ORIGINAL RESEARCH

Relative age effect on Turkish national paralympic athletes

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Abstract

The aim of this study was to systematically examine the effect of the "Relative Age Effect" on the competitive performance of Turkish National Paralympic athletes in individual and team sports at the international level. The literature between January 1985 and December 2022 was reviewed for a comprehensive assessment of the relative age effect. The methodology of the study was determined as "Basic Qualitative Research" and "Document Analysis" was used as the data collection technique. A descriptive analysis approach such as the Miles-Huberman model was adopted to analyze the data. The population of this research consists of Paralympic national athletes, while the sample consists of Turkish Paralympic national athletes. Density sampling was used as the sampling method, meaning that the selection of the sample was concentrated according to certain criteria. The results obtained highlight that the birth dates of Paralympic Turkish National athletes are concentrated in certain periods and which period of the election year they fall in. Additionally, by examining the birth dates of Turkish athletes who won medals at the Paralympic Games, it was seen that the majority of athletes were born in the first half of the election year. In another dimension of the analysis, paralympic national athletes of both genders, men and women, are also affected by the relative age effect.

Keywords: Paralympics, paralympic athletes, relative age effect.

Introduction

Grouping athletes according to age groups is very common in sports (Bayarslan & Çevik, 2023). However, one of the themes of talent identification programs in sports is the attempt to recognize a future "talent" based on the physical and/or anthropometric characteristics of the athlete through cross-measurement models (Çalışkan & Arıkan, 2021). Particularly in team sports, categories often correspond to annual or biannual competition cycles, with competition groupings based on the athlete's chronological age and a predetermined end date (Çevik, 2023). This normally applied strategy sharpens differences between athletes due to their maturation status, which does not necessarily correspond to their chronological age (Wattie et al., 2008). This phenomenon is known as "relative age" and the results are referred to as the relative age effect (Çevik & Bayarslan, 2023; Musch & Grondin, 2001). This feature is often seen in the context of youth sports and is explained as the disproportionate representation of athletes born in the first months of the year because

their maturation process is not yet complete (Barnsley et al., 1985). Therefore, relatively older athletes appear to have more opportunities than their relatively younger peers to reach a higher level of sport in terms of selection and competition performance (Till et al., 2010). This "maturation-selection hypothesis" is the most discussed and cited theory to explain the advantages of relatively older players in team sports where physical quality is predominantly at the forefront (Cobley et al., 2009; Helsen et al., 1998). In some cases, there may be an over-representation of athletes born in the first months of the election year. A reverse case of relative age effect is a phenomenon known as the "underdog effect". Recently, several studies have been conducted regarding this phenomenon in team sports, finding different explanations for its existence and magnitude. From a psychological perspective, relatively younger athletes have been found to present a psychological profile with a high degree of resilience in the early stages of development (Collins & MacNamara, 2012). The aim of this study is to conduct a systematic examination of the effect of the "Relative Age Effect" on

competitive performance in individual and team sports at the international level for Turkish national paralympic athletes. Although the "Relative Age Effect" has been studied in depth in individual and team sports, to our knowledge, its impact on the competitive performance of paralympic athletes is not fully known. The literature published on this subject between January 1985 and December 2022 was examined with one main purpose: Therefore, the importance of this study is to determine the impact of the "Relative Age Effect" on the total sample of Turkish national paralympic athletes and to discover how important it is in competition.

Methods

The method of the research was determined as "Basic Qualitative Research" and the data collection technique in the research was determined as "Document Analysis". The Miles-Huberman model, a descriptive analysis form, was used to analyze the data in the study.

Research Group

Paralympic national athletes constitute the universe of the research. The sample consists of Turkish Paralympic national athletes. Density sampling was used in the sampling method of the research. Density sampling used in qualitative research includes the best or most informative examples of the phenomenon under study rather than extreme or unusual situations (Morgan & Morgan, 2008). Density sampling is generally used in heuristic-based research, which is one of the qualitative research methods (Mays & Pope, 2000). The phenomenon studied in heuristic research need not be extraordinary, pathological, or contradictory. Instead, it is essential that they contain intense information and have samples that can reach different and new information over time (Strauss & Corbin, 2015). The intuitive approach aims to discover and make sense of the nature of the event or phenomenon under study through the researcher's own experiences and subjective explanations (Denzin & Lincoln, 2008). It enables the researcher to clearly express and make sense of the creative thought that exists within him. The heuristic approach is the only research approach that allows the researcher to establish subjective and creative connections between the researcher and the phenomenon under investigation, taking into account the tacit knowledge of human experiences (West, 2001).

Ethic statements

The ethics committee decision for this study was taken from Kilis 7 Aralık University. Ethics Committee Permission was obtained for the research (Document date and number: 14.04.2023-2023/8 E-76062934-044-22861).

Data Collecting

Quantitative research has a hypothesis-based orientation. In qualitative research, the problem situation related to the event or phenomenon examined is transformed into a question sentence. The questions to be addressed in the research were answered by adhering to the principles of qualitative research methods. Because, as discussed in the literature, qualitative research is based on criticism of the ontological, epistemological and axiological assumptions of the quantitative research paradigm (Tanyaş, 2014).

