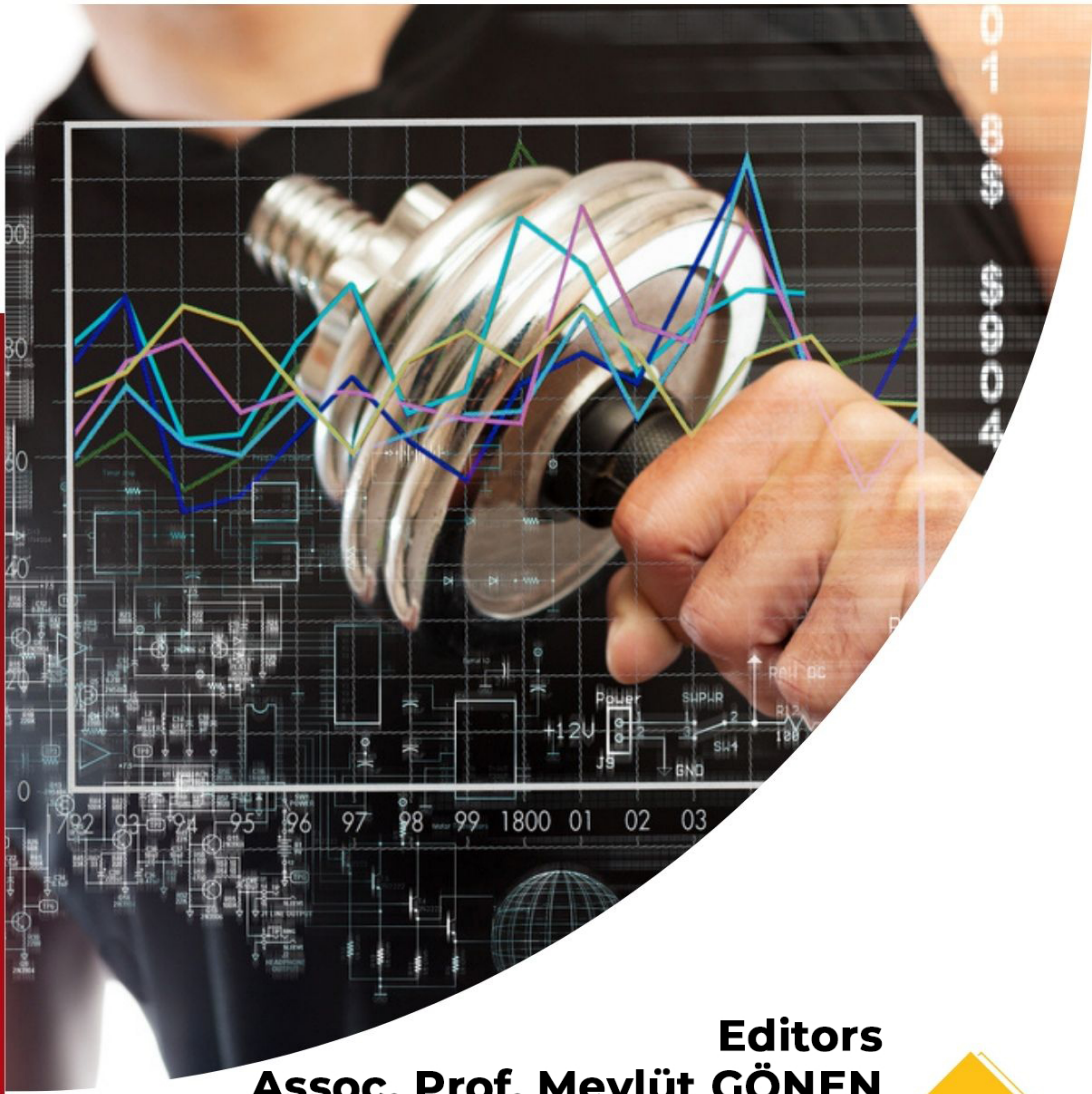
ADVANCED AND CONTEMPORARY STUDIES IN SPORT SCIENCES



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Assoc. Prof. Mevlüt GÖNEN

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DUVAR

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Chapter 1

A QUALITATIVE RESEARCH TO EXAMINE THE RECREATION INDUSTRY IN THE CONTEXT OF SPORTS

Doç. Dr. İsmail KARATAŞ[1]

INTRODUCTION

Recreation is generally defined as the process of participation in activities and experiences carried out in free time and chosen voluntarily for feelings of satisfaction, pleasure, or value (Torkildsen, 1999). According to Şimşek (2018), the importance of recreational products and services, which are becoming increasingly more substantial and more diversified within the recreation industry, in human life is increasing daily. Industrial, technological and economic developments in our contemporary world cause changes in individuals' living standards and increase their free time. This increase in free time creates the need for individuals to use their free time more effectively and in a planned manner. This need attracts the attention of many sectors that are or may be associated with the leisure and recreation industry. These sectors enable individuals to meet their leisure needs for a fee by converting their leisure activities and products into services according to their needs. Individuals consume Leisure products and activities in the form of services, creating tremendous economic power. This emerging economic power attracts the attention of sectors, causing the leisure and recreation industry to become even more substantial and diversified. In addition, the economic power generated by existing sectors within the leisure and recreation industry is growing within its borders and includes new services (p. 27). In this regard, the needs and desires of individuals within the scope of the recreation industry can generally be classified as follows (İnce, 2000):

- Desire to get away or be in another environment,
- Relaxing and resting,
- Desire to be in a pleasant environment,
- Improving human relations,
- The need to express oneself and demonstrate productivity through participation in various activities,
- Curiosity and desire to explore the outside world depending on cultural desires,

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- Material and spiritual pleasure,
- Need for entertainment.

Considering the position and relative importance of the recreation industry in the world economy, this qualitative study aims to examine the recreation industry in the context of sports. In this context, many publications in the national and international literature were examined in the study. In this regard, information about the recreation industry's activity areas, models, and sports recreation is included.

RECREATION INDUSTRY

The industry is defined as transforming raw materials and intermediate goods into goods and services with the contribution of worker labour using the knowledge, skills and technologies available in factories or facilities (Seyidoğlu, 2002). According to another definition, industry is the production of goods, services or income sources by a group of production enterprises or organizations (Britannica Group, 2023). In this context, the recreation industry, which has a vast scope, is defined as a service branch that includes all organizations that produce recreational goods and services to meet people's demands and needs and includes limited resources (environment, facilities, facilities, services, access opportunities, etc.) and existing transforms resources into recreational goods and services (Coşkun, 2013).

As can be understood from the definition of recreation, leisure forms the basis of recreational activities. In addition, the commercial aspect of the recreation industry is essential, suggesting that explanations within this framework have a critical role in understanding information about this industry. In this context, areas of activity within the framework of the commercial recreation industry are examined under five headings: travel and tourism, enterprises that provide educational services, production and supply of recreational materials, enterprises that provide entertainment and social facilities that direct people, and these titles are explained below (Kraus, 1984; cited in Şimşek, 2018):

- **Travel and Tourism:** Includes various activities at recreational theme parks, tour companies, small resorts, commercial camps, hotels and motels.
- **Enterprises Providing Educational Services:** Includes dance, music, fitness and other activities provided educationally.
- **Production and Supply of Recreational Materials:** Includes sports clothing, toys, games, books, magazines, radio, television, gardening materials and musical equipment.

- **Entertainment Providing Enterprises:** Includes entertainment clubs, shopping malls and sports stadiums.
- **Social Facilities Directing People:** Includes golf courses, swimming pools, social areas where bowling and other recreational activities are carried out, and entertaining places away from people's supervision.

RECREATION INDUSTRY MODELS

Kraus (1984) considered the areas of activity within the industry to determine the boundaries of the commercial recreation industry. On the other hand, the model did not include sectoral characteristics and auxiliary factors in creating the service (Şimşek, 2018). In this context, a model called industrial sectors of leisure was put forward by Horner and Swarbrooke (2005).

In this model proposed by Horner and Swarbrooke (2005), the industrial sectors and the leisure industry related to leisure time are trying to be explained with a focus on the recreation consumer. However, according to Şimşek (2018), this model has some limitations. Considering the definition of the industry concept, it is expected that the sub-dimensions that make up the industry will exhibit common characteristics. In this context, since the consumer is centred in the model, auxiliary industries are formed to create recreational services. These industries have nothing in common besides their relationship with the leisure consumer, and most do not have recreation as their primary purpose. It is claimed that the element that should be taken into the centre is free time itself. Because the concept that needs to be divided into sectors is leisure time, the sectors that make it up are expected to exhibit common characteristics. In other words, it is suggested that regardless of the recreation sector, the recreation services offered should have similar characteristics (pp. 29-30). In this context, the model put forward by Torkildsen (2005) is structured by focusing on leisure, and the leisure industry is divided into three: private sector, public sector and voluntary sector.

According to Şimşek (2018), although free time is centred in this model put forward by Torkildsen (2005), some factors create limitations. These factors: Recreational services related to free time in the sector can be listed as the primary areas in which the recreational service is structured, the service types of the recreation specialist and auxiliary industrial services. In this context, the models put forward by Horner and Swarbrooke (2005) and Torkildsen (2005) support each other. However, even if these two models are combined, it is thought that there are limitations in summarizing the industrial framework (p. 30).

According to Şimşek (2018), the Leisure and Recreation Industry Model is based on the phenomenon of leisure time and includes all factors involved in the creation of the service offered to the consumer as an umbrella concept. The

Leisure and Recreation Industry Model consists of three sectors, as suggested by Torkildsen. This is because recreation professionals have three options when starting their careers: public, private and voluntary sector. There is no other type of industry where recreation specialists can be employed. Regardless of the sector where recreation specialists are employed, they will produce recreation services within a business and deliver this service to cross-sectoral customers. Recreation management services are seen as recreation types frequently included in the recreation literature. These types of recreation can meet customer needs according to demand, regardless of sector (p. 32).

EXAMINING THE RECREATION INDUSTRY IN THE CONTEXT OF SPORTS

The world accepts that Türkiye is a holiday centre with historical and natural beauties and the sea-sand-sun trio (Karacar, 2014). In addition, it is seen that the phenomenon of recreation is becoming more understandable day by day, thanks to various recreational activities organized in Türkiye (Şimşek, 2018). According to Karacar (2014), in developing countries such as Türkiye, being able to utilize free time becomes more important because the level of free time that people in all segments of society have is relatively high. In today's world, leisure time is considered a service for civilization and development in developed and developing countries such as Türkiye (p. 77). In this context, it is a fact that people's free time will increase in parallel with the increase in the level of civilization and development (Karaküçük, 1999).

Türkiye is a country rich in history and culture, with a wide range of recreational activities and entertainment options for locals and visitors alike; from historical landmarks to natural wonders, Türkiye appeals to everyone (Expat Focus, 2023). In this context, the recreation industry is on its way to becoming a significant industry that can make meaningful contributions to the Turkish economy (Şimşek, 2022). According to Şimşek (2018), the idea that profit or non-profit purposes can be realized within the scope of recreational activities has begun to be accepted in the public and Turkish business world. Thus, the private sector's support for significant events increased, and recreation began to be used to achieve commercial goals. In this regard, the public can provide financial support, equipment and expert personnel in cooperation with the private sector. Accordingly, more comprehensive activities can be provided to society by creating joint working commissions and areas. Thanks to the support given by the public and private sectors to activities in Turkiye, the desire to benefit from recreational activities in society is increasing day by day. National and international festivals organized by municipalities or the private sector in many

provinces (Great Ankara Festival, Samsun International Folk Dances Festival, Kemaliye International Nature and Sports Festivals, International Ölüdeniz Air Games Festival, etc.) can be cited as examples of this. In parallel with the support given by the public and private sectors to recreational activities, the number of recreation department graduates at universities is also increasing. Graduates of this department create commercial environments related to their areas of expertise, making meaningful contributions to the development and diversification of recreational activities (pp. 25-26).

According to Şimşek (2018), today, some people come to hotels where recreational sports are carried out just to do sports. For example, a business based in France, catamaran, windsurfing, canoeing, canyoning, etc. It offers those who want to do the activities the opportunity to practice for a fee. Similar practices are also carried out in Türkiye. Especially commercial businesses and hotels in the Antalya region. It offers alternative sports services such as rafting, rock climbing, trekking, paragliding, ATV tours, water surfing, windsurfing, diving and catamaran. Similarly, in the Eastern Black Sea Region, plateau tourism, mountaineering, trekking, rafting, heliskiing, bird watching, etc. Many recreational activities meet consumers (p. 26). However, in Türkiye, many types of cultural celebrations, commercial events, performing arts, sports events, entertainment and recreational activities and special events take place with small and large participation (Şimşek, 2022).

Individuals from other countries can find various social clubs, communities and organizations in Türkiye to connect with like-minded people and enjoy their free time (Expat Focus, 2023):

- The American Women's Association (AWA) is a popular foreign organization serving American women living in Istanbul. This association offers various activities, including cultural trips, social events and social service projects.
- British Residents Society (BRS) is another well-established expatriate organization that provides support and social events to British individuals living in Türkiye. BRS: It holds regular events such as quizzes, barbecues and charity fundraisers.
- International Women of Istanbul (IWI) is an organization that brings together women from other countries worldwide and promotes cultural exchange, community service and social events. This group organizes cooking lessons, book clubs and language exchanges.
- There are various online expat forums and social media groups, such as InterNations and Facebook groups, where individuals from other countries can connect and exchange information and experiences. These platforms can be a

very effective way to meet new people, make suggestions for activities and events, and get advice about living in Türkiye.

- Individuals from other countries interested in sports can join the Istanbul Rugby Football Club (IRFC), the oldest rugby club in Türkiye, founded in 1966. This club provides opportunities to play rugby, participate in social events and tournaments and connect with the local rugby community.

In terms of major cultural venues in Türkiye, Türkiye is home to many historical landmarks and cultural venues that attract visitors from around the world; some of the popular ones are presented below (Expat Focus, 2023):

- **Hagia Sophia:** It is a symbolic building dating back to 537 AD. Its striking architecture makes it an essential place for visitors to Türkiye.
- **Topkapi Palace:** This historical palace in Istanbul was once the residence of the Ottoman sultans. It now serves as a museum displaying the lifestyle of Ottoman rulers.
- **Ephesus:** Located in western Türkiye, Ephesus is one of the best-preserved ancient Roman cities in the world. Visitors can access the city's ruins, including the Library of Celsus and the Grand Theatre.
- **Pamukkale:** This natural wonder in southwestern Türkiye is famous for its stunning white terraces from mineral-rich hot springs. Visitors can swim in the warm waters and enjoy beautiful views of the surrounding landscape.
- **Cappadocia:** This region in central Türkiye is known for its unique rock formations and underground cities. Visitors can tour the area with a hot air balloon and see ancient cave houses.

Some of the characteristics of Türkiye in terms of socialization are presented below (Expat Focus, 2023):

- Socialization in Türkiye generally occurs around family and society.
- Turkish people are known for their hospitality and rich food culture; sharing meals with friends and family is a common way to socialize.
- Tea gardens are also popular meeting places where people can relax and chat over a cup of tea.

Türkiye has a wide variety to offer in terms of leisure activities (Expat Focus, 2023):

- Beaches on the Mediterranean and Aegean coasts are popular destinations for water sports such as swimming, sunbathing, jet skiing and windsurfing.
- Türkiye has many beautiful nature parks and forests, such as Yedigöller National Park and Sapanca Lake.
- Another popular leisure activity in Türkiye is shopping.

- The Grand Bazaar in Istanbul is one of the world's largest and oldest covered markets, with more than 4,000 shops selling items ranging from jewellery to textiles and spices.

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Recreation allows people to enrich their lives, be happy, and move forward in this direction with the activities they choose and participate in, apart from their professional work (Kement, 2014). In these respects, more and more importance is given to achieving goals through recreational activities (Karaküçük, 2008). In this context, it is thought to be beneficial to first talk about the concept of sport to understand better the relationship between sports and recreation (Kement, 2014).

Sport is a competitive, solidaristic and cultural concept that socializes and develops the individual's soul and body by professionalizing the skills acquired while transforming the natural environment into a human environment, within the framework of specific rules, with or without equipment, individually or in groups, in free time or all of the time (İnal, 2003). Compared to the past, sports has become an essential social institution with various features today (Kement, 2014). The expansion of physical performance limits and the increase in the economic and political importance of sports have caused sports and athletes to be included among various people and professional groups (Başer, 1986). In addition, the rapid development of technology and urbanization, the increasing importance of leisure time, and the increased inclusion of sports activities in spare time have brought a different and essential dimension to sports (Kement, 2014).

Explaining the relationship between recreation and sports is thought to be helpful. Among the recreational activities, the type based on the application of physical exercise and various sports branches for recreational purposes that constitute a large part of the recreational activities is called sportive recreation (Kement, 2014). Physical exercise forms the basis of sportive recreation (Tekin, 2003). For this reason, sports or sporting activities are included explicitly in the

definition of recreation (Kement, 2014). In this direction, recreation is claimed to mean productively expressing the personality by using sports, physical exercise, art and game forms (Tekin et al., 2007).

Recreation and sports provide many benefits, and activities combining recreation and sports are essential for decision-making mechanisms (Kement, 2014). These benefits are classified under four headings: *personal and individual benefits*, *social and community benefits*, *economic benefits and planning* and *environmental benefits* (Daly, 2000).

- **Personal and Individual Benefits:** According to Kement (2014), recreation and sports activities are significant for people of all ages regarding personal and individual benefits. Sportive recreation activities enable individuals to improve their bodies and live spiritually and mentally healthy lives (p. 91). It also has benefits such as preventing health problems, improving quality of life, and reducing stress (Bouchard, Shephard, & Stephens, 1994; Hawes, 1978; Holahan, 1988; Rywerant, 2003; Seefeldt & Vogel, 1987; Ulrich, Dimberg, & Driver, 1991).
- **Social and Community Benefits:** Recreation and sports are essential in social and community development (Kement, 2014). It positively affects the formation of unity and solidarity in society, team spirit and ethical behaviour, and the strengthening of national unity and solidarity (Daly, 2000). It also has benefits such as social solidarity, improving social life, strengthening family ties, adopting an understanding that prioritizes social values, creating activities that include the elderly, and making women gain importance in society through events for women (Bramham, Hylton, & Jackson, 2001; Earle, 1992; Fallding, 1961; Marans & Mohai, 1991; Vreugdenhil & Rigby, 1987).
- **Economic Benefits:** According to Kement (2014), many people benefit from the economic aspects of recreation and sports. The fact that the public and private sectors carry out various studies to develop recreation and sports activities shows that recreation and sports have a direct economic impact (p. 91). It creates various economic benefits such as creating investment opportunities, reducing health costs, increasing national capital, providing job opportunities, supporting economic development, contributing to the financial growth of the country, being influential in the development of local destinations, increasing the productivity of employees and working on the protection and regulation of the environment (Australian Bureau of Statistics, 1997; Bureau of Tourism, 1996; Gibbons, 1989; Gibson & Singleton, 2012).
- **Planning and Environmental Benefits:** In addition to protecting the environmental health of society, recreation and sports have many benefits, such as the construction and arrangement of parks, leaving empty spaces in cities for

purposes such as entertainment, recreation and sports, and the protection of the natural environment (Daly, 2000). Also, in the city, It is essential to form various aesthetic appearances and develop the destination; It is of great importance that the regulations are made within the scope of stable and precise planning (Kement, 2014). Outdoor recreation activities are essential in terms of precise planning and creating an environmental system for this planning (Daly, 1987; Gibson & Singleton, 2012; Gold, 1980; Schleien et al., 1993).

Information on some popular sports in Türkiye is given below (Expat Focus, 2023):

- Football is by far the most popular sport in Türkiye. The Turkish Football Federation manages the country's professional football leagues, and the national team has had various international successes.
- Basketball is a popular sport in Türkiye, with many professional teams and a dedicated fan base.
- Wrestling, especially oil wrestling, is a traditional Turkish sport that dates back centuries. Kırkpınar Oil Wrestling Festival is an event attended by thousands of spectators worldwide every year.

In line with the explanations, Türkiye has a rich cultural heritage and a vibrant social environment and has many recreational activity opportunities; Opportunities are offered for everyone in Türkiye, from sporting activities to exploring historical sites and museums and participating in outdoor activities and foreign clubs and organizations (Expat Focus, 2023). It can also be argued that sports recreation is particularly essential.

CONCLUSION

Recreation is generally defined as the process of participation in activities and experiences carried out in free time and chosen voluntarily for feelings of satisfaction, pleasure or value (Torkildsen, 1999). According to Şimşek (2018), the importance of recreational products and services, which are becoming increasingly more substantial and diversified within the recreation industry, in human life is increasing daily. In this context, the concept of Industry is defined as the transformation of raw materials and intermediate goods into goods and services with the contribution of worker labour using the knowledge, skills and technologies available in factories or facilities (Seyidoğlu, 2002). In this regard, the recreation industry, which has a vast scope, is defined as a service branch that includes all organizations that produce recreational goods and services to meet people's demands and needs and uses limited resources (environment, facilities, facilities, services, access opportunities, etc.) and existing transforms resources into recreational goods and services (Coşkun, 2013).

Recreation allows people to enrich their lives, be happy, and move forward in this direction with the activities they choose and participate in, apart from their professional work (Kement, 2014). In these respects, more and more importance is given to achieving goals through recreational activities (Karaküçük, 2008). In this context, it is thought to be beneficial to first talk about the concept of sport to understand better the relationship between sports and recreation (Kement, 2014). Among the recreational activities, the type based on the application of physical exercise and various sports branches for recreational purposes that constitute a large part of the recreational activities is called sportive recreation (Kement, 2014). Physical exercise forms the basis of sportive recreation (Tekin, 2003). For this reason, sports or sporting activities are included explicitly in the definition of recreation (Kement, 2014). In this direction, recreation is claimed to mean productively expressing the personality by using sports, physical exercise, art and game forms (Tekin et al., 2007).

As a result, it is understood that Türkiye offers significant opportunities in sports recreation, which is one of the recreation industry areas. However, it is thought that qualified recreation experts are needed for this. It can be argued that these recreation experts have crucial roles in revealing and developing the potential within the scope of sports recreation in Türkiye. However, the information within the scope of the study was obtained through the literature review approach, and it is anticipated that research using quantitative or mixed approaches will add diversity to this information.

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Chapter 2

THE RELATIONSHIP BETWEEN SWIMMING SPORT AND BODY POSTURE

Prof. Dr. Şebnem ŞARVAN CENGİZ[1]
Ebrar Şevval COŞKUN[2]

ÖZ

Araştırmanın amacı, yüzücülerin postüral özellikleri ile cinsiyet ve antrenman yaşları arasındaki potansiyel ilişkileri incelemek ve değerlendirmektir. Bu bağlamda, yüzücülerin anatomik duruşları temel alınarak beş farklı pozisyonda ("ön," "arka," "sağ," "sol," ve "bükülme pozisyonu") fotoğrafları alınmış ve posterior, anterior ve lateral postür analizleri gerçekleştirilmiştir. Analizler, Apecs-AI Posture Evaluation and Correction System® (Apecs Posture Analysis Pro Plus 8.2.6 Sürümü) adlı mobil postür analiz programı kullanılarak yürütülmüştür. Yüzücülerin postür analizleri için "New York Postür Değerlendirme Testi (NYPD) " uygulanarak sporcuların postür yapıları değerlendirilmiştir.

Antrenman yaşının ve cinsiyetin NYPD skorları üzerindeki etkilerini değerlendirmek amacıyla 2 yönlü varyans analizi yapılmıştır. NYPD skorları modele bağımlı değişken olarak dahil edilirken, antrenman yaşları (1-3, 4-6 ve 7 üstü) ve cinsiyet (kadın-erkek) bağımsız değişken olarak dikkate alınmıştır. Elde edilen sonuçlar, cinsiyetin NYPD skorları üzerindeki ana etkisinin istatistiksel açıdan anlamlı olmadığını göstermiştir. Benzer şekilde, antrenman yaşının NYPD skorları üzerindeki ana etkisi de istatistiksel olarak anlamlı bulunmamıştır [$F\ (2,74) = 0,439$, $p = 0,646$, $\mu^2 = 0,012$]. Cinsiyet ile antrenman yaşının etkileşimi de anlamlı değildir [$F\ (2,74) = 0,972$, $p = 0,383$, $\mu^2 = 0,026$]. Gerçekleştirilen çift faktörlü varyans analizinden elde edilen sonuçlara dayanarak sol diz açısı ile sağ ayak rotasyonu arasında bir ilişki tespit edilmiştir ($p=0,013$ ve $p=0,018$ sırasıyla). Ancak, bağımlı değişkenler arasında anlamlı bir ilişki belirlenmemiştir.

Bu sonuçlar, yüzücülerin vücut duruşları ile antrenman yaşları ve cinsiyet arasındaki ilişkilerin istatistiksel olarak belirgin olmadığını göstermektedir. Sol diz açısı ile sağ ayak rotasyonu arasında tespit edilen ilişki ise yüzücülerin daha

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kuvvetli pronasyonlu ayak duruşuna sahip olmalarından ve ağırlıklı olarak yüzdükleri stilden kaynaklı olabilir.

ABSTRACT

The research aims to examine and evaluate potential relationships between swimmers' postural features and gender and training ages. In this context, photographs of swimmers in five different positions ("front," "back," "right," "left," and "bend") were taken based on their anatomical postures, and posterior, anterior, and lateral posture analyses were conducted. The analyses were carried out using the Apecs-AI Posture Evaluation and Correction System® (Apecs Posture Analysis Pro Plus 8.2.6 Version), a mobile posture analysis program. Posture structures of athletes were assessed using the "New York Posture Assessment Test (NYPD)" for postural analysis of swimmers.

A two-way analysis of variance was conducted to assess the effects of training age and gender on NYPD scores. While NYPD scores were included as the dependent variable in the model, training ages (1-3, 4-6, and 7 and above) and gender (female-male) were considered as independent variables. The results showed that the main effect of gender on NYPD scores was not statistically significant. Similarly, the main effect of training age on NYPD scores was also not statistically significant [$F(2,74) = 0.439$, $p = 0.646$, $\mu^2 = 0.012$]. The interaction between gender and training age was also not significant [$F(2,74) = 0.972$, $p = 0.383$, $\mu^2 = 0.026$]. Based on the results of the conducted two-way analysis of variance, a relationship was identified between the left knee angle and the right foot rotation ($p=0.013$ and $p=0.018$, respectively). However, no significant relationship was found between the dependent variables.

These findings indicate that the statistical significance of the relationships between swimmers' body postures and training ages and gender is not apparent. The detected relationship between the left knee angle and right foot rotation may be attributed to swimmers having a stronger pronated foot posture. It could be related to the predominant swimming style.

Introduction

One of the most critical factors for human physical health is the skeletal system, which constitutes a vital structure within the human body. The most accurate alignment of the skeletal system is referred to as posture (Otman et al., 1995). The term "posture" is derived from the Latin "positura" and the French "posture," commonly used in our language. Posture signifies the optimal positioning of each part of the body in relation to adjacent segments and the entire body (Kendall et al., 1993). In a general sense, posture, representing the position

where body parts articulate at joints and are controlled through nerves and muscles, ensures an individual's resistance against external forces that could disturb balance and equilibrium. Posture explains the state of balance in which the muscular and skeletal systems work efficiently with minimal damage (Çeviker, 2017).

The literature presents various yet conceptually similar definitions regarding body posture. In essence, posture is the alignment of specific regions of the body where joints articulate, and are controlled by nerves, tendons, and muscles. This alignment gives different names to muscle groups connected to each joint and limb, such as shoulder muscles, arm muscles, chest muscles, back muscles, abdominal and lumbar muscles, groin and thigh muscles, contributing to the formation of posture. Therefore, the term "postural" encompasses the balance of all muscles, nerves, tendons, joints, and bones extending from head to toe (Şimşek and Ertan, 2011).

Posture represents the body's stance, and individuals can have different posture types depending on genetic traits and environmental factors. Those who sit continuously may experience posture deterioration, while others may have congenital postural abnormalities. Posture is not only crucial for human health but also a significant physical characteristic affecting athletes' performance and success. Proper body posture supports maximum performance and muscle efficiency. Good posture ensures the balanced distribution of body weight, allowing athletes to move more effectively and efficiently. Additionally, good posture can reduce the risk of injury and help athletes endure physical activity for longer periods. Poor posture habits, such as slouching, rounded shoulders, or pelvic tilting, can lead to muscle imbalances and discomfort. Therefore, athletes need to pay attention to their postures (Karakuş and Kılınç, 1997; Sahrmann, 2002).

Studies on posture disorders trace back to the 5th century BC when Hippocrates initiated the exploration of this field. Subsequently, the physician, philosopher, and scientist Galen, who lived between AD 131-201, described posture disorders using terms like lordosis, scoliosis, and kyphosis. Lordosis typically refers to curvatures occurring in the neck region of the spine, while it is also used for abnormal curvatures extending from the beginning of the lower back to the coccyx. Scoliosis denotes the situation where the spine takes an S or C shape, deviating in one direction, and is the most common type of spinal deformity. Kyphosis, on the other hand, refers to the curvatures from the upper limit of the lumbar region to the lower part of the neck (Solak and Benli, 2016).

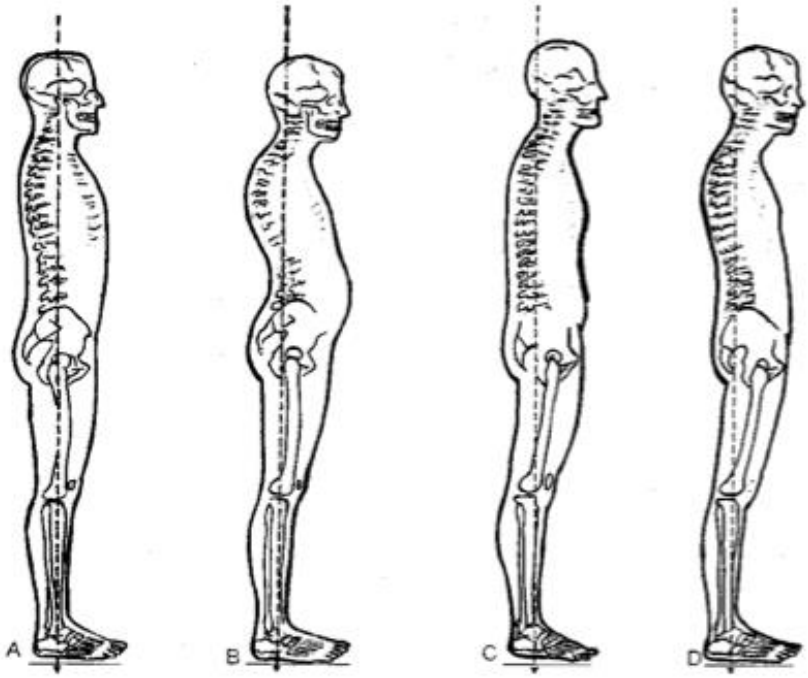

Figure 1. a. Standard b. Kypho-Lordosis c. Dosplat (Flat Back) d. Scheuermann (Karakuş et al., 2006)

When we pay attention to the relationship between swimming sport and body posture, swimming is universally recognized as a fundamental sport for the development of physical and conditioning attributes. Although swimming is typically considered a sport that falls under the "late specialization sports" category according to the "long-term development model," given its early initiation in childhood, it also fits within the structure of "early specialization sports" (Acıkada and Hazır, 2016).

