, hormonal imbalances, and potentially fertility, advancements in fertility preservation offer opportunities for athletes aged 30-41 to undergo oocyte extraction cycles, raising the need for individualized assessment and support in navigating the complex intersection of athletic demands and reproductive health.

For many female athletes, the race for a successful career and the race for motherhood occur concurrently - each requiring a distinct and separate strategy and timing. This overlap and the possible effects of strenuous physical effort on the woman's body pose a unique challenge for professional female athletes, a challenge that transcends the limits of physical effort and enters the realm of personal life: fertility.

Every woman is born with a limited number of oocytes which should enable her to have children later in life. With the awakening of the hormonal axis and following puberty, every month several oocytes begin the process of growth and the race to the finish line. Only one of those oocytes reaches the finish line and actually undergoes a process of ovulation, while the other oocytes fail to reach it and undergo

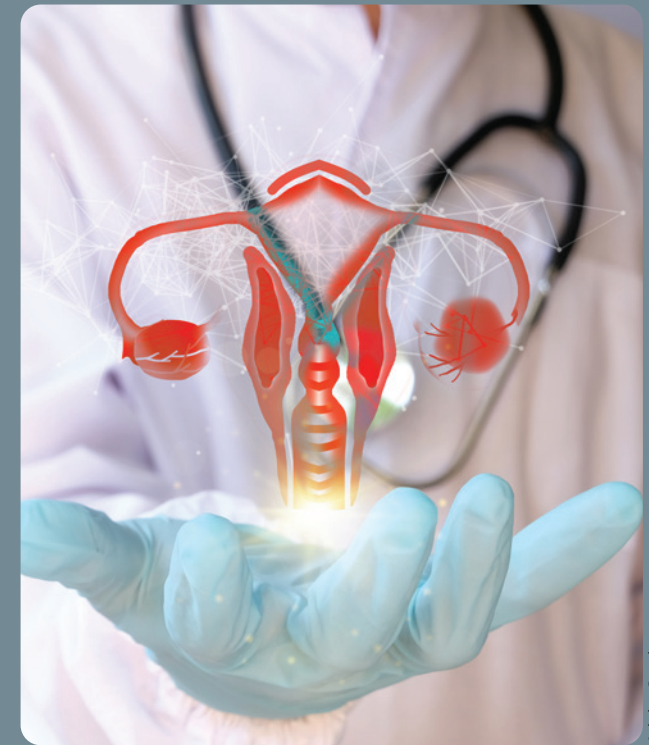
a process of absorption along the way. The woman's oocytes reserve continues to decline from month to month. Another process that occurs with age is a decrease in the quality of the oocytes. The chance of an oocyte to lead to pregnancy decreases with age, as is the chance of giving birth. One of the most prominent manifestations of this process is an increased rate of natural abortions at older ages. Over the age of 35, the proportion of women who need fertility treatments in order to conceive becomes more significant, and more so after the age of 40.

In recent years there has been a significant improvement in women's awareness of fertility, particularly, the effect of age on fertility. Women postpone the age in which they try to conceive for the first time in their lives for various reasons - career, studies, a relationship, etc. At the same time, the

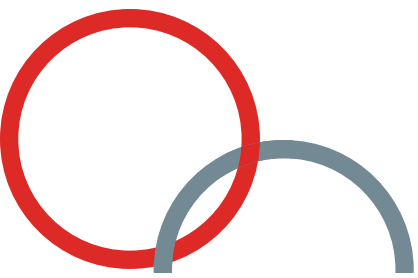


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technological medical developments that have taken place in the last decade make it possible to provide women with options and promote preventive medicine in the field of fertility. In fact, today in a routine checkup of a patient at a certain age with her gynecologist, the doctor is expected to consider the issue of fertility and inform the patient of the options available to her.

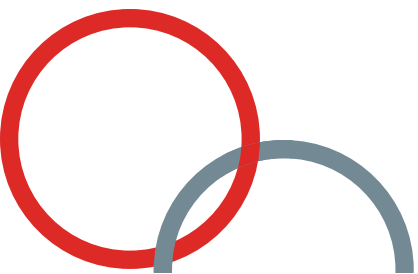
Athletes have unique characteristics that are distinct to the rest of the population, and as such, the issue of fertility should be given special medical consideration. For example, there is an overlap between the age of childbearing and the age in which female athletes can realize their full potential in their discipline. Therefore, in female athletes the age of the first attempt to conceive is expected to be older compared to the general population. Moreover, intense physical activity can have distinct physiological effects. For example, female athletes, especially from sports that require low body mass or low fat percentages, may suffer from menstrual irregularities and hormonal imbalances as a result of energy deficiencies. It is known that stress in itself, as well as, at times, the absence of menstruation through the suppression of the hormonal axis, may cause menstrual disorders. These effects of physical activity manifest themselves in the short term and are considered reversible when the level of physical activity changes.

Regarding long-term effects, there is no well-established medical knowledge. It is not known whether there is a direct effect of intense physical training on ovarian reserve (ovarian function) or whether some of the effects may be irreversible.

