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EXECUTIVE MASTERS IN SPORTS ORGANISATION MANAGEMENT

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Identification of the key elements of a medical protocol for elite Syrian athletes as a tool to prevent injuries and to improve performance

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As I reached the point of my journey in studying EXECUTIVE MASTERS IN SPORTS ORGANISATION MANAGEMENT (MEMOS) to write the acknowledgment text,
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1. Chapter One: Introduction

Professional sports require the symbiosis of several factors for an athlete to succeed at his/her highest level. The medical evaluation is one of the most important factors as it ensures the physiological preparedness of the athlete to train, participate in competitions and recover after injuries.[1] Therefore, sports medicine is not only involved after injuries but also beforehand[2] as the sports medicine physician accompanies the athlete in his/her professional career, during which, the athlete is exposed to psychological and physical pressure. The sports medicine physician always seeks to optimize the health conditions of the athletes and minimize the risks of their injuries.[3]

1.1 Theoretical framework

1.1.1 The history and the evaluation of adopting the medical assessment in the International Olympic Committee (IOC)

In 1967[4], the International Olympic Committee Medical Commission was officially formed. During the 1970s, most of the work of the International Olympic Committee's Medical Commission was devoted to fighting doping and seeking various methods to test athletes and prevent their use of performance-enhancing drugs. Thereafter, shortly after the 1980 Olympic Games in Moscow, the

[1] Lombardo, B., Izzo, V., Terracciano, D., Ranieri, A., Mazzaccara, C., Fimiani, F., Cesaro, A., Gentile, L., Leggiero, E., Pero, R., Izzo, B., D'Alicandro, A., Ercolini, D., D'Alicandro, G., Frisso, G., Pastore, L., Calabrò, P. & Scudiero, O. (2019). Laboratory medicine: health evaluation in elite athletes. *Clinical Chemistry and Laboratory Medicine (CCLM)*, *57*(10), 1450-1473. https://doi.org/10.1515/cclm-2018-1107

[2] Dijkstra, P. and Pollock, N., 2022. *Aspetar Sports Medicine Journal - The role of the specialist sports medicine physician in elite sport*. [online] Aspetar.com. Available at: <https://www.aspetar.com/journal/viewarticle.aspx?id=124> [Accessed 17 May 2022].

[3] Speed C. (2013). High-performance sports medicine. *Clinical medicine (London, England)*, *13*(1), 47–49. https://doi.org/10.7861/clinmedicine.13-1-47

[4] 2022. [online] Available at: <https://olympics.com/ioc/1967-creation-of-the-ioc-medical-commission#:~:text=The%20Medical%20Commission%20is%20the,pay%20more%20attention%20to%20doping.> [Accessed 17 May 2022].

International Olympic Committee's Medical Commission was re-organized to broaden its interest in maintaining and promoting the health of the athletes, and three sub-commissions were formed. These sub-commissions were focused on 1) doping and the biochemistry of sport; 2) the biomechanics and physiology of sport; and 3) sports medicine and orthopedics, a branch of medicine that focuses on the care of the musculoskeletal system[5]. Throughout the years, the International Olympic Committee's Medical Commission created an important legacy in terms of medical and health assessment of athletes, emphasizing that its priority was and is to protect the health of the athlete as stated in the International Olympic Committee Consensus Statement on Periodic Health Evaluation (PHE) of Elite Athletes[6]. The PHE includes a comprehensive assessment of the athlete's current health status and risk of future injury or disease and, typically, is the entry point for medical care of the athlete, while the Pre-Participation Evaluation (PPE), which was also mentioned in the previously cited consensus, has been routinely performed for almost 40 years[7] and its overarching goal is to maximize the health of athletes and their safe participation in sports. In addition, the International Olympic Committee has supported and partnered with established research centers from around the world to promote athletes' health[8].

[5] Gehrig LM. Orthopedic surgery. Am J Surg. 2011 Sep;202(3):364-8. doi: 10.1016/j.amjsurg.2011.06.007. PMID: 21871990.
[6] The International Olympic Committee (IOC) consensus statement on periodic health evaluation of elite athletes: March 2009. (2009). *Journal of athletic training*, *44*(5), 538–557. https://doi.org/10.4085/1062-6050-44.5.538
[7] Miller, S. and Peterson, A., 2019. The Sports Preparticipation Evaluation. Pediatrics In Review, 40(3), pp.108-128.
[8] [online] Available at: <https://olympics.com/ioc/medical-research/research-centres#:~:text=The%20IOC%20research%20centres%20are,Exercise%20Medicine%20Research%20Centre%2C%20Australia)> [Accessed 17 May 2022].

1.1.2 The history and the evaluation of the Syrian Olympic Committee and its medical commission

While the modern Olympic movement goes back to 1896, the Syrian Olympic movement started in 1948 when the Syrian Olympic Committee was founded. Since then, the Syrian Olympic Committee has sent delegations to 15 Summer Olympic Games and has won 4 Olympic Medals[9]; a silver in Los Angeles in 1984, gold in Atlanta in 1996, and bronze in Athens in 2004 and Tokyo in 2020 respectively. The Medical Commission at the Syrian Olympic Committee consists of five members; a chairperson who is elected by members of the Central Sports Council in Syria, consisting of current and former athletes, presidents, and general secretaries of the National Sports Federations, and experienced sports leaders. After getting elected, the chairperson appoints the other four members who must be qualified and knowledgeable in the fields of sports and medicine or health, considering that there are no sports medicine physicians in Syria, the specialties of the members of the Medical Commission are often related to nutrition, orthopedic surgery, and physical therapy. Since its inception, the Syrian Olympic Committee's Medical Commission has been concerned about doping matters to ensure the clean participation of Syrian athletes at the Games. Later, in 2017, under the auspices of the Syrian Olympic Committee's Medical Commission, a Memorandum of Understanding (MOU) was signed between the General Sports Federation—which represents the highest sports authority in Syria—and the University Hospital in Damascus to provide the required medical services and treatments for athletes. This was a pioneering step in the field of medical care for athletes in Syria. Nevertheless, it has not been applied systematically, as the MOU served some goals in an arbitrary and not systematic manner, such as treating cases of injuries or conducting medical tests for athletes

[9] Olympiandatabase.com. 2022. Syrian Results and Medals in the Olympic Games. [online] Available at: <https://www.olympiandatabase.com/index.php?id=28898&L=1> [Accessed 17 May 2022].

who know that they have chronic diseases, and that, at the athlete's request, not based on a periodic follow-up that reveals cases that need medical interventions neither based on an action plan or protocol. Yet, having an established set of standards and protocols can increase the quality of the services rendered or products created[10]. Benefits from designing and implementing a medical monitoring system or a medical protocol for athletes have been observed in many countries. In Norway[11], applying a long-term health monitoring system provided valuable information for the athletes, their coaches, and the healthcare team enabling risk mitigation and prioritization of targeted preventive strategies. In Italy, [12] there has been an application for a national PPE test regulated by law for competitive athletes since 1982, and this application presented several benefits including early diagnosis of health-threatening conditions which allows tackling through regular follow-up and treatment. The Italian PPE implementation has also helped in the identification of athletes with inherited diseases, which has prompted family screening. For Syria, the lack of periodic medical assessment has led to sudden medical incidents that held negative effects on athletes' health and performance as for the incident that happened with Majd Eddin Ghazal[13], a high jump elite athlete that competed for an Olympic medal in Rio de Janeiro Olympic Games in 2016, in which his undetected severe anemia pushed him to finish the seventh before being transferred to the hospital where a blood test was conducted and his hemoglobin level was 5 g/dl while the

[10] Bizfluent. 2022. Importance of Standards & Protocols. [online] Available at: <https://bizfluent.com/about-6547691-importance-standards-protocols.html> [Accessed 18 May 2022].