The formation of appropriate posture during childhood is crucial for balanced growth and the development of various biomotor skills. Many children are inclined towards swimming as a sport due to its contributions to healthy development. Considering the positive impact of swimming on the healthy development of children, it can be considered as forming the foundational infrastructure for other sports (Malina et al., 2004).

Moreover, in the literature, swimming is described as a sport that utilizes each region of the body in a balanced manner, requiring high effort and promoting the development of the body in a symmetric manner (Bozdoğan and Özüak, 2003). Therefore, swimming is a preferred exercise method for the development of

children's bodies and the formation of correct posture (Muratlı, 2007). However, when examining asymmetry in swimming, it is noted in the literature that even in sports activities where both sides are used equally, asymmetries can occur (Sanders et al., 2011). Despite swimmers specializing in swimming from a young age and, therefore, expected to have fairly equal stresses on both sides, many swimmers may have a history of developing their upper and lower extremities differently due to their preference for one side (Kanchan et al., 2008). For this reason, the research aims to examine and evaluate potential relationships between swimmers' postural characteristics and gender and training ages.

Posture Classification

Just as there are postural differences among individuals, various classifications of posture exist in the literature. These classifications are used to understand and examine the fundamental characteristics of posture.

Static and dynamic posture are two important concepts used to examine the body's stance and balance capabilities in different contexts. Static posture refers to an individual's ability to maintain posture and balance in a stationary or static position. For example, when a person stands or sits, their body posture represents an example of static posture. Static posture analysis involves evaluating a person's anatomical structure and body weight center. On the other hand, dynamic posture reflects an individual's ability to maintain body posture and balance while in motion. Dynamic posture is particularly crucial for athletes or those engaged in professions requiring physical activity, as it involves the control of body balance during movements and activities (Panjabi, 1992).

In posture classifications, the concepts of "good" and "bad" posture are essential terms defining the quality and effects of body posture. Good posture reflects a stance where the body is correctly and evenly aligned. This includes features such as aligning the head properly with the spine, keeping the shoulders back and in a proper position, maintaining the back in the correct posture, and having the waist region with appropriate inclinations. Good posture supports the proper functioning of muscles and joints, minimizes pain, and ensures an even distribution of body weight. This contributes to athletes training more effectively, demonstrating better performance, and reducing the risk of injuries (Kendall et al., 2005).

Bad posture signifies an unwanted or unbalanced alignment of body posture, leading to various negative effects. It results in muscles and joints working in incorrect positions, leading to muscle strains, pains, and tension. Bad posture, especially, has a significant impact on spinal health and specific posture disorders may lead to serious problems over time, such as spinal curvature. Additionally,

there are long-term effects of bad posture, including chronic back pains, neck pains, and headaches. Bad posture can also contribute to respiratory problems, as the chest cannot open properly. Overall, bad posture can adversely affect an individual's self-confidence and stance (Janda, 1983).

When looking at the ideal standing posture in the literature, it is emphasized that maintaining balance and supporting spinal health are crucial (Kendall, McCreary & Provance, 2005). The position of the legs should also be considered, requiring a slight bend in the legs but emphasizing the importance of not locking the knees, as a slight bend in the knees reduces joint stress and provides a comfortable stance (Neumann, 2016). The back is a critical component of the ideal standing posture. The back should be upright and straight, meaning the shoulders are held back and down, the chest is open, and breathing can be done comfortably (Clark, Lucett & Sutton, 2017). The position of the head and neck should also be carefully addressed. The head should be naturally aligned with the spine, the neck should be gently extended, and the chin should neither be pulled forward nor backward. The eyes should be at eye level and look forward (Page & Frank, 2010).

Posture Analysis

Posture analysis includes various methods used to evaluate and understand body posture. These methods can be employed by health professionals, physiotherapists, sports scientists, and coaches for posture examination. Observation forms the basis of posture analysis. Health professionals and physiotherapists carefully observe a person's body posture to identify any signs of abnormal posture or balance deficiencies. This observation may include factors such as the position of the feet, legs, back, neck, and head. Photogrammetry is a method used for posture analysis involving photographs or videos. Special software and markers are used to measure a person's body alignment and balance from photographs or videos. This method allows for detailed analyses based on objective data. Electromyography (EMG) is another method used to measure muscle activity. During posture analysis, EMG can be used to determine how active specific muscle groups are during posture. This helps identify muscle imbalances and weaknesses. Posture monitoring devices are specialized devices that continuously track a person's body posture. These devices detect abnormal postures by recording a person's movements and stance in real-time, providing objective data. Finally, during posture analysis, an individual's muscle strength and flexibility can also be evaluated. These tests can help identify muscle weaknesses or limited ranges of motion (Kendall et al., 2005; Neumann, 2016).

Basis Factors Affecting Posture

Body posture results from the interaction of many complex factors, and these factors can vary from person to person. Research indicates the existence of a series of key factors affecting posture. Firstly, the health of the musculoskeletal system significantly influences body posture. Weak or imbalanced muscles can lead to the development of poor posture (Clark et al., 2017). Activity level also plays a crucial role in posture. A sedentary lifestyle or inactivity can lead to the development of poor posture habits (O'Sullivan, 2005). However, environmental factors also influence posture. An ergonomically unfavorable workplace or living space can contribute to the development of poor posture (Karwowski & Marras, 2003). Physical activity and regular exercise support body posture. Exercises that strengthen core muscles can assist in creating good posture (McGill, 2010). Additionally, psychological factors can affect posture. Stress or anxiety can impact an individual's body posture. For example, a person under stress may tend to elevate their shoulders (Cailliet, 1991). Genetic factors are influential in physical characteristics such as bone structure and muscle development, and consequently, they can affect posture (Bouchard & Pérusse, 2011). Shoe choice is another factor; improper shoes can lead to body imbalance and the development of poor posture (Rossi & Fawcett, 1992). Additionally, daily habits also influence posture. Incorrect sitting, standing, and walking patterns can promote poor posture (Kendig, 2015). Gender differences can also affect posture. Certain muscle groups may differ between women and men (Delitto & Snyder-Mackler, 2019). Health status also plays a significant role in posture. Chronic illnesses or injuries can lead to the development of poor posture (Braddom, 2015). Finally, it is crucial for individuals to observe their postures and receive feedback for correction (Page & Frank, 2010).

Material and Methods

In the scope of the research, anatomical posture was adopted for the purpose of conducting postural analyses of swimmers. In this context, photographs of athletes were taken in five different positions ("front," "back," "right," "left," and "bend"), and posterior, anterior, and lateral posture analyses were performed using these photographs. Swimmers with at least one year or more of training experience were included in the study. Analyses were conducted using the Apecs-AI Posture Evaluation and Correction System® (Apecs Posture Analysis Pro Plus 8.2.6 Version), a mobile posture analysis program. Posture structures of swimmers were evaluated by applying the "New York Posture Assessment Test."

Within the framework of the "New York Posture Assessment Test," posture changes that could occur in thirteen (13) different regions of the body were observed, and scores were assigned to these changes. Based on the body postures exhibited by swimmers, if all five swimmers demonstrated proper posture, they received 5 points, those showing moderate deviations received 3 points, and those showing significant deviations received 1 point. The total score obtained from the test ranges between a maximum of 65 and a minimum of 13 (İnal H.S., 2013).

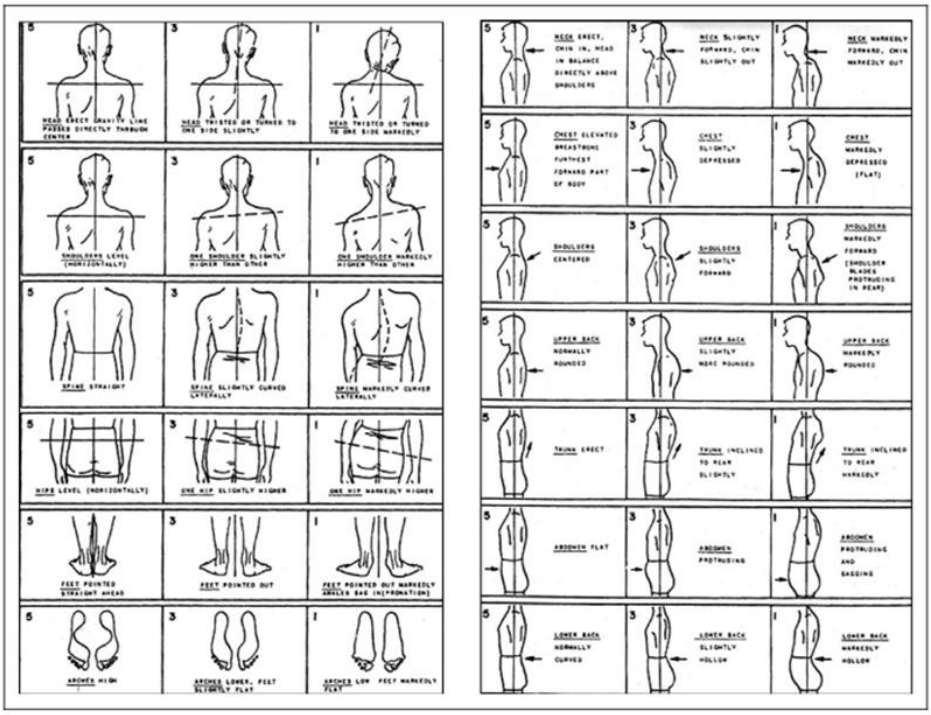

Figure 2. Rearview segments obtained by the "New York Posture Rating Chart" (left). Lateral view segments obtained by the "New York Posture Rating Chart" (right). (Both reproduced with permission from the New York Department of Education, State University of New York, Albany, NY. Items marked with an asterisk (*) are not present in the version published by Howley and Franks (1992) and the scores for these items have also been changed to 10-5-0) (McRoberts et al., 2013).

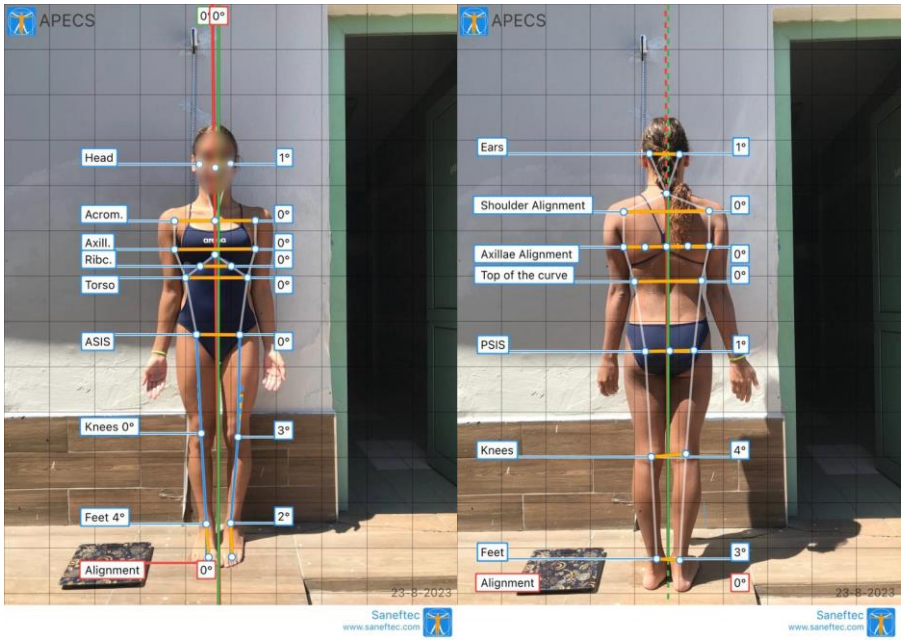

Figure 3. "Anterior and posterior" posture analysis conducted based on anatomical posture using the Apecs-AI Posture Evaluation and Correction System® (Apecs Posture Analysis Pro Plus 8.2.6 Version) mobile posture analysis program.

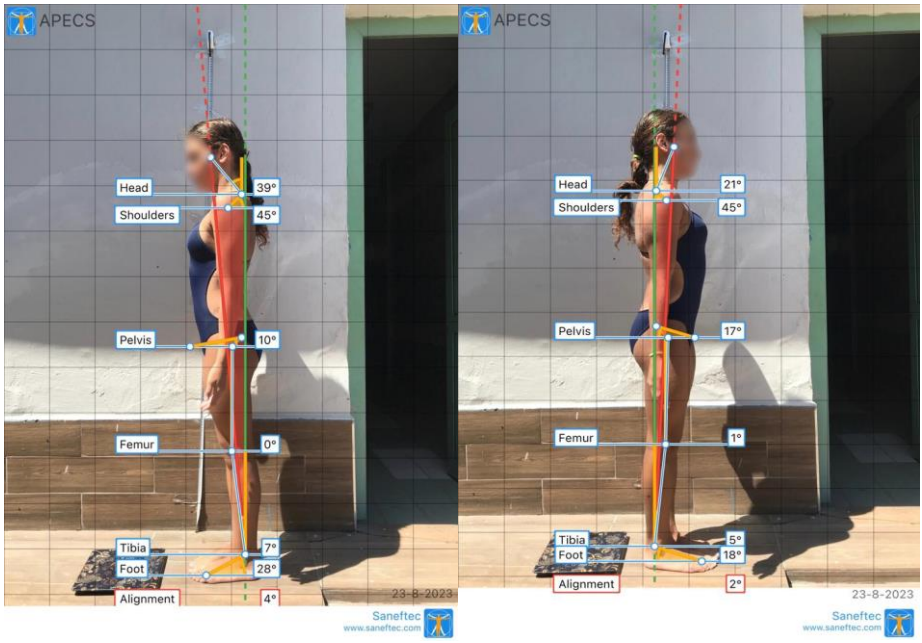

Figure 4. "Lateral" posture analyses in the left and right positions conducted based on anatomical posture using the Apecs-AI Posture Evaluation and Correction System® (Apecs Posture Analysis Pro Plus 8.2.6 Version) mobile posture analysis program.

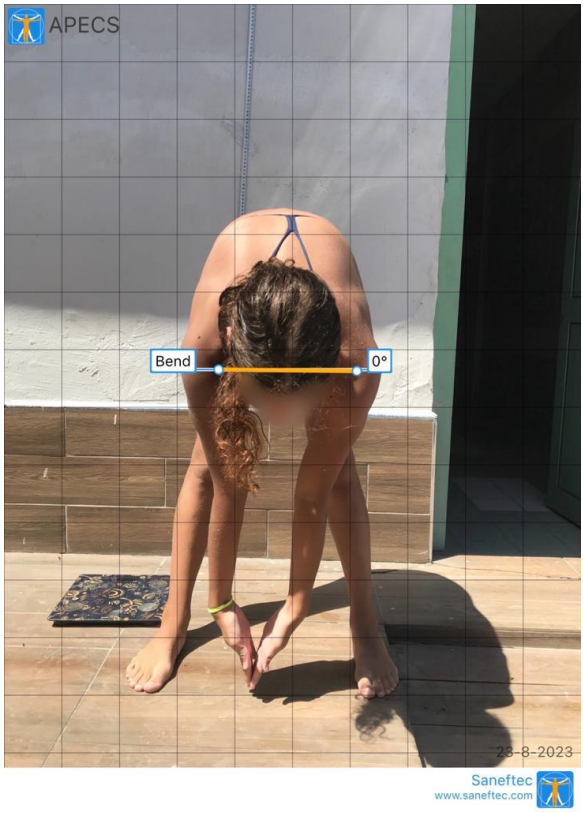

Figure 5. Posture analysis in the "bend" posture position is conducted based on anatomical posture using the Apecs-AI Posture Evaluation and Correction System® (Apecs Posture Analysis Pro Plus 8.2.6 Version) mobile posture analysis program.

Findings

Table 1. Distribution of Demographic Information of Participants

		N	%
Gender	Female	41	51,3
	Male	39	48,8
Yaş	9-10	25	31,3
	11-12	36	45
	13+	19	23,8
Training Age	1-3	26	32,6
	4-6	35	43,9
	7+	19	23,8

In this study, detailed demographic data of the participants, which constitutes the focal point of our research, is presented in Table 1. When analyzed based on gender, the proportion of female participants is determined as 51.3%, while male participants account for 48.8%. In the assessment of age groups, it is observed that participants in the 9-10 age range have the lowest percentage at 31.3%, whereas those in the 11-12 age range contribute the highest participation with a rate of 45%. Participants aged 13 and above are represented at a rate of 23.8%. Regarding the analysis of training age, participants with 1-3 years of training experience constitute 32.6%, those with 4-6 years of training history make up 43.9%, and participants with 7 years and above of training experience are present at a rate of 23.8%.

Table 2. Results of Two-Way Analysis of Variance (ANOVA) on the Interaction between Participants' NYPD Scores, Gender, and Training Age.

Gender	Age Group	Mean	Std. Deviation	N	F	Sig
Male	1-3 year	45,6667	7,24046	12		
	4-6 year	45,5882	5,17275	17		
	7 and above	49,3000	7,30373	10		
	Total	46,5641	6,45957	39		
Female	1-3 year	45,7143	4,19576	14	,972	,383
	4-6 year	46,1111	5,12076	18		
	7 and above	45,2222	8,16667	9		
	Total	45,7805	5,50687	41		

Table 4. Results of Two-Way Factorial Analysis on the Interaction between Participants' Training Age and the Interaction of LkneeA and Rfootr.

Dependent Variable	(I) Age Group	(J) Age Group	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
						Lower Bound	Upper Bound
LKneeA	1-3 year	4-6 year	-,376	,416	,368	-1,204	,452
		7 and above	-1,441*	,485	,004	-2,406	-,475
	4-6 year	1-3 year	,376	,416	,368	-,452	1,204
		7 and above	-1,065*	,457	,023	-1,975	-,154
	7 and above	1-3 year	1,441*	,485	,004	,475	2,406
		4-6 year	1,065*	,457	,023	,154	1,975
RFootR	1-3 year	4-6 year	2,460*	1,177	,040	,115	4,805
		7 and above	-1,023	1,372	,458	-3,757	1,711
	4-6 year	1-3 year	-2,460*	1,177	,040	-4,805	-,115
		7 and above	-3,483*	1,294	,009	-6,062	-,904
	7 and above	1-3 year	1,023	1,372	,458	-1,711	3,757
		4-6 year	3,483*	1,294	,009	,904	6,062

According to the obtained results from the two-way factorial analysis, some findings regarding the relationships among swimmers with different training ages were identified.

When examined in terms of the left knee angle (LkneeA), a negative correlation was determined between swimmers with 1-3 years of training age and those with 7 years and above of training age. Similarly, a negative correlation in the left knee angle was observed between swimmers with 4-6 years of training age and those with 7 years and above of training age. However, a positive correlation in the left knee angle was observed between swimmers with 4-6 years of training age and those with 7 years and above of training age. These findings indicate a complex relationship between the left knee angle and training age.

Regarding the right foot rotation (Rfootr), a positive correlation was found between swimmers with 1-3 years of training age and those with 4-6 years of training age. However, negative correlations were observed between swimmers with 4-6 years of training age and those with 1-3 years of training age, as well as between swimmers with 4-6 years of training age and those with 7 years and above of training age. Additionally, a significant relationship was identified between swimmers with 7 years and above of training age and those with 4-6 years of training age.

These findings suggest intricate relationships between training age, left knee angle, and right foot rotation among the participants in the study.

DISCUSSION AND RESULT

Sports activities have a significant impact on athletes' body posture and physical development (Smith, 2008). Particularly in sports branches that require intense physical effort, such as swimming, athletes' regular training contributes to the development of their physical abilities (Johnson, 2015). Therefore, the body posture of swimmers, who are members of the swimming discipline, holds great importance for both their performance and health.

Research investigating the relationship between swimming technique and posture, conducted by Strzała et al. (2018), has demonstrated that swimming contributes to posture development. The study by Şenel, Köklü, and Yapıcı (2012), focusing on the relationship between young swimmers' postures and freestyle swimming technique, has indicated a positive shaping of body posture in the early years of swimming. Imbalances in muscle development, responding to the requirements of the activity, can also affect posture. Particularly in breaststroke swimming, there tends to be development in the pectoralis muscles, which can lead to kyphosis (Schiller et al., 2008).

In a study examining the impact of different physical activities on foot posture and knee angle, statistically significant results were obtained between swimmers and football players. The findings revealed that swimmers have a tendency toward pronation in foot posture and valgus in the Q angle, whereas football players' results fell within the normal range (Reca et al., 2018).

An investigation into how the vertical body position during swimming affects drag and swimming speed revealed a positive relationship between swimming speed and vertical body position. These results indicate that swimming speed influences the vertical body position, and this effect varies among individuals (Aksamit et al., 2018).

A study by Huang et al. (2022) examined the long-term impact of participation in amateur sports on the body posture of school students. An analysis of 1,658 students aged 6 to 17 in two primary schools and one middle school in Tianjin city revealed that sports participation affects the physical posture of adolescents. Specifically, the natural standing thoracic kyphosis angles of the swimming and football groups were significantly larger compared to other groups. Other sports groups showed differences in specific kyphosis angles under certain conditions. These results suggest that long-term recreational sports participation can influence the body posture of adolescents.

In a study aiming to assess the curvature of the cervical, thoracic, and lumbar spine regions in selected sports-playing children, comparisons between football, swimming, biathlon/taekwondo, and volleyball groups revealed statistical differences in specific spine parameters. While most participants demonstrated

correct body posture, the precise effects of different sports and training loads on spine curves could not be determined (Grybalow et al., 2023).

A study investigating the effects of vertical and horizontal body positions, crucial in the fundamental techniques of windsurfing and swimming, on postural balance, found significant statistical differences between groups and surface types. Particularly, windsurfers exhibited better postural balance performance in a two-legged stance on both hard and soft surfaces compared to swimmers (Ashkar et al., 2023).

In conclusion, the analyses indicate that the main effect of gender on NYPD scores is not statistically significant. Similarly, the main effect of training age on NYPD scores is also not statistically significant ($F(2,74) = 0.439$, $p = 0.646$, $\mu^2 = 0.012$). The interaction between gender and training age is also not significant ($F(2,74) = 0.972$, $p = 0.383$, $\mu^2 = 0.026$). Based on the results of the two-way analysis of variance, a relationship between the left knee angle and right foot rotation is identified ($p = 0.013$ and $p = 0.018$, respectively). However, no significant relationship is found between the dependent variables. These findings suggest that the relationships between swimmers' body postures, training ages, and gender are not statistically significant. The observed relationship between the left knee angle and right foot rotation may be attributed to swimmers having a stronger tendency toward pronation in foot posture and their predominantly practiced swimming style.

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Chapter 3

AN INVESTIGATION OF BOCCE ATHLETES' SELF-REGULATION AND RESPECT FOR OPPOSING VIEWS IN SPORT

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INTRODUCTION

Sport is developing and growing day by day by increasing its impact on people as active and passive participants all over the world. With the increase in interest, competitive environments have been formed between countries and countries have started to gather all their resources together to benefit from the positive effects of sports. With the help of developing science and technology, sports records have been renewed, and the economy, technology, education and development level of the countries represented by the teams and athletes competing in sports have become competitive with each other. Sport is one of the most important factors determining the level of development of countries (Gümüş, 2002).

Although there is no definite research on the historical development of Bocce, Bocce sport in its present form has existed since ancient times. Bocce is seen as the fastest growing sport in Turkey with inter-club leagues. The Italian word "bocce" is translated into French as "boules" and into English as "bowls". In our country, the term Bocce is used for all Raffa, Volo and Petanque sports. The general logic of these sports is to get as close as possible to the big ball by throwing or rolling "jack", "pallino" or "marble" (small ball). They can be played by two opposing players or teams in open fields, cities and beaches, on hard surfaces, gravel, grass, sand and even on private facilities and pitches. While

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some disciplines are played for enjoyment alone, others have become competitive sports (Türkmen, 2011; Nauright, 2012; Türkmen et al., 2018).

Different moods experienced in sports environments are a self-control for people. As a result of self-control, the individual first learns to respect himself/herself, then his/her competitors or supporters. The most important personal control in sport is the ability to control oneself. With self-control, it is to respect people and learn to take important steps towards becoming good individuals (Gülle, 2018). The necessity of social life and the right to live together require respecting people's personal rights and being responsible. In this sense, interfering with the personal rights of individuals for any reason creates disappointment and pessimism (Gülle, 2013). It is seen that the current approaches to learning self-control are increasing significantly day by day. It is accepted that self-control directs one's thoughts, emotions, behaviours and systematic goals that facilitate the process of self-control to achieve one's goals (Baumeister & Vohs, 2007). Self-control is another aspect of being under control. Friese and Hofmann (2009), examined individual differences in self-control and the antecedents of impulsive behaviours. They found that while impulsive antecedents changed the behaviour of subjects with low self-control, there was no change in the behaviour of subjects with high self-control. These results showed that there is a dynamic interaction between impulse and self-control in self-regulation behaviour. In a study conducted by Sinha et al., (2002), it was found that participants with high self-control showed higher perceived control than participants with low self-control.

People show their behaviours consciously by passing through the self-control filter according to the basic norms, laws, goals, social norms, religious beliefs, moral and ethical values, traditions and customs of social life (Baumeister & Alquist, 2009). It is said that there is a strong connection between self-control and behaviour and that self-control affects behaviour. Self-control can prevent undesirable behaviours and support the display of desired behaviours. In addition, self-control is known to be a mechanism that guides the appropriateness of habitual behaviours (Ridder et al., 2012). It can be said that one of the biggest problems in the development of individuals who experience lack of self-control in sport is personalities who do not feel empathic feelings and feel themselves

unquestioning. It can be seen that the lack of self-control and empathy leads to a lack of emotion towards the opponent, especially during the competition, and as a result, violence in sports (Gülle, 2018).

The aim of the study is to examine the self-control and respect for opposing views in sports of athletes participating in the Turkish Bocce (Volo) shooting games championship held in Mersin Toroslar facilities on 8-11 August 2023.

Material Method

Research Group

The aim of the study is to examine the self-control in sports and respect for opposing views of athletes participating in the Turkish Bocce (volo) shooting games championship held in Mersin Toroslar facilities on 8-11 August 2023. The sample of the study consisted of a total of 300 bocce (volo) athletes, 152 women and 148 men. The study was conducted using convenience sampling method. This method is defined as the voluntary participation of individuals in the research (Coşkun et al., 2017).

Data Collection Tool

The questionnaire consists of a 7-question demographic variable and a 15-question scale of respect for opposing views and self-control in sport developed by Gülle, (2018). The scale was applied to reveal the self-control and respect for opposing views in sports of different team fans studying in different departments of Hatay Mustafa Kemal University (Faculty of Physical Education, Faculty of Education, Faculty of Science and Literature, Faculty of Medicine and Faculty of Veterinary Medicine). A 5-point Likert-type rating was used to express the level of agreement with the scale items. These evaluations are "Strongly disagree (1), disagree (2), not sure (3), agree (4) and strongly agree (5). There are two sub-dimensions in total. There are 6 items in the "hatred towards the opponent" sub-dimension and the item loading coefficients vary between 0.462 and 0.702 the second sub-dimension is "respect towards the opponent" and there are 9 items and the loading coefficients vary between 0.519 and 0.782. The Cronbach's α reliability coefficient of the scale was 0.80 indicating that the scale is quite reliable.

Data Collection

All questions were created in the questionnaire system and communicated to the participants. Participants were told that their meaning, method, purpose and names would not be shared anywhere and would be used only for research purposes.

Analysing the Data

The data of bocce athletes were analysed by using Cronbach's Alpha reliability test, T-test and Anova-Tukey tests in SPSS 26.0 analysis programme.

Research Model

The research was conducted using the relational survey method. Karasar, (2007), defined this model as a model that "aims to determine the existence and/or degree of covariance between two or more variables".

FINDINGS

Table 1: Cronbach's Alpha data of respect for opposing opinion and self-control scale and its sub-dimensions

Scale	Cronbach's α Coefficient	Number of Questions
Respect for opposing opinion and self-control scale in sport (general)	0.772	15
Hatred towards the opponent	0.927	6
Respect for the opponent	0.843	9

In the Cronbach's alpha values of the scale of respect for opposing opinion and self-control in sport and its sub-dimensions, it was found that the overall scale used in the research was highly reliable with 0.772 the sub-dimension of hatred towards the opponent was highly reliable with 0.927 and the sub-dimension of respect towards the opponent was highly reliable with 0.843 (Table 1).

Table 2: Demographic distribution of bocce athletes

Variables		N	%
Age	18 Years and Under	83	27.7
	19-23 Years	55	18.3
	24-28 Years	53	17.7
	29-33 Years	43	14.3
	34 Years and Over	66	22.0
Gender	Woman	152	50.7
	Male	148	49.3
Marital Status	Married	90	30.0
	Single	210	70.0
Education Status	Primary and Secondary	23	7.7
	High School	114	38.0
	University	163	54.3
Are you a National Athlete?	Yes	67	22.3
	No	233	77.7
Bocce Sport Age	1-5 Years	144	48.0
	6-10 Years	88	29.3
	11 Years and Over	68	22.7
Socio-Economic Income Level	Low	40	13.3
	Centre	237	79.0
	High	23	7.7

Table 3: One Way Anova-Tukey analyses according to the age of bocce athletes

Age							
Scale	**Variables**	**n**	**x**	**ss**	**f**	**p**	**Tukey**
Respect for opposing opinion and self-control scale in sport (general)	18 Years and	83	3.312	0.429	10.532	**0.000***	**a>b, c, d, e**
	19-23 Years[b]	55	3.648	0.607			
	24-28 Years[c]	53	3.640	0.510			
	29-33 Years[d]	43	3.829	0.457			
	34 Years and Over[e]	66	3.753	0.539			
Hatred towards the opponent	18 Years and	83	2.371	0.899	4.737	**0.001***	**a>d c>d d>e**
	19-23 Years[b]	55	2.887	1.114			
	24-28 Years[c]	53	2.512	1.188			
	29-33 Years[d]	43	3.228	1.135			
	34 Years and Over[e]	66	2.601	1.408			
Respect for the opponent	18 Years and	83	3.939	0.593	12.018	**0.000***	**a>c, d, e b>e**
	19-23 Years[b]	55	4.155	0.632			
	24-28 Years[c]	53	4.392	0.524			
	29-33 Years[d]	43	4.230	0.455			
	34 Years and Over[e]	66	4.521	0.469			

*significant at $p<0.05$

One Way Anova-Tukey analysis related to the ages of the athletes revealed differences at the level of ($p<0.05$) in the total and all dimensions of the scale used in the study (Table 3).

