

COMMITTEE FOR SCIENTIFIC BACKGROUND EVALUATION OF THE DOCTORAL DISSERTATION PROPOSAL

FACULTY OF SPORT AND PHYSICAL EDUCATION TEACHING SCIENTIFIC BOARD

Objective: Committee report about assessment and evaluation of the doctoral dissertation proposal – Azzi Mazen, PhD student

On the 13th teaching-scientific board meeting of the University of Belgrade – Faculty of Sport and Physical Education, which was held on 3rd of July 2025, decision was made about forming the committee for scientific background evaluation of the doctoral dissertation proposal written by Azzi Mazen under the title **”Associations between anthropometric measures, physical fitness, and technical skill development in lebanese youth basketball: a cross-positional study”**. Committee members:

1. Dr. Radivoj Mandić, associate professor, University of Belgrade - Faculty of Sport and Physical Education, Chair
2. Dr. Marija Macura, full professor, University of Belgrade - Faculty of Sport and Physical Education, Member
3. Dr. Jelena Obradović, full professor, University of Novi Sad - Faculty of Sport and Physical Education, Member

After evaluation of the material Committee is handing in the following:

R E P O R T

Biography

Azzi (Georges) Mazen was born in 1976. in Lebanon. Bachelor degree in physical education and sports and Masters in sports science Antonine University in Lebanon. In the 2022/23 school year, he enrolled in the doctoral program at the “Faculty of Sport and Physical Education – University of Belgrade”.

He possesses Level 3 Basketball Coaching Certificate issued by Lebanese Basketball Federation, and Certificate in physical conditioning for teams through Claude Bernard University in France.

Bibliography

1. **Azzi, M.**, Fayad, F. (2022). The effects of Core Training Program on Speed and Agility Performance in Lebanese High School Basketball Female Players. *Al Otrouha Journal*, 1(7), 31-55.

2. Аззи, М., Фајад, Ф., и Стефановић, Ж. (2022). Побољшање перформанси вертикалног скока и анаеробне снаге Либанских кошаркаша кроз плиометријски тренинг. *Годишњак*, 25, 108-121.

Doctoral Dissertation Proposal

Azzi Mazen proposed the topic for his doctoral dissertation: "Associations between anthropometric measures, physical fitness, and technical skill development in lebanese youth basketball: a cross-positional study". In accordance with Article 31, Paragraph 2 of the Rulebook on Doctoral Academic Studies, a public presentation of the doctoral dissertation project proposal was held on March 25th 2025 in front of the members of the Council of Doctoral Academic Studies. Based on the presentation, the topic proposal and the research project for the doctoral dissertation were positively evaluated.

Proposal contains three chapters. First chapter includes: Introduction, Defining the Problem, Purpose, Objectives, Hypotheses and Significance of the Study. Second chapter includes Literature Review, and third chapter explains Method. There is also a proposed references and an appendix.

Theme rationale

In the **Introduction** candidate states that basketball demands a combination of physical, technical, psychological, and cognitive skills, with traits like speed, agility, power, and body height playing key roles in player performance and talent identification. While these attributes help distinguish elite youth players, their direct impact on basketball-specific skills (e.g., shooting, passing, dribbling) is still not fully understood—especially during adolescence, when development varies widely. Although other sports have well-developed talent evaluation systems, Lebanese youth basketball lacks a structured approach for assessing physical and technical skills by playing position. Despite the sport's success in Lebanon, more research is needed to understand how physical and anthropometric traits affect player development and performance.

In the **Defining the Problem** it is stated that technical skills, physical abilities, and anthropometric traits all significantly influence the development and performance of young basketball players, but their specific interactions and variations across playing positions remain unclear. To design effective, role-specific training programs and improve youth development globally—not just in Lebanon—future research should investigate the long-term effects of growth, physical traits, training methods, and broader contextual factors across diverse populations.

The **Purpose** of this study is to examine how anthropometric characteristics and physical abilities affect basketball-specific skills—shooting, dribbling, and passing—among young Lebanese players, with a focus on differences across playing positions. Through statistical analysis, the study seeks to identify key relationships between body composition, agility, power, speed, and technical skill proficiency, offering practical guidance for position-specific training and player development.