Based on an interpretive philosophy, qualitative data analysis is usually a combination of (i) rough analysis (review, condensation, and summarization) and (ii) detailed analysis (categorized elaboration, hermeneutic interpretation, data description) of the data set under study. The aim is to produce common explanations by describing various data in detail or comparing different data (Flick, 2013). In qualitative research, the analysis process basically involves understanding the essence of large amounts of data by reducing the volume of raw data, identifying important patterns, and creating a logical chain of evidence for the phenomenon under investigation by extracting meaning from the data (Patton, 2014). For the validity of the research, data triangulation was made and data collected from at least 2 different sources were interpreted by document review. Thus, the internal validity of the study was increased. The data is taken from archives containing information about the Paralympic Games, Paralympic World and European Championships finals, which can be accessed online. By using the document analysis method in qualitative research, accessible information and characteristics of successful national athletes were collected to be interpreted within the scope of qualitative research.

Data Collection Tools

For the research, databases containing open access information about the athletes from the official website of the Ministry of Youth and Sports (GSB, 2023) and the official website of the Turkish National Paralympic

Committee (TMPK, 2023) were used. It is aimed to access the necessary documents by examining e-content documents containing athlete data. In addition, validity-reliability is handled differently in qualitative research than in quantitative research (Yıldırım & Şimşek, 2013). In terms of the reliability of the research, the internal validity was increased by using the "triangulation" technique, which is perhaps the most known and applied strategy. Data triangulation is the comparison of results from two or more data sources. In this way, the weaknesses of one of the methods can be compensated by the strengths of the other method (Streubert & Carpenter, 2011). In this study, documents taken from at least two different databases were compared and examined.

Data Analysis

In this research, it is aimed to provide a basis for data analysis with the theory known as 'Embedded Theory'. This type of analysis was developed by Glaser and Strauss (2006). Grounded theory is used as both a research strategy and a data analysis method. Grounded theory is called the most impressive paradigm for qualitative research method today (Ilgar & Ilgar, 2013). In the grounded theory approach, data collection and data analysis are closely intertwined. Each collected data can be directly compared with consecutive data. The grounded theory method consists of systematic but flexible instructions developed to collect and analyze qualitative data, and this approach focuses on creating theories that are embedded in and derived from data (Charmaz, 2006). In the grounded theory approach, data analysis involves a well-defined process and starts with basic descriptions, progresses to conceptual organization, and eventually turns to theorization (Patton, 2002). This method has become a solid basis for the qualitative approach to be accepted in the scientific world by ensuring that qualitative research is evaluated according to quantitative standards (Atkinson, 1997).

Results

Table 1, a total of 169 paralympic Turkish national athletes in 15 different sports branches were examined based on their birth dates. It was observed that 96 of the athletes were born within the first 6 months of the election year and 73 were born in the last 6 months.

When the Turkish athletes who won medals and success in the Paralympic Games are examined according to their sports branches based on their birth dates in Table 2; it was observed that 24 of the 41 medal-winning athletes were born in the first 6 months of the year and 16 were born in the last 6 months of the year.

Table 1

Relative age effect on Turkish national Paralympic athletes (www.tmpk.org.tr 30.07.2023).

Sport Branches	n	Born within the first 6 months of the year	Born within the last 6 months of the year
Para Football (5 Team Player)	16	11	5
Para Goalbol	22	11	11
Para Ski (Alpine Skiing)	2	2	-
Para Shooting	11	3	8
Para Athletics	20	6	14
Para Badminton	2	2	-
Para Lifting	11	10	1
Para Judo	13	8	5
Para Table Tennis	10	4	6
Para Archery	24	16	8
Para Taekwondo	6	6	-
Para Swimming	8	5	3
Para Basketbol	21	10	11
Para Fencing	1	1	-
Para Tennis	2	1	1
Total	*169*	*96*	*73*

Table 2

"Relative age effect" of Turkish national athletes who won medals in the Paralympic games (www.tmpk.org.tr 30.07.2023).

Sport Branches	Medal Winner at the Olympic Games	Born within the first 6 months of the year	Born within the last 6 months of the year
Para Football (5 Team Player)	-	-	-
Para Goalbol	17	10	7
Para Ski (Alpine Skiing)	-	-	-
Para Shooting	2	-	2
Para Athletics	-	-	-
Para Badminton	-	-	-
Para Lifting	4	4	-
Para Judo	6	4	2
Para Table Tennis	5	3	2
Para Archery	4	1	3
Para Taekwondo	2	2	-
Para Swimming	1	-	-
Para Basketbol	-	-	-
Para Fencing	-	-	-
Para Tennis	-	-	-
Total	*41*	*24*	*16*

Table 3

"Relative age effect" status of Turkish national Paralympic athletes by gender (www.tmpk.org.tr 30.07.2023).

Paralympic National Athlete	n	Born within the first 6 months of the year	Born within the last 6 months of the year
Men	102	57	45
Women	67	40	27
Total	*169*	*97*	*72*

Table 3, the "Relative Age Effect" Situation of Turkish National Paralympic Athletes according to their Gender is examined. It was determined that in the group consisting of 102 male and 67 female athletes from 15 different sports branches, there were more athletes born in the first 6 months of the year than athletes born in the last 6 months of the year.