Table 4: One Way Anova-Tukey analyses according to income level of bocce athletes

Income Level							
Scale	**Variables**	**n**	**x**	**ss**	**f**	**p**	**Tukey**
Respect for opposing opinion and self-control scale in sport (general)	Low[a]	40	3.263	0.505	9.734	**0.000***	**a>b, c**
	Centre[b]	237	3.651	0.528			
	High[c]	23	3.692	0.517			
Hatred towards the opponent	Low[a]	40	1.900	1.146	10.538	**0.000***	**a>b, c**
	Centre[b]	237	2.796	1.153			
	High[c]	23	2.637	1.010			
Respect for the opponent	Low[a]	40	4.172	0.814	1.146	0.319	-
	Centre[b]	237	4.222	0.544			
	High[c]	23	4.396	0.501			

*significant at p<0.05

One Way Anova-Tukey analysis of the income levels of the athletes showed that there were differences at the level of (p<0,05) in the overall scale used in the study and in the dimension of hatred towards the opponent, while there were no differences at the level of (p<0,05) in the dimension of respect towards the opponent (Table 4).

Table 5: One Way Anova-Tukey analyses according to the educational status of bocce athletes

Education Status							
Scale	**Variables**	**n**	**x**	**ss**	**f**	**p**	**Tukey**
Respect for opposing opinion and self-control scale in sport (general)	Primary and Secondary School[a]	23	3.460	0.560	9.992	**0.000***	**b>c**
	High School[b]	114	3.454	0.502			
	University[c]	163	3.727	0.534			
Hatred towards the opponent	Primary and Secondary School[a]	23	2.587	1.213	7.231	**0.001***	**b>c**
	High School[b]	114	2.356	1.148			
	University[c]	163	2.890	1.150			
Respect for the opponent	Primary and Secondary School[a]	23	4.043	0.545	2.230	0.109	-
	High School[b]	114	4.186	0.593			
	University[c]	163	4.284	0.587			

*significant at $p<0.05$

In the One Way Anova-Tukey analysis according to the educational status of the athletes, it was seen that there were differences at the level of ($p<0.05$) in the overall scale used in the study and in the dimension of hatred towards the opponent, while there were no differences at the level of ($p<0.05$) in the sub-dimension of respect towards the opponent (Table 5).

Table 6: One Way Anova-Tukey analyses according to sport age of bocce athletes

Bocce Sport Age							
Scale	**Variables**	**n**	**x**	**ss**	**f**	**p**	**Tukey**
Respect for opposing opinion and self-control scale in sport (general)	1-5 Years[a]	144	3.635	0.527	1.969	0.141	-
	6-10 Years[b]	88	3.637	0.612			
	11 Years and Over[c]	68	3.489	0.450			
Hatred towards the opponent	1-5 Years[a]	144	2.894	1.113	12.571	**0.000***	**a>c** **b>c**
	6-10 Years[b]	88	2.748	1.241			
	11 Years and Over[c]	68	2.068	1.029			
Respect for the opponent	1-5 Years[a]	144	4.129	0.548	6.596	**0.002***	**a>c**
	6-10 Years[b]	88	4.231	0.650			
	11 Years and Over[c]	68	4.436	0.517			

*significant at p<0.05

In the One Way Anova-Tukey study conducted according to the sports age of the athletes, it was determined that there were no differences at the level of (p<0.05) in the overall scale used, but there were differences at the level of (p<0.05) in the dimensions of hatred towards the opponent and respect towards the opponent (Table 6).

Table 7: T-Test analyses of bocce athletes according to gender variable

Gender							
Scale	**Variables**	**n**	**x**	**ss**	**sd**	**t**	**p**
Respect for opposing opinion and self-control scale in sport (general)	Woman	152	3.514	0.501	298.000	-2.932	**0.004***
	Male	148	3.694	0.563			
Hatred towards the opponent	Woman	152	2.435	1.153	298.000	-3.477	**0.001***
	Male	148	2.899	1.160			
Respect for the opponent	Woman	152	4.233	0.562	298.000	0.129	0.898
	Male	148	4.224	0.608			

*significant at p<0.05

In the T-Test analysis according to the gender variable of the athletes, there were differences at the level of ($p<0.05$) in the overall scale used in the study and in the dimension of hatred towards the opponent, while there were no differences at the level of ($p<0.05$) in the sub-dimension of respect towards the opponent (Table 7).

Table 8: T-Test analyses of bocce athletes according to marital status variable

Marital Status							
Scale	**Variables**	**n**	**x**	**ss**	**sd**	**t**	**p**
Respect for opposing opinion and self-control scale in sport (general)	Married	90	3.807	0.514	298.000	4.421	**0.000***
	Single	210	3.515	0.527			
Hatred towards the opponent	Married	90	2.840	1.370	138.486	1.549	0.090
	Single	210	2.588	1.080			
Respect for the opponent	Married	90	4.451	0.464	298.000	4.460	**0.000***
	Single	210	4.133	0.605			

*significant at $p<0.05$

In the T-Test analysis according to the marital status of the athletes, it was seen that there were differences at the level of ($p<0.05$) in the overall scale used in the study and in the sub-dimension of respect towards the opponent, while there were no differences at the level of ($p<0.05$) in the sub-dimension of hatred towards the opponent (Table 8).

Table 9: T-Test analyses of bocce athletes according to being a national athlete

Are you a National Athlete?							
Scale	**Variables**	**n**	**x**	**ss**	**sd**	**t**	**p**
Respect for opposing opinion and self-control scale in sport (general)	Yes	67	3.254	0.432	127.590	-7.104	**0.000***
	No	233	3.703	0.526			
Hatred towards the opponent	Yes	67	2.057	0.892	140.753	-5.826	**0.000***
	No	233	2.839	1.193			
Respect for the opponent	Yes	67	4.053	0.699	298.000	-2.827	**0.005***
	No	233	4.279	0.538			

*significant at $p<0.05$

In the T-Test analysis according to the national athlete status of the athletes, differences were found at the level of ($p<0.05$) in the total and all dimensions of the scale used in the study (Table 9).

DISCUSSION AND CONCLUSION

In Cronbach's alpha values of the scale of respect for opposing opinion and self-control in sport and its sub-dimensions, it was determined that the total scale was highly reliable with 0.772 the sub-dimension of hatred towards the opponent was highly reliable with 0.927 and the sub-dimension of respect towards the opponent was highly reliable with 0.843 (Table 1).

One Way Anova-Tukey analysis of the age of the athletes revealed differences at the level of ($p<0.05$) in the total and all dimensions of the scale used in the study (Table 3). Demir & Talimciler, (2014), in their study, determined that young individuals use visuals and writings aimed at hatred more and that they transfer this to their daily lives. Gıdık & Şipal, (2023), determined that there were differences in the age variable in their study. Evli et al., (2023), found that there were differences in the age variable in their study with football players. Tokmak, (2021), reported that there were no differences in the age variable. Çelik et al., (2022), reported that there were no differences in the sub-dimensions of hatred towards rival and respect towards rival in their research. Göksel & Kul, (2023), determined that there were no differences in the sub-dimension of hatred towards the opponent in the age variable, while there were differences in the sub-dimension of respect towards the opponent.

One Way Anova-Tukey analysis of the income levels of the athletes showed that there were differences at the level of ($p<0.05$) in the overall scale used in the study and in the dimension of hatred towards the opponent, while there were no differences at the level of ($p<0.05$) in the dimension of respect towards the opponent (Table 4). Sert, (2022), reported that there was no difference in income level in his study with students. Köroğlu et al., (2023), determined that there were no differences in income levels. Akpınar Kocakulak & Özdemir, (2023), reported that there were no differences in income levels. Kaya et al., (2023), determined that there were no differences in income levels in their study. Çelik & Gıdık, (2023), determined that there were differences in income levels.

In the One Way Anova-Tukey analysis according to the educational status of the athletes, it was seen that there were differences at the level of ($p<0.05$) in the overall scale used in the study and in the dimension of hatred towards the opponent, while there were no differences at the level of ($p<0.05$) in the sub-dimension of respect towards the opponent (Table 5). Kul et al., (2021), determined that there were no differences in educational status. Topal et al., (2021), reported that there were no differences in the sub-dimensions of respect and hatred towards the opponent at the level of education, while there was a differentiation in the overall scale. Uruç, (2023), determined that there were differences in the education variable. Göksel & Kul, (2023), determined that there were no differences in the sub-dimension of hatred towards rival in education levels, while there were differences in the sub-dimension of respect towards rival. Şimşek & Kartal, (2023), reported that there were differences in education levels.

In the One Way Anova-Tukey study conducted according to the sports age of the athletes, it was determined that there were no differences at the level of ($p<0.05$) in the overall scale used, but there were differences at the level of ($p<0.05$) in the dimensions of hatred towards the opponent and respect towards the opponent (Table 6). Çelik & Gıdık, (2022), reported that there were differences in the sport age variable. Murathan, (2023), reported that there were differences in the variable of sport age in his research with female athletes. Terkin & Abakay, (2023), found differences in the sport age variable. Albayatı, (2023), determined that there was no differentiation in sports age. Yıldırım & Yılmaz, (2023), reported that there were no differences in the sport age variable in their study with swimmers.

In the T-Test analysis according to the gender variable of the athletes, differences were found in the overall scale used in the study and in the dimension of hatred towards the opponent at the level of ($p<0.05$), while no differences were found in the sub-dimension of respect towards the opponent at the level of ($p<0.05$) (Table 7). Gülle et al., (2020), determined that there were differences in the sub-dimensions of hatred and respect for the opponent. Topal et al., (2021), determined that there were differences in the sub-dimension of respect for rival in gender variable, while there were no differences in the dimension of hate for rival and in the overall scale. Çelik et al., (2022), reported that there were

differences in the sub-dimension of hatred towards the opponent, while there were no differences in the sub-dimension of respect towards the opponent. Göksel & Kul, (2023), determined that there were differences in the sub-dimensions of respect and hatred towards the opponent in gender variable.

In the T-Test analysis according to the marital status of the athletes, it was seen that there were differences in the overall scale used in the study and in the respect for the opponent sub-dimension ($p<0.05$), while there were no differences in the opponent hatred sub-dimension ($p<0.05$) (Table 8). Evli et al., (2020), found that there were no significant differences in their study. Yıldırım et al., (2023), reported that there were no differences in the marital status variable in their study with underwater athletes. Demir & Duman, (2019), determined that there were differences in their study. Söyler et al., (2022), found differences in marital status. Göksel & Kul, (2023), determined that there were differences in the sub-dimensions of respect and hatred towards the opponent in the marital status variable. Güler & Sezer, (2023), found differences in marital status variable in their research. Tutar, (2023), determined that there were differences in the marital status variable.

In the T-Test analysis according to the national athlete status of the athletes, differences were found at the level of ($p<0.05$) in the total and all dimensions of the scale used in the study (Table 9). Erdoğan & Gülşen, (2020), found high rates of differences in nationality status. Kozak et al., (2021), found differences in the level of nationality. Ateş, (2023), determined that there were differences in the nationality variable. Koç, (2023), in his research with elite athletes, found significant differences in the national athlete variable. Bedir & Önal, (2023), determined that there were no differences in the variable of being a national athlete in their study with athletes.

Declaration of Contribution Rates of Researchers

The authors of the study declare that they have contributed equally to the research.

Declaration of Conflict of Interest of the Researchers

The authors declare that there is no conflict of interest between them.

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Chapter 4

WHY IS VISUALIZATION IMPORTANT IN KARATE SPORT?

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INTRODUCTION

When an experience (skill, event, object, place, etc.) is not realized physically, a person can visualize the images of that experience. This mental visualization process is called visualization (Pylyshyn, 2002). Conceptually, it is possible to define it as "the process of mentally visualizing the performance of a skill without related explicit actions" (Cohn, 1990). In this regard, both empirical and meta-analysis studies have revealed that imagery intervention programs have both psychological (anxiety, self-confidence, etc.) and physical (such as skill learning and development) benefits (Öztürk, 2023; Jose, Joseph & Matha, 2018). One of the most frequently used areas to obtain these benefits is skill learning in sports (Ekmekçi, 2017). An example of these skills can be given by developing the turning technique of a style in swimming through mental visualization exercises (Elçi, Ağbuğa, Işık & Öztop, 2013). Acquisitions such as the example skill can be achieved with visualization programs integrated into sports activities; Acquisition of a new skill can be achieved by identifying the strengths and weaknesses of the existing skill and preparing work programs based on these determinations (Konter, 1999).

The active participation of all senses is essential in order to realize an effective application for the acquisition and development of sports technical skills through imagery programs (Suat & Işıldak, 2008). In these studies, seeing, hearing or tasting the image and environmental factors in the mind for the targeted achievement are the elements that strengthen the study. However, visualization is a beneficial intervention program in the process of developing the senses and transforming them into reality, as it is done with the active participation of the senses. In order for this situation to be possible through visualization studies, effective mental visualization is required. Because, as a result of an effectively implemented visualization program, not only the rotation of images in the mind but also an effect on the autonomic nervous system can be caused, and even an

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electrical current that has not existed before in the relevant muscle groups can be caused (Jacobson, 1930).

KARATE

The term "karate", known as the art of unarmed combat; It was formed as a result of the combination of the words empty (kara) and el (te). Although this fighting art is commonly referred to as "karate", it originally emerged as “karate-do”. The meaning of the expression “Do” conceptually means “way”. What is meant by the expression path is an ethical process and the journey that every individual who receives training in the discipline of the discipline continues to improve himself and reach perfection (Çetintaş, 2021). This Far Eastern discipline is expressed in different definitions with keywords containing its basic meaning. For example; Güven (1982) defined the karate discipline with the words “It is the art of defending oneself in difficult conditions with an empty hand, without using a weapon.” The term “karate”, which came to our language from Japanese, is defined by the Turkish Language Association (TDK); It is expressed as “a fighting method of Japanese origin, based on foot and hand kicks” (TDK, 2023).

Although the art of karate is known today as the Japanese ancestral sport, it is actually from Okinawa, the largest of the Ryukyu archipelago, which has an extensive trade connection with China, especially the Fujian province in the south, as its foundations and origin are located between the Japanese mainland and China. (Cowie & Dyson, 2016). For this reason, many Chinese merchants frequently visited or settled in Okinawa. Similarly, many Okinawans also traveled to China and immigrated to those areas. These visits and migrations led to cultural exchange between two different communities over time. Karate emerged as one of this cultural mixture, creating a mixture of martial arts. In fact, according to legend, karate techniques were used by the locals to defend themselves against the samurai from the Satsuma region who invaded the island in 1609. Again, according to various sources and legends, karate techniques have become not only an activity that is of interest to a certain segment of people, but also a discipline used and practiced by Okinawan karate nobles and upper-class people (Gottner, 2022).

After this defense-oriented deep-rooted discipline became widespread in all segments of society, it was greatly influenced by the established karate schools while taking its current form, known as “modern karate”. The person who has the biggest share in the magnitude of this impact undoubtedly comes to mind as “Funakoshi” (Funakoshi, 1994). Karate, which became a specific discipline as a result of Funakoshi's efforts, began to organize competitions in parallel with the

increase in its participants over time. In this sense, the first known karate competition with rules was held at Tokyo Gymnastics Center in 1957 (Koca, 2016). With the increase in popularity of these regular competitions around the world, they began to be recognized in our country, and in the future, Turkish karate players also started to compete in international arenas. In this regard, the recognition of karate in Turkey was achieved through Hakkı Koşar (Koşar, 1979). The biggest institutional step taken for karate sport, which became widespread in Turkey under the leadership of Koşar, was in the federation process. In this process, the federation process first started in 1981 under the Judo Federation. Karate discipline, which increased its activities after federation, took its current form in 1990 and took the name Turkish Karate Federation (TKF) and declared its independence as of this date (TKF, 2023). As a result of all these processes, tournaments are organized in two different disciplines in karate, where competitions are held even in the Olympic Games, the most comprehensive sports organization in the world. These; "kata" and "kumite" (Lystad, Augustovičová, Harris, Beskin & Arriaza, 2020).

IMAGERY

When it comes to defining the term "imagery" conceptually, there are common keywords in almost all definitions. These; It refers to the sensory rehearsal of a phenomenon in the mind without actual practice of imagery (Weinberg, & Gould, 2015). The term "image" is at the root of the concept of visualization, and the definition of this action, which manifests the visualization of images in the mind, by the Turkish Language Association, uses the expressions "to visualize, imagine the image of something" (Turkish Language Association, 2023). Murphy (1990) made a definition of the imagery process that suggests the memory-oriented aspects of this process, suggesting the recovery of stored sensory experiences that can be replaced in the absence of any external stimulus. According to Vealey and Greenleaf's (2006) functional definition of imagery; "Imagination is the use of all senses to visualize or re-enact an experience in the mind." Denis (1985), on the other hand, made a definition that draws attention to the dynamic and creative features of images and emphasized that imagination is a psychological activity that creates the concrete features of an abstract object in our field of perception, temporarily or permanently.

Wilhelm Wundt, who put forward the view that imagination occurs with the basic elements that make up human consciousness as a result of the combination of images of an object or experience, senses and emotions related to that time, is among the oldest known thinkers in the history of imagination studies, and he is the person who founded the first psychology laboratory in this field. At that time,

psychologists of the period were divided into two regarding the views that there was a connection between actions such as “imagining” and “thinking”. According to one group, the view that “thought is impossible without images”, as stated by Aristotle, was convincing, while another group argued that thought could exist in the absence of images (Goldstein, 2013). In the 20th century, many new views were put forward regarding the necessity of images for thinking. However, behaviorism managed to shake the important position of imagination and the debates ended (Watson, 1913). In this regard, Morgan (2013) argued that people's use of imagery due to differences in their experiences and cognitive skills may lead to individual differences, and that both views have their counterparts in practice (Morgan, 2013).

Applications of imagery studies were widely used in the field of psychology. Imagination, which has the feature of being a therapeutic intervention program, has also gained application in various fields after being included in psychotherapy studies (Gülüm, 2018). One of these areas where the use of imagery is frequently used is physical education and sports (Konter, 1999). Models of the use of imagery in physical education and sports indicate that it gives very effective results in learning and developing a skill (Simonsmeier, Andronie, Buecker & Frank, 2021). These studies are also used to intervene in all various cognitive, behavioral or affective expressions in athletes (Hall, 2001). It is known that athletes frequently use this practice because the use of imagery in sports increases sports performance and has a psychologically regulating effect (Altıntaş & Akalan, 2008; Morris, Spittle & Watt, 2005). The results of the study, in which amateur athletes and elite athletes constituted the research group, indicate that elite level athletes use these applications more frequently (Ashrafi & Hemayattalab, 2015; Shearer, Thomson, Mellalieu & Shearer, 2007). In fact, it is thought that the use of imagery exercises by elite athletes is not a coincidence and is a predictor of the success of athletes in this group (Nezam, IsaZadeh, Hojjati, & Zadeh, 2014). Because as much as the athlete produces images of the conditions in which he will be successful, he can positively affect the process with these practices during the injury period, and this is one of the indicators of how effective visualization is in sports (Rodriguez, Marroquin & Cosby, 2019).

Skill learning, psychological skill development and some rehabilitative issues through visualization studies that provide visible outcomes in sports were mentioned in the previous section. However, it is confirmed by the studies in the literature on the subject that some neurophysiological findings may be encountered as a result of planned and intensified application of imagery studies. Carpenter's study is the first of the studies conducted in this field using various neuroimaging methods. Carpenter (Carpente Effect), who gave his name to the

finding, determined that there is a similarity between the intensity of the electrical current that occurs as a result of muscle tension during physical participation in sports activities and the organic electrical current that occurs as a result of the muscle tension of an athlete who watches those movements and creates his mental design through imagination. (Weinberg, & Gould, 2015).

This physiological finding, called the Carpenter effect, was later confirmed by various studies. One of these is Jacobson's (1930) research. In the relevant study, it was determined that visualizing the image of the arm bending movement caused small contractions in the flexor muscles in that arm. In other words, as a result of this research, it was found that small amounts of muscular activity may occur during imagery exercises. Another research result conducted for this purpose belongs to Suinn (1972). In this research, measurements were first made during the skiing performance through electrodes attached to the ski athlete's legs. Then, the tests were repeated by asking the child to visualize images of the same movements. At the end of the research, it was determined that there was a similarity between the data obtained from both measurements of the athlete. In addition to these studies, it is also known that imagery studies are a determinant of fatigue to a certain extent among the physiological effects. Moreover, it is established in the research in the literature on the subject that even the level of lactic acid in the body can be relatively increased as a result of visualization exercises (Razon, Mandler, Arsal, Tokac & Tenenbaum, 2014).

According to all the data obtained as a result of both empirical and meta-analysis studies regarding imagery exercises, it is possible to say that imagery exercises should be included in training programs in a supportive manner in order to improve an athlete's sporting success and performance as well as his ability to cope with various conditions. In other words, in order to achieve various physical and physiological successes, exercising the body and activating the mind is essential for success. Because physical training alone may be insufficient to develop and improve all parameters of success (Yalçın & Ramazanoğlu, 2020; Mizuguchi, Nakata, Uchida & Kanosue, 2012; Murphy, 1990).

Uses of Imagery in Sports

There are various purposes for using imagery in the field of sports. However, in this research, a widely accepted classification by Morris, Spittle and Watt (2005) is included. Researchers have grouped imagery studies used in exercise and sports applications under five headings. The purposes of using this visualization are; skill learning and practice, tactics and game skills, competition and performance, psychological skills and injury and heavy training. Detailed information about these usage areas is given below.

Skill learning and practice: Imagination exercises used for skill learning and practice can be defined as "imagery development" or "cognitive special imagery". The main purpose of these practices is to enable the athlete to acquire techniques specific to the relevant sports branch and to improve existing skills during the application phase. Imagination studies applied for this purpose should include realistic details. Because if the athlete images the basic points related to the images in detail and improves this skill, he will have made progress in physical/spiritual development and correcting his mistakes (Morris, Spittle & Watt, 2005).

The data obtained as a result of empirical studies on visualization conducted in the literature on the subject clearly show that visualization studies are a very pragmatic method in terms of learning and practicing motor skills. The aforementioned empirical studies were applied to subjects with various skill levels and to athletes from many sports branches (such as individual-team sports, combat sports) (Weinberger & Gould, 2015).

If it is necessary to give an example of studies showing that skill learning is achieved through imagery exercises, the study conducted by Hamrouni, Alem, Baert and Bouguerra (2015) with karate athletes can be cited as an example. Researchers have determined that a more effective learning process is achieved by including visualization exercises in teaching the techniques of the kata sub-discipline of karate sport.

Tactics and gaming skills: Another use of imagery exercises is to develop tactics and develop game-specific skills. Both athletes and coaches can create a strategy or create a game plan for the competition by visualizing various situations in their minds. In sports, it is very important to visualize both the performance and the strategies of the matches in order to achieve success both individually and as a team (Morris, Spittle & Watt, 2005). The tactical part of the fight requires developing strategy. These strategies are among the most essential elements for success (Omar-Fauzee, Daud, Abdullah & Rashid, 2009).

Paivio (1985), who puts forward a motivational approach in his theoretical study that improvement can be achieved in strategy development and the competition process through imagery studies, argues that a general mastery in terms of motivation can be achieved through these studies. The athlete creates difficult conditions and images of overcoming those conditions in his mind with the strategies and games he will create against various rivals in the competition. By being exposed to these situations, the mind gains mastery without experiencing it physically (Callow & Hardy, 1997).

Competition and performance: Mental visualization exercises by creating images are not only a training method used by athletes, but they also provide the

opportunity to mentally visualize the atmosphere of a competition, the athlete's opponents, the performance or the aftermath of the competition (Morris, Spittle, & Watt, 2005). There are various studies in the literature on how both sports performance and competition performance can be improved through imagery exercises. These studies are multidisciplinary as well as gathering the concepts of competition, performance and imagination under one roof (Hall, Rodgers & Barr, 1990).

Although the study of Morone et al. (2022) is an exemplary study in this regard, it is a systematic review model study on the relationship between motor imagery and sports performance. On the other hand, Bedir and Erhan (2021), who worked with athletes from various sports branches (archery, bowling and curling) in parallel with visualization studies and virtual reality studies, stated that the target-oriented sports performances of the athletes could be improved as a result of the mentioned applications. This experimental study also shows that, as a result of visualization studies, it is possible to detect improvements in athletes' sports performances and various competition-related parameters.

Psychological skills: Although the uses mentioned in the previous headings regarding the purposes of using imagery in sports include physical skills, it is also possible to acquire psychological skills and improve existing skills (motivation, anxiety, stress, self-confidence, optimal performance mood, etc.) through imagery exercises (Pile, Williamson, Saunders, Holmes & Lau, 2021). Regarding the effect of imagery exercises on psychological skills, it is possible to improve both individual and team sports athletes (Morris, Spittle & Watt, 2005).

According to the results of the research on psychological skills; A decrease in stress and anxiety levels is observed as a result of visualization exercises of athletes (Boz & Kul, 2020). On the other hand, positive correlations have been detected in parameters such as motivation and optimal performance mood in athletes performing imagery exercises (Rhodes, Nedza, May, Jenkins & Stone, 2021; Seleciler & Türkmen, 2020). Based on relevant studies, it is possible to say that there is a correlation between imagery and variables that can be described as both positive and negative.

Injury and heavy training: The last title that can be mentioned regarding the use of imagery exercises is the use of rehabilitative imagery, which is used during the injury process to enable athletes to return to the training and competition fields in a healthy way. It should also be noted that under this umbrella of use, it is used during the heavy training season. During periods where the recovery process takes a long time, such as during injury or heavy training, it may be difficult for the athlete to accept the current situation. However, it is quite possible

to cope with these conditions with imagery exercises (Morris, Spittle & Watt, 2005).

Many studies indicate that athletes resort to imagery exercises because they cannot train or participate in competitions due to injury. In addition to these periods of injury, visualization exercises, which are applied in situations where they are away from the field due to various diseases, are a method that keeps them active at the point of returning to sports (Weinberg & Gould, 2015). Starekova and her colleagues (2021), who investigated this situation in athletes who were sick during the covid-19 epidemic period, found that the athletes visualized the techniques specific to their sports branches, their performances and their opponents in the competition during the period they were sick.

Cognitive Theories of Imagery

Two separate topics from the cognitive theories of imagery are mentioned in this part of the research. These approaches; "Bioinformational Theory" and "Triple Coding Theory". Firstly, bioinformational theory (bioinformational) was developed by Lang (1977) and is the approach that is accepted as the best among the theories on imagination in the literature. Under this theory, research is carried out on issues such as phobia and anxiety disorders. Bioinformational theory, presented as a cognitive hypothesis, benefits from the information processing process of imagery studies. According to Lang, imagination has two propositions. The first of these propositions is the "warning proposition". The stimulus proposition describes the imagery of environmental factors. The other proposition is the "reaction proposition". In this proposition, the individual's behavioral reactions to the environment are discussed. (Lang, 1977).

The purpose of developing bioinformational theory stems from the effort to understand people's emotional and psycho-physiological reactions to objects they fear (Lang, 1979). While developing the theory for this purpose, Lang (1977) was influenced by the imagery studies of Pylyshyn (2002). According to Lang (1977), images are not just pictures in the head, but also representations of the future have abstract, language-like cognitive codes that are not similar to the stimuli they concretely refer to. According to Pylyshyn's (2002) views, there are three types of information regarding the object or experience visualized in the mind. The first of these is the "stimulus situation". This information consists of expressions that help define the content of events visualized in the mind. The second is the "reaction state". Reaction states are expressions that explain how people feel when responding to the scenario they envision in their minds. The last one is the "state of meaning". In this case, the perceived importance is expressed on behalf of those who have the skill visualized in the mind. In summary, in these three

cases, it is believed that the information obtained from the suggestion type is organized in a network of relationships in the mind (Murphy, 1990).

Another cognitive theory of imagery is the "Triple Coding Model" put forward by Ahsen (1984). According to Ahsen's theory, imagery studies have three separate components known as "Itself, Somatic Response and Meaning (ISM)". The first of these components is the image itself (Itself) to be visualized in the mind. Having an internal sensation that represents the same as the real sensation and internal arousal are expressed by this component. Ahsen (1984); He advocates the view that images help us interact with the external world and the objects in it by representing them with sensory reality, as if we were interacting with real life. The other component is the somatic/physical response. This component describes the psycho-physiological changes caused in the body as a result of visualization. In this respect, it is similar to Lang's (1977) bioinformational theory. The third and last component is defined as the meaning of the image. This component is difficult to find in many visualization models. However, the meaning of the images is a very important component. While images of an athlete associated with a situation may cause anxiety and stress in that athlete, the same situation may create an environment of trust for another athlete (Weinberg & Gould, 2015).

IMAGERY IN KARATE

Various studies in which karate athletes constitute the research group are available in the literature on the subject. These researches attract a lot of attention in multidisciplinary fields as well as in the field of physical education and sports. In this context, when the research results in the domestic literature were examined, no research in an experimental model was found. However, there are various studies on the screening model (Satılmış, 2021; Özgey, 2019; Boz, 2019). As a result of the research in which EEG measurements of elite karate athletes were also taken; It was determined that there was no relationship between self-efficacy and attention and imagination correlation results (Özgey, 2019). On the other hand, as a result of these studies, it was determined that there was a decrease in the trait anxiety levels of karate players due to the use of imagery (Boz, 2019) and an increase in their motivation levels (Satlamış, 2021).

It is possible to reach both experimental and survey studies on karate players and their use of imagery as a result of foreign literature review. The first studies encountered in this context are; They point out that the regular and systematic application of imagery exercises has a feature that improves the techniques specific to karate sport and increases sports performance (Weinberg, Seabourne & Jackson, 1981; Seabourne, Weinberg & Jackson, 1984). Harris and Robinson

(1986) found that it was possible to affect the muscle innervations of karate players through imagery studies and significantly reduced tonic muscle activity. Terry and Slade (1995) examined the parameters that can be defined as the criterion of success in karate sport. In this study, parameters that can cause failure (such as anger and depression) and parameters that will lead the athlete to success (such as motivation and self-confidence) are defined. In order to regulate all these parameters and achieve success in karate, researchers have recommended visualization exercises to karate athletes.

When more recent studies are examined compared to the studies mentioned above, it is seen that the topics related to the use of imagery by karate athletes maintain their popularity. In these studies, it was determined that karate players' visualization skills were at a high level (Di Corrado, Guarnera, & Quartiroli, 2014). Moreover, it has been found that cognitive skills can be improved with the use of imagery (Hamrouni, Alem, Baert & Bouguerra, 2015) and that there is a positive relationship between emotional intelligence (Reza, Zhong, Ali & Yang, 2020).

CONCLUSION

Karate is known as both a physical and mental sport. This sport teaches students valuable skills such as discipline, focus and self-control, while also increasing self-defense ability. In karate, visualization is of great importance during training and competitions. Visualization means visualizing a certain situation, event or experience in the mind. In karate, visualization is used to fully feel the techniques and perform physical movements more effectively. Rather than thinking about a technique or simply moving physically, through visualization a person can improve their performance by literally imagining the movement. An important benefit of visualization in karate is that it improves muscle memory.

