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The Effect of Relative Age on the Success of Elite Wrestlers in Iraq: A Descriptive Study

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Original Article

Abstract

Introduction: The term "relative age effect" refers to the age discrepancies among individuals participating in the same sports competition. This phenomenon suggests that younger athletes born in the first half of the year may possess greater physical and cognitive abilities compared to those born in the latter half of the year. The aim of this study was to examine the impact of relative age on the success of elite wrestlers in Iraq.

Materials and Methods: The study involved 477 wrestlers who participated in the national championships of Iraq between 2020 and 2022 in both the freestyle and Greco-Roman wrestling categories. The participants' relative ages were categorized into two half-years based on the month of birth. Those born in the first six months of the Georgian calendar (January 1 to June 31) were assigned into the first half, while those born in the latter six months (July 1 to December 31) were categorized into the second half. Finally, the data were analyzed using the chi-square test (χ^2).

Results: More athletes were born in the first half of the year compared to the second half (54.3% vs. 45.7%, respectively), and most champions were born in the first half (53.6%). However, the groups were not statistically different in terms of the number of athletes and number of champions ($P > 0.05$).

Conclusion: Apparently, the relative age effect is not an impactful factor for Iraqi wrestlers.

Keywords: Wrestling; Birth certificates; Success

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Introduction

What factors contribute to high-level athletic performance? (1) Researchers have examined environmental variables related to the development of athletic talent (2), including an individual's time of birth (2). International federations in most sports have established January 1 as the cut-off date for each age group to classify competitors. In this type of grouping, an almost 11-month age difference can exist between a player born in January and one born in December of the same year (3). The difference in chronological age among group members is called relative age, and the effects of this age difference among individuals born in the same calendar year are termed the relative age effect (RAE) (3).

Growth and maturation do not always correspond to chronological age. Thus, researchers should always consider the distinction between biological and chronological age. Because growth and maturation do not always align with chronological age, distinguishing between biological and chronological age is crucial. The relative age effect highlights a bias that favors athletes born later in the year (2, 3). Although this bias is unintentional, it holds significant implications (4), as older children often enjoy advantages in several areas, including emotional development (5), biological maturation (6), and cognitive capabilities (7-10). Accordingly, relative age

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is considered a determining factor in athletic success (5, 11). As competition intensifies, the existing differences among players become more noticeable (9). Coaches who aim for optimal performance often mistake maturity for talent. As a result, they tend to choose physically and emotionally more mature players, which leads to a higher selection of athletes born in the early months of the year (12, 13).

Some studies have reported findings contrary to the typical relative age effect, a phenomenon referred to as the "reversal of the relative age effect" (RAE Reversal) (14). In some sports, athletes born later in the year tend to receive higher ratings and salaries than their earlier-born peers (14). In artistic gymnastics, a larger size is not always beneficial; gymnasts who are generally younger and smaller in stature often have a competitive advantage (15). A separate study revealed that playing position in rugby significantly affects relative age (16). Most back-position players were born in the year's first three months, while most forwards were born in the last three months (16). Numerous studies have reported the relative age effect across various sports, including athletics and swimming (17, 18), football (19, 20), basketball (21), judo (22, 23), boxing (24), and winter sports (25). Delorme (26) emphasized that the influence of relative age in combat sports should be viewed differently than in other sports. This distinction is important because athletes in combat sports compete within specific weight classes. These classifications help to address and reduce the disparities in maturity and physical ability among younger athletes, which can be influenced by relative age. Albuquerque et al. (27) reported relative age effects among Olympic heavyweight judo athletes, challenging the previous hypothesis concerning the impact of weight classes.

Relative age effects are evident in sports where physical traits such as body mass, height, strength, and the level of physical contact are crucial. Wrestling is a martial art with a weight-class system that relies on strength and muscular power (29, 30). Furthermore, this sport involves the most direct contact with the opponent (31). Therefore, wrestling is a compelling model for investigating the mechanisms that explain the effects of relative age in combat sports. Therefore, wrestling is a persuasive model for investigating the mechanisms that explain the effects of relative age in combat sports. In addition, this sport is popular in Iraq, and data on the impact of birth date on success (such as winning medals) may be used for sports planning and forecasting performance outcomes in the country. Accordingly, this study explored the effect of relative age on competitive outcomes among Iraqi wrestlers.

Materials and Methods

This study was descriptive in design and used a survey method for data collection. It was carried out in the summer of 2023. This study analyzed 477 junior wrestlers competing in Iraqi national freestyle and Greco-Roman championships, comparing 159 medal-winning athletes (first to third place) against 318 non-medalists (fifth to eighth place). Data on the performance and date of birth of selected players in national wrestling competitions were collected from the Iraqi Wrestling Federation reference website (https://uww.org/). The relative age of participants was assessed based on their birth month. Individuals born in the first six months of the year (January 1 to June 30) were categorized as being in the first half of the year, while those born in the last six months (July 1 to December 31) were classified as being in the second half. At the national level, success was defined as whether participants won a medal. This study utilized SPSS software version 26 (IBM Corp., 2018. IBM SPSS Statistics for Windows, Version 26.0, Armonk, NY, USA) for data analysis. The chi-square test identified statistically significant deviations. We assumed that 50% of athletes were born in the first half of the year and 50% in the second half to calculate statistically significant differences across all athletes. For other indicators, we considered the actual distribution of athletes born in the first and second halves of the year to obtain statistical significance. We used a significance level of 0.05. Additionally, because we obtained this information from the Iraqi Wrestling Federation website, written consent was not required for participation, in accordance with national laws and organizational requirements.