[11] Clarsen B, Steffen K, Berge HM, et al. Methods, challenges and benefits of a health monitoring program for Norwegian Olympic and Paralympic athletes: the road from London 2012 to Tokyo 2020 British Journal of Sports Medicine 2021;55:1342-1349.

[12] Vessella T, Zorzi A, Merlo L, et al. The Italian preparticipation evaluation program: diagnostic yield, rate of disqualification and cost analysis British Journal of Sports Medicine 2020;54:231-237.

[13] My greatest challenge – Majd Eddin Ghazal | SERIES | World Athletics. (n.d.). Worldathletics.org. Retrieved from https://worldathletics.org/news/series/majd-eddin-ghazal-syria-high-jump

normal range of hemoglobin levels is 13-14 for adult males. Mr. Majd Eddin Ghazal's risk could have been worse, a matter of life or death.

1.1.3 Research question

Due to the particular situation of the Syrian athletes and to assure them of a more thorough medical assessment, this study aims to answer the following research question:

Is the implementation of a medical protocol for elite athletes in Syria a solution to prevent injuries and improve their training and competition?

To answer this question, the study will be structured as follows:

Chapter 1 – Introduction

Chapter 2 - Existing knowledge

The existing knowledge in the literature enables the assessment of research available on the topic of medical assessment of athletes. In the existing knowledge section in this study, 10 publications will be analyzed to give an overview of the different aspects of the need for a medical assessment for athletes, how it is conducted, challenges, obstacles, and benefits, to build a better positioning of this study topic.

Chapter 3 - Methodology

The study will use a qualitative methodology. Interviews will be conducted with key stakeholders. The interviews will be done in person and via Zoom. Also, case studies will be analyzed to provide data on the success of establishing medical protocols in other countries.

1) The interviews will be conducted as follow:

a) In-person with the head of the Medical Commission at the Syrian Olympic Committee; Dr. Marwan Doweier, because he is the most familiar with the reality of medical care for Syrian athletes, and he has the vision of the Syrian Olympic Committee's medical commission.

b) Online via video calls with:

- The persons in charge of the medical assessments at the National Olympic Committees that have medical protocols such as Jordan and the United Arab Emirates due to the similarities in the conditions with Syria such as the culture, and sports mentality. These persons are:
  - Dr. Zaid Habashneh, from Jordan. He is the national coordinator of the Qusai medical initiative[14] that was launched in Jordan in 2013 regarding the medical assessment of athletes.
  - A representative of a Gulf country, due to the similarities in the conditions with Syria, such as the culture, sports mentality, and country's health systems. This person requested anonymity and the researcher is granting it.
- The person in charge of the medical assessments for athletes in Canada because Canada has been a successful model in the field of the medical assessment for athletes for more than a decade, and this person is:
  - Mr. Antoine Attallah, the general manager of major games integration and health services at the Canadian Olympic Committee.

[14] *Qusai Initiative*. (n.d.). Jordan Olympic Committee. Retrieved June 18, 2022, from https://www.joc.jo/en/programs/qusai-initiative/

2) Case studies: Evidence would also be gathered by benchmarking case studies mentioned in the literature review brief, that provide useful data on the topic of the medical assessment for elite athletes, including the Norwegian School of Sports and Science which published a paper on the country's experience in implementing a health monitoring program[15], the British pragmatic model for the structuring of medical and scientific support services to elite athletes[16], and the Malawian case study. A research study was published in the Malawi Medical Journal[17] on the effects of the absence of PPE on Malawian athletes. Chapter 4 - Results and discussion

This chapter will present the results of the interviews and case studies, followed by a discussion.

Chapter 5 – Recommendations

After the discussion of the results, the study will provide recommendations based on the information coming from the literature review, the analysis of the data from interviews and the case studies benchmarking, and the existing capabilities of the Syrian Olympic Committee. It is expected that a draft of a Medical protocol for the Syrian Olympic Committee would be drawn so its future implementation can help the Syrian elite athletes.

[15] Clarsen B, Steffen K, Berge HM, *et al.* Methods, challenges and benefits of a health monitoring program for Norwegian Olympic and Paralympic athletes: the road from London 2012 to Tokyo 2020 *British Journal of Sports Medicine* 2021;**55:**1342-1349.

[16] Dijkstra, H. P., Pollock, N., Chakraverty, R., & Alonso, J. M. (2014). Managing the health of the elite athlete: a new integrated performance health management and coaching model. British journal of sports medicine, 48(7), 523–531. https://doi.org/10.1136/bjsports-2013-093222

[17] Chisati EM, Nyasa C, Banda AM. Preparticipation physical evaluation: An opportunity for Malawian athletes. Malawi Med J. 2016 Dec;28(4):182-184. doi: 10.4314/mmj.v28i4.7. PMID: 28321283; PMCID: PMC5348612.

1.2. The study rationale

It has become known that delayed medical diagnosis in primary care is a common, harmful and costly patient safety incident[14] and that many of the problems that arise in the sports field could be prevented with a periodic and well-structured medical assessment.[18]

Also, due to the lack of a periodic medical assessment for the Syrian athletes, which affects their health safety and sports performance, given that practicing sports is a physical effort that requires physical readiness, but may also cause health conditions that need follow-up, the study concludes that there is a need to design a medical protocol by the Medical Commission of the Syrian Olympic Committee to optimize the health of its athletes.

1.3 Limitations

This study has several limitations:

1. Regarding collecting data within Syria, it is limited because it is not available due to the destruction of the information because of war.
2. Sample size is small because Syria does not have experts in sports medicine.
3. Limiting the sports issue to the General Sports Federation and the National Olympic Committee and the lack of resources for both institutions to conduct the required surveys and surveys with high efficiency.

[18] Pruna R, Lizarraga A, Domínguez D. Medical assessment in athletes. Med Clin (Barc). 2018 Apr 13;150(7):268-274. English, Spanish. doi: 10.1016/j.medcli.2017.09.008. Epub 2017 Oct 31. PMID: 29096970.