While there is evidence that physical activity positively affects a woman's fertility, the effect probably depends on the intensity of the activity. For example, in a questionnaire study that examined 3887 women, a relationship was found between increased participation in sports and fertility problems [1]. On the other hand, in a study carried out in the fertility unit at Meir Medical Center in Kfar Saba, indicators related to ovarian reserve were examined and no difference was found between 31 women who engage in sports and 31 women who do not engage in sports [2]. It should be remembered that each sport has its own characteristics, and therefore a general and decisive statement regarding the long-term effects of sport on fertility cannot be made. Today, it is possible to offer women treatment to preserve fertility. The treatment is offered to women aged 30-41. It is self-financed and includes between one and four cycles of treatment aimed at extracting oocytes from the ovaries. The oocytes that are collected are kept frozen and allow for future use, if needed. The greatest advantage is their quality, which corresponds to the age of the woman at the time of retrieval.



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Awareness of fertility preservation among female athletes must be raised in order to examine the necessity for each female athlete individually. Informing female athletes and addressing this issue may have medico-legal and financial implications in the future and dealing with these implications is currently gaining momentum. Carrying out a treatment process for the preservation of fertility in women who engage in achievement sports is expected to be challenging. One round of oocytes extraction involves hormonal treatment, frequent medical follow-up for approximately two weeks, and the oocytes retrieval procedure itself – all of which require ideal timing within an athlete's tight schedule. Also, complications arising from the treatment and the operation itself are rare when it comes to healthy women, but may be heightened in women who make strenuous effort during the treatment. In light of the complexity of combining the treatment with the athlete's activity, the involvement and cooperation of the team supporting the athlete (the coach, sports doctor, gynecologist, nutritionist, etc.) are required in order to provide an adequate medical response, while maintaining the athlete's competence and abilities.

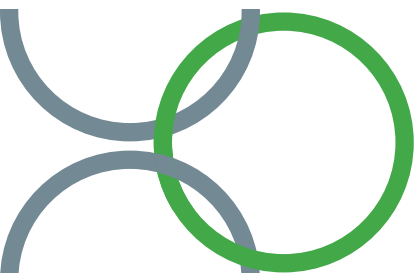
It is now possible to perform a number of simple tests that allow for the evaluation of a woman's ovarian reserve. Performing this evaluation can provide a baseline report, allows for long-term monitoring of the nature of the decrease

in the ovarian reserve over time, and may even help to reach a decision regarding fertility preservation treatment. As of today, there is no research evidence regarding the nature of the decrease in the ovarian reserve of female athletes over time.

In conclusion, with the growing recognition of the importance and role of women's sports in Israel, and in light of the impressive successes of Israeli athletes on the world stage, the need for understanding and providing support to the unique aspects faced by female athletes regarding fertility is clear. Research on the issue among Israeli female athletes is still in its infancy. Substantiating comprehensive research, or constructing a targeted program aimed at evaluating and supporting fertility in female athletes, could provide both important insight into the encounter between maximum athletic performance and fertility, as well as provide guidance to female athletes who are required to navigate between their careers and their personal lives.

- 1 **Gudmundsdottir, S., Flanders, W. & Augestad, L. Physical activity and fertility in women: the North-Trøndelag Health Study. *Human Reproduction* 24, 3196-3204 (2009).**
- 2 **Miller, N. et al. High physical activity and ovarian reserve: a prospective study of normo-ovulatory professional athletes. *Journal of Ovarian Research* 15, 107 (2022).**





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Assessing the Quality of Life of Israeli Elite Athletes: A Focus on Mental Health to Improve Sports

An increasing number of Olympic athletes are now openly addressing their challenges with mental health. This shift away from hiding one's struggles is encouraging more awareness and dialogue on the subject. This not only benefits the athlete seeking help, but also serves to normalize such issues, encouraging other athletes and individuals to acknowledge their own struggles and pursue treatment. An important factor in mental health is resilience, the ability to adapt and adjust in the face of difficult or challenging experiences. Resilience can play a crucial role for an athlete due to the constant challenging situations that arise during practice or competition. It is therefore important to continue to understand the prevalence of mental illness, as well as resilience levels, among the athletic population.

As a two-time Israeli Olympian and medical doctor aspiring to become a sports psychiatrist, my mission is to enhance mental health for athletes in Israel and worldwide. Over my 24-year journey as a competitive swimmer, I have personally experienced substantial stress and have observed teammates and friends experience difficulties with mental health, including depression, anxiety, and eating disorders, to name a few. I have witnessed many talented athletes struggle to unleash their full potential due to these mental health challenges. I am committed to advocating for mental health and to enhance the support system available for athletes.