Imagining the technique with eyes closed activates the nervous system to ensure the muscles move correctly. In this way, the body can perform the movement faster and more accurately. Visualization helps karate players use techniques more effectively. Additionally, visualization increases karate players' mental focus. Mentally imagining the movements allows the athlete to focus their attention on a single point. This helps karate players perform better by avoiding distractions. In karate competitions or training, it is important to have high mental focus and visualization is an effective method in this regard. In addition, visualization increases the self-confidence of karate players. Visualizing before a technique or competition gives the individual self-confidence. Imagining having the ability to perform the technique perfectly increases the athlete's self-

confidence. Self-confidence helps karate players perform better and move more easily in challenging situations.

In conclusion, visualization plays an important role in the sport of karate. Visualization allows you to feel the techniques better and develop muscle memory. It also helps karate players perform better by increasing mental focus and increases their self-confidence. Therefore, it is important for karate players to develop their visualization skills and use this method frequently in their training.

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Chapter 5

EXAMINATION OF ARTIFICIAL INTELLIGENCE ANXIETY LEVELS OF BOCCE ATHLETES

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INTRODUCTION

The word "Bocce" is of Italian origin and is used in French as "Boules", in English as "bowls" and in Turkey as a synonym for all the games of Lawn Ball, Raffa, Volo and Petanque. In international sports organisations it is referred to as "Boules" since the confederation that includes all branches under its roof is based in France. The most common branch of Bocce is petanque. Although Bocce sport has been adopted as boules at the international level Petanque has become a system known by its own name in most countries (Türkmen, 2011). The general logic of Bocce sport is to approach the big ball by rolling or throwing the ball known as "Jack", "cochonet", "bouchon", "le petit" or "pallino" (tiny ball) as much as possible. Traditionally, the games are played in teams or in pairs of rivals in cities, towns, open spaces, beaches, on grass, sand, hard soil, gravel and some variants on specialised facilities and grounds. Although some branches are only for competition, some branches have become sports for spending time (Nauright, 2012). The new rules of the petanque form of the bocce game have taken its current form with updates such as the presence of both feet of the players in a shooting circle, the distance to be placed as a target to be at least 6 metres, and certain standards of the place and ground to be played (Kirsch et al., 2000). Participation in bocce sport develops many characteristics such as establishing friendship relations, gaining new experiences, sense of achievement, physical endurance, using mental powers, emotional experience and rest (Tezcan, 1994). Especially in the recent period, the ability to use mental powers brings us the feature of artificial intelligence, which has started to take place in the field of sports with the development of technology. Artificial intelligence consists of two words, one of which is "artificial" and the other is "intelligence", and "artificial"

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defines man-made while the word "intelligence" defines it as thinking capacity (Hoşgör & Güngördü, 2022). The term artificial intelligence, which was first introduced to the literature in 1955 is defined as a machine that has the ability to perform only human-specific intelligent behaviours such as learning, perception, communication and reasoning (Chan & Zary, 2019). In other words, it is not an effort or attempt to reveal an artificial human being, but is defined as the acquisition of only human characteristics such as decision-making and thinking to machines (Keleş, 2018). As with the transition to the world of information by developing in limited environments, changes in communication and data collection processes in the sectors, the way of life between generations has also changed over time and it is known that a new era has begun with the name of the digital age, and this period is also called the age of artificial intelligence (Büyükgöze & Dereli, 2019). Another name of artificial intelligence is machine intelligence and therefore it was created by human intelligence. When you look at the literature research, you can see the rapid progress in the field of artificial intelligence with the irregular emergence of advanced networks also known as industrial networks (Ting et al., 2019). Artificial intelligence is a software that can make the most accurate predictions and decisions by analysing machine learning, data-based decision-making mechanism, autonomous control data, mathematics and logic-based models with models close to human consciousness (Serçemeli, 2018). Artificial intelligence works with a model that closely matches human consciousness such as speech, learning, understanding visual perception, recognition and strategy determination (Gültekin, 2021). It is seen that artificial intelligence has continued to exist in health, finance, marketing and many other fields especially in recent years. In the researches conducted in the literature, there is no study on artificial intelligence anxiety levels of bocce athletes.

The aim of this study is to examine the artificial intelligence anxiety levels of the athletes participating in the Turkish Petanque Championship held in Antalya Kemer between 13-18 April 2023.

Material Method

Research Group

The research group consists of a total of 533 bocce athletes 190 women and 343 men who participated in the Turkish Petanque Championship in Antalya Kemer between 13-18 April 2023. It was conducted with convenience sampling method. This method is defined as the voluntary participation of individuals in the study (Coşkun et al., 2017).

Data Collection Tool

The research consists of a 12-question demographic variable and an artificial intelligence anxiety scale developed by Wang and Wang, (2019), and adapted into Turkish by Terzi, (2020). The scale consists of four sub-dimensions and 21 items: artificial intelligence configuration, job change, learning and sociotechnical blindness. Learning sub-dimension consists of questions 1, 2, 3, 4, 5, 6, 7, 8, 9; job change sub-dimension consists of questions 10, 11, 12, 13, 14; sociotechnical blindness sub-dimension consists of questions 15, 16, 17, 18; and artificial intelligence configuration sub-dimension consists of questions 19 and 20. The scale is in 7-point Likert type, with 1 being "Not at all" and 7 being "Completely". According to the results of the reliability analyses, it was found that learning was 0.974, job change was 0.917, sociotechnical blindness was 0.917 and artificial intelligence configuration was 0.916 (Wang & Wang, 2019; Terzi, 2020).

Data Collection

All questions in the study were created in the questionnaire system and delivered to the participants. The individuals participating in the study were informed that their importance, method, purpose and names would not be shared anywhere and would be used only for research purposes.

Analysing the Data

The data obtained from bocce athletes were statistically obtained by performing Cronbach's Alpha reliability test, T-test and Anova-Tukey tests in SPSS 26.0 analysis programme. The significance level of the obtained data was evaluated as $p<0,05$.

Research Model

The study was conducted by utilising the relational survey method. Karasar, (2007), defined this model as "aiming to determine the existence and/or degree of change between two or more variables".

FINDINGS

Table 1: Cronbach's alpha values of artificial intelligence anxiety scale and its sub-dimensions

Scale	**Cronbach's Alpha Coefficient**	**Number of Questions**
Artificial Intelligence Anxiety Scale	0.960	21
Learning	0.922	9
Job Change	0.919	5
Sociotechnical Blindness	0.911	4
Artificial Intelligence Configuration	0.916	3

According to the results of the reliability distribution of the artificial intelligence anxiety scale used in our research; Cronbach's Alpha coefficient value of the Artificial Intelligence Anxiety Scale was 0.960, the Learning sub-dimension was 0.922, the Job Change sub-dimension was 0.919, the Sociotechnical Blindness sub-dimension was 0.911 and the Artificial Intelligence Configuration sub-dimension was 0.916. Since these values were between 0.80<R2<1.00 it was determined that the scale and sub-dimensions were highly reliable (Table 1).

Table 2: Demographic distribution data of Bocce athletes

VARIABLES		N	%
Age	14-18 Years	285	53.5
	19-23 Years	151	28.3
	24-28 Years	43	8.1
	29 Years and Over	54	10.1
Gender	Woman	190	35.6
	Male	343	64.4
Marital Status	Married	47	8.8
	Single	486	91.2
Socio-Economic Income Level	Low	51	9.6
	Centre	414	77.6
	High	68	12.8
Education Status	Primary and Secondary School	20	3.8
	High School	338	63.4
	University	175	32.8
Mother's Education Status	Primary and Secondary School	380	71.3
	High School	90	16.9
	University	63	11.8
Father's Education Status	Primary and Secondary School	297	55.8
	High School	143	26.8
	University	93	17.4
Sport Age (Bocce)	1-3 Years	143	26.8
	4-6 Years	180	33.8
	7 Years and Over	210	39.4
Does Your Family Support You to Play Bocce?	Yes	487	91.4
	No	46	8.6
Smartphone Brand You Use	iPhone	117	22.0
	Samsung	92	17.3
	Xiaomi	108	20.3
	Huawei	82	15.4
	Other	134	25.0
Do You Have a Smart Robot Vacuum Cleaner at Home?	Yes	78	14.6
	No	455	85.4
Do You use Applications Like "SIRI" on Mobile Phones?	Yes	168	31.5
	No	365	68.5

Table 3: One Way Anova-Tukey test results of age variable of Bocce athletes

Scale	Age	n	x	ss	f	p	Tukey
Artificial Intelligence Anxiety Scale	14-18 Years[a]	285	2.572	1.448	20.583	**0.000***	**a>c, d b>c, d**
	19-23 Years[b]	151	2.594	1.539			
	24-28 Years[c]	43	3.947	0.832			
	29 Years and Over[d]	54	3.684	0.947			
Learning	14-18 Years[a]	285	2.077	1.191	14.869	**0.000***	**a>c, d b>c, d**
	19-23 Years[b]	151	2.206	1.404			
	24-28 Years[c]	43	3.118	0.736			
	29 Years and Over[d]	54	3.045	1.728			
Job Change	14-18 Years[a]	285	3.098	1.946	11.983	**0.000***	**a>c, d b>c, d**
	19-23 Years[b]	151	2.925	1.972			
	24-28 Years[c]	43	4.539	1.155			
	29 Years and Over[d]	54	3.925	0.745			
Sociotechnical Blindness	14-18 Years[a]	285	2.866	1.915	17.730	**0.000***	**a>c, d b>c, d**
	19-23 Years[b]	151	2.910	1.971			
	24-28 Years[c]	43	4.563	1.435			
	29 Years and Over[d]	54	4.166	0.490			
Artificial Intelligence Configuration	14-18 Years[a]	285	2.789	1.960	24.760	**0.000***	**a>c, d b>c, d**
	19-23 Years[b]	151	2.785	1.943			
	24-28 Years[c]	43	4.627	1.585			
	29 Years and Over[d]	54	4.555	1.123			

*significant at $p<0.05$

In the One Way Anova-Tukey results of the "age" variable of bocce athletes, it was determined that there was a significant difference in the sub-dimensions of artificial intelligence anxiety scale (general), learning, sociotechnical blindness, job change and artificial intelligence configuration ($p<0.05$) (Table 3).

Table 4: One Way Anova-Tukey test results of socio-economic income level of Bocce athletes

Scale	Socio-Economic Income Level	n	x	ss	f	p	Tukey
Artificial Intelligence Anxiety Scale	Low[a]	51	3.773	1.512	18.179	**0.000***	**a>b b>c**
	Centre[b]	414	2.616	1.428			
	High[c]	68	3.209	1.321			
Learning	Low[a]	51	3.446	1.529	42.385	**0.000***	**a>b b>c**
	Centre[b]	414	2.035	1.193			
	High[c]	68	3.022	1.322			
Job Change	Low[a]	51	4.321	1.729	10.998	**0.000***	**a>b, c**
	Centre[b]	414	3.079	1.906			
	High[c]	68	3.482	0.173			
Sociotechnical Blindness	Low[a]	51	3.906	1.717	5.394	**0.005***	**a>b**
	Centre[b]	414	3.024	1.949			
	High[c]	68	3.327	1.455			
Artificial Intelligence Configuration	Low[a]	51	3.660	1.790	2.239	0.108	-
	Centre[b]	414	3.041	2.059			
	High[c]	68	3.156	1.533			

*significant at $p<0.05$

In the One Way Anova-Tukey results of the "socio-economic income level" variable of bocce athletes; while significant differences were found in the artificial intelligence anxiety scale (general), learning, job change and sociotechnical blindness sub-dimensions ($p<0.05$), no significant difference was found in the artificial intelligence configuration sub-dimension (Table 4).

Table 5: One Way AnovaTukey test results of the educational status variable of Bocce athletes

Scale	Education Status	n	x	ss	f	p	Tukey
Artificial Intelligence Anxiety Scale	Primary and Secondary School[a]	20	3.188	1.066	13.802	**0.000***	**b>c**
	High School[b]	338	2.554	1.437			
	University[c]	175	3.237	1.463			
Learning	Primary and Secondary School[a]	20	2.738	1.274	7.711	**0.001***	**b>c**
	High School[b]	338	2.126	1.245			
	University[c]	175	2.572	1.466			
Job Change	Primary and Secondary School[a]	20	4.150	1.493	10.080	**0.000***	**a>b** **b>c**
	High School[b]	338	2.987	1.891			
	University[c]	175	3.654	1.771			
Sociotechnical Blindness	Primary and Secondary School[a]	20	3.475	1.432	15.312	**0.000***	**b>c**
	High School[b]	338	2.815	1.856			
	University[c]	175	3.752	1.845			
Artificial Intelligence Configuration	Primary and Secondary School[a]	20	2.550	1.534	19.120	**0.000***	**a>c** **b>c**
	High School[b]	338	2.770	1.878			
	University[c]	175	3.847	2.025			

*significant at $p<0.05$

In the One Way Anova-Tukey results of the "educational status" variable of bocce athletes, a significant difference was found in the artificial intelligence anxiety scale (general) and all sub-dimensions ($p<0.05$) (Table 5).

Table 6: One Way Anova-Tukey test results of mother's education status variable of Bocce athletes

Scale	Mother's Education Status	n	x	ss	f	p	Tukey
Artificial Intelligence Anxiety Scale	Primary and Secondary School[a]	380	2.597	1.535	21.228	**0.000***	**a>c**
	High School[b]	90	2.945	1.164			**b>c**
	University[c]	63	3.836	0.884			
Learning	Primary and Secondary School[a]	380	2.103	1.301	48.204	**0.000***	**a>c**
	High School[b]	90	2.107	1.116			**b>c**
	University[c]	63	3.730	0.939			
Job Change	Primary and Secondary School[a]	380	3.020	1.962	10.586	**0.000***	**a>b, c**
	High School[b]	90	3.735	1.699			
	University[c]	63	3.942	1.095			
Sociotechnical Blindness	Primary and Secondary School[a]	380	2.950	2.038	9.078	**0.000***	**a>c**
	High School[b]	90	3.413	1.458			
	University[c]	63	3.960	1.062			
Artificial Intelligence Configuration	Primary and Secondary School[a]	380	2.905	2.071	8.079	**0.000***	**a>b, c**
	High School[b]	90	3.518	1.842			
	University[c]	63	3.809	1.255			

*significant at $p<0.05$

In the One Way Anova-Tukey results of the "mother's education status" variable of bocce athletes; a significant difference was found in the artificial intelligence anxiety scale (general) and all sub-dimensions ($p<0.05$) (Table 6).

Table 7: One Way Anova-Tukey test results of father's education status variable of Bocce athletes

Scale	Father's Education Status	n	x	ss	f	p	Tukey
Artificial Intelligence Anxiety Scale	Primary and Secondary School[a]	297	2.601	1.550	18.545	**0.000***	**a>c** **b>c**
	High School[b]	143	2.692	1.242			
	University[c]	93	3.614	1.243			
Learning	Primary and Secondary School[a]	297	2.153	1.269	39.321	**0.000***	**a>c** **b>c**
	High School[b]	143	1.927	1.154			
	University[c]	93	3.321	1.339			
Job Change	Primary and Secondary School[a]	297	3.103	2.038	5.660	**0.004***	**a>c** **b>c**
	High School[b]	143	3.173	1.703			
	University[c]	93	3.834	1.405			
Sociotechnical Blindness	Primary and Secondary School[a]	297	2.861	2.032	11.927	**0.000***	**a>c** **b>c**
	High School[b]	143	3.237	1.713			
	University[c]	93	3.924	1.381			
Artificial Intelligence Configuration	Primary and Secondary School[a]	297	2.762	2.086	11.587	**0.000***	**a>b, c**
	High School[b]	143	3.461	1.927			
	University[c]	93	3.713	1.416			

*significant at $p<0.05$

In the One Way Anova-Tukey results of the "father's education status" variable of bocce athletes; a significant difference was found in the artificial intelligence anxiety scale (general) and all sub-dimensions ($p<0.05$) (Table 7).

Table 8: One Way Anova-Tukey test results of sport age variable of Bocce athletes

Scale	Sport Age (Bocce)	n	x	ss	f	p	Tukey
Artificial Intelligence Anxiety Scale	1-3 Years[a]	143	2.617	1.410	2.440	0.088	-
	4-6 Years[b]	180	2.976	1.242			
	7 Years and Over[c]	210	2.779	1.663			
Learning	1-3 Years[a]	143	2.138	1.212	6.269	**0.002***	**a>b b>c**
	4-6 Years[b]	180	2.580	1.254			
	7 Years and Over[c]	210	2.159	1.454			
Job Change	1-3 Years[a]	143	3.370	2.088	0.782	0.458	-
	4-6 Years[b]	180	3.294	1.468			
	7 Years and Over[c]	210	3.129	2.019			
Sociotechnical Blindness	1-3 Years[a]	143	2.772	1.733	3.927	**0.020***	**a>c**
	4-6 Years[b]	180	3.259	1.667			
	7 Years and Over[c]	210	3.307	2.126			
Artificial Intelligence Configuration	1-3 Years[a]	143	2.589	1.766	7.171	**0.001***	**a>b, c**
	4-6 Years[b]	180	3.255	1.734			
	7 Years and Over[c]	210	3.354	2.242			

*significant at $p<0.05$

In the One Way Anova-Tukey results of the "sport age (Bocce)" variable of Bocce athletes; while there was a significant difference in the learning sociotechnical blindness and artificial intelligence configuration sub-dimensions ($p<0.05$), no significant difference was found in the artificial intelligence anxiety scale (general) and job change sub-dimension (Table 8).

Table 9: One Way Anova-Tukey test results of the smartphone brand variable used by Bocce athletes

Scale	Smartphone Brand	n	x	ss	f	p	Tukey
Artificial Intelligence Anxiety Scale	iPhone[a]	117	2.496	1.490	2.481	**0.043***	**a>b**
	Samsung[b]	92	2.848	1.454			
	Xiaomi[c]	108	3.070	1.213			
	Huawei[d]	82	2.686	1.396			
	Other[e]	134	2.893	1.647			
Learning	iPhone[a]	117	2.086	1.277	2.355	0.053	-
	Samsung[b]	92	2.134	1.322			
	Xiaomi[c]	108	2.511	1.311			
	Huawei[d]	82	2.222	1.371			
	Other[e]	134	2.462	1.379			
Job Change	iPhone[a]	117	2.774	1.964	3.143	**0.014***	**a>b**
	Samsung[b]	92	3.439	1.975			
	Xiaomi[c]	108	3.564	1.412			
	Huawei[d]	82	3.124	1.860			
	Other[e]	134	3.358	1.983			
Sociotechnical Blindness	iPhone[a]	117	2.863	2.028	1.714	0.146	-
	Samsung[b]	92	3.366	2.166			
	Xiaomi[c]	108	3.395	1.518			
	Huawei[d]	82	2.936	1.498			
	Other[e]	134	3.175	2.014			
Artificial Intelligence Configuration	iPhone[a]	117	2.772	2.118	2.225	0.065	-
	Samsung[b]	92	3.315	2.246			
	Xiaomi[c]	108	3.493	1.653			
	Huawei[d]	82	3.016	1.580			
	Other[e]	134	3.034	2.085			

*significant at $p<0.05$

In the One Way Anova-Tukey results of the "smartphone brand used" variable of bocce athletes; while significant differences were found in the artificial intelligence anxiety scale (general) and job change sub-dimensions ($p<0.05$) no significant differences were found in learning, sociotechnical blindness and artificial intelligence configuration sub-dimension (Table 9).

Table 10: T-test results of gender variable of Bocce athletes

Scale	Gender	n	x	ss	sd	t	p
Artificial Intelligence Anxiety Scale	Woman	190	3.304	1.206	469.248	6.485	**0.000***
	Male	343	2.524	1.527			
Learning	Woman	190	2.421	1.198	445.044	1.679	0.094
	Male	343	2.227	1.408			
Job Change	Woman	190	4.054	1.717	406.929	7.907	**0.000***
	Male	343	2.804	1.805			
Sociotechnical Blindness	Woman	190	3.906	1.829	531.000	7.230	**0.000***
	Male	343	2.727	1.788			
Artificial Intelligence Configuration	Woman	190	3.901	1.895	389.778	7.131	**0.000***
	Male	343	2.680	1.893			

*significant at p<0.05

In the One Way Anova-Tukey results of the "smartphone brand used" variable of bocce athletes; while significant differences were found in the artificial intelligence anxiety scale (general) and job change sub-dimensions (p<0.05) no significant difference was found in learning, sociotechnical blindness and artificial intelligence configuration sub-dimension (Table 10).

Table 11: T-test results of marital status variable of Bocce athletes

Scale	Marital Status	n	x	ss	sd	t	p
Artificial Intelligence Anxiety Scale	Married	47	3.318	1.012	67.228	3.479	**0.001***
	Single	486	2.752	1.496			
Learning	Married	47	2.605	1.711	51.228	1.321	0.192
	Single	486	2.266	1.296			
Job Change	Married	47	3.753	1.038	80.865	3.156	**0.002***
	Single	486	3.201	1.926			
Sociotechnical Blindness	Married	47	3.723	0.782	114.300	4.369	**0.000***
	Single	486	3.092	1.954			
Artificial Intelligence Configuration	Married	47	4.191	1.393	65.902	5.302	**0.000***
	Single	486	3.011	1.999			

*significant at p<0.05

In the T-test results of the "marital status" variable of bocce athletes; while significant differences were found in the sub-dimensions of artificial intelligence anxiety scale (general), job change, sociotechnical blindness and artificial intelligence configuration (p<0.05), no significant difference was found in the learning dimension (Table 11).

Table 12: T-test results of family support status variable of Bocce athletes

Scale	Family Support Status	n	x	ss	sd	t	p
Artificial Intelligence Anxiety Scale	Yes	487	2.703	1.474	71.049	-7.789	**0.000***
	No	86	3.848	0.888			
Learning	Yes	487	2.162	1.294	62.562	-10.364	**0.000***
	No	86	3.715	0.935			
Job Change	Yes	487	3.178	1.910	70.807	-4.345	**0.000***
	No	86	4.008	1.155			
Sociotechnical Blindness	Yes	487	3.068	1.930	77.196	-5.123	**0.000***
	No	86	3.983	1.055			
Artificial Intelligence Configuration	Yes	487	3.050	2.016	64.478	-3.361	**0.001***
	No	86	3.804	1.388			

*significant at $p<0.05$

In the T-test results of the variable "Does your family support you to do Bocce sport?" of Bocce athletes; it was determined that there were significant differences at the level of ($p<0.05$) in general and all sub-dimensions of the artificial intelligence anxiety scale (Table 12).

Table 13: T-test results of the variable "Do you have a smart robot vacuum cleaner at home?" of Bocce athletes

Scale	Do you have a Smart Robot Vacuum Cleaner?	n	x	ss	sd	t	p
Artificial Intelligence Anxiety Scale	Yes	78	3.783	0.971	145.902	8.846	**0.000***
	No	455	2.634	1.474			
Learning	Yes	78	3.300	1.156	531.000	7.534	**0.000***
	No	455	2.124	1.293			
Job Change	Yes	78	4.138	1.622	115.074	5.114	**0.000***
	No	455	3.097	1.870			
Sociotechnical Blindness	Yes	78	4.169	1.630	114.892	5.856	**0.000***
	No	455	2.972	1.875			
Artificial Intelligence Configuration	Yes	78	4.128	1.672	117.266	5.624	**0.000***
	No	455	2.942	1.979			

*significant at $p<0.05$

In the T-test results of the variable "Do you have a smart robot vacuum cleaner in your home?" of bocce athletes; it was determined that there were significant differences at the level of ($p<0.05$) in general and all sub-dimensions of the artificial intelligence anxiety scale (Table 13).

Table 14: T-test results of the variable "Do you use "SIRI" type applications on mobile phones of Bocce athletes?

Scale	Do you use "SIRI	n	x	ss	sd	t	p
Artificial Intelligence Anxiety Scale	Yes	168	2.672	1.349	531.000	-1.387	0.166
	No	365	2.862	1.518			
Learning	Yes	168	2.328	1.253	531.000	0.379	0.704
	No	365	2.281	1.378			
Job Change	Yes	168	2.953	1.800	531.000	-2.492	**0.013***
	No	365	3.386	1.889			
Sociotechnical Blindness	Yes	168	2.971	1.808	531.000	-1.462	0.144
	No	365	3.228	1.920			
Artificial Intelligence Configuration	Yes	168	2.837	1.850	353.162	-2.285	**0.023***
	No	365	1.850	2.027			

*significant at p<0.05

In the T-test results of the variable "Do you use SIRI-style applications on mobile phones?" of bocce athletes; while significant differences were found in the sub-dimensions of job change and artificial intelligence configuration (p<0.05), no significant difference was found in the sub-dimensions of artificial intelligence anxiety scale (general), learning and sociotechnical blindness (Table 14).

DISCUSSION AND CONCLUSION

In the Cronbach's alpha values of the artificial intelligence anxiety scale and its sub-dimensions, the artificial intelligence anxiety scale (general) was 0.960, the learning sub-dimension was 0.922, the job change sub-dimension was 0.919, the sociotechnical blindness sub-dimension was 0.911 and the artificial intelligence configuration sub-dimension was 0.916. Since these values are between 0,80<R2<1,00 it was found that there is high reliability in the general scale and its sub-dimensions (Table 1).

In the One Way Anova-Tukey results of the "age" variable of bocce athletes; it was determined that there were significant differences in the artificial intelligence anxiety scale (general) and all sub-dimensions (p<0.05) (Table 3). In parallel with our study, Gümüş et al., (2020), reported that there were differences in the age variable in their research on artificial intelligence in finance and banking. Karaman & Ekizoğlu, (2022), determined that there were differences in the age variable. Gıdık & Çelik, (2023), found significant differences in the age variable in their study on hockey athletes.

In the One Way Anova-Tukey results of the "socio-economic income level" variable of bocce athletes; while significant differences were found in the sub-dimensions of artificial intelligence anxiety scale (general), learning and job

change, sociotechnical blindness ($p<0.05$) no significant difference was found in the sub-dimension of artificial intelligence configuration (Table 4). Takıl et al., (2022), found that there was no significant difference in the economic status variable in their study on different occupational group candidates. Çelik and Gıdık, (2023), found differences in income levels.

In the One Way Anova-Tukey results of the "educational status" variable of Bocce athletes; it was determined that there were significant differences in the artificial intelligence anxiety scale (general) and all sub-dimensions ($p<0.05$) (Table 5). In parallel with our study, Filiz et al., (2022), in their study on health professionals, concluded that employees who graduated from high school had higher artificial intelligence anxiety than those who graduated from graduate school. Evli et al., (2023), determined that there were differences in education levels in their study with football players. Kul et al., (2021), did not find differences in education levels.

In the One Way Anova-Tukey results of the "smartphone brand used" variable of bocce athletes; while significant differences were found in the artificial intelligence anxiety scale (general) and job change sub-dimensions ($p<0.05$) no differences were found in learning, sociotechnical blindness and artificial intelligence configuration sub-dimension (Table 9). Ocak, (2023), reported that there were differences in the smartphone brands used in his study on consumers by finding that the iphone brand was in the first place and the Samsung brand was in the second place.

In the T-test results of the "gender" variable of bocce athletes; while significant differences were found in the artificial intelligence anxiety scale (general), job change, sociotechnical blindness and artificial intelligence configuration sub-dimensions ($p<0.05$) no differences were found in the learning sub-dimension (Table 10). Filiz et al., (2022), reported that there were differences in gender variable in their study on health professionals. Bulut et al., (2022), found a difference in the gender variable in their study on dentists and found that the level of artificial intelligence anxiety was higher in women than in men ($p<0.05$). Unlike our study, Takıl et al., (2022), found that there was no significant difference in the gender variable in their study on different professional group candidates. Çelik et al., (2022), determined that there were no differences in their study.

In the T-test results of the "marital status" variable of bocce athletes; while significant differences were found in the sub-dimensions of artificial intelligence anxiety scale (general), job change, sociotechnical blindness and artificial intelligence configuration ($p<0.05$) no significant difference was found in the learning sub-dimension (Table 11). Filiz et al., (2022), reported that there were

differences in the marital status variable in their study on health professionals. Gıdık & Şipal, (2023), determined that there were differences in the marital status variable. Evli et al., (2020), determined that there were no differences in the marital status variable in their research.

In the T-test results of the variable "Do you have a smart robot vacuum cleaner in your home?" of bocce athletes; it was determined that there were significant differences at the level of ($p<0.05$) in artificial intelligence anxiety general scale and all sub-dimensions (Table 13). Gıdık & Çelik, (2023), in their study on hockey athletes, found significant differences in the variable "Do you have a smart robot vacuum cleaner?".

In the One Way Anova-Tukey results of the variable "mother and father education level, sport age (bocce), does your family support you to do bocce sport, do you use SIRI-style applications on mobile phones?" of bocce athletes; a significant difference was found in the artificial intelligence anxiety scale (general) and all sub-dimensions ($p<0.05$) (Table 6; 7; 8; 12; 14).

As a result, it is seen that the artificial intelligence anxiety levels of the athletes participating in our study increase as their age, socio-economic income level, education level, parents' education level, bocce branch sport age decreases. At the same time, as a result of the analyses, it is seen that women, married athletes, athletes without family support, athletes with smart robots in their homes and athletes with Iphone phone brand have high levels of artificial intelligence anxiety. Based on the findings of this study, the following can be suggested; artificial intelligence can be included in the field of sports, athletes should make individual efforts to reach accurate and reliable information about artificial intelligence, and more comprehensive studies can be conducted to understand their concerns about artificial intelligence in the field of sports.

Declaration of Contribution Rates of Researchers

The authors of the study declare that they have contributed equally to the research.

Declaration of Conflict of Interest of the Researchers

The authors of the research declare that there is no problem of interest between them.

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Chapter 6

EXERCISE ADDICTION

Öğr. Gör. Ömer Faruk AKSOY[1]

INTRODUCTION

Regular participation in exercise has many effects on the human body and mind (Başar, 2018; Ardıç, 2014). In our research, these effects were examined under three headings (physiological, psychological, sociological). It is the most widely known fact that exercise provides positive changes and improvements to the human organism physiologically. This positive effect also has pragmatic effects on the person's health. Exercise; It has the potential to create many positive effects such as reducing chronic pain, some types of cancer, increasing bone-mineral density, regulating blood/fat/glucose levels, reducing cardiac disorders and thrombosis risk, ideal weight control, providing optimum strength/flexibility/endurance in muscle mass. (Lee, et al., 2012).