2. Chapter Two: Existing knowledge

Medical evaluation terminology in literature:

The regular medical assessment for athletes is expressed using several terms such as:

- Pre-Participation Evaluation (PPE); defined as "a commonly requested medical visit for amateur and professional athletes of all ages"[19] in the American Family Physicians Journal, or as "the screening of athletes for injuries and some risk factors for disease, to minimize the risk of injury, disease exacerbation, and even sudden death during training and competition"[20] in the Malawi Medical Journal
- Periodic Health Evaluation (PHE); defined as a term used widely to "identify potential risk factors for diseases or disorders early with the view of implementing targeted prevention measures to reduce future morbidity and mortality"[21] in the British Journal of Sports Medicine
- Pre-participation Medical Examination (PPME) and Pre Competition Medical Assessment (PCMA)[22] which, by definition, fully corresponds to PPE and "includes medical history, anthropometric data, physical examination, baseline 12-lead ECG, a maximal stress test, a 2D-Doppler echocardiography and an extensive orthopedic evaluation" as stated in the Apunts Sports Medicine Journal's publication entitled: "Pre-participation medical evaluation in competitive athletes: the experience of an international multisport club"[23]

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[19] Mirabelli MH, Devine MJ, Singh J, Mendoza M. The Preparticipation Sports Evaluation. Am Fam Physician. 2015 Sep 1;92(5):371-6. PMID: 26371570.

[20] Chisati EM, Nyasa C, Banda AM. Preparticipation physical evaluation: An opportunity for Malawian athletes. Malawi Med J. 2016 Dec;28(4):182-184. doi: 10.4314/mmj.v28i4.7. PMID: 28321283; PMCID: PMC5348612.

[21] Bakken A, Targett S, Bere T, *et al.*
Health conditions detected in a comprehensive periodic health evaluation of 558 professional football players *British Journal of Sports Medicine* 2016;**50:**1142-1150.

[22] Ljungqvist A, Jenoure P, Engebretsen L, *et al.* The International Olympic Committee (IOC) Consensus Statement on periodic health evaluation of elite athletes March 2009 *British Journal of Sports Medicine* 2009;**43:**631-643.

[23] Ramon Pi-Rusiñol, María Sanz-de la Garza, Gonzalo Grazioli, Manel García, Marta Sitges, Franchek Drobnic, Pre-participation medical evaluation in competitive athletes: the experience of an international multisport club,

Despite the different synonyms, regular medical evaluation for athletes has been studied in different research papers and different countries, environments, and conditions.

In the literature, all studies agree on the importance and usefulness of medical evaluation of athletes for their health and performance, but there is a concern over time regarding the effectiveness of medical evaluation in excluding or retaining athletes from the competition, as well as, in indicators of health conditions that are revealed when conducting the evaluation.

- Two researchers from the University of Nevada have published a paper[24] regarding the sports participation evaluation, in which, they have indicated that the main function of sports participation evaluation is assessing for underlying medical pathology while also ensuring that the athlete is in optimal health. The researchers listed investigations into the key symptoms of common illnesses and medical history in athletes, also, supplement and drug use, and cardiac screening tests. This paper shared a major concern regarding the medical conditions diagnosed by false-positive findings leading to further invasive testing. When unnecessary, this invasive testing causes superfluous harm and anxiety to the athlete.
- Researchers from the University of Rochester published a paper in the American Family Physicians Journal[25] stating that the purpose of the PPE is to maximize the health of athletes and their safe participation in sports. The researchers provided recommendations regarding special considerations; some of them align with many other studies like

Apunts Sports Medicine, Volume 57, Issue 213,2022,100369,ISSN 2666-5069,https://doi.org/10.1016/j.apunsm.2021.100369.

[24] Farzam K, Akhondi H. Sports Participation Evaluation. [Updated 2022 Jan 19]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK539688/

[25] Mirabelli , Mark H., et al.., "The Preparticipation Sports Evaluation." *American Family Physicians*, vol. 92, no. 5, 1 Sept. 2015.

cardiovascular diseases, and some others, were presented uniquely in this paper such as asthma, epilepsy, concussion, eating disorders, and psychiatric disorders. The paper stated that the medical clearance of an athlete was not only decided based on the PPE results, but it took into consideration the type of sport and the event planned for.

- Researchers at the Norwegian School of Sports Sciences[26] benchmarked the implementation of a health monitoring program between 2011 and 2020, which shows that the medical follow-up that is usually carried out during the 10-17 days of the Olympic Games does not provide enough data to make an accurate assessment on the athlete's health. This is because the data required for the medical follow-up of the athletes and the monitoring of their health need constant communication and information gathering by one authority while the athletes usually resort to several medical providers. The research points out that the athletes travel a lot without medical staff which, in addition to making surveillance difficult, also hampers the quality and consistency of athletes' medical care, leading to an increased risk of health problems. The Norwegian School of Sports and Science paper leads to a conclusion that there are several potential benefits from the year-round monitoring of health among Olympic and Paralympic athletes, at both an individual and a group level.
- A clinical commentary was published in the International Journal of Sports Physical Therapy[27] in 2013 on the preparticipation screening. The commentary explains that participation in sports and athletic activities has

[26] Clarsen B, Steffen K, Berge HM, et al. Methods, challenges, and benefits of a health monitoring programme for Norwegian Olympic and Paralympic athletes: the road from London 2012 to Tokyo 2020 British Journal of Sports Medicine 2021;55:1342-1349.

[27] Sanders, B., Blackburn, T. A., & Boucher, B. (2013). Preparticipation screening - the sports physical therapy perspective. International Journal of Sports Physical Therapy, 8(2), 180–193.

continued to increase at all levels of society. With this increase in participation comes the need for specific health care related to the demands of the athlete. The commentary states that the main goal of the preparticipation screening has always been to promote the health and safety of athletes in training and competition, while secondary objectives feature based on the fact that in this day and age of limited access to health care due to lack of insurance, the PPE may be the only opportunity for some athletes to have access to medical care even though it does not replace a routine health visit. Yet, there is no single right way to organize a PPE.

- Four researchers from the United Kingdom (UK), Monaco, and the Aspetar foundation in Qatar published in 2013 in the British Journal of Sports Medicine a description of a pragmatic model for the structuring of medical and scientific support services to elite athletes, discussing aspects of the model and health strategy used by the UK Athletics (UKA) before the 2012 Olympic Games[28], based on the facts that the vast majority (80%) of the British Track and Field athletes selected to compete at the London 2012 Olympic Games had injuries or illnesses requiring management before, during and after the Games. The paper highlights the importance of establishing appropriate services to manage athlete health continuously.
- The European Federation of Sports Medicine Associations published a research paper[29] in 2021 entitled**: "**Preparticipation medical evaluation

[28] Dijkstra, H. P., Pollock, N., Chakraverty, R., & Alonso, J. M. (2014). Managing the health of the elite athlete: a new integrated performance health management and coaching model. British journal of sports medicine, 48(7), 523–531. https://doi.org/10.1136/bjsports-2013-093222