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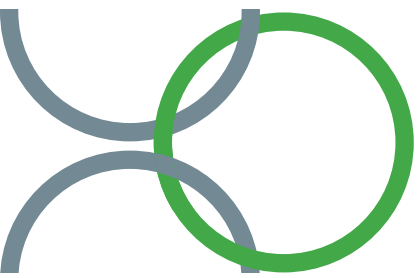
Founder, and current co-Chair of the Section on Exercise, Psychiatry and Sport, World Psychiatric Association, and senior Board member, International Society of Sports Psychiatrists

Prof. Dan Nemet, M.D, M.H.A

Medical Director, Olympic Committee of Israel



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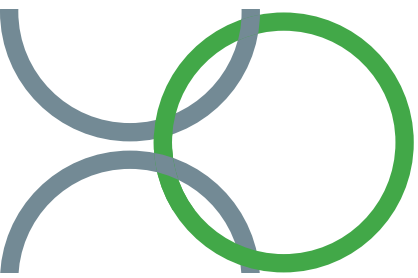
While there is an existing infrastructure for athletes to receive support from a performance enhancement perspective, this project is an initial step in creating an ongoing program for mental health support within the athletic community that can complement the performance enhancement component. Inspired by the robust system in place for conducting annual physical health assessments before starting the competitive season, my vision is to introduce a baseline mental health screening tool as an integral part of this annual evaluation. To garner support, I have initiated this project to better understand the current status of mental health. This year holds particular significance as it is the Olympic year, a period when National Team athletes naturally experience an increase in stress. To my knowledge, there has been no prior endeavor to comprehensively assess the mental health of all National Team athletes.

The project comprises a three-part questionnaire. The first section utilizes a validated and standardized assessment: the Sport Mental Health Assessment Tool 1 was developed by the International Olympic Committee. It aims to promote athlete wellness and to identify those at risk at an early stage for timely intervention and support. The second section delves into questions on resilience, one of the most important factors of success in sports. The third and final part of the questionnaire comprises open-ended questions that allow athletes to give their candid feedback about the system and the support they receive. While the original questions were in English, they have been translated into Hebrew with a back-translation process to ensure the questionnaire's comprehensibility and the collection of honest, accurate responses.

After receiving IRB approval, the questionnaire will be administered via an online platform to all National Team athletes in Olympic sports to be completed at three time



Andrea Murez



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points throughout the current athletic year: The first time will be immediately after the questionnaire is finalized and approved; the second in 2024 before the Olympic Games; and the third after the Olympic Games. The three time points will be used to compare the mental health among athletes throughout the year and create a generalized baseline of mental health in athletes.

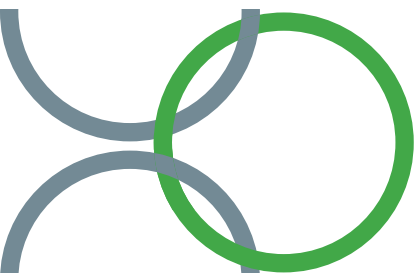
The process will adhere to approved ethics guidelines. Participation in the questionnaire will be voluntary and prior consent will be obtained. No information will be shared that can identify an athlete individually. The data collected from the questionnaire will be kept completely confidential and will not be shared with any coaches or staff or within the Olympic Committee. It will not affect an athlete's status in their sport or any selection processes in any way. Only the conclusions as a whole from all of the information collected from the survey will be shared with the Olympic Committee. After the data is collected, it will be analyzed in order to provide a conclusion to be published and provide feedback to the Israeli Olympic Committee. The project is designed with the ultimate goal of improving the quality of life and quality of sport performance for the Israeli athletes and the community as a whole.

References:

Gouttebarga V, Bindra A, Blauwet C, Campriani N, Currie A, Engebretsen L, Hainline B, Kroshus E, McDuff D, Mountjoy M, Purcell R, Putukian M, Reardon CL, Rice SM, Budgett R. International Olympic Committee (IOC) Sport Mental Health Assessment Tool 1 (SMHAT-1) and Sport Mental Health Recognition Tool 1 (SMHRT-1): towards better support of athletes' mental health. *Br J Sports Med.* 2021 Jan;55(1):30-37. doi: 10.1136/bjsports-2020-102411. Epub 2020 Sep 18. PMID: 32948518; PMCID: PMC7788187.



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Mindfulness for Sailing Teams in Water and Off Shore

Mindfulness, adapted for sports performance, is actively integrated into the training and competition routines of a sailing team, enhancing athletes' focus, reducing stress, and managing uncertainties associated with the sport. The practice contributes not only to improved performance but also to the overall well-being of athletes, emphasizing the importance of mental health in sports success.

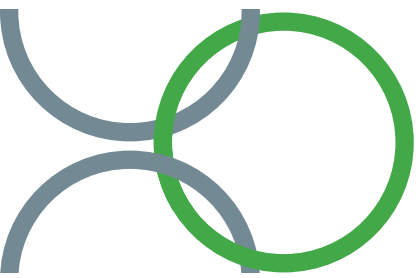
Recent years have witnessed a growing understanding of the significant role psychology plays in sport success. There is wide agreement that sport psychology is required when training athletes, especially top athletes, who are under continuous pressure. The main objectives of the sports psychologist are to reduce stress and improve focus with an emphasis on maintaining the wellbeing of the athletes. Today it is understood that it is not just the performance that matters, but also the wellbeing of athletes. Among the many techniques that have developed, the implementation of mindfulness with athletes has particularly increased in the past few years. The definition of mindfulness is broad, but according to John Kabat-Zinn, it refers to paying attention to the present moment in a deliberate and non-judgmental way. Specifically in sports, it refers to the practice of being present and fully engaged in the moment while participating in physical activity.