With regular repetition of exercise, many positive gains are achieved psychologically, as well as its physical effects on the human body and life. At its most basic, reducing negative feelings such as excitement, stress and fear in the person, as well as increasing positive emotions such as ambition and self-confidence, are among the psychological effects of participating in regular exercises Nazik & Hazar, 2023a; Nazik & Hazar, 2023b; Nazik, Hazar & Hazar, 2023). If we examine exercise on a personal basis, it has an important role in increasing the individual's mental activity and developing body awareness and image. Its effects on society are that it helps the person to get rid of family and career concerns, to play an active role in mutual relations, and to develop group thinking and the concept of respect. During the time a person participates in exercise, the feeling of pleasure/pleasure also develops through the hormones secreted in the body. In addition, psychological effects such as developing adaptation to stressful conditions, improving sleep patterns, and inhibiting negative thoughts are gained through exercise (Karacabey, & Özmerdivenli, 2011).

Sport appears as a very important and widespread institution that can affect almost all aspects of a person's daily life. Sports also has a prestigious position in the social life of all societies. If we consider one of the greatest powers of sports

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from a sociological perspective, we must state that it has the features of socializing and uniting people in our lives (Aydemir ve Kul, 2023; Şipal vd., 2023; Erbaş, 2023; Çabuk, 2023; Göncü ve Kardeş, 2023). In other words, sports is an effective tool for socializing and changing socially (Yetim, 2005). It is known that the unique structure and characteristics of any society, as well as its socio-economic/psychological conditions and the relationships of each social group with other groups, vary in traditional/modern societies. Apart from these differences, sports activities in society eliminate the concept of loneliness from a spiritual perspective. By participating in exercises, a person can eliminate the disadvantages that cause the feeling of loneliness that he may feel spiritually (Erkal, 1996).

It is known that the concept of addiction is a broad concept in terms of meaning and content, but its origins are based on Latin. It basically comes from the word "addicere", which means "feeling oneself obliged to something or someone, devoting oneself to that thing" (Babaoğlu, 1997). In our language, addiction is presented to us by TDK (2021) as "subordination". The clarification brought to addiction by Orford (1985) was with the expressions "excessive eagerness" (Orford, 1985). This concept dates back to the 19th century. Previously, it was used to mean illness and drugs, but today it is used more broadly. By the end of the 19th century, with some medical developments, the meaning of the concept of addiction was tried to be clarified again as it became negative (Rawson, et al., 2015).

Many definitions have been made regarding the concept of addiction. The first example that can be given from these definitions is, in the words of Köknel (1998), "the feeling of repetition and irresistible desire to repeat, which may cause physiological or psychological problems in human health and has negative effects on daily life". In foreign sources, addiction is summarized by Milkman (1987) with the following expressions; “Addiction is a set of involuntary changes in neurotransmission that result in changes in a person's behavior.”

If we summarize addiction in the most general terms, it is a state of irresistible desire for any object or person. In other words, addiction is a pathological result between the person's cognitive activities and the behaviors associated with this situation. The onset of addiction occurs with the continuous use of the substance in question. The person then exhibits some withdrawal symptoms and requires repeated consumption in order to prevent these symptoms. In this way, the desire to buy the substance is created (Şahin, 2011). The withdrawal symptoms mentioned are explained as follows; The physiological and psychological symptoms that occur when a physiological addiction develops to the substance used and the use of that substance is reduced or stopped are called withdrawal

(Dilbaz, 2012). The World Health Organization states that this condition is a disorder that occurs as a result of changes in brain functions due to the use of psychoactive substances. It is known that the use of such substances also affects the normal perception, emotion and motivation processes in the human brain. Neurological research shows that this is a chronic and persistent disorder that can be both biologically and genetically based (WHO, 2004).

According to DSM-IV (Diagnostic and Statistical Manual of Mental Disorders), in order to make the diagnosis of addiction in a clinical setting, at least three or more of the following symptoms must be observed in the last 12 (twelve) months (APA, 1994);

- Tolerance.
- Withdrawal symptoms.
- Excessive consumption.
- Loss of control.
- Being constantly engaged in supplying materials.
- Disruption of social, family and work-related responsibilities due to substance use.
- Continuing to use the addictive substance despite the presence of ongoing or recurrent physiological and psychological problems.

According to ICD 10 (The International Classification of Diseases), in order to diagnose addiction in a clinical setting, 3 (three) or more of the 6 (six) symptoms (5th and 6th symptoms are accepted together) must be present in the last 30 (thirty) symptoms. It is observed during the day, and if it is shorter than this period, its repetition is followed within a period of 1 (one) year (Kalsi, et al., 2008).

If a person meets these addiction criteria, there is a definition suggested by Goodman (1990). This definition; The researcher defines the diagnosis of addiction as 2 (two) specifically characterized behaviors that provide pleasure and reduce the feeling of pain at similar times. The first of the two steps of diagnosis is (1) repeated unsuccessful attempts to control the behavior, followed by (2) the maintenance of addictive behavior despite serious negative consequences.

When it comes to the root of addiction, it can occur for different reasons. At first, glances made by friends, curiosity, social marketing factors, easy accessibility, personality and similar related factors may have an impact. Along with the stimulating properties of all addictive substances and objects, the person's physiological structure and environmental factors may be the determinants of future addiction to the substance or object (WHO 2004).

Any addiction that may occur is seen as a result of the simultaneous reaction of not only physiological but also psychological, neurological and sociological factors. It is also known that there are many reasons for the factors mentioned above, such as society's perspective on addiction and media influence (Martin, & Pritchard, 1991).

Addiction is conceptually defined as "excessive desire" by Orford (1985). From this conceptual definition, it is also known that many physical activities and behaviors can be addictive (Orford, 1985). For this type of addiction to occur, Ögel (2015) first emphasizes the development of infrequent repetition and deprivation. Griffiths (2000) defines the situation that is thought to reveal addiction in the individual and create behavioral addiction as a result of the interactions of the activities in which the person participates or the behaviors exhibited, as addiction in the full sense of the word (Attention Attraction, Mood-State Change, Tolerance, Withdrawal Symptom, Conflict and Relapse) emphasized the need for attention. These criteria (Griffiths, 2000);

Attracting attention, the behaviors exhibited by a person change their feelings, thoughts and behaviors within a certain period of time and turn them into a daily part of their life. Emotion-State change turns into a coping strategy along with the consequences arising from the level of interest in any activity or exercise participated in and the non-objective (subjective) experiences acquired by the individual, and emotion/state change is defined in this way.

Tolerance, the feeling of having to increase the desire, frequency and intensity of that activity, depending on the pleasure received from continuous activities, can be defined as tolerance. Withdrawal symptom, the state where various emotions (stressful mood, feeling of restlessness, being generally angry) that occur when the addicted physical activity cannot be continued or is diluted, affecting the person physically is defined as a withdrawal symptom.

Conflict, it is defined as conflicts between the addicted person and the people around him, changes in daily functioning such as work and social life, hobbies, conflict or "conflict" that the individual may experience within himself. Relapse, the tendency of the person to repeat this habit even after a certain period of time after avoiding and controlling the acquired addiction is called relapse.

EXERCISE ADDICTION

The definition of exercise addiction is a condition defined as excessive desire to do physical exercise and exercise, despite the harmful effects of exercise, for example, exercising even in case of injury, and feeling bad in case of disability. The fact that the concept of addiction is used for physical exercise other than a biological substance creates confusion. Internet addiction, gambling addiction,

and exercise addiction, other than addictions that develop with chemical substances, can be considered to be similar behavioral phenomena in the compulsive-impulsive line (Adams, 2009). Sachs (1981) definition of exercise addiction is; Although withdrawal symptoms, which occur when a person stays away from exercise for approximately 24 to 36 hours, make it easier to diagnose exercise addiction, these symptoms are called the individual's dependence on exercise both psychologically and physiologically (Weinberg, & Gould, 2019).

Exercise addiction and similar behavioral addiction concepts are not included in the American Psychiatric Association (APA) and World Health Organization (WHO) classifications of mental illnesses (Adams, & Kirkby, 1997). On the other hand, psychoactive substance addiction is conceptualized as a disorder with the development of tolerance, the presence of withdrawal symptoms and impairment of functionality. Similarly, exercise addiction has been proposed as a disorder with the same concepts. Of the three main components of exercise addiction, the first is tolerance (increasing the amount of exercise to achieve the desired effect or the effects decrease as a result of continuing to exercise the same amount), the second is the withdrawal effect (the negative effects are seen when the behavior is prevented), and the third is compulsive behavior (avoiding stress and anxiety). It is defined as the repetition of behavior for Tolerance or exercise cessation symptoms are called physiological dependence, and those who do not show these symptoms are classified as exercise addicts who do not show physiological dependence. Exercise is a positive behavior that has positive physical and mental effects. Despite this, it is interesting that it is compatible with a negative concept such as addiction (Vardar, et al., 2005).

Vardar, et al. above. (2005) mentioned, exercise addiction does not only have psychological effects. In the study and different sources, exercise addiction; It was evaluated under two headings: "positive dependence" and "negative dependence". The situation of exercising excessively in order to cope with some of the situations and obstacles that a person encounters in his life is defined as "positive addiction". If a person who exercises excessively experiences symptoms such as stress, anxiety, depressive mood, irritability, and sleep disorders if they do not exercise, this type of addiction is evaluated with the diagnosis of "negative addiction" (Weinberg, & Gould, 2019; Hausenblas and Downs, 2002).

POSITIVE EXERCISE ADDICTION

"Positive exercise addiction", which is the subject of the evaluation process of exercise addiction, became famous conceptually with William Glasser's book "Positive Addiction (1976)". Glasser stated in this book that positive addiction

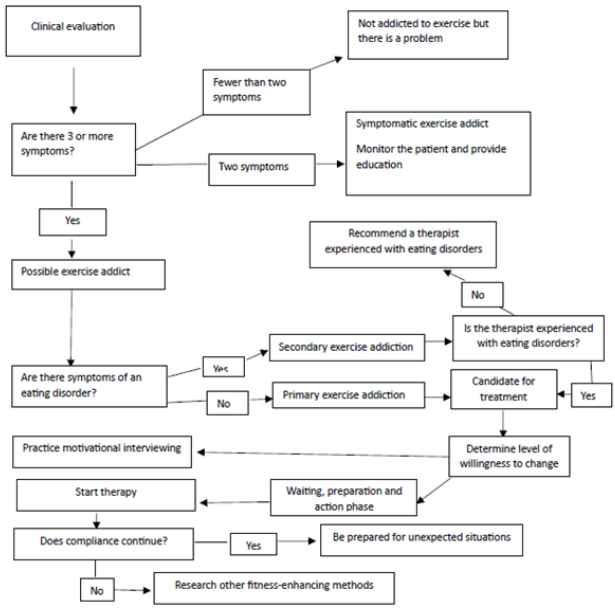
types such as running and meditation in daily life contribute to both psychological health and a person's life satisfaction. These positive situations are exactly the opposite of heroin, cocaine and similar types of negative addiction. Because such addictions (substance addiction) have negative effects on physical functionality as well as psychological functionality. Glasser's way of describing exercise is that it is pragmatic in terms of a person's mental and physical health, in this way it is a compulsion that contributes to general well-being and functionality, that is, it is more than an addiction. While obtaining these data, Glasser benefited from qualitative clinical and psychiatric evaluation studies rather than using the usual quantitative analyzes and measurements (Weinberg, & Gould, 2019).

The psychological and physical benefits that a person gains through positive exercise addiction occur if the person periodically participates in physical activities in a certain order. With a positive exercise addiction, a person who continues his exercises perceives the activities he does regularly as a very important part of his life and successfully integrates and maintains these activities with his work, family and circle of friends. In other words, exercise becomes a daily life habit (eating, sleeping, etc.) for that person. This level of commitment in a person can be interpreted as a healthy habit (Weinberg, & Gould, 2019).

NEGATIVE EXERCISE ADDICTION

Although the common opinion among researchers is that positive exercise addiction has improving effects, it is also a widely known fact that exercise causes negativities by taking control of a person's life, even to a small extent. When this situation occurs, negative exercise addiction develops in the individual. After a negative exercise addiction, it is likely that this addiction will inhibit other choices that the person will make in his life. Lives are structured around exercise as a result of these choices. This situation can basically continue as the person is prevented from responsibilities towards his/her work and family. All these obstacles that the person experiences are; It clearly reflects a personal and social disagreement. The inhibition process of negative exercise addiction is parallel to other addiction processes. Many negatively exercise addicted individuals accept their developing unpleasant symptoms. In addition, these people feel that the exercise they do contributes to their existence (Weinberg, & Gould, 2019). The visual, which is called the "decision tree" by the researcher and serves as a map for the path to be followed in order to diagnose and treat exercise addiction, is shown in Figure 1 (Adams, 2009).

Figure 1. A decision tree for diagnosing and treating exercise addiction.



While many researchers offer different diagnostic criteria for diagnosis in this road map, one of the most comprehensive is Terry, et al. (2004). It is possible to classify these criteria under the following headings;

- Salience: Salience occurs when the particular activity becomes the most important task in a person's life, dominating their thoughts (preoccupation and cognitive distortions), emotions (wanting), and behavior (disruption of socialized behavior). For example, even if a person is not actually engaged in exercise at that moment, he or she keeps his mind busy with thoughts about his next exercise.
- Mood-State Change: This criterion refers to the subjective experiences people report as a result of engaging in a particular activity and can be viewed as a coping strategy (i.e., a stimulating element can cause a mood change in the person).
- Tolerance: This criterion is the process by which increasing amounts of certain activity are required to achieve the previous effects. For example, a gambler may have to gradually increase the size of the bet to experience an euphoric effect achieved with a much smaller initial bet.
- Withdrawal Symptoms: These are unpleasant emotional states or physical effects (e.g., tremors, moodiness, irritability, etc.) that occur when certain activity is stopped or suddenly reduced.

- Conflict: This refers to conflicts between the addict and those around him (interpersonal conflict), conflicts with other activities (work, social life, hobbies and interests), or conflicts from within the individual regarding a particular activity (intrapsychic conflict).
- Relapse: This criterion is the tendency for repeated returns to previous patterns of the particular activity to occur, and even the most extreme patterns characteristic of high levels of addiction to be rapidly regained after years of abstinence or control (Terry, et al., 2004).

In addition to the "positive exercise addiction/negative exercise addiction" classification of exercise addiction; It is also possible to classify it as "Primary Exercise Addiction" and "Secondary Exercise Addiction". These classifications are very important for determining both the severity of exercise addiction and diagnosis (Vardar, 2012).

It is very important to differentiate primary exercise addiction and secondary exercise addiction, which differ from each other due to their structures. In primary exercise addiction, physical activity is the main goal. However, when secondary exercise addiction is examined, it is seen that the main source of motivation is weight control and manipulation (Hamer, & Karageorghis, 2007). In case of secondary exercise addiction, individuals generally have eating disorders similar to anorexia nervosa or bulimia nervosa (Egorov, & Szabo, 2013). Based on these differences, it is concluded that the etiologies of primary exercise addiction and secondary exercise addiction are different from each other.

CONCLUSION

As a result, exercise addiction may start as a physical fitness goal, but over time it can turn into a mental illness. This addiction can cause physical and psychological problems that will negatively affect a person's life. Seeing exercise as a health and fitness tool and taking precautions when symptoms of addiction are noticed play an important role in controlling this addiction. Know your own limits and enjoy a healthy lifestyle, but be careful not to fall into the trap of exercise addiction.

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Chapter 7

PHYSICAL ACTIVITY AND SPORTS IN INDIVIDUALS WITH HEARING IMPAIRMENT

Assoc. Prof. Turan BAŞKONUŞ[1]

PHYSICAL ACTIVITY AND SPORTS IN INDIVIDUALS WITH HEARING IMPAIRMENT

According to the definition proposed by Eripek (2002), individuals with special needs encompass not only children exhibiting learning or behavioral issues but also those with physical or sensory impairments, as well as intellectually gifted or specially talented children. Some children may possess distinct characteristics due to conditions they are born with or encounter later in life, leading to their perception differently from typically developing children. Differences such as exceptional intelligence, talents, autism spectrum disorder, visual or orthopedic impairments may contribute to the distinct perception of these children owing to their special needs (Ummanel & Gürkan, 2017). Meeting the developmental needs of individuals with special needs and accessing educational services necessitates specialized tools, methods, programs, as well as the involvement of special education teachers and institutions (Koparan, 2003). Addressing these needs comprehensively is highly crucial to ensure the participation and integration of individuals with special needs into life. Hearing impairment, due to communication difficulties, can have adverse effects on education, learning, and social life (MEB, 2006). However, physical activity and sports for students with hearing impairment are not only essential for physical health but also crucial for overall well-being, social interaction, and self-esteem. Regular physical activity's boost in energy and vitality can enhance students' confidence, aiding them in better self-expression and social interactions. Sports and movement can trigger the release of endorphins in the body, reducing stress and positively influencing mood.

Hearing Impairment

Hearing impairment, as defined by Özsoy, Özyürek, and Eripek (1996), refers to the partial or complete disruption of the ability to hear or comprehend

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sounds. It signifies limitations in hearing abilities and typically encompasses varying degrees of hearing loss. The causes behind this loss can be genetic, environmental, structural, or pathological (due to an illness). While termed as hearing loss, hearing impairment is a comprehensive term signifying the inability of the auditory sense to function normally. Hearing loss can vary from mild to profound levels. First-degree hearing impairment ranges from mild hearing loss to severe hearing impairment. Second-degree impairment indicates moderate difficulty in hearing, while third-degree implies severe hearing loss. The highest level, fourth-degree hearing impairment, involves almost complete hearing loss. Hearing impairment can impact various aspects of an individual's life. Challenges encountered in education, communication, social interactions, and the professional sphere shape the daily lives of those with hearing impairment. This underscores the necessity to understand their needs and provide appropriate support and resources (MEB, 2015; WHO, 2021'a; ASHA, 2021; NIDCD, 2021). Children with hearing loss follow the motor skill developmental stages of typically hearing children. However, depending on the cause and degree of hearing loss, they may exhibit deficiencies in balance and coordination skills (MEB, 2015). Particularly due to issues with hearing devices, individuals with hearing impairment might not effectively utilize verbal language in their daily lives (Girgin, 2003). Hearing loss can manifest during prenatal, perinatal, and postnatal periods. Prenatally, risk factors for hearing loss during pregnancy include genetic predisposition, the use of ototoxic drugs, febrile illnesses, exposure to X-rays, systemic diseases, and traumas. Perinatal risk factors during birth include low birth weight, blood incompatibility, asphyxia, head trauma, and blood exchange. Postnatally, risk factors comprise illnesses, seizures, medication usage, head injuries, ear infections, genetic disorders, anatomical abnormalities, and exposure to loud noises (MEB, 2015).

Physical Activity and Sports

Studies show that two out of every four children will develop cardiovascular diseases in middle age, with one of these children unfortunately experiencing a heart attack at that stage. Initiating preventive measures during childhood is crucial to reduce the adverse effects of this situation. Risk factors are more easily controlled during this period (İlhan, 2010). Embracing exercise as part of daily life holds critical importance in enhancing quality of life. Therefore, physical activity plays a vital role not only for healthy individuals but especially for disabled ones (Ataman, 2009). Movement is an inherent part of life and continues throughout one's lifespan. Early experiences with movement during

childhood are essential for development across all domains. Particularly when considering the development of disabled children, early implementation of physical education and sports programs is believed to be effective. This underscores the significance of physical education and sports programs within institutions (Karakaş & Yılmaz, 2023).

Physical activity and sports are activities that enhance physical health, improve physical abilities, and support overall well-being. While physical activity encompasses a wide range from daily movements to exercise routines, sports entail more organized activities based on specific rules. The diversity of physical activities varies according to individuals' preferences. There are various options, from aerobic activities like walking, running, swimming, and cycling to exercises that enhance endurance like weight training, pilates, and yoga. These activities can increase muscle strength, support heart health, and positively influence mood by reducing stress. Sports generally entail organized activities based on specific rules and aims. A wide spectrum of sports disciplines, from team sports to individual ones, not only enhance physical skills but also support social and mental abilities such as teamwork, leadership, and discipline. Physical activity and sports not only promote a healthy lifestyle but also increase social interaction, boost self-confidence, and improve mental health. Moreover, regular physical activity has scientifically proven to reduce the risk of various chronic diseases such as obesity and diabetes (WHO, 2021b; American Heart Association [AHA], 2021; Centers for Disease Control and Prevention [CDC], 2021). Individuals engaged in sports tend to have greater self-confidence, harmonious relationships with peers and surroundings, and balanced and stable mental health. Exercise forms the foundation of health and increases the fundamental capacity of physical health to prevent or slow down organic and physical disorders (İlhan, 2010).

The Importance of Physical Activity and Sports in Individuals with Hearing Impairment

Exercise is considered one of the most effective ways to maintain health and support physiological well-being. Regular exercise not only promotes physical fitness but also helps enhance psychological well-being, aiding in reducing one of the biggest issues of our time, which is stress (İlhan, 2010). Sport can serve as a means of expression and development for individuals with special needs. Through sports, these individuals can establish social support through communication with their environment, engaging in rehabilitation where sharing and self-confidence are developed (Kabasakal, 2007). Participation of children with special needs in physical activities can contribute to their

increased happiness and the development of their social skills (Orhan, Karaçam, Özdemir, Gökçelik, Sabuncu & Talaghir, 2023; Orhan, Karaçam, & Çetin, 2023). Physical Education activities planned in the education of these children should encourage development in psychomotor, sensory, and cognitive domains. This development can assist in achieving long-term goals (Koparan, 2003).

Hearing impairment can impact individuals' lives in various ways, yet the significance of physical activity and sports can aid in overcoming these challenges. The opportunities provided by sports offer significant advantages for individuals with hearing disabilities. Primarily, sports activities support physical health. Regular exercise at any age enhances overall health, boosts the immune system, and maintains cardiovascular health. Hearing impairment might pose communication difficulties; therefore, maintaining physical health can improve overall quality of life. Additionally, engaging in sports can boost self-confidence and encourage social interaction. Team sports or group activities enable individuals with hearing impairments to come together, understand, and support each other. Such environments can enhance communication skills, foster a sense of solidarity, and support personal development. Moreover, engaging in sports can reduce stress, improve mood, and enhance self-confidence, thereby elevating the quality of life.

Conclusion

The initial point of contact for individuals with special needs in sports is typically through physical education classes. Their participation in sports activities can be supported or guided through the physical education classes they attend in their schools. These classes can be offered with some adaptations tailored to different needs while partially adhering to the National Education Program. The support provided by these classes is crucial for individuals with special needs to explore and embrace sports (Güven Karahan & Kuru, 2015). When planning regular and continuous sports education programs, specialized physical education and sports teachers should consider the differences of individuals with special needs. These teachers should create an appropriate environment by providing education in the same sports areas as individuals receiving normal sports education and realistically set goals and objectives tailored to the special needs of the individuals. It's essential to keep students' interest and desires alive by selecting appropriate teaching methods and topics during the teaching process. Moreover, to make sports more appealing, pleasing equipment should be chosen, positive authority should be utilized, an award system and a clear discipline approach should be adopted, and the evaluation of

how far students have reached their sports goals should be meticulously monitored (Koparan, 2003).

Adapting physical activity and sports activities for individuals with hearing impairments is highly important. Physical Education is a comprehensive teaching program designed for individuals with special needs to gain enriched free activity, recreational, and sports experiences throughout their lives. This program aims to meet the physical education needs of individuals with different needs rather than directing specialized physical education to specific groups, such as the elderly, pregnant women, or individuals with special needs, providing personalized teaching strategies to enable everyone to benefit from physical activities according to their specific needs (Savucu, 2019). Sports and physical activity for individuals with hearing impairments can enhance communication skills. Team sports or exercise groups can strengthen the collaborative abilities of students with hearing impairments. Sharing a common goal and working together can enhance the sense of solidarity among students and help overcome communication barriers. Educational institutions should offer support and opportunities for students with hearing impairments in physical activity and sports. Organizing suitable physical activities for special sports programs or students with hearing impairments can encourage their participation, supporting both their physical and mental development.

The active participation of individuals with special needs in social life and their ability to lead an independent life are primarily based on education rights and regulations that provide equal opportunities for individuals without special needs (Güven Karahan & Kuru, 2015). When engaging in sports, special considerations should be made for individuals with hearing impairments. It's essential for sports facilities to be accessible, coaches or instructors to be knowledgeable, and alternative communication methods to be used. Furthermore, sports activities and facilities need to be adapted to be more suitable for these individuals to encourage their participation. Consequently, physical activity and sports for individuals with hearing impairments serve as not only a healthy lifestyle but also significant tools that strengthen social connections and boost self-confidence. These activities can assist individuals in expressing themselves, empowering them, and aiding their integration into society, thereby supporting them in leading healthier and happier lives. Ultimately, physical activity and sports are crucial elements that not only support the health but also the social, emotional, and communicative development of students with hearing impairments. These activities enrich their lives by allowing them to express themselves, build confidence, and integrate more effectively into society.

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Chapter 8

UNDERSTANDING AUTISM SPECTRUM DISORDER (ASD)

Assoc. Prof. Turan BAŞKONUŞ[1]

AUTISM SPECTRUM DISORDER

The word "Autism" is derived from the Greek word "autos" (a term containing meanings such as self, self, self) (Tekin-İftar, 2018). The term autism was first used in the 20th century by Swiss psychiatrist Eugen Bleuler to express certain thought patterns and describe patients with schizophrenia (Mazurek, 2016).

Autism was determined based on the common features defined by Leo Kanner and named "Early Childhood Autism". In the same period, Austrian psychiatrist Hans Asperger defined similar behaviors as "Autism Psychopathy" (Eisenberg & Kanner, 1956; Özbey, 2005). Later research has shown that Kanner and Asperger's describe the same disease.

With the publication of DSM-3, autism was classified under "Pervasive Developmental Disorders" and thus entered the psychiatric diagnosis system and became widely known. Autism was included as "pervasive developmental disorder" in DSM IV, and was changed to "autism spectrum disorder" with DSM-V in 2013. In the DSM-V, ratings are made according to the level of support the individual needs.

Autism spectrum disorder is a neurodevelopmental disorder characterized by poor social relationships, difficulty with language and communication skills, limited interests, and behavioral problems such as repetitive movements (Chamak & Bonniau, 2016; DiCicco-Bloom et al., 2006). According to DSM-V, individuals with autism spectrum disorder have significant deficiencies in the social-communicative field and limited, repetitive behaviors and special interests (APA, 2013; Güleç-Aslan, 2020).

According to DSM-5, autism may be accompanied by other neurodevelopmental, mental or behavioral disorders, medical, genetic causes or symptoms. In this case, the level of support is determined by the degree of importance in problem identification. In the first stage, deficits in social

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communication can cause significant gaps. Difficulty initiating social interactions, inability to respond to individual social signals, and lack of interest in social interactions may be observed. Additionally, difficulties in coping with changes, rituals or repetitive behaviors, and reactions to attempts to change these rituals may be observed. Second, marked deficits in the distribution of verbal or nonverbal communication; Social interruptions in the current state may be observed despite limited social interactions and reduced or abnormal responses to intermittent signal social. Additionally, changes can include initial difficulties, rituals or repetitive behaviors, and reactions to attempts to change these rituals. Third, impairments in the maintenance of verbal and/or nonverbal social communication can lead to severe impairments in functionality, limited speed of social interactions, and minimal responsiveness to social signals (APA, 2013).

According to ICD-11, autism spectrum disorder is a disorder characterized by difficulties in social interaction and restricted, repetitive behaviors (World Health Organization [WHO], 2019). The term neurodevelopmental disorder describes a condition that affects the brain's response to the outside world and can often occur from a young age.

Autism is defined as a disorder in social and emotional skills. It is also identified with limited and repetitive behaviors and interests. Autism can cause delays or problems in many different skills, often beginning before the age of three and from infancy through adulthood (O'Reilly & Lester, 2017; Karim, 2017; Veague, 2010; Shriver, 2005).

Kanner's criteria played a major role in defining autism and led to the conclusion that the disease was biologically based (Yüksel, 2005). Kanner's criteria include symptoms such as communication difficulties, delay in speech development, and repetitive behaviors (Özbey, 2005).

In this context, Kanner's criteria are as follows:

• They have difficulty communicating with their environment.

• His speaking skills develop late and he avoids speaking for communication purposes,

• They have speech called echolalia,

• They have difficulty in using pronouns correctly and in the right places, especially in conversations,

• They have difficulty accepting changes in their daily and social lives,

• There are many aimlessly repetitive elements in his behaviors and

• A good memory means having a normal intelligence level and normal appearance (Özbey, 2005).

Causes Of ASD

Hand Autism Spectrum Disorder (ASD) is a neuro-developmental condition that occurs after the first years of life, and becomes evident in the early stages, where limitations in social communication and communication as well as repetitive flashes are observed (APA, 2013). In other words, there are ages ranging from birth to 36 months, with poor communication, obsessive behavior, and difficulties in understanding and adapting to the environment in general.

Although it may be mentioned, it is a developmental disorder that is generally not associated with mental retardation and has limited contact and distinctive eye features (Diken, 2012).

General causes of autism can generally be classified depending on psychodynamic and familial factors (Doğangün, 2008). Literature reviews show that it is generally genetically active (Kim and Leventhal, 2015). It is also stated that activities such as viruses, radiation exposure and drug use also have effects (Özeren, 2013). The formation of ASD is limited to a single outcome. Research shows that more than one factor plays a role and, in some cases, more than one factor varies in this spectrum at different rates (Özkan, Ergenekon, Çolak, Kaya, & Cavkaytar, 2016; Yosunkaya, 2013).

• Genetic factors (Nucleotide, DNA, Gene, Chromosome)

• Environmental factors

medical diseases

• Prenatal and postnatal factors

• Neuro biochemical disruptions (Dopaminergic- Serotonergic-PeptidergicNoradrenergic systems)

• Neurobiological factors

• Neuroanatomical factors

•Emotional development problems (Empathy impairments – Neurosensory impairments)

• Cognitive impairments and problems observed in language-speech development (Şener & Özkul, 2013).

While some of the mentioned factors can be observed together, it is also possible that they are affected by a single factor (Töret, Özdemir, Selimoğlu, & Özkubat, 2014). Although it was initially thought that the presence of ASD could be caused by psychological factors such as chronic personality disorder and schizophrenia, and later by cold and indifferent parents such as "refrigerator mothers", this has lost its validity over time (Danış, 2001).

Frequency Of ASD

Autism is a developmental disorder whose prevalence has increased in all societies from past to present (Baio, Wiggins, Christensen, Maenner, Daniels, Warren & Dowling, 2018). The incidence of autism is increasing today. When the rate of prevalence of ASD is examined, 1 in 2,500 children was diagnosed with autism in 1985, while when the studies conducted by the American Centers for Disease Control and Prevention (Centers for Disease Control Prevention, 2020) are examined, 1 in 68 people was diagnosed with ASD in 2012 (Christensen et al., 2016) in 1 out of every 44 people in 2018; It is seen in 1 in 36 people in 2020 (Centers for Disease Control and Prevention). It is stated that in Turkey, approximately 434 thousand children and young people with autism between the ages of 0-18 are waiting to benefit from education, health and social services. Considering the population ratio, it is estimated that there are approximately 1,400,000 individuals with autism in Turkey and more than 5,550,000 family members affected by this condition (Savucu, 2020).