[29] Ionescu AM, Pitsiladis YP, Rozenstoka S, Bigard X, Löllgen H, Bachl N, Debruyne A, Pigozzi F, Casasco M, Jegier A, Smaranda AM, Caramoci A, Papadopoulou T. Preparticipation medical evaluation for elite athletes: EFSMA recommendations on a standardized preparticipation evaluation form in European countries. BMJ Open Sport Exerc Med. 2021 Oct 19;7(4):e001178. doi: 10.1136/bmjsem-2021-001178. PMID: 34745648; PMCID: PMC8527121.

for elite athletes: EFSMA recommendations on a standardized preparticipation evaluation form in European countries". In 2018, two researchers applied a questionnaire to evaluate the status of the PPE in Europe. 30 European countries participated in the questionnaire. The questionnaire aimed to evaluate the medical evaluation: its implementation, its costs, and its effectiveness. The paper stated that medical evaluation is mandatory in most European countries (21 out of 35 which is around 70% of the European countries) but only in some competitive sports, and it is recommended in only nine of them. The department responsible for doing this evaluation differed between sports medicine specialists and general practitioners who have had specialized certificates in areas such as electrocardiography (ECG). The summary of this research emphasized the importance of the medical evaluation of athletes in all European countries and the importance of working to raise awareness and raise the competencies of medical staff to carry out the tasks related to the medical evaluation for athletes. The European Federation of Sports Medicine Associations considered the interest in the medical evaluation of athletes and their development as an essential step toward improving the athlete's health and performance in the short and long term.

- Researchers from Italy published a paper in 2019 in the British Journal of Sports Medicine[30] on the Italian preparticipation evaluation program commencing from the fact that since 1982[31], Italian law mandates that

[30] Vessella T, Zorzi A, Merlo L, Pegoraro C, Giorgiano F, Trevisanato M, Viel M, Formentini P, Corrado D, Sarto P. The Italian preparticipation evaluation program: diagnostic yield, rate of disqualification and cost analysis. Br J Sports Med. 2020 Feb;54(4):231-237. doi: 10.1136/bjsports-2018-100293. Epub 2019 Jul 17. PMID: 31315826; PMCID: PMC7029244.

[31] Decree of the Ministry of Health 18/02/1982 "Rules for the health care of competitive sport activities"

every competitive athlete must undergo an annual preparticipation evaluation (PPE). The study included 5910 healthy athletes, and during a 12-month study period, a total of 32 (0.5%) athletes were temporarily or permanently disqualified from competitive sports. The researchers indicated that the PPE allowed the identification of 70 cardiac vascular diseases not considered to be at risk of Sudden Death (SD) but that require treatment or follow-up, and 31 relevant non-CV conditions such as asthma, visual impairment, or scoliosis. This paper stated that some medical conditions detected through PPE were hereditary cardiac diseases. When these diseases were detected in the athlete's medical evaluation, a follow-up screening was requested for the athlete's family and in three of them, family members were diagnosed with the disease that they were not aware of.

This study raised a concern regarding the exclusion of athletes from competitions. Some health conditions might not be very dangerous but the athlete still got an exclusion. The concern was raised due to the high number of these cases. After reviewing the development of implementing the medical evaluation in Italy and its updated recommendations, the study found that only 0.5% of athletes were excluded at present. These athletes were not deprived of the psychological and physical advantages of the rest of the athletes. Rather, they receive their medical follow-up and treatment as special cases. They have continued their training under intensive or directed medical supervision that ensures their safety.

The Apunts Sports Medicine Journal published a retrospective study[32] in 2022. The study aimed to assess the effectiveness of a tailored Pre-Participation Medical

[32] Pi-Rusiñol, Ramon, et al.. "Pre-Participation Medical Evaluation in Competitive Athletes: The Experience of an International Multisport Club." *Apunts Sports Medicine*, vol. 57, no. 213, 2022, p. 100369., https://doi.org/10.1016/j.apunsm.2021.100369.

Examination (PPME) before sports practice for athletes competing in team sports in the Football Club Barcelona (FCB) by analyzing the data of 2570 athletes between the ages of 12 and 35 years from 12 different teams after being subjected to PPME. The analysis classified the results into three main categories: healthy, minor abnormal findings, and pathological conditions. Approximately 19% of the athletes showed cases with pathological conditions that required therapeutic medical intervention which is considered a relatively high number. Despite the limitations, the study concluded that the PPME protocol allowed for providing early and specific treatment and implementing strategic and preventive programs.
A group of researchers from Aspetar Orthopedic and Sports Medicine Hospital in Doha has published a cross-sectional study[33] in 2016 in the British Journal of Sports Medicine to assess health conditions detected by a comprehensive PHE in professional male football players that were qualified to compete in Qatar Stars League (QSL) and evaluate their consequences for participation clearance. They subjected 558 professional football players to complete PHE in either 2013 or 2014 (each player had the choice to complete the PHE in either year). The conducted PHE included medical history, blood tests, cardiovascular and musculoskeletal examinations, and lower extremity strength and flexibility tests. It turned out that in 95.5% of the players, at least one health condition was detected and required treatment. 69 players were not given medical clearance to participate, and one player was disqualified from competitive football. In conclusion, the researchers stated that a targeted PHE in professional Qatari football players is beneficial in detecting current health conditions for which treatment, investigation, or

[33] Bakken A, Targett S, Bere T, *et al.*
Health conditions detected in a comprehensive periodic health evaluation of 558 professional football players
British Journal of Sports Medicine 2016;**50:**1142-1150.

prevention management can be instigated. However, the study recommended that studies should be conducted to evaluate each component of PHE separately.

The International Olympic Committee published a Consensus Statement on periodic health evaluation of elite athletes[34] in 2009, which reviewed the data of 10,500 athletes from 204 countries studied at the Olympic Games in Beijing explaining the purpose of the medical evaluation and its general requirements, then detailed cardiac and non-cardiac examinations, i.e., chest, blood, allergic diseases, and even ear, nose, throat, skin, ophthalmic and dental diseases as well. In this Consensus Statement, a paragraph about health problems related to females, as well as providing ideas about the future update related to each part of the athlete's medical assessment. In the end, the study submitted a medical evaluation form for the athletes by collecting existing forms, including those in widespread use. These included the FIFA Pre Competition Medical Assessment (PCMA), the Pre-Participation Physical Evaluation form[35], the electronic Pre-Participation Evaluation[36], the National Hockey League Pre-Participation Medical Evaluation form, plus specialized forms including the American Heart Association recommendations[37], the Lausanne Recommendations[38]. The Statement has also reviewed the value of the scientific advisors at the International Olympic Committee. These advisors are capable of monitoring new developments in the field of PHE.

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[34] Ljungqvist A, Jenoure P, Engebretsen L, *et al.* The International Olympic Committee (IOC) Consensus Statement on periodic health evaluation of elite athletes March 2009 *British Journal of Sports Medicine* 2009;**43:**631-643.

[35] . *American Academy of Family Physicians, American Academy of Pediatrics, American College of Sports Medicine, American Medical Society for Sports Medicine, American Orthopaedic Society for Sports Medicine. Preparticipation physical evaluation*. 3rd edn. Minneapolis: McGraw-Hill, 2005.