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Mindfulness involves focusing on the present moment and acknowledging one's thoughts, emotions, and bodily sensations without judgment. There are many elements that work with awareness, concentration, observation and openness. As a result, we can improve the athletes' confidence and skills and in addition better prepare them for the day of competition. Mindfulness can also help athletes manage the daily pressure of continuous preparation for competition and stress of competitive life. Moreover, it can have positive effects on an athlete's overall well-being. By practicing mindfulness regularly, athletes enhance their mental health, reduce symptoms of depression and anxiety, and increase their overall happiness.

Mindfulness is very broad. In Mindful Sport Performance Enhancement (MSPE), mindfulness is specifically adjusted to sports and the core work is learning and focusing on basic mindfulness skills. In Mindfulness-Based Stress Reduction (MBSR) emphasis is placed on reducing stress. Both methods work on similar qualities. First, by using different senses, awareness is brought to the present moment. Second, being open to the present experience, that is accepting things as they are in the current moment, even if they are not ideal, and committed to one's goals are addressed. Athletes exercise the formal practice of meditation, such as a mental body scan and bringing awareness to their breathing. On the day of competition, during the morning routine, athletes practice 5-10 minutes of different types of meditation before starting the day, according to what the athletes communicate they need.

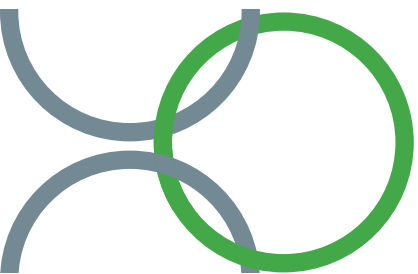
Our sailing team has been practicing mindfulness on a regular basis for the past year. In preparation for competition, there are different types of work for each part of the year. For example, during the preparation period we focus more on lengthy meditation to improve the concentration muscle. However, on the day of the competition, we work



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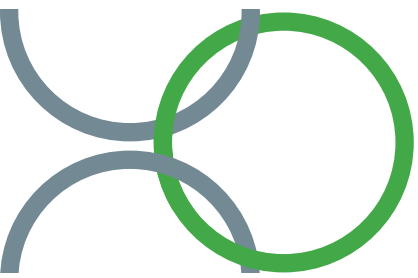
more specifically on reducing pressure and achieving the right level of arousal.

On the day of the competition, mindfulness skills come into play. Sailing, depending on the sea and the wind, is accompanied by a great deal of uncertainty, which can be challenging and confounding. As the athletes wait to enter the sea, disturbing thoughts and worries may ruminate and reduce performance. By learning to accept, and become more aware, athletes can manage this uncertainty much better.

When the team is at sea, work in the water involves helping athletes increase their awareness to the present moment so that they can focus on what they are doing and reduce mind wandering behavior. They learn how to divide their attention more accurately by paying closer attention to themselves and their surroundings. Both are necessary for a successful sailing race. In addition, in between races, they are reminded of the more minute details of mindfulness that can help them resume attention and focus to the next race, rather than staying in the previous race. At the end of the day of competition, special relaxation meditation is practiced to train the brain to follow the sounds of music and calm the body.

In conclusion, mindfulness is a valuable tool for our athletes using it to both improve performance and wellbeing.





Elite Athlete's Blood Test - When and What to Test?

This study aims to assess the necessity and frequency of blood tests (BTs) in asymptomatic elite athletes over 21 years, analyzing variations across sports, gender, and age. The research seeks to establish optimal testing protocols, considering the unique demands of different sports and the potential benefits of detecting biomarkers related to performance optimization and health monitoring in elite athletes.

Background

Modern professional and Olympic-level athletes are supported by a team of sports medicine and sport science experts that aims to maximize performance and minimize injury and illness. Blood tests (BTs) are a key component of this support, with biomarkers being periodically tested to evaluate an athlete's physical condition and assess medical risks. There is a wide variation in the use of laboratory tests in the population of athletes, with some organizations sampling blood as part of a general Periodic Health Evaluation and others performing routine, repeated extensive tests. Based on clinical conditions, further tests are performed on a per-need basis. Many believe routine laboratory screening has a low yield in the asymptomatic athlete. Yet, only a few studies have examined the necessity of BTs in asymptomatic athletes, particularly in the context of elite athletes (EA). Research has indicated that performing routine laboratory screening



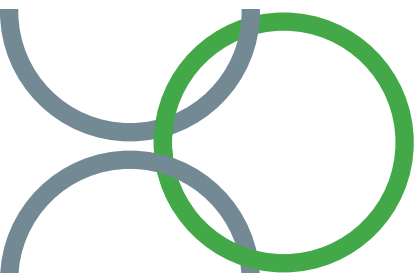
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of asymptomatic athletes provides limited results, with only a small percentage of initial tests resulting in clinically significant outcomes. However, detecting deficiencies in iron metabolism and Vitamin D through BTs has been shown to be beneficial, particularly in females and young athletes. Furthermore, extensive BTs can detect a decrease in insulin and IGF1, leptin, and oxytocin, which may suggest low energy availability status and the main etiological factor of relative energy deficiency in sport, which **is more common among females and can cause metabolic and physiological deficits in many systems.**

EAs from different sports and gender vary in their physical and mental demands, nutrition habits, general lifestyle, and the average age of peak performance. Only a few studies have attempted to characterize athletes' BTs by the type of sport and its specific requirements, with an athlete's normal range of values differing from the general population.