Diagnosis Process And Symptoms Of ASD

There are some symptoms observed by physicians or nurses during the ASD diagnosis process. These symptoms are as follows (Töret et al., 2014, p.3):

- No symbolic play for up to 18 months.
- Not playing with toys properly.
- Delay in speech and language skills, difficulty in communicating with other children.
- Do not shake your body, turn around, or clap your hands.
- Inappropriate reactions or lack of response to smells, sounds, tastes.
- Giving irrelevant answers to questions.
- Obsessive interests in behavior.
- Laughing or crying without reason.
- Repetitive movements, hyperactivity or inactivity.
- In an environment where there are people and objects, paying attention to objects rather than people.
- No appropriate direction for up to 12 months when their name is mentioned.
- Lack of interest in surrounding objects for up to 14 months.
- Desire to be alone, looking away, avoiding eye contact.
- When communicating with people around him, he only talks about his own emotions and does not react to other people's emotions.
- Don't react too much to small changes in their environment.

It is stated that awareness of the symptoms of autism varies, especially in terms of time. Recognizing the symptoms generally occurs in two ways. The first is the differences that parents see in their children's development. The most basic differences expressed by parents are the child's lack of eye contact and their obsessive attachment to certain objects and their incessant interest in that object instead of playing symbolic games. The second is the regression seen in the skills that the child has acquired until a certain period (Öztürk, 2020). ASD begins to manifest itself with different symptoms from the first years of life, and these go down to basic reflexes. Impairments in reflexes or unintegrated reflexes are defined as the harbinger of some problems in the child's development process (Akbuga & Eliöz, 2021). In 70% of children diagnosed with ASD, the symptoms become apparent slowly, while in 30%, the symptoms become clear as the regression in the children's development increases between the 18th and 24th months (Brasher & Elder, 2015). General characteristics of individuals with ASD

These include language development, social development, repetitive behaviors, problem behavior, sensory sensitivities, and physical and cognitive limitations (Cavkaytar Ergenekon, Acar & Çolak, 2019). Autism can include disabilities in many areas in the individual, and symptoms vary from individual to individual (Geschwind & Levitt, 2007). Autism symptoms usually appear before the age of 3 and continue throughout life (Chen, Wei, Chen, Su, Bai, Hsu, Huang, Chang, Chen & Chen, 2015). In order to reliably diagnose autism at an early age, the child must be observed by many experts more than once, in different environments and at regular intervals. Factors such as the ease of increasing the learning speed at a young age by starting education immediately after the early diagnosis process of the child with ASD and better preparing the family for the process are of great importance as they will take positive steps in the child's development. In addition, the mild, moderate and severe symptoms exhibited by the diagnosed child will affect the intensity and severity of the symptoms with early intervention (Korkmaz, 2010). Early symptoms include unusual use of material functions, excessive isolation from social environments, limited eye contact and joint attention, symbolic There are difficulties in game skills and limitations in the use of gestures and facial expressions (Quill, 2000). In addition, lack of response to name, limited imitation skills, low muscle tone, poor posture and poor fine motor skills are among the early symptoms (Zakian, Malvy, Desombre, Roux & Lenoir, 2000). These basic symptoms are;

- General communication/interaction deficiencies
- Deficiencies in social-communication skills
- Deficits in social-emotional areas (Alexithymia)

- Limitations in verbal and non-verbal receptive language skills
- Difficulties in peer relationships
- Problems in setting up, starting and continuing the game

• Restricted and repetitive behaviors
- Obsessive Compulsive Disorders (OCD)

• Adherence to routine and rituals
• Stereotypes
- Not making eye contact

• Rotation around itself
- It is in the form of not responding to its name (APA, 2013).

However, the difficulties experienced by individuals with autism in social interaction can be listed as follows:

- Problems making eye contact and making contact
- Limitations in joint attention
- Insensitivity to what is happening around
- Reluctance to interact and play with other children.
- Limitations in expressing and understanding emotions
- Touching different people and surfaces and being overly sensitive about being touched. Limitations in the ability to play symbolic games (Prelock & Nelson, 2012).

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Chapter 9

INVESTIGATION OF SELF-EFFICACY IN TERMS OF REFEREE PERFORMANCE

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INTRODUCTION

Sports is a dynamic industry that brings millions of people worldwide. The sector covers various branches, such as football, basketball, volleyball, and tennis, and includes many sub-fields, such as sports events, sports equipment, media rights and tourism. This sector, which creates a multibillion-dollar economy through large organizations, media publications and sports equipment manufacturers, also unites societies. It promotes a healthy lifestyle and appeals to a broad audience. With its wide spectrum ranging from amateur to professional at all levels, the sports sector plays a vital role on a global scale by increasing cultural interactions and encouraging people to engage in physical activity.

Nowadays, it is observed that sports competitions are played faster, more visually, with more struggle and physical strength, and the game is more enjoyable due to the constantly evolving tactics used in the matches. Sports has become a vast economy and market with sponsorship, advertising revenues, incorporation in clubs, television broadcasting revenues and sales of fan products. According to Kern (2000), who defines the developments in question as the development of the sports industry, today, sports is understood as a vast business. The success or failure of the clubs determines the developments in this enormous market. Athlete performance, good management, fan organizations, and a solid economic structure determine a club's success.

In sports games, players, spectators, referees and managers form the inseparable links of a chain. Each of these elements is undoubtedly very important. The most essential element of sports is especially the referees, who fight on the field with the athletes and hold the fate of that competition in their hands. For this reason, the role of the referee in sporting activities cannot be denied. Since there is a fight against the opposing player or the rival team in

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almost all sports games, competition is always present. In this case, an expert is needed to distinguish right from wrong and ensure sports justice, and this is the referee (Güner, 2009). Since refereeing in sports is a social phenomenon, the referee is a dispenser of justice and a manager of the legal entity he represents, making him even more critical (Ekmekçi, 2008).

Referees must multitask under pressure to perform their duties successfully and avoid making mistakes in their decisions during the competition. For example, referees must evaluate and judge actions that take place during the match, under adverse conditions and pressure, make quick decisions, manage the game, communicate correctly, pay attention to multiple aspects of the game, maintain order, and resolve disputes and problems (Tuero et al., 2002; Karaçam and Pulur, 2016). Insufficiency in these tasks can lead to inattention, wrong decisions, delayed reactions, eventual stress and burnout (Ekmekçi, 2008; Guillén and Feltz, 2011; Ekmekçi, 2016; Hacıcaferoğlu, 2018). In addition, referees are exposed to pressure from spectators, players, and clubs before, during and after the competition, especially in popular sports branches. For this reason, the referees' job is quite complicated and exhausting. Despite all these negative factors, referees must show strong character and successful performance.

Measuring referee performance is very difficult and complex. Experts in this field should evaluate referee performance. It is essential to determine the referee's performance and to know the variables that affect it (Spencer, 2015). Determining referee performance and knowing the variables affecting performance will be beneficial in planning referee training processes and improving referee performance. Some studies have concluded that some of the referees' positive beliefs will positively affect their performance (Guillén ve Feltz, 2011; Myers et al. 2012; Hacıcaferoğlu, 2014; Karaçam ve Pulur, 2016; Karaçam ve Pulur, 2017a; Karaçam ve Pulur, 2017b; Karaçam ve Pulur, 2017c; Karaçam ve Pulur, 2018; Karaçam ve Adıgüzel, 2019). Self-efficacy is one of the most critical positive beliefs that positively affect the performance of referees. In this context, self-efficacy, one of the positive psychology variables that is thought to affect the performance of referees positively, was discussed.

Self-Efficacy

The concept of self-efficacy was introduced by Bandura (1977). The concept of self-efficacy has found its place within a more extensive social cognitive theory. Self-efficacy is defined by Bandura (1977) as a person's belief that he or she can successfully execute his or her behaviours to obtain desired results. In other words, self-efficacy is an individual's judgment and belief about

himself/herself regarding how successful he/she can be in overcoming difficult situations he/she may encounter in the future. Self-efficacy is the individual's judgment regarding his/her ability and capacity to cope with different situations and achieve a particular activity (Senemoğlu, 2000). The social cognitive theory emphasizes that self-efficacy beliefs play a vital role in human behaviour. Self-efficacy belief is not dependent on a person's abilities, but a person can believe that he can accomplish a task by believing in his abilities. These beliefs affect individuals' action plans (Zeldin et al., 2006). Self-efficacy is a concept that directly affects individuals' behaviour (Bandura, 2012). People's expectations regarding competence affect their coping behaviour in the face of obstacles and difficulties and the continuity of this behaviour (Bandura, 1977).

According to Bandura (1986), among the types of thoughts that affect action in the control of events that affect people's lives, none is as central and widespread as people's judgments about their capacities. The self-efficacy mechanism plays a central role in human action. People constantly have to make decisions in their daily lives about what actions they will continue and for how long they will continue these actions. Acting with incorrect judgments regarding personal competence can produce negative results. In addition, psychological situations in which somatic and emotional states are felt together also impact the perception of self-efficacy. Somatic states are a person's bodily feelings and sensations, for example, sensations such as heart rate, sweating, tremors, and pain. Emotional states, on the other hand, are mental states of the person, such as stress, anxiety, happiness, and enthusiasm. The psychological effects of thinking about doing a job affect the individual's perception of self-efficacy in coping with the difficulties that may arise (Bandura, 1977). In this context, it is important to evaluate one's capacity correctly.

Referee Self-Efficacy

Referee self-efficacy is conceptualized within Bandura's self-efficacy theory (Bandura, 1997), specifically self-efficacy in sports (Feltz et al., 2008). Self-efficacy is the belief that a person can successfully perform the necessary behaviours to produce the desired results in a particular field, given some situational demands and the ability to successfully fulfil different performance levels (Bandura, 1977, 1986). Referee self-efficacy is the belief that referees can perform their jobs successfully (Guillén and Feltz, 2011).

Guillén and Feltz (2011). Myers et al. (2012) and Karaçam and Pulur (2017a) stated that the referee self-efficacy areas are game knowledge and strategic skills, decision-making skills, psychological skills, communication and control of the game and physical fitness. In addition, Guillén and Feltz (2011),

based on self-efficacy theory and research in sports, also stated that referees with high self-efficacy are more accurate in their decisions and more effective in their performance. In addition, they stated that they received more respect from coaches, managers and other officials and experienced less stress than referees with low self-efficacy. Guillén and Feltz (2011) and Farshad et al. (2013) also stated that referees with high self-efficacy are more committed to the profession, positively affecting referee performance. In their study, Hepler and Feltz (2012) stated that self-efficacy significantly impacts decision-making, positively affecting the referee's performance.

Additionally, in their studies, Myers et al. (2012) and Karaçam and Pulur (2017a;2017b;2017c) found a positive relationship between referees' self-efficacy levels and their age and refereeing experience and stated that as referees' age and experience increase, their self-efficacy levels also increase. In addition, Karaçam and Adıgüzel (2019) examined the relationship between referee performance and self-efficacy. Considering the findings obtained in the study, it is seen that the performance of referees with high self-efficacy levels is also high. In this context, developing referee self-efficacy and self-efficacy areas is considered necessary.

Referees' self-efficacy includes the skills, knowledge and self-confidence required when performing this task. Several factors shape sports referees' self-efficacy and affect their performance.

1. **Game and Rules Information:** Referees must be familiar with the rules of the relevant sport. However, they must also have deep technical knowledge of the sports branch. This is critical to managing the game correctly and making decisions when necessary.
2. **Decision making:** Referees must be able to make quick and accurate decisions and solve problems clearly in instant situations. Making sound decisions under stress and demonstrating impartiality in controversial situations is essential to their self-efficacy.
3. **Pressure:** Referees must be able to make correct decisions without being influenced by player, spectator, and coach pressure.
4. **Communication:** Referees must communicate effectively with players, coaches, and spectators. The ability to explain decisions, resolve controversial situations and share problems encountered is vital for effective refereeing performance.
5. **Teamwork and Leadership:** Referees often work within a team, so teamwork skills are essential. Working in harmony with assistant

referees, making decisions together, and maintaining authority on the field represent referees' leadership and teamwork aspects.

6. **Self-Regulation and Stress Management:** Being under stress while refereeing is inevitable. However, referees' ability to cope with stress affects their ability to make correct decisions. Additionally, being able to self-criticize after the match and being open to improvement helps referees to improve themselves constantly.
7. **Physical ability:** Referees need physical qualities such as conditioning, speed and endurance, especially in branches such as football, basketball, and handball. Therefore, they need to become physically sufficient.

This self-efficacy of the referees ensures that the game is managed correctly and fairly. Each domain of self-efficacy impacts a referee's performance and works together for a successful referee experience. Practices such as continuing education, experience sharing, and mentoring can help referees improve their self-efficacy. In this way, a more solid refereeing experience and a fairer sports environment can be created (Myers et al. 2012; Karaçam ve Pulur, 2017a).

Referee Training and Continuous Development

Refereeing plays a critical role in making the right decisions, managing the game fairly and ensuring the safety of the athletes. Therefore, referee training and continuous development are of great importance to improve the quality of referees and ensure a practical referee experience.

1. **Educational Programs and Courses:** Training new referees forms the basis of referee training programs. These programs cover essential topics such as sports rules, game mechanics, decision-making processes, mechanics, and field management. These educations focus on improving the essential knowledge and skills of referee candidates.
2. **Field Practices and Experience Gaining:** When theoretical knowledge is combined with practical experience, the competence of referees improves. Internship opportunities allow young referees to gain on-field experience. Making real-time decisions in real matches allows referees to gain experience and strengthen their self-efficacy.
3. **Continuing Education and Development Programs:** The education of referees should continue throughout their referee careers. New rules, technological innovations and changes in game dynamics mean that referees must constantly stay up to date. These continuing programs keep referees' knowledge up to date and enable them to follow new developments.

4. **Mentorship and Experience Sharing:** Experienced referees mentoring young referees and sharing their experiences are critical in referee education and development. This allows new referees to learn from experienced mentors and benefit from the experience.
5. **Performance Evaluations and Feedback:** Evaluating referees' performances and receiving feedback contributes to their continuous development. Identifying mistakes and learning from these mistakes allows referees to perform better.

Referee education and continuous development are essential to ensure a fair, honest, and professional referee experience. These processes help discover new talent, improve the quality of existing referees and establish a better standard of refereeing at sporting events. Continuous education and development improve sports refereeing quality and create a more reliable competitive environment.

Use of Technology and Refereeing

The rapid advancement of technology has led to significant changes in refereeing, as in many areas of sports. Traditionally, refereeing relied heavily on human factors; However, today, integrating technology into the refereeing process contributes to making fair decisions and raising game standards.

1. **Video Assistant Referee (VAR) and Replay System:** VAR is a technology that supports referees in certain sports. This system uses video recordings to examine critical situations during the game and support the referees' decisions. The VAR system enables the reassessment of instantaneous decisions, such as penalty calls, offside positions, disqualifications, and the issuance of points or red cards (Kapil, 2018).
2. **Goal-Line Technology:** In sports such as football, goal-line technology comes into play when there is uncertainty about whether the ball has crossed the goal line. This system accurately determines whether the ball has crossed the goal line and helps referees make the right decision (Kapil, 2018; Dandıl and Özkul, 2019).
3. **Communication and Data Transfer:** Communication systems that facilitate referees' communication and improve play flow strengthen referee performance. Additionally, data analysis and statistics play an essential role in evaluating and improving the performance of referees.
4. **Technology's Contribution to Education:** Integration of technology into referees supports training new referees. Simulations, video analysis

and interactive education materials increase future referees' theoretical knowledge and field experience.

5. **Problems and Compatibility:** The use of technology in refereeing has also led to some controversy and implementation difficulties. Issues such as referees' adaptation to technology, errors of the systems and how much technology the decisions will be based on are areas that need constant improvement.

The use of technology in refereeing is essential in protecting a fair playing environment and supporting the decision-making processes of referees. However, integrating technology into arbitration processes should be balanced, and the harmony between the human factor and technology should be observed. Working in harmony with both elements ensures a fair and practical referee experience (Şahin and Yıldırım, 2023).

Self-Efficacy and Future Perspective

Self-efficacy is a critical factor determining the performance of sports referees. In the future, self-efficacy will gain even more importance and play a central role in improving referee standards.

1. **Impact of Technology and Adaptation:** In the future, technology's role in refereeing will likely increase further. Video assist systems, goal-line technology, and other innovations will support refereeing. Referees' ability to use technology effectively will increase the importance of their self-efficacy in the future.
2. **Education and Development Processes:** Education programs will be customized and expanded to strengthen referees' self-efficacy. Technology integration and the development of training materials and simulations will be used to increase the skills and self-confidence of new referees.
3. **Stress Management and Decision-making:** With the increasing number of stressful situations in games, referees' ability to cope with stress will be critical. Their ability to make immediate decisions will form the basis of their self-efficacy.
4. **Adaptation and Openness to Change:** Future referees' ability to quickly adapt to game dynamics and rule changes will indicate their self-efficacy. Their ability to be open to change and adapt to new technologies will be one of the factors that will determine the effectiveness of referees.
5. **Continuous Assessment of Self-Efficacy:** Examining referees' self-efficacy levels will help identify development opportunities. Feedback,

mentoring, and experience sharing will help referees continually strengthen their self-efficacy.

In the future, self-efficacy will continue to be a determining factor in the effectiveness and performance of referees. Technology, training, stress management and adaptation to change will be important areas to strengthen referees' self-efficacy. Self-efficacy will be crucial in ensuring fair and accurate decisions are made and will contribute to the continuous raising of referee standards.

Suggestions and Implications: To Improve Referees' Self-Efficacy

1. **Continuing and Development:** Continuously updating referee education programs and making them compatible with technological innovations will play a key role in increasing the self-efficacy of referees.
2. **Technology Integration:** In referee education, the correct use of technology should be emphasized, and skills to adapt to technology should be developed. Referees' ability to use technology effectively will help improve their self-efficacy.
3. **Mentorship and Experience Sharing:** Experienced referees guiding young referees, sharing their experiences and giving feedback will play a critical role in developing self-efficacy.
4. **Stress Management Education:** Their ability to make correct decisions under stress will determine referees' self-efficacy. Therefore, more emphasis should be placed on stress management training and techniques.
5. **Performance Evaluations and Feedback:** Regular evaluation of referees' performance is essential to identify errors and improvement opportunities. Feedback will help strengthen self-efficacy.
6. **Openness to Change and Adaptation:** Referees' ability to quickly adapt to game dynamics and rule changes is essential in developing their self-efficacy. Being open to change and adapting to new technologies is one of the determinants of self-efficacy.

As a result, these recommendations are essential to improve the self-efficacy of sports referees and raise refereeing standards. Continuing education, technology integration, mentoring, stress management training, performance evaluations and adaptation skills will help referees have strong self-efficacy. In this way, a more fair and practical refereeing experience and an increase in the overall quality of the sport can be achieved.

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Chapter 10

EVALUATION OF DYNAMIC BALANCE AND HYPERMOBILITY IN CHILDREN ACCORDING TO PARTICIPATION IN GYMNASTICS TRAINING

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ABSTRACT The aim of this study was to examine dynamic balance ability and hypermobility according to gender and gymnastics training participation in 6 years of age children. In this research, 76 male and 86 female totally 162 children with the mean body height 114.51±5.15 cm and with the mean body weight 20.54±3.73 kg participated voluntarily. While 47 of the children participating gymnastics training for 12 weeks, 115 of the children continued regular pre-school program. Dynamic balance ability measured by prokin tecno body with easy base for 30 seconds. Hypermobility identified by The Beighton criteria and cut-off point was taken as 4. For dynamic balance ability in 6 years of age there were statistically significant difference in favor of gymnastic participation compared with the others ($p<0.001$). There was a statistically significant difference in dynamic balance ability in favor of girls, according to gender ($p<0.005$). And hypermobility was significantly different in favor of gymnastic participation ($p<0.05$). The hypermobility rate of males is 23.7%, females is 43%, gymnasts is 51.1% and sedentary is 27%. There wasn't any correlation between dynamic balance ability and hypermobility. As a result, although they have similar physical characteristics and in the same age group, their dynamic balance performance and hypermobility differentiated depending on factors of gymnastics training and also it was observed that the dynamic balance performance was in favor of girls. This study emphasized the importance of early participation in gymnastics.

Key Words: Dynamic balance, hypermobility, preschool.

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INTRODUCTION

Balance or postural control is essential in everyday life. It allows performance of activities that range from maintenance of static positions to complex dynamic activities (Rombaut, Malfait, Wandele, Thijs, Palmans, Paepe, Calders, 2011). Also, balance is an integral part of almost every movement task and at the foundation of athletic performance. Dynamic balance is the ability to perform a task while preserving or regaining a stable position (Winter, Patla, Frank, 1990) or the ability to maintain or regain balance with minimal external motion on an unstable surface (Kioumourtzoglou, Derri, Mertzanidou, Tzetzis, 1997; Paillard, Noe, 2006; Hrysomallis, 2010). The most significant transitions in motor development occur in the first decade of life with balance control (Ronvesvalles, Woollacott, Jensen, 2001). Naturally, gymnastic training must be start at early ages to perform perfect skills and so balance is the key factor for complex gymnastic skills. Dynamic balance tests require participants to demonstrate strength, flexibility, proprioception, and concentration coupled with motion and coordination between the ankle, knee, and hip joints, as well as motion at the trunk. Each reach direction requires different activation of the lower extremity muscles (Earl, Hertel, 2001). In some studies mentioned about gender differences on dynamic balance ability. In a study conducted with children in Australia, males showed more postural sway at all static and dynamic equilibrium than females (Mickle, Munro, Steele, 2011). In addition, there are a number of studies that have reached the conclusion that females are more advantageous in balance ability (Mickle, Munro, Julie, Steele, 2010; Geldhof, Cardon, Bourdeaudhuij, Danneels, Coorevits, Vanderstraeten, Clereg, 2006; Dwayne, Sheehan, Katz, 2013). Gymnastics involves balanced movements of the body while at the same time it is one of the sports branches that require flexibility. A wide range of movement at the lumbar spine, hips and shoulders is required in gymnastics.

The required flexibility in gymnastics is sometimes intermingled concept. Joint hypermobility syndrome is a heritable disorder of the connective tissue characterized by excessive joint movement, musculoskeletal pain and neurophysiological deficits (Iatridou, Mandalidis, Chronopoulos, Vagenas, Athanasopoulos, 2013; Grahame, Bird, Child, 2000). A joint is considered hypermobile when it exhibits a range of motion greater than expected for a given age, ethnicity or gender (Hakim, Grahame, 2003; Simmonds, Keer, 2007). Children inherently have a greater range of joint motion than adults, the prevalence of hypermobility, as defined by several criteria, varying in different populations from 5 to 30% (Qvindesland, Jonsson, 1999). In musicians, athletes and dancers hypermobility is more pronounced, probably because hypermobility is an asset to these professions (Klemp, Stevens, Isaacs, 1984). This is thought to

be true, because joints that do not participate in the specific training also tend to be more lax than in other populations (Rikken, Bultman, Wellink, Dongen, 1997). Many studies have shown that there is wide variation in the prevalence of joint hypermobility. Hypermobility decreases during the ongoing growth process from childhood (Hakim and Grahme, 2003; Larsson et.al., 1993; Zarita et.al., 2009; Jansson et.al., 2004; Rikken et.al., 1997; Decoster et.al., 1997). It can be considered that hypermobility may be an advantage or disadvantage in various branches, which is thought to affect balance ability. And so, it can be a research topic that gymnasts have much in common with ballet and hypermobility would at first sight be deemed an advantage.

There are few studies in the literature between hypermobility and dynamic balance (Akın et.al., 2017; Kesilmis et al., 2017; Kesilmis & Akın, 2016; Falkerslev et.al., 2013; Iatridou et.al., 2014). Therefore, the main purpose of this study is to compare dynamic balance ability and hypermobility between children that participate gymnastics training and sedentary in 6 years of age and also to find out the gender differences.

MATERIALS AND METHODS

Participants

Seventy-six male and 86 female totally 162 children with the mean body height 114.51±5.15 cm and with the mean body weight 20.54±3.73 kg participated voluntarily. While 47 of the children participating gymnastics training for 12 weeks, 115 of the children continued regular school program. Informed consent form procedure as required by the Helsinki declaration (2008) signed by the entire participant, their parents and the trainer prior to the study.

Dynamic Balance

Dynamic balance ability was measured with Prokin Tecno Body (PK200WL, Italy). Easy type was used to measure bipedal dynamic balance ability for 30 seconds. Once the investigator was made the necessary preliminary information about the measurement, then two trials were done by children to become familiar for the test. After providing the position of the balance with bare feet and thin sportswear, test was started. The measurement repeated if participant fall over before the end of the test. Each child participated balance measurement for two times and the rest period between test was 60 second.

Hypermobility

The Beighton test is the best commonly used tool for detecting ligamentous hiperlaxity, characterized by excessive joint mobility (Ortega, Rodrigues,

Martinez, Sanchez, Paiz, Liria, 2010). Hypermobility was measured by Beighton criteria (Beighton, 1973). These are as follows; Passive dorsiflexion of the little fingers beyond 90° (one point for each hand) – two points. Passive apposition of the thumbs to the flexor aspects of the forearm (one point for each thumb) – two points. Hyperextension of the elbows beyond 10° (one point for each elbow) – two points. Hyperextension of the knee beyond 10° (one point for each knee) – two points. Forward flexion of the trunk with knees fully extended so that the palms of the hands rest flat on the floor – one point. Each hypermobile joint gives 1 point and so the maximum score being 9 points. With four or more points assigned, the individual is considered to be hypermobile (Birrel, Adebajo, Hazleman, Silman, 1994; Hudson, Star, Esdaile, Fitzcharles, 1995).

Statistics

Normality test has been applied and identified that data has statistically normal distribution. Then for statistical analyses independent samples t test used to compare gymnasts and sedentary and to compare males and females. Also, partial eta squared was calculated as measures of effect size.

RESULTS

TABLE 1. Mean, Standard Deviation and independent samples t tests according to participating gymnastics training.

		N	Mean	SD	t	Sig	Cohens'd	Effect Size r
BODY HEIGHT (cm)	Sedentary	115	114,20	5,15	-1,198	.23	-0.207	-0.103
	Gymnasts	47	115,27	5,14				
BODY WEIGHT (kg)	Sedentary	115	20,31	4,04	-1,26	.20	-0.234	-0.116
	Gymnasts	47	21,12	2,76				
BEIGHTON	Sedentary	115	,296	,44	-3,004	.003*	-0.454	-0.221
	Gymnasts	47	,510	,50				
PERIMETER LENGTH	Sedentary	115	608,55	184,78	5,841	.000**	1.068$^{\phi}$	0.471
	Gymnasts	47	433,61	139,61				
AREA GAP PERCENTAGE	Sedentary	115	29,01	15,70	4,112	.000**	0.721$^{\phi}$	0.339
	Gymnasts	47	18	14,82				
MEDIUM SPEED	Sedentary	115	20,34	6,15	6,701	.000**	1.260$^{\phi}$	0.533
	Gymnasts	47	13,84	3,92				
MECAP	Sedentary	115	,04	3,55	0,492	.62	0.094	0.047
	Gymnasts	47	-,21	1,19				
MECML	Sedentary	115	-1,59	3,89	-1,826	.07	-0.364	-0.179
	Gymnasts	47	-,52	1,45				

*p<.05, **p<.001 Effect size, Cohen's *d*. $^{\phi}$ $p < .001$.

As shown in Table 1, beighton scores were significantly different in favor of gymnastic group. Also, for dynamic balance ability, Perimeter Length, Area gap percentage and medium speed values are significantly different in favor of gymnastic group.

TABLE 2. Mean, Standard Deviation and independent samples t tests according to gender.

	Gender	N	Mean	SD	t	Sig	Cohens'd	Effect Size r
BEIGHTON	Male	76	,236	,427	-2,633	.009*	-0.418	-0.204
	Female	86	,430	,498				
PL	Male	76	607,77	189,91	3,239	.001*	0.509$^{\phi}$	0.246
	Female	86	513,63	179,78				
AGP	Male	76	29,09	15,19	2,458	.01*	0.387$^{\phi}$	0.190
	Female	86	22,92	16,59				
MS	Male	76	20,10	6,37	3,205	.002*	0.503$^{\phi}$	0.244
	Female	86	17,00	5,93				
MECAP	Male	76	-,13	2,77	-0,397	.69	-0.059	-0.029
	Female	86	,05	3,30				
MECML	Male	76	-1,22	3,32	0,204	.83	0.032	0.016
	Female	86	-1,33	3,49				

*p<.05*p<.05, Effect size, Cohen's *d*. $^{\phi}$ $p < .001$

The results of present study showed a statistically significant difference in beighton scores, perimeter length, area gap percentage, medium speed according to gender. For dynamic balance females showed better performance than males and also ratio of hypermobility in females (43%) is better than males (23.7%).

TABLE 3. Hypermobilite ratios of males, females, gymnasts and sedentary.

		Frequency	Percent
Male	**Nonhypermobile**	58	76,3 %
	Hypermobile	18	23,7 %
Female	**Nonhypermobile**	49	57 %
	Hypermobile	37	43 %
Sedentary	**Nonhypermobile**	84	73 %
	Hypermobile	31	27 %
Gymnasts	**Nonhypermobile**	23	48,9 %
	Hypermobile	24	51,1 %

DISCUSSION

The results of this study showed that dynamic balance ability is better in favor of children who participate gymnastics trainings. Gymnastic training group clearly showed better performance for perimeter length, area gap performance and medium speed. The results of the present study strengthened the important role of gymnastics training for dynamic balance ability in 6-year-old children as well. In accordance with our study, Alpkaya (2013) conducted a study with seven-year-old girls and ten week gymnastics training program was found beneficial for children and suggested that gymnastics training improved balance parameters. Similarly, in a study that researched the effect of eight week gymnastics training on gross motor skills including balance in 5-6 years of age children, reached the result that pre-level gymnastic exercises effects positively balance development (Fallah, Parivash, Bagherly, 2015). Also, Kioumourtzoglou, Derri, Martzanidou, Tzetzis (1997) showed that elite gymnasts have better dynamic and static balance than novices. In a study conducted by Davlin (2004), gymnasts were superior to all others in dynamic balance ability when compared to control group, swimmers and footballers. There are also some studies that find out gymnasts had better performance in dynamic balance ability when compared to control or different sport branches (Aydın et al., 2002; Carrick et.al., 2007; Asseman et.al., 2008; Kioumourtzoglou et.al., 1997). So; like many other studies, the positive effects of gymnastics training on the dynamic balance are evident in our research. It is clear that by participating in gymnastics training at an early age, positive contributions to dynamic balance ability can be achieved. Because during the preschool years, balance reaches an adequate level, while its development is completed in later childhood (Scheid, 1994).