Results

The study cohort comprised 477 wrestlers, with a higher proportion born in the first half of the year (57.7%, n=275) compared to the second half (42.3%, n=202). Overall, 159 wrestlers (33.3%) achieved medalist status (top three places), while 318 (66.7%) were non-medalists.

Among medalists, 53.6% (n=85) were born in the first half of the year and 46.4% (n=74) in the second. For non-medalists, 54.7% (n=174) were born in the first half and 45.3% (n=144) in the second. Table 1 provides a detailed breakdown of athlete distribution by birth period and competition performance. Statistical analysis revealed no significant difference in medal success between wrestlers born in the first and second half of the year.

Table 1. The Number and Percentage of Athletes by Relative Age

Type of classification	Group	Number of births in the first half of the year (%)	Number of births in the second half of the year (%)	χ^2	P
Medal-winning status	Medalist	85 (53.6)	74 (46.54)	0.24	0.72
	Non-medalist	174 (54.7)	144 (45.3)		
Total		259 (54.3)	218 (45.7)	2.6	0.08

Discussion

The primary objective of this research was to examine the association between relative age and medal-winning status among wrestlers in Iraqi national competitions. We hypothesized that wrestlers with a relative age advantage (i.e., born in the initial months of the competitive year) would exhibit a higher probability of securing medals than relatively younger wrestlers (i.e., born in the later months). The phenomenon of relative age, determined by an athlete's birth month within an age-defined cohort, has been documented as a potential determinant of success in elite athletic populations (32-34).

Contrary to the initial hypothesis, the current investigation found no statistically significant difference in wrestlers' birth distribution. However, a descriptive trend showed more individuals born in the year's first half. This outcome aligns with existing literature in several athletic domains, where the predictive utility of relative age for elite success is diminished or absent in specific contexts, such as professional basketball and golf (35). Research indicates that the impact of relative age varies by sport position (36). Other studies also suggest that the effect of relative age is influenced by competitors' age group (37). Relative age appears to have a greater influence on success at younger ages, but this effect diminishes as athletes grow older (37).

The data from the present study reveal that in Iraq, relative age does not demonstrably affect success in elite wrestling. Therefore, the relative age index seems unessential for elite Iraqi wrestlers and cannot reliably predict performance results. It remains plausible, however, that this criterion could influence athletes' performance outcomes in different age groups.

Limitations

In this study, we did not collect information on athletes' weight categories, which prevented us from examining the effect of relative age on success within each weight category. Therefore, weight category may influence the effects of relative age.

Recommendations

Future research should broaden the scope to include other age groups and use methods to measure and compare the impact of relative age on wrestlers' athletic success within these distinct age categories.

Conclusion

While relative age effects (RAEs) are documented with varying magnitudes across diverse sporting contexts, the heterogeneity of results across sports indicates a need for a more comprehensive understanding of the mechanisms that dictate their manifestation or absence. In this context, the current investigation found no discernible impact of relative age on the success rates of young Iraqi wrestlers.

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Authors' Contribution

Design and conceptualization of the project: Rokhsareh Badami, Abbas Abdulhamza Kadhim, Hosein Satar Abdolah

Attracting financial resources to carry out the project: Hosein Satar Abdolah

Project support, scientific and executive services: Rokhsareh Badami, Abbas Abdulhamza Kadhim, Hosein Satar Abdolah, Zohreh Meshkati

Data collection: Hosein Satar Abdolah

Analysis and interpretation of the results: Rokhsareh Badami, Abbas Abdulhamza Kadhim, Hosein Satar Abdolah

Specialized statistics services: Rokhsareh Badami, Abbas Abdulhamza Kadhim, Hosein Satar Abdolah

Manuscript preparation: Rokhsareh Badami, Abbas Abdulhamza Kadhim, Hosein Satar Abdolah, Zohreh Meshkati

Critical scientific evaluation of the manuscript: Rokhsareh Badami, Abbas Abdulhamza Kadhim, Hosein Satar Abdolah, Zohreh Meshkati

Approval of the final manuscript to be submitted to the journal office: Rokhsareh Badami, Abbas Abdulhamza Kadhim, Hosein Satar Abdolah, Zohreh Meshkati

Maintaining the integrity of the study process from the beginning to the publication, and responding to the reviewers' comments: Rokhsareh Badami, Abbas Abdulhamza Kadhim, Hosein Satar Abdolah,

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Conflict of Interest

The authors did not have a conflict of interest.

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