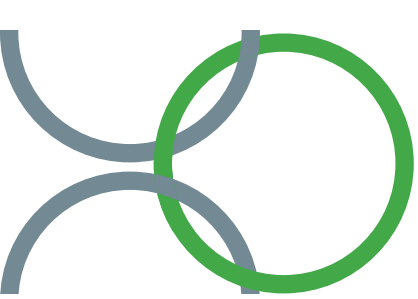
To date, no specific screening testing panel is recommended for EA other than the tests used in the context of public health. A BT is an invasive, time-consuming, expensive procedure, and it is clearly an inconvenience for athletes. Reviewing Israel's Olympic team athletes' BTs over the last 20 years may help understand when it is most beneficial from a clinical perspective to evaluate BTs in EAs during the training or competition periods and which biomarkers are worth testing and followed over time. In addition, athletes' BT profile can help create an Athlete's Biological Passport, which can assist in optimizing training and detecting disease/doping.

Objectives

Primary aim: To review Israel Olympic athletes' BT results over the last 21 years.



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Secondary aims:

- 1) To compare BT results between types of sport, gender, and age.
- 2) To examine how often repeated tests reflect a significant change in the result.
- 3) To compare BT values between EAs and GP.

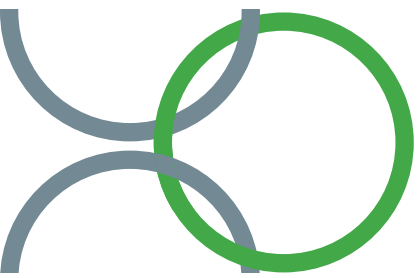
Methods

We will use ex-post facto BT data of hundreds of athletes from over 20 types of sport. As of 2002, thousands of routine BTs were collected over the last 21 years. Blood samples (BS) were collected by the Ribstein Center for Sports Medicine Sciences and Research medical team at the Wingate Institute. BTs were analyzed at the Meir Medical Center (MMC) labs within 24 hours after collection. The results are uploaded to a private cloud safe and stored in the athlete management system "Smartabase" (Fusion Sport Pty Ltd, Brisbane, Australia). Abnormal values (AV) proportions according to the MMC laboratory standards will be recorded. Repeated tests that yield different results (normal to AV or vice versa) and the dynamics within one year will be examined and classified by sport, gender, and age. In addition, differences within normal ranges by age will be tested between the types of sport as well as the general population.

This paper is a prospective study to be conducted by Ori Abulafia in the framework of his thesis for a Master of Sciences in Exercise Physiology (M.Sc.) at Tel Aviv University, supervised by Prof. Dan Nemet.



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Strength, Power and anaerobic Capacities of Male Judo Athletes across Age and Competitive Levels

Introduction

Achieving success in sports involves a combination of factors, including technical skill, tactical planning and execution, physical abilities, and psychological traits. While some sports, like athletics and track and field, are quantifiable (i.e., through centimeters, grams, seconds) making the identification of the key factors contributing to success relatively straightforward, others, like team sports and combat sports, present more complex challenges. Understanding the physiological profile and sport demands can help assess athletes and direct training in hopes to increase chances of success.

Judo can be considered an intermittent high-intensity anaerobic combat sport with the aerobic system functioning to support athletes' recovery between efforts. Athletes need not only strength and power, but also the ability to endure the physical demands and recover quickly during the match.

As part of an ongoing collaboration between the Israeli men's national judo team, the Development Youth Academy, and the Sports Science Department at the Wingate Institute, we set out to try and elucidate crucial factors contributing to success in judo and to assess areas for improvement for the future of the national team. The coaching staff was specifically interested in strength and power indices and how they match between different levels of athletes.