Discussion

This study aimed to understand more deeply the "Relative Age Effect" that affects the competitive performance of Paralympic athletes. Based on a large sample of Turkish national paralympic athletes, it aimed to shed light on how this effect emerges and what role it plays in competition. The findings obtained may help us better understand the effect of the age factor of athletes on success. This study makes an important contribution to understanding the factors that shape the performance of Paralympic athletes and to plan future athlete training and development strategies more effectively. Age is a common classification criterion in the world of sports, and the purpose of an age classification system is to increase the likelihood that successful athletes have the most advantageous combination of physiological and psychological characteristics and to control the effect of age on competitive results (Tweedy et al., 2014; Tweedy & Vanlandewijck, 2011). Based on the general results of the existing studies, it can be said that the relative age effect is observed in different branches of sports and plays an important role. Research in a variety of sports such as baseball, ice hockey, netball, rugby, football and tennis involves comparing birth dates between young and experienced athletes. The analyses clearly showed skewed birth date distributions, reflecting the tendency for individuals born in the election year to be more favored. These results enable us to understand how the relative age effect in athletes affects the infrastructure and development processes of sports (Musch & Grondin, 2001). In this context, studies on the relative age effect in the field of sports have been carried out in the relevant literature and its importance has been emphasized (Barnsley et al., 1985; Grondin et al., 1984).

In addition, age grouping is among the organizational strategies used in sports. Such strategies seem to create the impression of promoting relative age advantages (Cobley et al., 2009).

The relative age effect is considered a common phenomenon within elite sport (Delorme, 2009). In the literature, it appears that theories are needed to understand new phenomena of the relative age effect in sports (Handcock et al., 2013). When the relative age effect is investigated in Brazilian paralympic swimmers; it was concluded that the selection process of Brazilian Paralympic swimmers was affected by the time of birth of the athletes (Oliveira et al., 2023). Similarly, in our study, it was observed that Turkish Paralympic National Athletes were mostly born in the first half of the year.

In this study; when the birth dates of a total of 169 Turkish paralympic athletes are examined, the birth distribution of these athletes in different sports branches is remarkable. In this analysis, the distribution of athletes' birth dates according to different periods of the Paralympic selection year was observed. The analysis aimed to group athletes participating in individual and team sports according to their chronological age (Bayarslan et al., 2023) and month of birth. According to the analysis results, it was seen that among the 169 athletes examined, 96 were born in the first 6 months of the paralympic selection year and 73 were born in the last 6 months. This shows that among Paralympic athletes, the period of their birth date in the election year is concentrated in some branches. These data highlight that the birth dates of paralympic athletes are concentrated in certain periods and which period of the selection year they fall in. It is also interesting to examine the birth dates of Turkish athletes who won medals in the Paralympic Games. It was observed that 24 of the 41 medal-winning athletes were born in the first 6 months of the year, and 16 were born in the last 6 months of the year. This data shows that the distribution of the birth dates of medal-winning athletes varies according to the periods of the election year.

Another dimension of the analysis was made according to the gender of the athletes. In the group of 102 male and 67 female athletes in total, it was observed that the number of athletes born in the first 6 months of the year was higher than those born in the last 6 months of the year. This result reveals that the distribution of birth dates by gender differs among Turkish paralympic national athletes. This analysis examined the distribution of athletes' birth dates according to gender

factor and revealed interesting results. This finding is valuable for understanding the impact of gender factor on athlete selection and development strategies. The results of the analysis show that the distribution of birth dates among athletes of different genders is unequal. This situation highlights that the selection and development processes of the athletes should be carefully considered in addition to the gender factor as well as the date of birth.

This data is also important from the perspective of gender equality and equal opportunity. Analysis results can help us identify situations where athletes of a particular gender are over-represented or gain an advantageous position. Recognizing such inequalities is important to ensure that athletes are evaluated based on their abilities and efforts, and that equal opportunity is promoted.

Conclusion

As a result, this analysis shows how the birth dates of Turkish national paralympic athletes are distributed according to the periods of the election year and the different dimensions of these distributions. Such data can help us understand the relationship of athletes' birth dates to their selection year and sport and may influence future athlete selection and development strategies. The importance of such analyzes provides critical understanding for more effective planning of athlete selection, development strategies and competitive performance. For example; The analysis shows how athletes' birth dates are distributed across different periods of the selection year, while also highlighting potential effects on the performance of athletes born in specific periods. This information can help identify young talents at an earlier age and include them in special development programs. For example, more effective development opportunities may be offered to athletes born during certain periods of the selection year. Such analyzes help to plan development and competitive strategies in the sports industry more efficiently, while providing an important basis for maximizing athletes' abilities and promoting equality of opportunity.

In addition, this study contributes to the process of planning athlete selection and development strategies more effectively by revealing the effect of birth dates of Paralympic Turkish national athletes on their competitive performance. Taking such data into consideration, determining future athlete training

policies and strategies may serve the purpose of guiding them to a more successful sport.

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