[36] Prevalence of positive responses on sports preparticipation screening in Ohio students. Clin J Sport Med 2003;**13**:381

[37] Recommendations and considerations related to preparticipation screening for cardiovascular abnormalities in competitive athletes: 2007 update. Circulation 2007;**115**:1643–55.

[38] Sudden cardiac death in athletes: the Lausanne recommendations. Eur J Cardiovasc Prev Rehabil 2006;**13**:859–75.

3. Chapter Three: Methodology

3.1 Mode:

The study will use a qualitative methodology. The qualitative method is used to understand people's beliefs, experiences, attitudes, behavior, and interactions. It generates non-numerical data. The integration of qualitative research into intervention studies is a research strategy that is gaining increased attention across disciplines[39].

3.2 Segments:

3.2.1 Interviews:

Interviews were conducted on fixed dates by prior agreement with the previously named gentlemen.

The interview questions were intended to obtain specific and useful answers regarding:

- Implementation of the medical protocol or medical evaluation system for athletes

- Challenges facing the Olympic Committee in implementing the medical protocol

- The effect of applying the medical protocol on athletes and their performance

- Methods of evaluating the application of the approved medical evaluation system

- Recommendations and advice for countries that do not have a medical protocol in the initiation and evaluation process

[39] Pathak, V., Jena, B., & Kalra, S. (2013). Qualitative research. *Perspectives in clinical research*, *4*(3), 192. https://doi.org/10.4103/2229-3485.115389

3.2.2 Case studies:

In this section, three different experiences in the field of medical evaluation of athletes will be reviewed:

- Norway's experience in the field of medical assessment of athletes'[40] implementation of a national medical evaluation system. This medical evaluation system was designed to begin when the coaches of the national teams submit the names of the athletes nominated for the Summer or Winter Olympics a year or two before the start of the Olympic Games. These nominated athletes were included in a medical monitoring program where information got collected every week via an electronic online form. Through the form, the athlete, with the guidance of his/her coach, could enter data regarding his/her health. The athlete could also enter data when an injury occurs. To do so, athletes were provided with current consensus-based definitions to assist their classification of health problem types and the characterization of their occurrence[41].

  A team of General Physicians (GPs) and psychiatrists reviewed the athletes' entries and requested additional investigations for those who show concerning data to have them put under intense follow-up mode.

  Since the start of the medical evaluation program in Norway ten years ago (in 2012), the system has been updated and developed several times and at several levels to improve the athlete and medical staff's interaction with the program,

[40] Clarsen B, Steffen K, Berge HM, *et al.*
Methods, challenges and benefits of a health monitoring programme for Norwegian Olympic and Paralympic athletes: the road from London 2012 to Tokyo 2020
British Journal of Sports Medicine 2021;**55:**1342-1349.

[41] International Olympic Committee consensus statement: methods for recording and reporting of epidemiological data on injury and illness in sport 2020 (including STROBE extension for sport injury and illness surveillance (STROBE-SIIS)). Br J Sports Med 2020;**54**:372–89.doi:10.1136/bjsports-2019-101969

and in 2018, the electronic form was converted online into a mobile application to facilitate its use.

Through the athletes' input, information regarding training and outage periods is obtained to be also shared with the coaching staff. The medical evaluation system respects the information trust and confidentiality obligations that fall under the European Union's GDPR law[42].

The summary of the Norwegian experience finds that the long-term medical evaluation for athletes benefits both the athlete to maintain his/her health and performance, as well as the coaches to know the level of physical readiness they are dealing with, as the data collected can be used in several forms and all are in the interest of improving sports work. Researchers believe that this experience can be applied more widely and it can benefit the field of Olympic and Paralympic sports.

- In Great Britain, four researchers from the Sports Medicine department in Qatar, the Performance department of British Athletics in the UK, and the International Association of Athletics Federations designed an integrated system[43]. This system combined technical and medical sections to follow up with the athlete simultaneously and automatically. In other words, in one system, there is a coaching official and a health official in addition to a structural system that includes general practitioners, specialists, and head and secondary coaches. This experience was applied to track and field athletes in 2012. The system aims to ultimately improve the athlete's performance.

[42] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016

[43] Dijkstra HP, Pollock N, Chakraverty R, Alonso JM. Managing the health of the elite athlete: a new integrated performance health management and coaching model. Br J Sports Med. 2014 Apr;48(7):523-31. doi: 10.1136/bjsports-2013-093222. PMID: 24620040; PMCID: PMC3963533.

Follow-up is conducted throughout the year, with special follow-up in the training and preparatory camps for external competitions.

To implement this system, it was necessary to provide private medical insurance for all athletes, and with time, the British experience was enriched by the development of medical facilities within sports centers for national sports organizations in addition to allocating a medical diagnostic base in a central hospital in London, and thus a multidisciplinary system was formed that can perform monitoring, diagnosis, and treatment of athletes in addition to physical therapy techniques and discussion sessions on physical endurance and effort in training and competition.

Another case study to benchmark is Malawi[44]. Malawi does not have a medical evaluation system for Malawian athletes, due to several reasons, including financial constraints, lack of interest among Malawi's sporting administrators, and the public's lack of knowledge about PPE and its benefits. Despite the fact and reality of the causes and obstacles, the presence of a medical evaluation of the athletes is a cornerstone in sports work, especially after the incident that was published by The Daily Times newspaper on April 7, 2015, in which a Malawian athlete died suddenly. It was discovered that he had a skull tumor that was not medically followed up. From here, Malawian researchers found that in the absence of a medical evaluation and records that reflect meaningful data, the health of athletes in Malawi is at risk.

[44] Chisati EM, Nyasa C, Banda AM. Preparticipation physical evaluation: An opportunity for Malawian athletes. Malawi Med J. 2016 Dec;28(4):182-184. doi: 10.4314/mmj.v28i4.7. PMID: 28321283; PMCID: PMC5348612.

The paper published by these researchers in the Malawi Medical Journal[43] recommends the government to formulate deliberate policies to enforce PPE as a key requirement for sports participation at the local and national levels.

4. Chapter Four: Results analysis and discussion

4.1 Introducing the problem and the medical evaluation

Based on existing knowledge, published studies, opinions, and statements obtained from the interviews conducted, as well as the athletes' medical evaluation systems in different countries and institutions, it appears that the importance of medical evaluation of athletes is not disputed. This holds regardless of how the evaluation is conducted, and the different periods between evaluations. Nevertheless, medical evaluation of the athletes is absent from many countries and institutions, and Syria is one of these countries that went through a painful experience at a high sporting level, i.e. in the Olympic Games when Syria lost the opportunity to win an Olympic medal in the 2016 Rio de Janeiro Olympic Games, as one athlete suffered from unpleasant symptoms resulting from undiagnosed anemia under the physical and psychological stress that has already existed due to the competitions.