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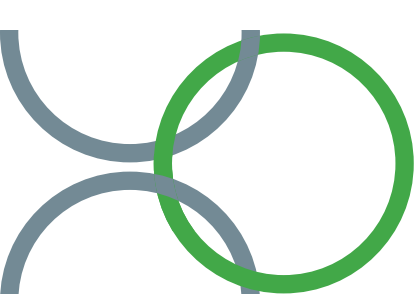


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Dreamstime



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Methods

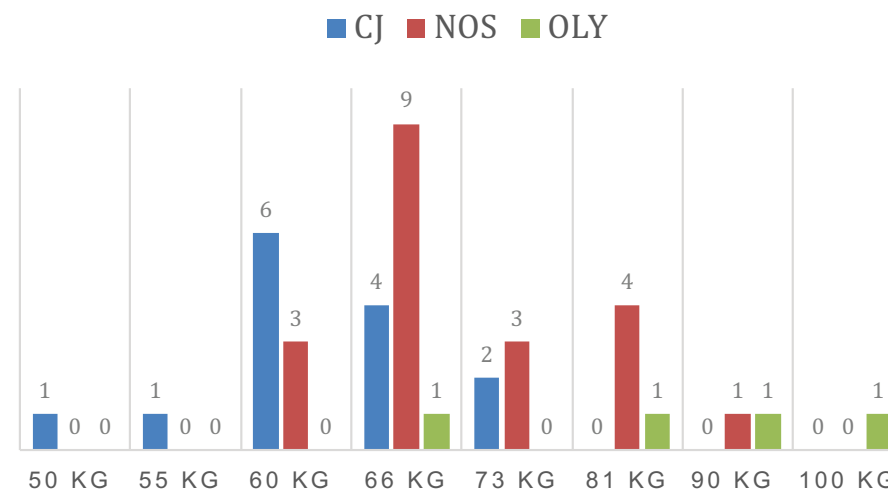
Based on a scientific literature review we devised a battery of tests and assessed the academy athletes (cadets and juniors [CJ], n=14), non-Olympic seniors (NOS, n=20), and several senior Olympic (OLY, n=4) judokas from the national team (see Figure 1 for weight category distribution in each group). The tests employed were countermovement jump (CMJ), drop jump (to calculate reactive strength index), maximal grip strength, upper body Wingate Anaerobic Test (WAnT) to measure peak and mean anaerobic power, and total strength (5RM in 3 exercises).

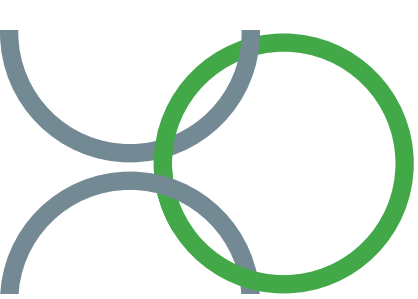
We compared the results between the three groups with the rationale that differences between them will indicate important physiological characteristics for judo performance. We also attempted to compare athletes within each group to determine if any parameter would differentiate between success levels (i.e., indicate which athletes were more successful).

Results

None of the tests we used successfully distinguished between higher and lower-ranked athletes within each group. Although there were notable differences in absolute values among the groups, many of these distinctions disappeared when normalized to body mass. The only remaining significant differences were observed in the WAnT test's relative peak power (PP) and relative mean power (MP) (see Figure 2). These differences were predominantly noted between the younger and older groups, rather than between the two senior groups (i.e., Olympic vs. non-Olympic judokas).

Figure 1:
Distribution of athletes' weight categories by level



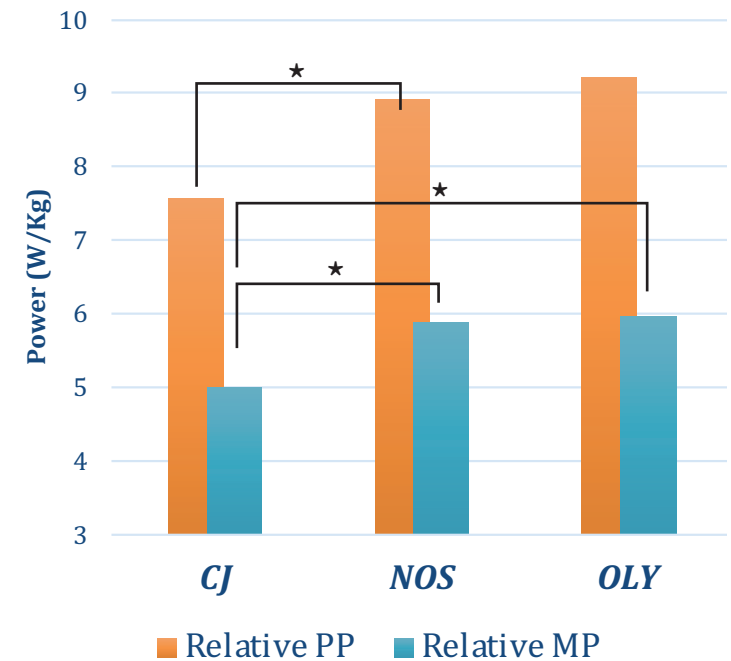


Discussion

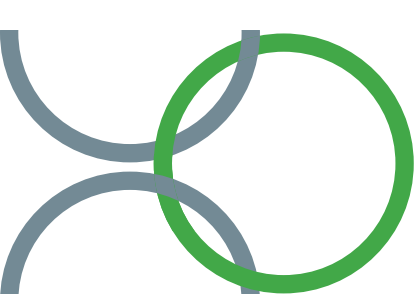
The results from the current study are partly in agreement with previous studies in the field. Notably, the persistent differences in WAnT test outcomes across various age groups, even after accounting for body mass, suggest that other than size, weight and muscle mass, additional factors might play a role in our observed results. Variables such as experience, neural muscle activation, and training status might contribute to the variations in performance. Interestingly, no distinctions were identified in terms of strength and lower body power, as measured by the CMJ. It's possible that a broader study with a larger pool of elite athletes, including Olympians, would yield different results. Furthermore, our results support previous research that the WAnT test is a relevant measure for assessing judokas' fitness and can be a valid tool in judo research and scientific support for high level athletes.