In literature on balance abilities at the preschool children, females have better scores than males (Alves, Rossi, Pranke and Lemos, 2013; Fjørtoft, 2000; Lejarraga et al., 2002; Lam et al., 2003; Sigmundsson & Rostoft, 2003) and on the other hand, several researchers report no significant differences on dynamic balance ability between preschool children according to gender (Davlin, 2004; Kourtessis et al., 2008; Venetsanou, 2007). In recent research dynamic balance ability findings that in favor of females showed on perimeter length, area gap percentage and medium speed.

In addition, we found that the beighton score was significantly different between gymnasts and sedentary in favor of gymnasts. And also, in our study hypermobility was significantly different according to gender in favor of females. In literature, there are some studies that have shown similarity results as our research (Ortega, Rodrigues, Martinez, Sanchez, Paiz, Liria, 2010; Jansson, Saartok, Werner, Renström, 2004; Yıldırım, Yılmaz, Ayhan, Saygı, Yanaral,

Zubarioğlu, Kasapçopur, Arısoy, 2005). Hypermobility diminishes with age from childhood onward, is about three times more common in female than males (Hakim, Grahame, 2003). Our findings suggest that knowledge. The hypermobility rate of males is 23.7%, females is 43%, gymnasts is 51.1% and sedentary is 27%. Qvindesland and Jonsson (1988) conducted a study with 143 female and 124 male and reported that hypermobility seadrome was 40.5% in females and 12.9% in males. In a study by Ortega et al. (2010); there were 2956 children participant %49.9 male %50.1 female from eight to twelve years and in accordance with our study females were more hypermobile than males.

CONCLUSIONS

According to our research, it was observed that the group participating in gymnastics training and also females had better dynamic balance and more hypermobile. Positive contributions from participating in sportive activities from childhood are an indisputable fact. Ferrell et. al. (2007) put emphasis on that adequate training improves proprioception as well as balance. Moreover, balance training not only improves balance but also reduces pain and thus has a positive effect on quality of life on the hypermobile person. From these findings, the balance achieved in sportive activities are a necessary motor ability for life. Thus, sportive activities should be encouraged from childhood and regular and continuous participation in sportive activities can contribute to motor development.

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Chapter 11

AUTISM AND SPORTS

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INTRODUCTION

Autism is a developmental disorder that encompasses delays in multiple core functions in the areas of social interaction, communication, language development, and behavior, beginning in early childhood. Autism Spectrum Disorder is used to signify an advanced and complex developmental disability, affecting behaviors specific to human interaction such as social engagement, sharing thoughts and emotions, imagination, and engaging with others, due to structural issues that emerge either from birth or early stages of life (Diken ve ark., 2016; Sucuoğlu, 2011).

Individuals with autism often encounter challenges, particularly in social communication, emotional adjustment related to internal feelings, academic skills, and at times, physical issues as well.

Each individual, based on their own physical abilities, can engage in a certain level of physical activity and sports-related activities. Mobility, play, and sporting activities provide people with opportunities and environments to experience and experiment with characteristics like simplicity, difficulty, social responsibility, authority, choice, personal preference, and being aware of their own potential and abilities (Sarol, 2013).

Physical activity and sports activities create opportunities for various physical, mental, emotional, and social benefits that influence the quality of life and satisfaction for every individual. It's noted that mobility, play, physical activity, and sports activities have positive effects on the social adaptation, physical health, and well-being of both individuals with disabilities and typically developing children and adults. Considering these positive impacts, it can be said that mobility, play, and physical activities address many essential and fundamental needs of both individuals and the community, holding a significant place for individuals with autism as well (Sarol, 2013; Derer, 2018; Er, 2018; Uzun Dönmez, 2019).

Educators, physiotherapists, and physical education instructors often express that individuals with autism lag behind in terms of motor functions. While differences exist among individuals with autism, most research indicates that

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children and young individuals with autism generally possess lower motor proficiency compared to their peers, exhibiting more limited movement skills. Challenges in movements requiring balance, coordination, and overall muscle weakness are commonly observed. Significant deficiencies in motor and movement skills have been noted in individuals with autism, particularly in activities involving balance, jumping, hopping, catching small/large balls, kicking a ball with the foot, and throwing a ball with the hand. There's also an observed lack of coordination and movement harmony in performing activities and games that necessitate using both sides of the hands, feet, and body (Green ve ark. 2009; Staples ve Reid, 2010; Yanardağ, 2017). The mentioned limitations in individuals with autism can persist throughout their lives and adversely affect their quality of life. Participation in mobility, play, and sporting activities contributes positively to the physical, social, and emotional development of individuals with autism. Engaging in these activities helps reduce repetitive behaviors, such as echolalia, and facilitates the development of desired behaviors, like perceiving, learning, and applying complex or challenging skills. The progression of their skills not only provides a foundation for other body movements but also aids in acquiring complex, combined, varied, and different movements.

Mobility, play, and sporting activities aid in strengthening muscles, improving balance, enhancing hand-eye coordination, and assisting in overcoming the primary challenge faced by individuals with autism: establishing social relationships. Interaction with peers, especially for individuals with autism, is extremely important. Engaging in physical activities and sports throughout life can be effective in the personal and social development of individuals with autism, facilitating the acquisition of necessary skills for these activities. Physical activity and sporting engagements contribute to increasing self-acceptance, self-worth, self-confidence, independence, social support, motivation, life quality, and satisfaction levels among individuals with autism, thereby enhancing overall health (Sarol, 2013; Yanardağ, 2017; Derer, 2018; Er, 2018; Uzun Dönmez, 2019).

Based on this information, the aim of this study is to determine, through relevant literature and research findings, that mobility, play, physical activity, and sporting activities serve as significant factors in positively impacting the physical, mental, and emotional development of individuals with autism. Additionally, the study aims to establish that these activities play a crucial role in addressing the deficiencies in social communication/interaction and improving the overall quality of life for individuals with autism.

Autism

Otism, a complex neurodevelopmental difference that either occurs from birth or manifests in the early years of life. It's believed to stem from certain nervous system issues that affect the structure or functioning of the brain.

Autism falls within the realm of Pervasive Developmental Disorders (PDD). In related literature, the term Autism Spectrum Disorder (ASD) can be used interchangeably with PDD. However, while PDD was initially included in the manual on mental disorders published by the American Psychiatric Association in 1980, ASD emerged as a concept in 1988 (Diken, 2008).

Within the PDD group, autism is used among other categories, contributing to conceptual confusion, as is the case in many countries. Although disorders within the PDD group often exhibit shared characteristics, each disorder within it is distinct. Autism, specifically, is recognized as the most prevalent disorder (Turnbull, Turnbull, & Wehmeyer, 2007).

Neurodevelopmental disorders are conditions that arise when the central nervous system loses its ability to self-organize due to identified or unidentified reasons. This negatively impacts the holistic systematic neurodevelopment. Communication patterns begin to deviate from the balance, ranging from slightly to significantly. Neurodevelopmental problems can occur in individuals of all ages.

The term "spectrum" signifies a range of symptoms that vary in degrees. Symptoms refer to deviations from normal body functions or sensations, noticed by the individual due to an illness or an unusual condition.

History

Paul Eugen Bleuler (1857-1939) introduced the term "autism" to the literature in 1911, initially used to describe withdrawn behavior in schizophrenic patients.

Bleuler, renowned for his studies in mental illnesses, was also credited with introducing the term "schizophrenia" to the literature. The concept of autism, which doesn't have a precise origin or start of exploration, was initially a term used in adult psychiatry terminology to depict the gradual withdrawal of schizophrenic patients from the external world (Aydın & Kınacı, 2013).

The contemporary understanding of autism, as we perceive it today, was first used by Austrian-born American psychiatrist Leo Kanner in his 1943 paper titled "Autistic Disturbances of Affective Contact." Kanner described common behavioral disorders like social isolation, repetitive behaviors, echolalia, and loneliness observed in 11 children, terming it "early infantile autism."

In 1944, Austrian psychiatrist Hans Asperger described certain behavioral disorders observed in a group of older children and adolescents as "autistic psychopathy." While the syndromes described by Kanner and Asperger largely overlap, there are observed differences, particularly in specific aspects (Friend, 2006; Diken, 2008).

Otism Spectrum Disorder's causes have been debated for years since its diagnosis and studies began. Factors such as genetic components, children from socioeconomically/culturally disadvantaged families, children of neglectful parents, and environmental elements like toxic chemicals have been considered as potential causes. Another misconception suggested that children affected by autism consciously isolated themselves from their surroundings, but this belief has been debunked. In the 1980s, autism began to be acknowledged as a genetic, organic, and neurobiological disorder (Diken, 2008).

In the 1990s, the initial diagnosis and classification studies regarding autism commenced. By the 2000s, in the fourth edition of psychiatric disease definitions and classifications, autism was classified as a subset of Pervasive Developmental Disorders (PDD) (Diken, 2008; Aydın & Kınacı, 2013).

In 1998, British Dr. Andrew Wakefield and twelve colleagues published an article in Lancet, one of the world's most respected medical journals, based on data from only twelve children. The authors claimed to identify a chronic enterocolitis (a type of intestinal inflammation) that could be associated with autism and asserted that in most cases, symptoms started after the measles-mumps-rubella (MMR) vaccine (Wakefield et al., 1998).

The same issue of the journal featured an evaluation critical of Wakefield's article. Chen and Stefano emphasized that Wakefield couldn't substantiate that a virus originating from the vaccine was present in the patients' brains or intestines and highlighted methodological flaws in the research. They pointed out that in a widely administered vaccine like MMR, there would coincidentally be children who experience such issues after vaccination. Additionally, relying solely on parental feedback to indicate that autism onset occurred after vaccination isn't sufficient; more reliable data is necessary (Chen & Stefano, 1998).

Following Wakefield's statements, MMR vaccine rates in the UK dropped from 92% in 1996 to 84% in 2002. Although this rate has since climbed to 91%, it still remains below the WHO-recommended 95%. These fluctuations in rates have also been observed globally.

The belief that MMR vaccines cause autism has resulted in a trend among families to avoid these vaccines. However, research outcomes have consistently shown that these vaccines do not cause autism (Ümit, 2019).

Progress in the education, employment, and societal integration of individuals with autism has been significant from the early 1900s to the present day.

Definition of Autism

Autism is defined as a developmental disorder characterized by social interaction and communication deficiencies, limited interests and activities, and stereotypical and repetitive behaviors in at least one area of social communication or symbolic/imaging play skills before the age of three (Diken, 2008).

The legislation of the Republic of Turkey, the Law No. 5378 Regarding Disabled Persons, enacted on July 1, 2005, and published in the Official Gazette on July 7, 2005, focuses on regulations pertaining to the rights and responsibilities of disabled individuals in rehabilitation, education, employment, and societal life (Official Gazette, 2005).

The Regulation on Special Education Services, published in the Official Gazette dated May 31, 2006, and numbered 26184, employs the concept of an autistic individual, defining them as those who exhibit limitations in social interaction, verbal and non-verbal communication, and interests and activities in early childhood and thus requiring special education and support services (ÖEHY, 2006).

The Special Education Services Regulation, initially published in 2006 and subsequently updated on July 7, 2018, introduced the concepts of mild, moderate, and severe levels of autism. For individuals with moderate autism, there is a profound need for special education and support due to limitations in social interaction, verbal and non-verbal communication, and interests and activities. Meanwhile, individuals with mild or severe autism are described as requiring special education and support due to limitations in the same areas (2018).

Causes and Symptoms of Autism

The long-held belief that autism stems from neurological dysfunction, indifferent parenting, caregiver abuse, and neglect no longer holds sway in contemporary understanding (Heward, 2003; Friend, 2006; Turnbull, Turnbull, & Wehmeyer, 2007; Diken, 2008).

While the precise causes of autism remain unknown, genetic and environmental factors are often emphasized. Recent studies predominantly focus on genetic factors and gene-environment interactions (Sousa, 2001; Ulay & Ertuğrul, 2009).

Environmental research has primarily delved into vaccines, nutrition, and environmental pollution. Various factors such as the consumption of foods containing gluten (a protein found in wheat) and casein (a protein found in milk), allergies, increased use of vitamins and antibiotics, reduced omega-3 intake, reasons related to various infectious diseases, and familial factors including maternal age, education level, socio-economic status, and substance addiction have been posited. However, there isn't enough scientific evidence to substantiate these factors (Tekin Ersan, 2015).

Exploring potential etiological factors reveals the involvement of genetic, biochemical, neurological, familial, and environmental elements (Özbaran, 2014). Genetic causes in this etiology have indicated that autism may not only be linked to a handful of highly impactful genes but also hundreds of minor genetic mutations (Yosunkaya, 2013).

Similar to other causes of disability, autism causation factors encompass prenatal, perinatal, and postnatal factors (Previc, 2007). The mother's chronic and metabolic illnesses and characteristics (Reynolds et al., 2014; Krakowiak et al., 2012), and advanced paternal age (which might have an effect of 15-30%) have been proposed as environmental factors contributing to autism (Kong et al., 2012).

While disabled individuals exhibit differences from non-disabled individuals, each autistic individual also displays distinct characteristics and behaviors from other autistic individuals (Erol, 2014).

Common behaviors observed in individuals with autism can be listed as symptoms of autism: They may generally appear restless and experience limitations in making eye contact. They might display sensitivity to sound and light, sometimes becoming aggressive. They could harm themselves or those around them and might have minimal feelings of fear or danger. Utilizing their imagination might pose difficulty, and they might struggle with facial expressions and gestures. They tend to adhere to rituals that could be considered obsessions and repetitively utter nonsensical phrases. They might not enjoy physical contact, although some might appreciate tight hugs. They derive comfort from constant habits and routines. Autistic individuals might find it challenging to initiate contact with others and struggle to make friends. They might not develop independent learning methods as their peers do. Due to weakened immune systems, individuals with autism tend to fall ill more easily (Er, 2018).

Pervasive Developmental Disorders

Otism-Spectrum Disorder (OSD) Widely regarded as synonymous with pervasive developmental disorders, autism spectrum disorder is known as an extensively complex developmental disability (Sherrill, 2004). Pervasive developmental disorders are characterized by limited social skills, communication impairments, and repetitive/stereotypical behaviors (Portvin et al., 2008). Due to its broad spectrum, they are collectively referred to as "Pervasive Developmental Disorders" alongside related conditions (Hollander, Nowinski, 2003). All types of pervasive developmental disorders are generally identified as neurological disorders diagnosed by the age of three, exhibiting deficiencies in social interaction skills, communication skills, or stereotyped behaviors (Sherrill, 2004; Sarol, 2013; Yanardağ, 2017).

With DSM-5, separate diagnostic criteria for autistic disorder, Asperger's syndrome, pervasive developmental disorder not otherwise specified (PDD-NOS), childhood disintegrative disorder, and Rett syndrome—previously under the umbrella of OSD—have been discontinued.

Following the latest classification and definitions in DSM-5, Rett syndrome has been removed from the OSD framework, and categories have been organized under three headings based on the severity of the disorder. The first category signifies mild levels and is described as "requiring support." The second category represents moderate levels and is labeled as "requiring significant support." The last category signifies severe levels and is denoted as "requiring very substantial support."

Additionally, reassessment criteria have been established to determine the presence of intellectual disabilities accompanying children previously diagnosed with PDD-NOS and Asperger's syndrome, whether there is accompanying language impairment, whether there are known medical, genetic, or environmental factors, and whether other neurodevelopmental, mental, or behavioral conditions, or catatonia (a phenomenon involving the motor system), are present.

Asperger's Syndrome

First described by Hans Asperger in 1944, the disorder is named "Asperger's syndrome." The most significant difference between individuals with high-level autism and autistic individuals is their above-average intelligence (Korkmaz, 2016). Characteristics that differentiate children with Asperger's syndrome from autistic children include starting to speak on time and exhibiting excessive expertise and special difficulties in manual dexterity. The most significant feature that distinguishes Asperger's syndrome from autism is the absence of

cognitive and/or language delays or regressions in development (Kırcaali İftar et al., 2014). Unlike autism, children with Asperger's syndrome do not clinically display significant delays in language and cognitive development, age-appropriate self-care skills, and curiosity about their surroundings. Individuals diagnosed with Asperger's syndrome may also exhibit depression, anxiety, attention deficit, hyperactivity, or obsessive-compulsive disorders. Moreover, they may show intense interest in unusual subjects and difficulties in motor coordination, also referred to as clumsiness (Derer, 2018).

Childhood Disintegrative

Disorder These children develop entirely normally during the first two years. Symptoms typically appear between ages 3-4. The majority of patients are male. With the onset of the disorder, previously acquired skills rapidly deteriorate. For example, learned words are quickly forgotten, and control over bodily functions is lost. Symptoms that start with hyperactivity and restlessness continue until severe intellectual losses occur. Some may also experience epileptic seizures (Aydın, Kınacı, 2013). It is said that the prevalence of these individuals is two per one hundred thousand.

Unspecified Pervasive Developmental Disorder (Atypical Autism-Mild Autism) Atypical autism is a general term used for pervasive developmental disorders that cannot be classified in another way. Children classified under atypical autism exhibit limitations in reciprocal social interaction, verbal and non-verbal communication, and rigid stereotypical (repetitive) behaviors (Doğangün 2008). In atypical autism, some features of autism or Asperger's syndrome may be observed while others are not. It can be referred to as mild autism. Unlike autism, autism symptoms in mild autism may fade over time; with good education and suitable conditions, they can completely return to normal. There is no severe form (MEB, 2008; Derer, 2018).

Psychomotor Development in Individuals with Autism

Psychomotor development is the process of controlling and enhancing behavioral patterns that arise from 'motor' skills throughout one's life. These behaviors involve the coordinated functioning of sensory organs, the mind, and muscles. Essentially, this process that regulates and coordinates these behaviors defines psychomotor development.

Psychomotor development is defined as the acquisition of voluntary movements in line with physical growth and the development of the central nervous system. While motor development undergoes various changes, it

remains a continuous process built upon each developmental stage of an individual's life (such as infancy, childhood, adolescence, adulthood).

In conjunction with intellectual disabilities, the psychomotor performance and motor skills of individuals with mild, moderate, and severe autism spectrum disorder are negatively impacted according to the degree of ASD.

Autism, characterized as a pervasive developmental disorder and behavioral difference, may exhibit deficiencies in both fine and gross motor skills. While autistic children possess motor development, they display a range of variations and shortcomings in these skills compared to their peers (Altiere & Kluge, 2009). Despite having physical development features that may seem equivalent to their peers, autistic children are noted to lack readiness in executing movement (Fazlıoğlu, 2004).

Some autistic children might experience delays in walking or may not be adequately skilled in gross motor movements. However, some exhibit high proficiency in activities like running, rolling, sliding, or climbing. Behaviors such as flapping arms like a bird or walking on tiptoes are also commonly observed. These behaviors indicate an immaturity in psychomotor development (Turan, 2005). Typically, it's noted that autistic children acquire the ability to throw and catch a ball around 14-15 months old, and by the age of 3-4, those with mild to moderate ASD can balance on a line on the floor or a sufficiently wide surface. Those with a good level of psychomotor development can even balance on a board or balance apparatus. Some autistic infants may not acquire expected physical developmental skills due to their indifference to their surroundings (Fazlıoğlu, 2004; Sarol, 2013).

Individuals with Autism and Physical Activity

Technological advancements and products that have become a part of our lives lead people towards inactivity from childhood onwards. This results in an unhealthy lifestyle that doesn't align with the human body's structure and function (Sarol, 2013).

It's stated that a sedentary lifestyle causes 3.2 million deaths worldwide annually. Additionally, approximately 10-16% of global cases of breast cancer, colon cancer, and diabetes, and 22% of heart diseases are attributed to sedentary living (AA, 2017). Quality living has become as significant as longevity. It's observed that physical activity is one of the fundamental factors to live healthily and mitigate health risks associated with age (Vural et al., 2010). Physical Activity involves body movements resulting from energy expenditure using muscles and joints during daily life, increasing heart rate and respiration, and leading to varying levels of fatigue (Bek, 2008).

Physical activity encompasses not only exercise and sports but also leisure activities, occupational tasks, and daily life activities that involve energy expenditure (Vural et al., 2010).

Various sports, dance, exercise, games, and daily activities involving basic body movements like walking, running, jumping, swimming, cycling, squatting, rising, arm and leg movements, head and torso movements can be considered as physical activity (Bek, 2008).

The sedentary lifestyle observed in individuals with autism spectrum disorder (ASD) creates a specific risk group by increasing the risk of heart disease, diabetes, and obesity. Recognizing that physical activity is an effective tool to reduce these risks in typically developing individuals suggests its potential effectiveness for individuals with autism (Pitetti et al., 2007). Besides the success of standard treatment methods for ASD, several studies emphasize the positive effects of physical activity on reducing maladaptive behavior patterns/stereotypical behaviors in children with autism (Pan 2010, Sandt and Frey 2005).

In the educational programs designed for autistic children, including supportive movement, play, and sports activities to enhance motor skills is crucial. Providing movement experiences imparts important knowledge to children in perceiving and understanding their bodies and the environment/universe they are in. Moreover, utilizing movement and skill training can aid autistic children in enhancing attention, focusing thoughts, problem-solving, and seeking new ways/solutions for self-expression. Through a well-planned movement and skill training program, autistic children can develop their abilities to recognize other children, interact harmoniously with them, and establish emotional and social cooperation (Cerit et al., 2022; Fazlıoğlu, 2004; Sarol, 2013).

Individuals with Autism and Sports

Physical activity, movement, play, and sporting activities/exercises have existed throughout human history, whereas activities for disadvantaged groups such as disabled, elderly, children, chronic patients, and women emerged later.

Following the Second World War, especially in Europe and America, efforts concerning sports for disabled individuals commenced. The rapidly evolving and spreading disabled sports gained an international identity, transcending national boundaries.

In these countries, specialized teachers in disabled sports conducted physical education and sports classes in schools for disabled students, offering them the

opportunity to engage in various branches of disabled sports as athletes. They essentially formed the foundation of the teams.

In Turkey, in the early 2000s, Physical Education and Sports classes specifically dedicated to disabilities were introduced in Physical Education Teaching Departments, providing theoretical and practical lessons to teacher candidates regarding various types of disabled sports, thus creating awareness about disabled sports in our country. Additionally, in some Sports Sciences Departments, projects related to individuals with autism spectrum disorder (ASD) have been implemented (Şahin, Özdurak Sıngın & Düz, 2020).

The term used in Turkey as "Physical Education and Sports for Disabled" or "Physical Activity for Disabled" is also commonly referred to in international sources as "Adapted Physical Activity" or "Adapted Physical Education and Sports". This term emerged in 1973 when the International Federation of Adapted Physical Activity was established by Canadian and Belgian scientists. It's termed as "Physical Activity for Disabilities" or "Disabled Sports," encompassing sports and physical activities that can be performed at any age, including adapted physical activity and other uses (Sarol, 2013).

Disabled sports can be defined as a lifelong, multidisciplinary, and practical field led by experienced instructors, therapists, teachers, and coaches specialized in disabled sports, aiming to help individuals of all ages with movement limitations due to any disability, old age, or illness, or social/community constraints (behavioral and environmental barriers), to achieve their abilities and goals in mobility, play, physical activity, and sporting activities (Scherrill, 2004; Doll-Tepper et al., 1990).

It is well-known that sports are extremely valuable for disabled individuals, meeting their needs such as enjoyment, fun, capability, accomplishment, victory, and excellence in mobility, play, physical activity, and sports. Mobility, play, physical activity, and sports hold a significant place even among individuals with a pervasive developmental disorder such as autism spectrum disorder (ASD). This is because the development of movement, play, and sporting skills in individuals with autism sets the stage for learning other body movements, thus aiding in learning more complex behaviors (Sarol, 2013). Also, activities in mobility, play, and sports, which are possible at every stage of life, are highly important for autistic individuals to interact with their peers (Engel, 2011; Sarol, 2013).

The participation of autistic individuals in physical activity and sports may contribute not only to decreasing repetitive behaviors and increasing appropriate responses but also to the development of psychomotor functions. Sports can assist in strengthening muscles, enhancing eye-hand coordination, and

developing balance, all of which are crucial for autistic children who often struggle with social relationships.

As part of socialization programs through sports, activities like passing a ball, small competitions, enable autistic individuals to be in different social environments independently from their families, contributing significantly to their social interactions. By participating in exercises and sports activities organized with rules in different social settings, they can communicate with diverse people and develop various means of interacting independently. This opportunity allows them to see what they can achieve, thereby gaining self-respect and beginning to socialize.

Autistic individuals, except for their families and close circles, often do not interact in the same environment as others and do not engage in some basic social interactions such as gestures, facial expressions, etc. Sporting activities provide them with opportunities to interact with different individuals in different social settings, helping them to communicate with various people and take part in exercise and sports activities governed by certain rules.

The rigid and persistent behaviors of autistic individuals further narrow their already limited social boundaries. Through sporting activities, these maladaptive behaviors can be minimized, and the ability to communicate with others can be fostered. When physical education and exercise practices are considered from a rehabilitative perspective, the aim of sports is to regain/strengthen social adaptation and functional deficits and losses. The most crucial condition for this rejuvenation is the continuous and regular application of exercise therapies. The purpose here is to enable autistic individuals, who have been withdrawn into their own worlds or forced to withdraw due to wrong societal attitudes and behaviors, to gain self-respect and establish a place in societal life.

The development of speech skills directly determines an individual's social position. Communication and speech skills, the sole way for direct interaction among people, define the boundaries of autistic individuals' living spaces. Particularly, sports in rehabilitative and special education programs designed to enhance speech skills and psychomotor features can be beneficial for autistic individuals. Through these rehabilitation and therapy programs, skills can be imparted to facilitate the adaptation of autistic individuals to their surroundings, contributing to physical, social, emotional, and self-confidence development (Atalay and Karadağ, 2011).

Nutritional disorders in autistic individuals, combined with the effects of antipsychotic medications (mainly used in the treatment of psychoses such as schizophrenia), can lead to excessive weight gain or obesity. This situation can

lead to diabetes, cardiovascular, or bone and joint problems (Karaküçük, 2012). Regular engagement in physical activity and sporting activities plays an important role in

Sports Examples for Individuals with Autism

Physical activities and sports are essential elements of a healthy life. For individuals with autism, mobility, play, physical activity, and sports assist in addressing sensory integration deficiencies such as discomfort with touch, posture irregularities, hypersensitivity, and self-harm tendencies. They also aid in enhancing coordination, muscle tone, and social skills.

Enhancing motor skills in individuals with autism and other disabilities is achievable, much like their typically developing peers. The most effective approach to developing these motor skills, also known as psychomotor skills, involves continuous practical application. A gross motor development program encompassing mobility, play, physical activity, and sports exercises should be implemented for both autistic and typically developing peer children. This approach can activate larger muscle groups in inactive individuals with autism, thereby maintaining stronger and more dynamic muscles supporting the skeletal system. Sports such as running, cycling, walking, and swimming that engage non-regional, larger muscle groups can render the body's entirety, its muscles, and the organism more functional.

Activities like running, cycling, swimming, and walking, focusing on individual competition rather than the complex technical and tactical skills required in team sports like basketball or volleyball, can significantly enhance both the physical performance and social relationships of individuals with autism within their potential.

Despite appearing challenging, individuals with autism can engage in sports activities they desire, ranging from low to high levels of sporting performance based on their autism spectrum levels. Cooperative team sports like football, handball, and basketball all demand advanced social communication and collaboration skills. Autism, being a widespread developmental disorder, often hinders the adequate development of these skills. Consequently, it might be challenging for individuals with autism to establish good communication within a team or predict how another team member might behave.

Team sports requiring ball involvement, such as basketball, football, handball, and volleyball, necessitate high levels of strength, conditioning, and coordination. Autism typically involves weak muscle tone and problems with conditioning and coordination. Hence, sports might be a demanding activity for individuals with autism. Team sports are usually played in environments that

are often too hot, cold, or brightly lit. Individuals with autism often face sensory challenges such as high noise, bright lights, and extreme temperatures in these settings, making them unhappy, disengaged from team dynamics, and even uncooperative during sports.

However, many groups offer opportunities for individuals with autism to participate in team sports. When considering that your child/sibling/loved one with autism might be interested in participating in a sports club, take them to associations and clubs offering sports opportunities tailored for autistic children. Not every team sport suitable for your child/sibling/loved one might necessitate high-level communication and collaboration, but over time, they can develop habits of effective communication and collaboration.

Swimming

Swimming is a recommended sport for most individuals, including those with autism, disabilities, and those without disabilities. Individuals facing challenges with team sports can exhibit physical development through typical water gymnastics and water games. Since swimming allows for individual competition, successful autistic swimmers can become integral members of swimming teams. Engaging in swimming involves the use of nearly every muscle group, which contributes to the development and maintenance of various physiological functions. From a social perspective, engaging in different sporting activities in a different environment allows the experience of diverse feelings through physical activity (Sarol, 2013).

The impact of buoyancy in water significantly reduces the feeling of body weight compared to movements performed outside of water. This effect is more advantageous for individuals with joint problems compared to benefits obtained from other forms of exercise. Despite reducing the sense of weight, the resistance effect of water on the joints increases muscular tension, thus providing an exercise effect.

Certain movements that autistic and disabled individuals may struggle with outside of water can be performed more comfortably in water due to the buoyancy effect. Consequently, swimming instills a sense of self-confidence, self-proving, and the feeling of being part of society for autistic individuals. Additionally, the presence of other individuals in the water simultaneously allows them to be recognized and understood, contributing to the numerous physiological, social, and psychological benefits associated with swimming.

Walking-Running-Jumps and Throws

Walking and running are physical activities and sports that can be done both individually and as a team for individuals with autism. It's a social and sporting activity that can involve family members, friends, other disabled/autistic individuals, and those without disabilities. Because it can be done at low, moderate, or high speeds, it's suitable for all participants, making it an inclusive sport (including disabled/autistic individuals, family members, classmates/peers, and close circles) that accommodates everyone's performance.

These activities can take place in sports halls, around stadiums, or on walking trails, providing participants with an attractive sports environment free from monotony. Alongside walking, disciplines from athletics such as running, jumping, and throwing can also be included. While walking, running, and jumping can be practiced safely by all autism groups, implementing throwing disciplines, especially with mildly affected (atypical) autistics, requires stringent safety measures to enhance efficiency and prevent potential injuries and accidents.

Engaging in walking, running, jumping, and to some extent, throwing, utilizes major muscle groups and organs in the body, contributing to the physiological development and maintenance of various functions. Moreover, these physical activities/sports enable the exploration of diverse emotions through the joy of participating in different sporting activities in a unique setting.

Athletics disciplines demand less communication skills compared to most team sports, allowing individuals with autism to compete based on their individual performance, facilitating their self-expression and showcasing their abilities comfortably. For highly skilled autistic athletes, especially in relay races like the 100m or 400m, where intricate tactics and baton exchanges occur, they could be positioned as the first or final athlete to participate, thereby preparing them for team sports.