Currently, Syria does not have a medical evaluation system for athletes, but there is a medical commission affiliated with the Syrian Olympic Committee, and there is a Memorandum Of Understanding (MOU) between the Syrian NOC and a central university hospital in the capital, Damascus. Under this MOU, medical examinations and investigations for athletes' health have already been conducted in certain circumstances and upon special requests by the NOC.

According to the statement of Dr. Marwan Doweier, head of the Medical Committee of the Syrian Olympic Committee, experience has proven that the medical protocol for the athletes is a cornerstone in the continuation of the Syrian sport, as, without it, the safety of the athletes cannot be assured when they come to training, and accurate results of technical performance cannot be predicted[45].

[45] Dr.Marwan Doweier, Interview in person by author, Damascus-Syria, July 7th, 2022.

Jordan also suffered from the same painful experience when an athlete died suddenly on the field, and this was one of 14 sudden deaths of sports athletes in the history of Jordan.

Dr. Zaid Habashneh[46], the national coordinator of the Qusai Medical Initiative, which was launched to take care of the health of the athletes and carry out their medical follow-ups in Jordan under the patronage of the Crown Prince, said that before the initiative was launched, the athletes' families used the slogan: "We will not send our children to the stadium to die." Indeed, things have changed dramatically since the launch of the initiative." Dr.Zaid stated that the initiative is sponsored and supervised by the Jordanian Crown Prince and is not connected to the Medical Commission of the Jordan Olympic Committee, but is entrusted with the medical care of professional athletes until 2023. After that, the initiative will become a program of the Jordanian Olympic Committee.

Moreover, Mr.Antoine Atallah, the General Manager of Major Games Integration and Health Services at the Canadian Olympic Committee, stated[47] that there is no national medical evaluation system in Canada, but there is a medical evaluation system dedicated to each institution or sports federation. Currently, the Canadian Olympic Committee sends to the athletes a health questionnaire to fill out before participating in the tournaments and assigns sports medicine specialists to go with the Canadian delegations to major games.

The Canadian Olympic Committee is currently discussing ways to form a single national database that can collect information related to the medical evaluation of athletes regularly. However, there are many challenges such as the finances since

[46] Dr. Zaid Habashneh, Interview by author, online, July 4th, 2022.
[47] Mr. Antoine Atallah, Interview by author, online, July 11th, 2022.

the costs will be large, as well as the difficulty in the cooperation of all sports-related institutions which may hesitate to share the information they collect. In other words: 'It takes administrative coordination.'

4.2 Medical evaluation designation methods

There are currently many types of medical evaluation systems for sports athletes worldwide. For example, a form is filled out when the athlete joins the ranks of the national team, according to which medical follow-ups are carried out by case. Another example is periodic group examinations that are held once or twice annually. There are also electronic forms that athletes upload their data and then the data is evaluated regularly by medical specialists.

The various forms of medical evaluation systems for athletes were constructed by analyzing data from surveys and questionnaires, studying statistics related to injuries and their types, and diseases and their spread, then providing prototypes of medical evaluation systems that are constantly developing. Some medical evaluation protocols include detailed information about each organ of the body, and some ask for general information and then dive into the details through additional individually directed questions and forms. The medical evaluation form provided by the researchers at Aspater, Doha[48], included medical history, blood tests, cardiovascular and musculoskeletal examinations, and lower extremity strength and flexibility tests. Whereas researchers from the University of Nevada[49] defined the ingredients of medical evaluation forms to include the key symptoms

[48] Bakken A, Targett S, Bere T, *et al.*. Health conditions detected in a comprehensive periodic health evaluation of 558 professional football players *British Journal of Sports Medicine* 2016;**50:**1142-1150.
[49] Farzam K, Akhondi H. Sports Participation Evaluation. [Updated 2022 Jan 19]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK539688/

of common illnesses and medical history in athletes, also, supplement and drug use, and cardiac screening tests. Norway's[50] model relies on athletes inserting every health problem they face, then the specialists categorize these problems and provide a diagnostic code for every health problem reported by the athletes. Dr.Habashneh stated that Jordan's Pre Competition Medical Assessment includes cardiology tests, blood tests, nutrition investigations, functional tests, ophthalmic tests, and physiological tests.

4.3 Medical evaluation implementation levels and scopes

The medical evaluation system for athletes is applied on a national level, such as in Norway, or a specific level in one sport, such as in Britain. Some studies mentioned the application of the medical evaluation system for athletes at the level of central clubs such as Spain.

In the Jordanian experience, Dr. Zaid Habashneh stated that the application of the medical evaluation system for athletes began at a national level for specific elite athletes, and then expanded to include all elite athletes, with a strategic plan aiming to generalize the experience to all sports federations spanning all their athletes. This is done as it is very difficult to implement the medical evaluation system on the levels of clubs and local sports committees due to the lack of experts on this level and the high costs of doing so.

The medical evaluation system is often implemented under the supervision of the Medical Commission of the National Olympic Committee. Therefore, the Medical Commission of the National Olympic Committee conducts the analysis and

[50] Clarsen B, Steffen K, Berge HM, et al. Methods, challenges and benefits of a health monitoring programme for Norwegian Olympic and Paralympic athletes: the road from London 2012 to Tokyo 2020. British Journal of Sports Medicine 2021;55:1342-1349

monitoring of the implemented medical evaluation, but also some institutions might assess and analyze the implemented medical evaluation. For example, researchers from the University of Nevada started a continuing education activity in January 2022 to review the fundamental components of a medical evaluation, while in Canada, research and studies are conducted by sports organizations and universities, not by or through the Canadian Olympic Committee. Also, some studies are supervised by separate initiatives such as the case in Jordan, and some are supervised by a committee composed of several people working in different places and positions related to sports training and development. These multiple examples highlight the heterogeneity of the application of athletes' medical assessment which may reflect on the quality of provided services.

In a Gulf country, an anonymous representative of the medical committee in the National Olympic Committee says[51] that their medical evaluation is carried out through institutions, that is, national federations and clubs, without a unified evaluation at the national level, and its application varies according to the capabilities of each federation or club in terms of material and expertise

4.4 Concerns regarding designing and applying a medical protocol

Medical evaluation of athletes remains a topic of research today, given the pathways established by the Medical Committee of the International Olympic Committee to develop recommendations for the medical evaluation of athletes. Even considering this process began 52 years ago, many countries have yet to implement a medical assessment system for their athletes. The above facts show

[51] Anonymous representative from a Gulf country, interview by author, online, July 7th, 2022.

that there are many challenges and obstacles that prevent us from achieving our ideal goals.

Syria, for example, does not have a medical evaluation for athletes. The most significant limitations are the consequences of the war, which led to the loss of documents and data such as reports of old championships, camps, and training for the national team athletes, as well as the presence of reference people who could have provided important information but became not reachable during the war years because of either traveling outside the country or passing away. There are also financial challenges and obstacles related to demographic changes in the region.