Additionally, as modern judo fights can last up to 15 minutes of net time and even longer when gross time is considered (active + pause time), and with grip disputes lasting 20-30 sec at a time, it seems plausible that strength endurance and aerobic endurance are increasingly important as the duration of a match extends, especially when the match goes into a golden score period (up to 40% of fights). Indeed, it was shown that the aerobic energy system contributes up to 80% in a 5-minute judo match. It should be noted that aerobic capacity was not assessed in the current work, but one of our conclusions was that it might be important to find the appropriate and relevant test to evaluate aerobic fitness in judokas.

Figure 2:
Wingate Anaerobic Test



* significant difference between the groups



Conclusions

It was not possible to distinguish between high- and low-level athletes in our cohort. When comparing the three groups, only WAnT relative peak power and mean power were significantly different between groups while other measures lost significance when normalized to body mass.

Our results support the idea that anaerobic power and capacity are relevant to judo, although their relative contribution might differ depending on match duration. In shorter fights, maximal grip strength and anaerobic qualities could be a determining factor, while as the fight extends, these could shift to more aerobic and strength endurance. Furthermore, in intense short-term exercise, all energy pathways are activated, with the aerobic pathway gaining dominance as the event duration increases.

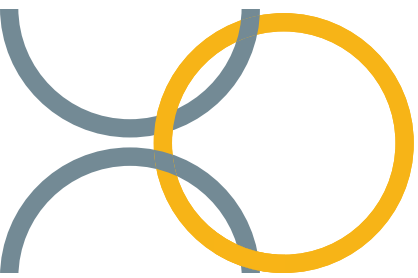
As modern judo matches last for several minutes, coaches can derive benefit from emphasizing the aerobic and strength endurance components of fitness in their training regimen, provided a sufficient level of strength is attained. Therefore, it is advisable to periodically assess judokas' anaerobic and aerobic capabilities using sport-specific tests, repeated high-intensity efforts, or traditional lab and field tests. This approach can provide valuable insights for coaches, enabling them to tailor training programs to optimize performance in judo matches.

Drop Jump



Wingate Anaerobic Test





Achievements



Maru Tefferi

| Name | Sport | Event | Competition | Result | Date | Place |
|-----------------|---------------------|--------------------------|------------------------|--------|------------|-------------------|
| Artem Dolgopyat | Artistic Gymnastics | Floor Exercise | European Championships | 2 | 15/04/2023 | Antalya, Turkiye |
| Artem Dolgopyat | Artistic Gymnastics | Floor Exercise | World Championships | 1 | 07/10/2023 | Antwerp, Belgium |
| Israel | Artistic Swimming | Team Free Routine | European Games | 3 | 25/6/2023 | Krakow, Poland |
| Israel | Artistic Swimming | Free Routine Combination | European Games | 1 | 23/6/2023 | Krakow, Poland |
| Maru Tefferi | Athletics | Marathon | World Championships | 2 | 27/08/2023 | Budapest, Hungary |
| Misha Zilberman | Badminton | Singles | European Championships | 3 | 02/07/2023 | Tarnów, Poland |



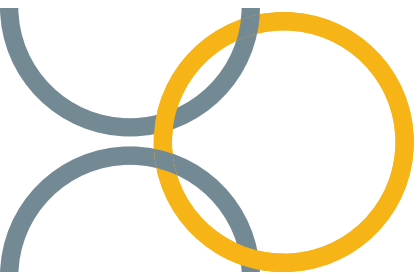
Artistic Swimming



Artem Dolgopyat



Misha Zilberman



Achievements



Raz Hershko

| Name | Sport | Event | Competition | Result | Date | Place |
|----------------|---------|-----------------|------------------------|--------|------------|---------------------|
| Gili Kuritzky | Fencing | Individual Foil | European Games | 3 | 25/6/2023 | Krakow, Poland |
| Inbar Lanir | Judo | -78kg | World Championships | 1 | 12/05/2023 | Doha, Qatar |
| Raz Hershko | Judo | +78kg | European Championships | 2 | 05/11/2023 | Montpellier, France |
| Gili Sharir | Judo | -63kg | European Championships | 2 | 04/11/2023 | Montpellier, France |
| Peter Paltchik | Judo | -100kg | World Championships | 3 | 12/05/2023 | Doha, Qatar |
| Raz Hershko | Judo | +78kg | World Championships | 3 | 13/05/2023 | Doha, Qatar |
| Inbar Lanir | Judo | -78kg | European Championships | 3 | 05/11/2023 | Montpellier, France |