To meet the aims of the study, the candidate states the following research **Objectives**: (1) analyze how body composition and (2) physical abilities like agility, power, and speed influence key basketball skills—shooting, passing, dribbling, and defense—in young Lebanese players. It also (3) assesses skill proficiency in relation to morphology and fitness, (4) explores the interaction between anthropometrics, physical fitness, and skill performance using statistical analyses, (5) examines variations by playing position, and (6) provides practical

recommendations for individualized, position-specific training programs to enhance youth basketball development.

The general **Hypothesis** proposes that anthropometric characteristics and physical abilities independently and significantly influence basketball-specific skills—shooting, dribbling, and passing—in young Lebanese players, depending on playing position. Supporting hypotheses specify that various anthropometric measures (e.g., height, weight, BMI, body fat, muscle mass, and fitness index) and physical abilities (agility, power, speed) each significantly impact these technical skills, and that playing position moderates these relationships.

This study is significant as it deepens understanding of how anthropometric traits and physical fitness affect basketball skill development in young Lebanese athletes, offering practical guidance for individualized, position-specific training. It fills a regional research gap, supports talent identification, and provides a comprehensive evaluation model that can inform evidence-based youth development strategies in Lebanon and potentially in other regions.

Chapter **Literature review** contains extensive research on the interplay between anthropometric characteristics, physical fitness, and technical skill development in youth basketball, with a particular focus on positional differences. Drawing from over ten key empirical studies—including international and regional sources—the chapter establishes a solid foundation for understanding how variables like body composition, height, arm span, muscle mass, fat percentage, agility, speed, and power contribute to basketball performance.

The chapter is structured around several core concepts:

Motor Learning and Skill Acquisition: Theoretical models such as Fitts and Posner’s stages of learning and the Integrative Model of Sports Performance are used to explain how players develop technical skills (shooting, passing, dribbling) through repeated, context-based practice that integrates physical, cognitive, and emotional components.

Body Composition and Performance: A detailed breakdown of skeletal muscle mass, body fat, and performance indices (e.g., SMMI, BFMI) is provided, illustrating their role in explosive actions, endurance, agility, and positional advantage. Taller, leaner athletes tend to have an edge in jumping and sprinting, while guards benefit from lower body mass and high mobility.

Assessment Methods: Various methods of body composition analysis are discussed, including skinfold calipers, BIA, DEXA scans, and hydrostatic weighing, each with strengths and limitations depending on context and resources.

Physical Abilities – Strength, Speed, Agility, Endurance, and Flexibility: These attributes are essential for all basketball positions but vary in emphasis. Strength and power are critical for centers and forwards, while speed and agility are prioritized for guards. Flexibility and endurance support injury prevention and game-long performance, especially during adolescent development.

Technical Skills: The chapter covers how foundational basketball skills are acquired and refined, stressing the need for position-specific training. Guards require quick decision-making and ball control, forwards need a balance of interior and perimeter skills, and centers depend on strength, height, and reach for rebounding and post play.

Positional Profiles and Performance Demands: Using both qualitative and quantitative data, the chapter compares positional roles, supported by evidence from NBA combine data and youth athlete studies. It explains how physical and technical demands differ across guards, forwards, and centers, and how tailored training improves effectiveness.

Synthesis of Related Research: Studies from authors like Cui et al. (2019), Gryko et al. (2019), Ilić et al. (2022), Stankovic et al. (2022), Milanović et al. (2011), Turkcapar (2021), and ABU TAHA et al. (2023) are critically analyzed. These studies confirm that physical and anthropometric variables can predict up to 49–89% of variance in technical performance. However, most prior research focuses on Western or elite-level populations, with limited

attention to youth or non-Western contexts—especially in Lebanon. The chapter reveals a robust body of evidence supporting the importance of physical and anthropometric profiling in youth basketball, but also highlights gaps—particularly in multicultural, adolescent, and positional analyses. The reviewed studies collectively justify the present research’s aim to explore how these factors influence Lebanese youth basketball players across positions, contributing to more effective talent identification and individualized training strategies.