As for countries that started implementing a medical evaluation system for athletes, they faced many challenges during the formation of this system, and are still facing obstacles during its application. Due to Dr. Habasneh's and Mr.Attalah's statements, the most prominent of these obstacles reside in the financial aspect, as the application of a medical evaluation system for athletes requires costs related to operating medical centers and conducting periodic surveys and examinations. In addition, there are costs related to the means of application such as programming and required technical equipment, per se, as well as costs related to medical insurance for athletes. This opens another door to other challenges, one of them being the coordination and administrative organization. The implementation of a medical evaluation system for athletes requires cooperation between the various institutions, whether governmental or private, and this needs good management, guidance, and clear plans to be agreed upon. Such matter represents an important challenge because it relates to the nature of the officials, and their understanding and appreciation of projects related to the health of athletes.

In Canada, for example, according to Mr. Attallah, one main challenge in conducting the medical evaluation for athletes is the long geographical distances between regions and cities, in addition to the unavailability of some athletes due to their training in other environments that are more convenient to their programs. Another challenge relates to geographical distance, as sometimes a professional athlete has to visit a local doctor for a medical review, and this doctor may not be familiar with the specifics of cases in athletes. This challenge was overcome by assigning a contact person whose job was to stay in touch with the athlete and report any medical conditions faced and direct the athlete to the best possible solution.

Also, other challenges in Canada are the medical evaluations of professional athletes who are sponsored by companies such as Nike and its team conducts the medical examinations for their athletes in different places such as Europe, the United States of America, and others.
While in the Gulf state, the anonymous representative interviewed says that the biggest obstacle is the difference between the levels of sports federations and clubs, as there are very small institutions and there are huge institutions with high potential, which makes it difficult to standardize and track the medical evaluation and unify the database.

Regarding finances, Dr.Habashneh stated that it would have been extremely hard to create and apply a medical evaluation system for athletes without the sponsorship and support of the official office of the Crown Prince. Also, it would have been very challenging if Jordanian athletes were not guaranteed with medical insurance because a successful application of the medical evaluation system will require tests and investigations which would be very expensive for athletes if not

covered by the Olympic committee or any other governmental or private foundations.

4.5 Assessment of implementing a medical evaluation system

Countries that have implemented a medical evaluation system have witnessed several benefits starting from the decrease in sudden death cases, unpredicted medical incidents, and post-competition intensive fatigue, and not exclusive to maximizing the athlete's performance in training and competing. In a study of the pre-participation medical examination protocol applied by Football Club Barcelona, up to 20% of athletes had medical issues detected by this protocol otherwise be missed. It appeared that periodic medical evaluation not only boosts athletes' health and performance, but it also raises their sportive spirits and makes them feel valued as athletes to the foundations that they play for; Olympic Committees, national federations, local clubs, and private institutions.

In Jordan's case, the medical evaluation that is conducted twice annually, in combination with an integrated coaching and managing system, eased the road to the first Olympic medal in 2016. After that, Jordan's participation in minor and major games became more productive as its delegation was 38 athletes in the former Asian Games, Jakarta 2018, and they got 12 medals. Dr.Habashneh stated that this success was due to the integrated system of medical and technical follow-ups, as well Mr.Atallah stated that the athletes from countries that conduct the periodic medical evaluation have a greater chance of competition than those from countries where they are not medically followed up.

Assessing the effectiveness of the medical evaluation of the athlete is carried out by multiple means, the most important of which is keeping statistics and introducing questionnaires about the results of the medical evaluation, the impact on the athletes and the Olympic Committee, and the athletes' comfort levels. One

of the best examples is the Norway model, which has adopted electronic forms through which the athlete could enter any data believed to affect him, thus, specialists would be able to follow it closely and intervene effectively when needed. Another study[52] performed in the USA to assess different medical evaluation methods compared two means of evaluation (questionnaires vs interviews) and found that interviews were 4 times more likely to detect a health problem to intervene promptly than questionnaires.

Given the developments and updates that have been made to the various medical evaluation systems for athletes, and given that many studies urge the continuation of medical evaluation implementation at all levels; the level of the International Olympic Committee, the level of the International Federation, the level of the National Olympic Committees, as well as the level of national federations and clubs, all this emphasis on the effectiveness and importance of the medical evaluation for athletes. This proves that the assessments of the athletes' medical evaluation systems are promising

4.6 Recommendations and advice from the interviews and case studies

Most of the recommendations in the above-published studies urge to follow the long-term medical evaluation system for professional athletes, and some even call for the preparation of integrated systems of technical and medical follow-up. While the Norwegian experience resulted in limited recommendations because what applies to Norway as a country with certain ingredients may not apply to other countries, the European Federation of Sports Medicine Associations recommends

[52] Nabhan, D., Taylor, D., Hedges, A., & Bahr, R. (2021). The Value of the Patient History in the Periodic Health Evaluation: Patient Interviews Capture 4 Times More Injuries Than Electronic Questionnaires. *The Journal of orthopaedic and sports physical therapy*, *51*(1), 46–51. https://doi.org/10.2519/jospt.2021.9821

the inclusion of specialist doctors in sports medicine fields to provide standardized care for all athletes alike.

Dr. Habashneh recommends that Syria, as a neighboring country and similar in many cultural and societal elements, start working today before tomorrow on designing and implementing a medical protocol for athletes and starting by encouraging insurance companies to provide programs specifically for athletes until the financial cost challenge of the application of a program is overcome.

Mr. Atallah believes that working on designing and implementing a medical protocol for athletes in small countries is easier than in large countries, despite the lack of resources and capabilities, as in small countries the National Olympic Committee can lead the entire process and obligate all parties to implement it because it is the only institution concerned with sports affairs in the country. Starting the process can be as simple as submitting a questionnaire to all athletes and starting to form a database of health and medical information.

To overcome the financial obstacles, Mr. Atallah recommended using the Olympic Solidarity grants and starting from the essential point, which is the qualification of doctors specializing in sports medicine through the programs of the International Olympic Committee.

As for Dr. Marwan Doweier, he finds that working on designing a medical protocol is an essential stage in the development of sports work in Syria, but this cannot happen overnight. It rather requires coordination, organization, and correspondence between the sports institution and other institutions in the country, especially since Syria spent ten years in the war and had incurred losses that may affect any new initiative.

Dr. Doweier was asked the research question of this project: (*Is the implementation of a medical protocol for elite athletes in Syria a solution to prevent injuries and improve their training and competition?)* and his answer was: Yes. In the end, there is always a first time for everything, and it is necessary to benefit from all the experiences and studies around the world to create a better reality for the athlete, whether in Syria or anywhere else.

5. Chapter Five: Recommendations

Recommendations are formulated specifically for Syria. It is possible to benefit from these recommendations to implement projects related to periodic medical evaluations for athletes in other countries with conditions similar to those in Syria.

Recommendations are ranked in order of priority. Each recommendation is detailed with action, lead, resources, timescale, and critical success factors:

5.1 Designing a medical protocol as a national model for the medical assessment system for athletes

Action: Formation of a team composed of members of the Syrian National Olympic Committee, members of the Medical Commission of the National Olympic Committee, experts in the field of protocol design, and experts in the field of sports medicine. As Syria lacks experts in sports medicine, sports medicine experts from outside Syria will be consulted.