Gili Kuritzky



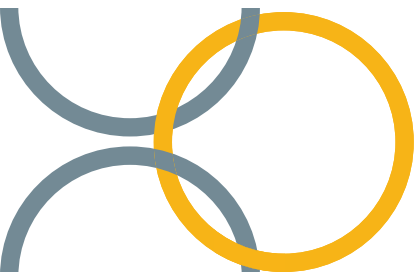
Inbar Lanir



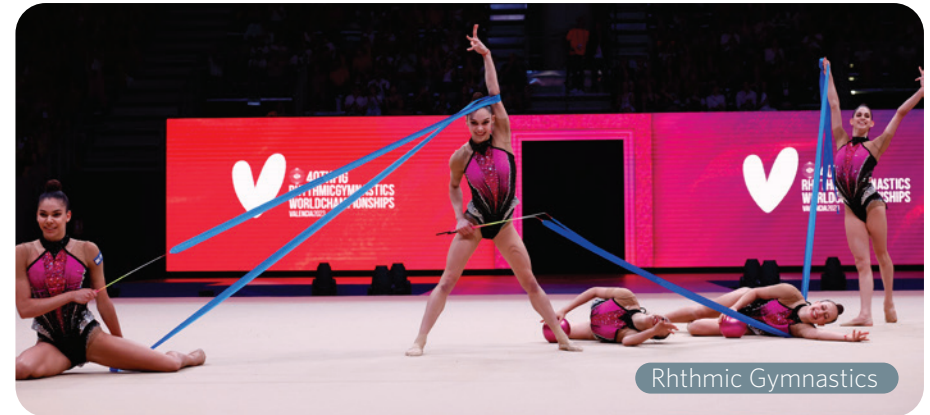
Gili Sharir



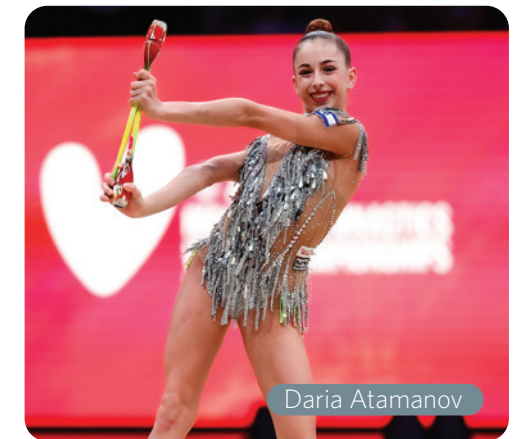
Peter Paltchik

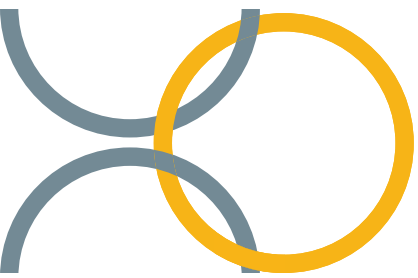


Achievements



| Name | Sport | Event | Competition | Result | Date | Place |
|----------------|---------------------|-----------------------|------------------------|--------|------------|------------------------|
| Israel | Rhythmic Gymnastics | Group All-Around | World Championships | 1 | 27/08/2023 | Valencia, Spain |
| Israel | Rhythmic Gymnastics | Group All-Around | European Championships | 2 | 20/05/2023 | Baku, Azerbaijan |
| Daria Atamanov | Rhythmic Gymnastics | Individual All-Around | World Championships | 3 | 26/08/2023 | Valencia, Spain |
| Shahar Tibi | Sailing | iQFOiL | World Championships | 1 | 20/08/2023 | The Hague, Netherlands |
| Katy Spychakov | Sailing | iQFOiL | World Championships | 2 | 20/08/2023 | The Hague, Netherlands |
| Sharon Kantor | Sailing | iQFOiL | European Championships | 2 | 14/05/2023 | Patras, Greece |





Achievements



Shachar Sagiv

| Name | Sport | Event | Competition | Result | Date | Place |
|-------------------|-----------|-----------------------|------------------------|--------|------------|------------------|
| Olga Tashtchiev | Shooting | 10m Air Rifle - Team | European Championships | 2 | 10/03/2023 | Tallinn, Estonia |
| Sergey Richter | Shooting | 10m Air Rifle - Team | European Championships | 2 | 10/03/2023 | Tallinn, Estonia |
| Nimrod Krivishkiy | Taekwondo | Featherweight 58-68kg | European Championships | 3 | 24/08/2023 | Tallinn, Estonia |
| Rivka Bayech | Taekwondo | Flyweight -49kg | European Championships | 3 | 26/08/2023 | Tallinn, Estonia |
| Shachar Sagiv | Triathlon | Olympic Distance | European Games | 2 | 28/6/2023 | Krakow, Poland |



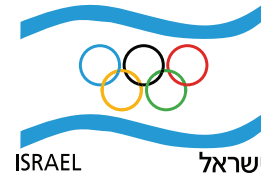
Nimrod Krivishkiy



Olga Tashtchiev and Sergey Richter



Rivka Bayech



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THANKS!