This study adopts a deductive, quantitative, non-experimental, cross-sectional design to analyze how anthropometric characteristics and physical abilities influence basketball-specific skills among young Lebanese players (ages 16–18). A representative sample of 260 players (160 males, 100 females) was selected from Lebanese basketball clubs using statistical sampling methods. Participants were classified into three positional groups—guards, forwards, and centers—and were required to have at least three years of regular training and be injury-free. Data collection, scheduled for April 2025, follows ethical guidelines, with informed consent and University of Belgrade ethics board approval. The research involves comprehensive testing procedures:

Anthropometric measurements were assessed using Bioelectrical Impedance Analysis (BIA) with the InBody 270 device, and fixed stadiometer for measuring the body height. Body composition parameters include 6 variables where 2 are basic: (1) Body height (BH) presented in cm; and 2) Body weight (BW) presented in kg, and 4 are calculated as index values as follows:

- Body mass index (BMI), presented in kg/m^2 ;
- Percentage of body fat (PBFM) presented as body fat Mass (BFM) relative to BW, calculated as: $(\text{BF}/\text{BW}) * 100 = \text{PBF} (\%)$
- Percentage of skeletal muscle mass (PSMM) presented as skeletal muscle mass (SMM) relative to BW, calculated as: $(\text{SMM}/\text{BW}) * 100 = \text{PSMM} (\%)$
- Protein Fat Index (PFI) presented as PM relative to BFM, calculated as: $\text{PF}/\text{BFM} = \text{PFI} (\text{kg})$

Physical abilities were evaluated through:

- Vertical Jump Test (to assess anaerobic power and calculate peak power)
- T-Test Agility Drill
- 20-meter Sprint Test with split times

Basketball-specific skills were assessed using validated tests approved by American Alliance for Health, Physical Education, Recreation & Dance:

- Shooting (speed spot shooting test)
- Dribbling (control dribble test through a set course)
- Passing (target passing drill)

All statistical analyses will be performed using IBM's Statistical Package for the Social Sciences (SPSS, version 26). A significance level of $p < 0.05$ has been established. Descriptive statistics: the mean, standard deviation (SD), minimum (min), maximum (max), coefficient of variation (cV%), and Kolmogorov-Smirnov test for distribution homogeneity (KST) will be used to provide the measures of central tendency and variability. However, the following statistical methods will be used to determine the inferential statistics that cover the relationships, significant differences, and predictions among the variables: independent samples t-test, Mann Whitney U Test, Analysis of Variance (ANOVA), Multivariate Analysis of Variance (MANOVA), Pearson and Spearman correlation, and, lastly, Multiple Regression Analysis (MRA).

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CONCLUSION

The topic of Azen Mazija's doctoral dissertation and the planned research aims to address important questions related to the learning and improvement of technical skills in young basketball players in relation to their physical and motor status.

In preparing the dissertation topic proposal, relevant literature was used, based on research analyzing anthropometric characteristics, physical (motor) abilities, and technical skills of young basketball players, with particular emphasis on positional differences, which served as the basis for defining the research problem. The objectives and hypotheses are well formulated, and the proposed methods are thoroughly described and aligned with the stated goals.

The research results are expected to contribute to a deeper understanding of how anthropometric characteristics and physical (motor) abilities influence the acquisition of technical skills. Furthermore, the findings of this study could potentially offer guidelines for improving training processes focused on the development of technical skills in young basketball players.

We propose that the Teaching and Scientific Council of the Faculty accept the Committee's Report and adopt the draft decision approving the doctoral dissertation topic **with the suggestion to the candidate to partly change the title in both, English and Serbian language, so the title of the doctoral dissertation reads: "Associations between anthropometric characteristics, motor abilities and technical skill development in Lebanese youth basketball: a cross-positional study" ("Релације између антропометријских карактеристика, моторичких способности и развоја техничких вештина у либанској омладинској кошарци: студија пресека")** and in accordance with positive legal regulations, refer to the Council of Social and Human Sciences for consideration.