Lead: The head of the Medical Commission at the National Olympic Committee

Resources:

- The information collected in this research paper, as well as all studies related to the formation of medical protocols
- Passion for making a real difference in the medical care of athletes
- Records of medical treatments carried out for the national athletes by the memorandum of understanding signed between the National Olympic Committee and the University Hospital

Timescale: Within 6 months of starting the implementation of the plan according to a timetable set by the Medical Commission of the Syrian National Olympic Committee, and before reaching the Paris Olympics 2024

Critical success factors:

- Existence of a prototype medical protocol aimed at periodic medical evaluation of professional athletes
- Putting the prototype into practice and start collecting data
- Implementation of the protocol at the level of elite national athletes, especially those who are qualified or have the highest probability to participate in the Olympic Games in Paris 2024

5.2 Working on establishing an insurance program for Syrian athletes

Action:

- Forming communication relationships with insurance companies located in the country, such as the Syrian insurance company[53] which is the company concerned with providing health insurance programs for employees in government sectors in Syria. Also Globe Med[54] which is a Syrian insurance company that has experience in partnering with foundations and organizations, and also, IMPA[55] the Insurance Management Portfolio Assurance.

[53] "السورية للتأمين - الموقع الرسمي." *Www.sic.sy*, www.sic.sy. Accessed 16 Aug. 2022.

[54] Globemed Syria. GlobeMed Syria. (n.d.). Retrieved August 14, 2022, from http://www.globemedsyria.com/

[55] "Insurance Management Portfolio Assurance." *Www.impa-Tpa.com*, www.impa-tpa.com/. Accessed 16 Aug. 2022.

- Study the insurance programs in insurance companies to find the most suitable for the conditions and specifications of sports athletes as youth with medium financial capabilities.
- Drafting a prototype of an insurance program suitable for both the insurance company and the NOC.
- Apply the prototype to a small sample of elite athletes, especially those who are eligible and those who potentially will be part of the Syrian delegation to participate in the 2024 Paris Olympic Games.

Lead: The responsible for Communication and External Relations of the Syrian National Olympic Committee and the Medical Commission.

Resources:

- Data available to insurance companies
- Bilateral relations between the Syrian National Olympic Committee and the insurance company and between it and other foundations such as the ministry of health, teachers union, students national union, and universities.
- The appropriate environment to promote partnership with the approach of the Olympic Games in Paris 2024

Timescale: Simultaneously with the formation of a medical protocol prototype

Critical success factors:

- The signing of a Memorandum Of Understanding between the Syrian National Olympic Committee and the insurance company stipulating cooperation in the field of the success of the project of forming an insurance program for the benefit of athletes

5.3 Seeking to sign Memoranda Of Understanding with university and public hospitals similar to the memorandum of understanding with the University Hospital in Damascus, and to form effective partnerships with them

Action:

- Forming communication relationships with various specialized governmental and university hospitals such as the public Damascus hospital, Tishreen university hospital in Lattakia, and Aleppo university hospital in Aleppo,
- Writing draft memoranda of understanding suitable for both parties
- Signing memoranda of understanding to build mutual relations for the benefit of the athletes

Lead: The responsible for Communication and External Relations of the National Olympic Committee and the Medical Commission.

Resources:

- The memorandum of understanding signed between the Syrian National Olympic Committee and the University Hospital in Damascus
- Existing studies that detail the necessary medical examinations

Timescale: During one year of administrative rotations of the foundations.

Critical success factors:

- Signing memoranda of understanding with various private and government hospitals
- Starting of work on distributing requests for postponed medical examinations from the main university hospital to be performed in the hospitals with which new agreements have been signed

5.4 Benefiting from the information contained in this project and applying it to other National Olympic Committees in countries with similar characteristics to those of Syria

Action: Study the information received and align it with the situation in the country, the conditions of sports medicine, medical follow-up of the athletes, and the capabilities of the status and the National Olympic Committee in terms of financial and management

Lead: Head and members of the Medical Commission at the National Olympic Committee

Resources:

- Studies and data reviewed in this paper and other studies in the medical literature
- Data extracted from interviews and case studies conducted when preparing this study
- Forms and programs for medical follow-up and periodic examination of athletes approved by the various National Olympic Committees around the world
- Data and statistics in hospitals and national health centers
- Existing experiences in the field of protocol design and in the field of sports medicine

Timescale: To be determined in proportion to the circumstances and characteristics of the National Olympic Committee

Critical success factors

- A basic base of information adapted to the conditions of the country and the National Olympic Committee
- A team with passion and dedication to complete the project
- Submit a prototype within the specified time period

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7. Summary

Practicing professional sports requires integration between the technical, health, psychological and administrative aspects. The health aspect has taken an important part in studies, research, and laws issued by the International Olympic Committee, National Olympic Committees, and universities with their research centers. The medical evaluation system for athletes is one of the factors that can help athletes to avoid health issues and succeed in the field. While the medical evaluation system in its various forms exists in many countries around the world, some countries are still trying to design a model that suits their circumstances. This project analyzes if the implementation of a medical protocol for elite athletes in Syria would be a solution to prevent injuries and improve their training and competition. Data was collected from personal interviews with experts involved in the medical evaluation systems in their National Olympic Committees as well as analyzing several case studies. The results were presented and a discussion was argued to assess medical evaluations and the best way to assure the health of the athletes. Recommendations were presented for Syria and its athletes on how to establish a medical protocol that will evaluate the athletes' health periodically and ensure their success.

Résumé

La pratique du sport professionnel nécessite une intégration entre les aspects techniques, sanitaires, psychologiques et administratifs. L'aspect santé a pris une part importante dans les études, les recherches et les lois émises par le Comité International Olympique, les Comités Nationaux Olympiques et les universités avec leurs centres de recherche. Le système d'évaluation médicale des athlètes est l'un des facteurs qui peuvent aider les athlètes à éviter les problèmes de santé et à réussir sur le terrain. Bien que le système d'évaluation médicale sous ses diverses formes existe dans de nombreux pays à travers le monde, certains pays tentent encore de concevoir un modèle adapté à leur situation. Ce projet analyse si la mise en place d'un protocole médical pour les athlètes d'élite en Syrie serait une solution pour prévenir les blessures et améliorer leur entraînement et leur compétition. Les données ont été recueillies à partir d'entretiens personnels avec des experts impliqués dans les systèmes d'évaluation médicale de leurs Comités Nationaux Olympiques ainsi qu'à partir de l'analyse de plusieurs études de cas. Les résultats ont été présentés et une discussion a été argumentée pour évaluer les évaluations médicales et la meilleure façon d'assurer la santé des athlètes. Des recommandations ont été présentées pour la Syrie et ses athlètes sur la manière d'établir un protocole médical qui évaluera périodiquement la santé des athlètes et assurera leur succès.