Proposal of the mentor, the mentor's consents and a list of their publications

Considering the nature of the problem that the candidate proposed as a topic for his doctoral dissertation, as well as the cooperation during the preparation of the research, we suggest that Dr. Saša Jakovljević, Full Professor, University of Belgrade - Faculty of Sports and Physical Education, be appointed as the mentor in the realization of the doctoral dissertation.

Saša Jakovljević, Ph.D., full professor, meets the requirements of the Standards for Accreditation of Doctoral Study Programs and agrees to be the mentor in the realization of Azzi Mazen's doctoral dissertation on the proposed topic.

A list of selected papers that Dr. Saša Jakovljević, full professor, published in international scientific journals in the last 10 years, which by their topic belong to the scientific field of Physical Education and Sport, and which are closely related to the proposed topic:

1. Erčulj, F., **Jakovljević, S.**, Todorović, G., & Mandić, R. S. (2024). Some basketball skills of players ages 12, 13 and 14 from three generations. *Kinesiology Slovenica: scientific journal on sport*, 30(3), 63-81.
2. Kocic, A., Ristanovic, L. J., Macura, M., Mirkovic, S., Seman, S., Ilic, V., Labudovic, D., Mrdakovic, V., **Jakovljevic, S.**, Okwose, N., Stojiljkovic, S., & Jakovljevic, D. (2024). Endurance training protects the heart during maximal exercise in long-distance runners. *European Journal of Preventive Cardiology*, 31(Supplement_1), zwae175-281.
3. Arsenijević, R. S., Božić, P. R., Matić, M. S., Berjan Bačvarević, B. B., **Jakovljević, S. T.**, & Pažin, N. R. (2023). Analysis of training load and performance in designing smart bodyweight power training: effects of set structure in vertical jumping sessions. *Kinesiology*, 55(2), 192-201.
4. Ivanović, J., Kukić, F., Greco, G., Koropanovski, N., **Jakovljević, S.**, & Dopsaj, M. (2022). Specific physical ability prediction in youth basketball players according to playing position. *International Journal of Environmental Research and Public Health*, 19(2), 977.
5. Pajić, Z., **Jakovljević, S.**, Anđelković, M., & Simović, S. (2022). Body Mass Index in determination of the relationship between body constitution and motor abilities. *Physical Culture/Fizička Kultura*, 76(1).
6. **Jakovljević, S.**, & Mandić, R. (2021). Serbia-the country of basketball. *Physical Culture/Fizička Kultura*, 75(1).
7. Erčulj, F., Trafela, A., Štrumbelj, E., **Jakovljević, S.**, & Mandić, R. (2020). The effect of practicing with a reduced diameter rim on the efficiency of free throws with young basketball players. *Kinesiology Slovenica*, 26(1).
8. Mandić, R., **Jakovljević, S.**, Erčulj, F., & Štrumbelj, E. (2019). Trends in NBA and Euroleague basketball: Analysis and comparison of statistical data from 2000 to 2017. *PloS one*, 14(10), e0223524.
9. **Jakovljevic, S.**, Macura, M., Mandić, R., Jankovic, N., Pajic, Z., & Erculj, F. (2016). Biological maturity status and motor performance in fourteen-year-old basketball players. *International Journal of Morphology*, 34(2), 637-643.
10. Mandic, R., **Jakovljevic, S.**, & Jaric, S. (2015). Effects of countermovement depth on kinematic and kinetic patterns of maximum vertical jumps. *Journal of Electromyography and Kinesiology*, 25(2), 265-272.

Committee members:

Dr. Radivoj Mandić, associate professor,
University of Belgrade – Faculty of Sport and Physical Education, chair

Dr. Marija Macura, full professor,
University of Belgrade – Faculty of Sport and Physical Education, member

Dr. Jelena Obradović, full professor,
University of Novi Sad – Faculty of Sport and Physical Education, member