Bicycle

A bicycle is a human-powered vehicle, typically having two or three wheels, pedals, and propelled by the rider's physical effort. Besides transportation, bicycles are also used in sports. Individuals with autism who have developed motor skills such as coordination and balance can comfortably use bicycles without difficulty. Consistently pedaling in the same direction is a repetitive stereotypical movement and behavior familiar to individuals with autism. Initiating young individuals or those with balance issues on a three-wheeled

bicycle, free from balance problems, can make this sport active and appealing for them.

Among the primary problems observed in individuals with autism are weight issues, the ability to analyze learned information for daily use, balance problems, moving in groups, adhering to rules, following commands/instructions and seeking help, concentration/focus.

Riding a bicycle, known to engage multiple muscle groups, triggers the release of certain hormones in the human body, resulting in reduced stress levels and a calming effect, as observed in individuals with autism due to these hormonal changes.

Balancing on two wheels requires good balance skills. Riding a bicycle directly supports individuals with autism in addressing their balance-related problems. Apart from the stronger impact of group rides, individual rides (An individual with autism should always be supervised while riding a bicycle for safety reasons. Cycling in traffic should be avoided, and the person's equipment must be complete.) enforce the necessity to adhere to rules. This necessity aids in understanding, perceiving, and appropriately utilizing rules, contributing to the development of skills to function within society and apply learned knowledge in daily life during education.

Individuals with autism often refrain from seeking help when they encounter difficulties. Particularly during group rides, providing proper guidance when an individual with autism faces challenges can support the development of their ability to seek help.

Many individuals with autism have heightened levels of visual perception. They often learn through imitation. During group rides, an individual initially imitates the lead rider, quickly acquiring the necessary skills to ride within the community. This progression continues over time. This changing and evolving process initiated by cycling can have an impact across various aspects of life

Riding

Individuals with autism can often establish communication with animals more easily than with humans. Many individuals with autism have the ability to calm horses. It can be said that horseback riding is one of the most suitable sports for individuals with autism who possess good interaction and communication skills with horses.

Horses share some traits similar to humans. Among the key reasons for their therapeutic use are their social and emotional nature, attitudes, moods, and instincts. The use of horses in psychotherapy is due to their shared characteristics with humans such as problem-solving, relationship building,

honest communication, trust, leadership, patience, assertiveness, bonding, and similar attributes, viewed as an instrument for developing and resolving these issues (Köseman & Şeker, 2015a, Ilkım et al. 2021). Equine-assisted therapy affects individuals through two factors: biomechanical and psychogenic. A horse can transmit about a hundred vibrational signals per minute to the rider. The horse's movement enables the functioning of nearly all muscle groups at a reflex level in the rider, stimulating the development of fine motor skills (Köseman & Şeker, 2015b,Ilkım et al.2021).

Considering the therapeutic benefits of horseback riding, it's notable that, like for any individual, both physiological and psychological advantages are mentioned for individuals with autism.

Physiological benefits include:

- Strengthening less-used muscles due to the rhythmic movements while riding or being on horseback.
- Enhancing the mobility of the pelvis and hip area.
- Improving balance reactions to enhance body stability.
- Developing the cardiovascular system.
- Stimulating metabolism.
- Enhancing the respiratory system.

Psychological benefits include:

- Feeling good due to the combination of outdoor exercise with horses and group activities.
- Enhancing self-confidence.
- Facilitating emotional control and developing self-discipline.
- Assisting in achieving a sense of relaxation.
- Increasing interest in the outside world and their own lives.
- Increasing the ability to take risks.
- Improving social communication.

The benefits of horseback riding for individuals with autism can be considered benefits for all individuals. Apart from the effects with horses in the section on physiological benefits and all factors in the psychological benefits section, these gains apply to all disabled and non-disabled individuals in various sports. For disabled individuals, especially those with autism, these changes in physical and psychological interaction and behavioral changes are more crucial.

To assert the effectiveness of horseback riding and therapeutic horseback riding in individuals with autism, more research and project results are needed. While positive effects are evident, particularly in studies involving disabled groups such as cerebral palsy (CP), multiple sclerosis (MS), paraplegia,

hemiplegia, and poliomyelitis, showing positive effects in some developmental (psychomotor) skills, controlled experimental research is necessary.

Apart from physical activities such as trampoline jumping, rope jumping, skating, skiing, using exercise machines (e.g., treadmill, weights, step machines, rowing, stationary bikes, and cross-country skiing), playing structured mobility and games like soccer or basketball, there are numerous physical activities for children with autism. These include fundamental sports skills like balance, jumping, hopping, leaping, throwing, catching, climbing, as well as table tennis, tennis, badminton, gymnastics, dancing, and outdoor nature walks. Adaptations should be made for these physical activities, games, and skill activities to be safe and successful. Individuals with autism should repeatedly perform adapted components of balance, locomotor, and manipulative (involving the use of an object) skills during the learning process of motor skills. Additionally, adapting games or sports activities should align with the abilities of individuals with autism. When planning a motor activity, adaptations are often required. Some recommended adaptations include reducing the playing area, using wider equipment, relaxing rules, shortening activity durations, providing frequent rest periods, using lighter equipment, simplifying activities, and slowing activity pace (Sarol, 2013).

Sherborne Movement Training

International Sherborne Developmental Movement Technique is an evolved and enhanced form of movement initiated by Veronica Sherborne (1922-1990) in England. Influenced by the specific developments in movement analysis and dance notation by Rudolf Laban (1879-1958), a French citizen from the Austro-Hungarian Empire, Sherborne applied her movement technique.

At the core of Rudolf Laban's work lies a desire to be creative in exploring the physical capabilities of the body, problem-solving abilities, and the potential for establishing relationships through movement.

The Sherborne developmental movement technique is a method that directs individuals of all ages and various characteristics to gain self-confidence and engage in relationships with themselves and others through innate movements. The technique's significant advantage lies in providing a learning experience for individuals in an environment free from judgment and criticism, allowing everyone to feel successful. This technique enriches the teaching for educators at all levels and offers children the opportunity to discover their abilities through movements. Courses for Sherborne developmental movement technique instructors have seen a growing number of participants from educational backgrounds, including child development specialists, physical

education instructors, physiotherapists, special education teachers, nurses, and university students preparing to work in this field, alongside volunteers.

The fundamental philosophy underlying Sherborne's work includes:

- Being success-oriented, where the manner of performing an activity is not crucial.
- Being differentiated and covering all skill areas, starting from the lowest level.
- Sequencing activities from simple to complex.
- Providing a positive experience.
- Being a shared experience where everyone in the group is equal, contributing to the development of positive self-esteem.
- Being individual-centered rather than rule-bound, fostering flexibility by collecting ideas from individuals and developing them within the group.
- Encouraging diversity and innovation.
- Cultivating self-confidence in oneself and others. Considering these characteristics, it can be said that applying the Sherborne developmental movement technique, especially with individuals with autism, yields several positive effects mentioned earlier (Sarol, 2013).

Programs that comprise movements, games, and sports exercises, such as indoor gym activities, sports field/open area activities, water-based/pool activities, recreational activities in nature, and adventure courses, can be implemented for individuals with autism of all ages, abilities, and inclinations. These exercise and sports programs include motifs/adaptations from various sports branches.

Implemented sports programs positively impact the physical, mental, and emotional development of disabled and non-disabled individuals, chronic patients, and those with autism, influencing their emotions, states, behaviors, and moods positively.

CONCLUSION

Movement, play, physical activity, and participation in sports hold significance not only for all individuals but also for those with autism. Researchers emphasize the importance of exercise and sports activities in dealing with physiological and psychological issues.

Studies on autism and physical activity, adapted physical education, sports, and exercise indicate that individuals in school age receiving special education and the majority of adults have professional training. Moreover, most individuals with autism have educated parents. These findings remain consistent both nationally and internationally.

Physical activity and exercise programs contribute to increased motor performance and physical fitness in children and young people with autism. They also aid in reducing stereotypical behaviors, facilitating appropriate responses, and contributing to their social integration.

Engaging in movement, play, and sports activities helps in developing communication skills, integrating into society through social interactions, object recognition, improving hand-eye coordination, acquiring skills, reducing attention deficits, and contributing to both gross and fine motor development in children.

Physical activity, exercise, and sports programs hold an important place in the lives of individuals with autism for achieving certain milestones. These activities support balance, coordination development, gaining courage and self-confidence, enhancing perceptual improvements, and contributing to emotional and psychological relaxation.

RECOMMENDATIONS

Involving parents in movement, play, and sports activity programs aimed at enhancing the physiological and psychological development and improving the quality of life for individuals with autism.

Designing exercise and sports activities based on the cognitive, physical, behavioral, and psychomotor development levels of individuals with autism and implementing them across different age groups to expand the sample.

Conducting studies on the physiological and psychological effects of physical activity and sports activities specifically focused on sports branches like basketball, athletics, table tennis, and swimming concerning autism.

Opening physical activity, exercise, and sports programs dedicated to individuals with autism under the coordination of relevant university departments, supported by non-governmental organizations, educational institutions, families, and local governments.

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Chapter 12

INDIVIDUALS WITH MENTAL DISABILITY AND SPORTS

Prof. Dr. Nurettin KONAR[1]

INTRODUCTION

Individuals, with their motor, social, emotional, and cognitive differences, continue their lives as members of social life. Depending on the severity of the disability and the individual affected, limitations in movement or sensory disturbances can separate and differentiate them from other members of society (Tekkurşun, İlhan, Esentürk, & Adnan 2018). The limitations and disabilities individuals have are categorized into four types called "types of disabilities": intellectual disability, hearing impairment, physical disability, and visual impairment. A person needing care and rehabilitation due to physical impairments is referred to as physically disabled. The source of bodily impairments is explained as problems related to muscles, bones, joints, and the nervous system (Cumurcu et al., 2012). Disability is a life situation that individuals and families often face beyond their control. Limitations or failures to perform expected roles due to age, gender, social and cultural factors, or disability are observed. According to the Turkey Disability Survey (2002), the disability rate in our country is 12.29%, while 10.32% of this rate comprises individuals aged 19 and below. It is estimated that 10% of the world's population is disabled (Özcebe, 2019). Throughout history, it has been observed that many scientists have approached concepts differently in various fields, including psychology. As a result, various definitions of concepts such as "intelligence," "mind," and "disability" have emerged. Particularly, psychologists used to consider intelligence as a fundamental skill that affects all cognitive performances (Ersoy & Avcı, 2000).

Concept and Emergence of Intellectual Disability

According to Piaget, intelligence relates to the harmony between an organism and its environment. It encompasses sequential interactions of all emotional, motor, and cognitive characteristics, indicating a state of balance. Intelligence involves multiple complex functions like mental activity, perception, memory, thinking, reasoning, and learning. According to Yörükoğlu (2000), the mind is the ability to adapt and find solutions to new situations by

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learning from what we have learned. Intellectual disability generally means that a child's cognitive abilities do not meet the cognitive expectations for their age. Among children needing special education are those with developmental disabilities, which constitute a significantly important group requiring educational support. The initial descriptions of children with developmental disabilities date back to the 19th century, while more defining descriptions were made in the 20th century. AAMR defines intellectual disability as "Significant limitations in both intellectual functioning and adaptive behavior as expressed in conceptual, social, and practical adaptive skills. The onset must occur before the age of 18" (Eripek, 2005: 17,Ilkım et al 2021).

Intellectual disability presents significant limitations in current functionality, notably below normal levels in terms of cognitive function and adaptability. Skill areas (communication, personal care, family life conditions, social abilities, social adaptability, self-management, health and safety, academic skills for daily life, work, and time) are conditions showing two or more limitations. Intellectual disability is identified before the age of 18 (Erkan, 1990). There are many reasons for intellectual disability, including:

- Hereditary factors
- Chromosomal disorders like Down syndrome
- Metabolic disorders like Phenylketonuria and some genetic diseases
- Unconscious use of drugs, narcotics, alcohol, and smoking by the mother during pregnancy
- Maternal exposure to contagious diseases such as rubella, toxoplasmosis, and exposure to radiation during pregnancy
- Maternal poisoning, inadequate nutrition, and lack of oxygen to the baby during pregnancy
- Contagious diseases of the fetus in the mother's womb, child-mother blood incompatibility with consanguineous marriage
- Premature or delayed birth, umbilical cord entanglement, difficult childbirths through the birth canal resulting in lack of oxygen
- Dropping the child, harming the child with feeding tools, unhealthy conditions
- Lack of treatment for specific diseases like measles and whooping cough
- Central nervous system disorders such as encephalitis, meningitis, convulsions, severe jaundice, thyroid hormone deficiency, inadequate and balanced nutrition for the child
- Environmental factors such as negligence, lack of maternal affection, child abuse, lack of encouragement (Özbey, 2006).

Physical Characteristics and Muscle Condition of Individuals with Intellectual Disabilities

Research indicates that around 15% of intellectually disabled children exhibit distinct physical differences. Limited movement in intellectually disabled individuals is attributed to weak muscle strength. Muscle weakness in individuals with developmental delay affects their activities of daily living, influences regression effects, and impacts work life. Therefore, accurate assessment of muscle strength and endurance should be conducted in individuals with developmental disabilities. Muscle strength in individuals with intellectual disabilities is less than that of ordinary individuals. The strength of leg muscles is closely related to maximum oxygen consumption and running capacity. Hence, intellectually disabled individuals have weak muscles. Weak strength is a limiting factor in maximum oxygen capacity. Children with intellectual disabilities cannot fully develop compared to normal children. Their abilities in strength, balance, agility, endurance, flexibility, and speed are weaker compared to other individuals. Hence, specific considerations must be made while providing sports education to these individuals, and it should be kept at a lower level. Many studies highlight that the strength levels of intellectually disabled adults are lower than those of normal individuals. Enhancing muscle strength and endurance through personalized planned programs is possible to improve performance in activities such as carrying loads, lifting weights, climbing up and down stairs, maintaining a good posture, and work-related activities. Lack of strength leads to osteoporosis and increases the risk of trauma. A strength training program should involve activities targeting specific muscles in the body, arms, and legs, ideally comprising sessions of 15-20 minutes, three days a week. Increasing muscle capacity includes using resistance bands, weights, presses, exercise equipment (for major muscle groups), and weightlifting exercises. It's said that two-thirds of the world's disabled population lives in underdeveloped or developing countries. The multitude of disabled individuals has a close relationship with the sociological structure, social movements, social attitudes, and sociological organization of society. It's estimated that there are around 8-8.5 million individuals with disabilities in our country. Considering individuals with disabilities and their families, their total number is said to be approximately 25 million. Close to 2 million disabled individuals in our country actively participate in the workforce. Children with developmental disabilities constitute the most common group among disabled children. However, these children are often not recognized in society. Individuals with developmental disabilities are classified among themselves into moderate, severe, and very severe mental

health problems. It has been identified that approximately 85% of individuals with intellectual disabilities experience learning difficulties. It is said that these children have the opportunity to receive partially or fully supported academic education at the elementary school level, to live independently in society, to adapt socially, and to gain vocational skills at an adult level (Özer, 2017; İlhan, 2008; Polat, 2009; Yetim, 2014; Ersoy & Avcı, 2000,Özdemir et al. 2018).

Physical education and sports for disabled individuals, known internationally as adapted physical activity, have been widely adopted in the international literature as Physical Education and Sports. This term was introduced by Canadian and Belgian scientists when the physical activity federation was established in 1973. Adapted physical activity refers to physical activities and sports activities adapted according to a person's limited movement capacity due to illness, disability, or old age. According to the International Federation of Adapted Physical Activity (IFAPA), physical activity for disabled individuals is a multidisciplinary academic field, a dynamic system that provides services between theory and practice, and a network advocating for the rights of disabled individuals.

When considering the developmental characteristics of individuals with developmental disabilities, which involve many deficiencies or shortcomings in social, emotional, physical, intellectual, and motor skills, the development of sports activities aims to belong to a group and community, maintain a sense of belonging, elevate a positive self-image, acquire mental skills, and support physical and mental health.

In a study conducted by Çevik and Kabasakal (2013) on intellectually disabled children aged 9-12, the impact of physical education provided to children on their social development was investigated. Within the scope of the study, intellectually disabled boys and girls aged 9-12 participated in a regular sports training program for eight weeks. It was determined that the social education skills of intellectually disabled children significantly improved as a result of the physical education implementation program. Exercise affects an individual who has lost physical and mental working ability. Sports engage with oneself and the entire society through its psychological and social structure. It's evident that sports promote a peaceful and integrated life. Sports disciplines are seen as a means of education and rehabilitation for disabled individuals in today's world. The positive impact of sports on disabled individuals, their families, and their jobs directly reflects on their surroundings and society (Cerit et al., 2022). Limitations in psychomotor attitudes are often widespread among intellectually disabled individuals. This is a characteristic because the lack of brain development also affects motor functions. Intellectually disabled

individuals are generally interested in physical activities but are less effective compared to their peers. Falls resulting from poor balance and coordination abilities are quite common in intellectually disabled individuals. However, it has been suggested that balance, coordination, and performance can be significantly improved in intellectually disabled individuals after various procedures. Participating in intensive training programs to enhance psychomotor underdevelopment in disabled individuals compared to their normal peers is an important way to improve their performance, and this habit significantly affects the daily lives of intellectually disabled individuals (Durak, 2020).

Brouwer and Ludeke (1995) express that exercise affects muscles and the nervous system, supporting the physical and psychological responses of the body as a tool for its metabolic development. According to the authors, participation in physical activity can strengthen an individual's muscles. Developing coordination, balance, postural control, respiration, and circulation offer significant benefits in preventing ***spasticity (Brouwer & Ludeke, 1995). Some intellectually disabled children are very similar to*** non-disabled children. They possess similar and equally capable abilities. Intellectually disabled children can succeed in many sports similar to other normally developing children (Yılmaz, 2008).

Regardless of the disability group, individuals who notice individual differences in development from an early age are usually the closest parents (İlhan, 2009), and appropriate individuals to consult when encountering a disability are doctors. Medical examinations ultimately determine whether a person has a disability and, if so, what type of disability they have, diagnose the individual's disability, and then determine the type of disability. Depending on the disability, individuals are directed to suitable areas such as fields involving colleagues like physiotherapy, psychiatry, rehabilitation, and physical education. According to Kayıhan et al. (2013), awareness training should be provided to the family members, friends, and other individuals concerned with the health of the individual, to solve health, environmental, and societal problems at the family level, in line with the directions of doctors. Doctors have the authority to manage families. It is important for doctors to raise awareness about exercise and sports.

Individuals with intellectual disabilities and the elderly have looser muscles parallel to their developmental disabilities. However, it is observed that losses in motor development are increasing (Hendry & Kerr, 1983), and the greatest loss of motor skills is in coordination, balance, speed, power, and manipulation skills (Bruininks & Chavat, 1990). This is due to the lack of opportunities for

physical activity (Clark, 1978). Children with intellectual disabilities have the same physical developmental abilities as individuals with normal intellect. Although their physical development progresses, their intellectual development lags behind (Özer, Nalbant, Ağlamış, Baran, Kaya Samut, Aktop, & Hutzler, 2013). Children with developmental disabilities learn late and with difficulty. Their focus easily disperses, and they experience memory problems (Özsoy, Özyürek, Eripek, 2002).

Sports for Individuals with Intellectual Disabilities

Without a doubt, individuals with disabilities can actively participate in sports activities. Sport, which enhances one's physical and mental health, is interactive within the social environment. It's a biological, pedagogical, and social phenomenon that enhances communication, bringing a certain level of mental-motor connection. Therefore, sports should be considered as a tool for social adaptation among disabled individuals (İlhan, 2008). All the positive effects of sports can be more pronounced in normally developed individuals and even in disabled individuals. All sports activities serve as a natural environment for disabled individuals, impacting individuals differently and supporting all dimensions of development (Tekkurşun et al., 2018).

Considering that education for children with intellectual disabilities often focuses on their physical abilities rather than their intellectual capacity, it's essential for children to benefit from professional education for the development of their physical and motor skills (Sherrill, 1988). When appropriate opportunities are provided, the motor skills of intellectually disabled individuals improve (Akın, 2015). It's crucial to recognize the needs of children with developmental disabilities more effectively and provide greater assistance according to their needs. Identifying their intellectual and learning abilities, physical and motor characteristics, is crucial for these children to be physically fit for participation, productivity, and staying healthy (Yılmaz et al., 2006).

Exercise forms social connections for disabled individuals. Any physical activity among the disabled positively impacts their care, fosters positive mental behavior, and aids in their social integration. Therefore, physical activity is as important for individuals with intellectual disabilities as it is for healthy individuals. Keeping individuals with intellectual disabilities physically fit and promoting their development is highly necessary. Especially in respiratory diseases caused by a sedentary lifestyle, sports are more beneficial than other activities. Physical activity is recommended for intellectually disabled individuals to foster good relationships (Savucu & Biçer, 2009). Educational

institutions play a crucial role in fulfilling the physical activity needs of people with disabilities. Hence, physical education holds significant importance within educational programs. Specific tools, methods, programs, teachers, and facilities are required to meet these needs. Meeting these requirements adequately is essential for enabling the participation and integration of disabled individuals into society. Therefore, creating a tailored environment in educational institutions where individuals with intellectual disabilities receive education along with their families is crucial (Şahin, Sıngın Özdurak & Düz, 2020). It's about addressing the harmony among students, their individual needs, skills, speech, competencies, and the challenges they encounter in their daily lives through education. The goal here is to eliminate these challenges through education in schools. Physical education classes are important to meet these needs. A well-planned exercise program not only enhances children's motor development but also develops them cognitively and perceptually.

As physical and mental health develops, sports evolve into competitive activities according to specific rules. It involves competition, enthusiasm, competing, and a desire to win in a race (Tamer & Pulur, 2001). Sports boost athletes' self-confidence, improve adaptation, and contribute to a more balanced and organized mental health (İlhan, 2010). Individuals continue their lives as members of society with motor, social, emotional, and cognitive differences. Depending on the severity of the disability and the person affected, any physical limitations or sensory disturbances may separate them from other members of society (Tekkurşun et al., 2018).

The educational development of intellectually disabled children and youth lags behind their ages by 2-4 years. Individuals with intellectual disabilities, when compared to their peers, are considerably weak in skills like endurance, strength, and speed. Just as sports activities are crucial for healthy individuals, they are equally important for disabled individuals. Trainable intellectually disabled individuals can live longer than other disabled individuals. Therefore, the physical fitness level of individuals at a certain level should be maintained and improved. These exercises and sports should begin at an early age. The physical condition of intellectually disabled individuals is considerably lower due to insufficient participation in physical activities. However, if they are well-organized and trained with exercise programs, their physical fitness can surpass that of non-disabled individuals. For the proper physical, physiological, and physical development of intellectually disabled individuals, regular exercise or physical activity is necessary to change and affect some behaviors that affect motor development (Dikici, 1990).

Specially targeted sports activities for developmental disabled children, especially those with social and intellectual disabilities, not only positively impact their adaptation level but also enhance their self-perception and offer opportunities to improve communication with their environment (Guvendi & İlhan, 2017).

In philosophically evaluating the benefits of physical activity for disabled individuals, writers emphasize their contribution to emotional and psychomotor development (Hazar, 1996). They acknowledge that participating in sports provides emotional needs such as fun, entertainment, and the enjoyment of success for individuals with disabilities. Sports help people cope with obstacles, teach them to heal wounds, bring joy, offer opportunities for communication and sharing, and enhance the morale of life. It promotes positive traits like honesty, tolerance, and collaboration, shaping individuals into positive members of society (Atay, 1995). Sports and games play a significant role in children's development, encouraging healthy growth (Hazar, 1996). Based on all these thoughts, it's been observed that developing extensive play areas and activity spaces (such as spas, swimming pools, physiotherapy rooms, places for horseback riding, basketball and volleyball courts, etc.) in rehabilitation education centers for disabled and intellectually disabled individuals is crucial.

Sports have a positive impact on the community through the physical and intellectual development of disabled individuals, enabling them to establish better relationships (Savucu & Biçer, 2009). To reduce physical and mental stress, individuals need to maintain physical fitness that corresponds to their living conditions. Games, sports, and competitive activities are the easiest ways to restore relationships and connect with the community (Ergun et al., 1990). As an educational activity, sports evoke the ability to express and evaluate shared goals. Additionally, sports foster skills like understanding, responsibility, and collaboration, develop patience, and as a member of an energetic and cooperative social group and community, strengthen the relationship between individuals and society, making them more adaptable (Erkal, 1998).

As physically and intellectually healthy individuals engage in sports activities, it was not considered for years that the same could apply to disabled individuals. However, after World War I and II, the emergence of disabled patients who had been left to their own devices until that day brought about the idea that disabled individuals could also be rehabilitated (Sherrill, 1988). It has been observed that individuals with intellectual disabilities who participated in exercise programs were more proficient in controlling anger. There has been extensive research on the effects of sports on the development of individuals with intellectual disabilities. According to some studies, Chiang (2003) directed

autistic children towards a fun environment with various physical activities, resulting in increased interaction between individuals, reduced isolation, and strengthened relationships with peers.

When examining the impact of basketball activities on the behavioral development of intellectually disabled youth, it was observed that those who played basketball exhibited positive changes in their attitudes within their families and classes (Gençöz, 1997). Studies have shown the importance of recreational activities in joint movement with the environment, making friends, and interacting with disabled individuals (İlhan, 2008).

In higher education institutions offering physical education in our country, studies continue in four departments: physical education and sports education, coaching, sports management, and recreation. Optional certificate programs in various fields such as fitness, sports journalism, and disabled sports have been established in some universities. The goal of disabled sports is to improve human quality of life, integrate them, and rehabilitate them. Some schools have opened programs in disabled sports that include physical education classes such as intellectual disabilities and athletics, sensory disabilities and sports, sports technology for disabilities, special pedagogy, disability sports techniques, health problems, sports education for disabilities, wheelchair basketball, disabilities and sports, individual sports, and disabilities and sports II: team. These programs especially include sports lessons for disabled individuals (Konar & Yıldıran, 2012).

When reviewing the results of past research, it is evident that physical education and sports classes significantly contribute to the social and physical development of all special needs individuals, especially intellectually disabled children (Açak & Karataş, 2016; Kırımoğlu, 2017). However, many parents of disabled children lack adequate knowledge about their children's physical activity and social development. Therefore, the participation of individuals with intellectual disabilities in physical education and sports activities depends on society's attitude and awareness levels on this matter (İlhan et al., 2016). It is essential for teachers in planning physical education for disabled students, especially for disabled youths, to employ different methods that support student participation in activities. Disabled students require special support to participate in physical education. It is essential to pay attention to the social and emotional characteristics of students requiring special academic support to ensure their participation. (Maxwell et al., 2018).

Siedentop, Mondi, and Toggart stated that if a disabled child is not given the opportunity to participate in play, their motor skills cannot be developed. In a comparison of some motor skills between disabled children who have the

opportunity to move and those who cannot participate in exercise and physical activity, it was found that disabled children's motor skill gains were higher (Biçer et al., 2004). Low physical fitness and physical mobility are closely related. Research findings indicate that individuals with poor motor coordination are physically less active compared to their more coordinated peers (Ploughman, 2008). Regardless of the type and severity of individuals' disabilities, mobility, sports activities, and participation in various activities bring joy. This happiness motivates them and fulfilling these needs enhances their self-esteem (Eichstaedt & Lavay, 1992). Generally, the benefits of sports activities for disabled individuals include motivation for sports, competition, fun, love for sports, health, knowledge, skill improvement in sports, and being part of a team spirit (Kaldımcı et al., 2012). Teachers can provide physical, social, emotional, and cognitive benefits for disabled students through planned physical education activities. By creating structured learning environments and lessons that promote their independence, meaningful learning environments can be established for these students through structured practice and lessons (Johnson-Bailey et al., 2009).

The History of Sports for the Intellectually Disabled

The history of disabled sports dates back to the 1870s. Its institutional structure was established when a group of gymnasts, bowlers, and chess players formed a sports community, leading to the establishment of the Berlin Deaf Gymnastics Association on October 18, 1888. Over the years and with an increasing number of participants, the implementation of the International Silent Games in Paris in 1924 laid the foundation for the Deaf Olympics (Uslu, 2020). Participation of individuals with disabilities in sports activities stemmed from the positive effects of treating injured soldiers and then all patients in need. The complementary role of exercise in therapy and its positive impact on the motivation of disabled individuals became apparent. Sports also drew attention as a rehabilitation tool. Furthermore, the social and psychological support that sports provide as part of rehabilitation for patients and the disabled was recognized. Initially, only the physical rehabilitation needs were addressed, but efforts were made toward achieving a rehabilitation understanding through collaboration and change (Karasüleymanoğlu, 1989).

On February 1, 1944, Dr. Ludwig Guttmann, the director of a spinal cord injury center in England, decided to adopt a new approach to the rehabilitation of intellectually disabled individuals, introducing them to a style of play and competition. He began to engage them in sports. Patients and their communities appreciated this new approach. In the early years, activities like dart throwing,

table tennis, and bowling were organized, culminating in the first Stoke Mandeville simple games on July 28, 1988 (Karasüleymanoğlu, 1989).

The first official event started with the participation of 16 individuals with lower limb paralysis, garnering interest and excitement internationally. Three years later, it was planned in England and the Netherlands. Since then, both the number of matches and participating countries have increased yearly. The ninth Stoke Mandeville Games concluded shortly after the Olympic Games in Rome. The inaugural Paralympic Games commenced on this occasion, being held annually alongside the Olympic Games. The Summer Sports Games, involving various disabled athletes, began in 1976 as the Swedish Winter Games. The Paralympic Games expanded immediately after the 1988 Seoul Olympics and took place at the same venue. Due to the intense interest in the 1989 Seoul Paralympic Games, the International Paralympic Committee (IPC) was established, organizing the games that year. Following the games held in Olympic cities in 1992, 1996, 2000, and 2001, an agreement between the International Paralympic Committee (IPC) and the International Olympic Committee (IOC) was reached, formalizing the coexistence of the Olympic and Paralympic Games in the same city. The Summer and Winter Paralympic Games take place every four years in the same year, while the Olympics were shifted to a two-year gap between Summer and Winter Games in 1992 (Özay, 2019).

The first Paralympic Games took place a few weeks after the end of the 17th Summer Olympics in 1960. The opening ceremony was held at the Aqua Acetosa Stadium with 5,000 spectators. Italy had the largest delegation in the games, consisting of a total of 400 athletes from 23 countries who competed in sports such as athletics, swimming, fencing, basketball, archery, and table tennis. Athletes from 21 countries competed for second place. Archery, athletics, darts, billiards, swimming, table tennis, weightlifting, wheelchair basketball, and wheelchair fencing were held in Toronto, Japan, in 1964. Israel declined to host the Paralympic Games after hosting the 1968 Olympics, leading to the games being held in different cities but the same country as the Olympics in 1972 and 1976 (Polvonovich, 2021). The 1972 Games took place in Heidelberg, Germany, with 98 participants from three countries. For visually impaired individuals, a 100m sprint and goalball were added as demonstration sports. In the 1976 Summer Paralympic Games in Toronto, 1,657 athletes from 38 countries competed in various sports, marking the first official inclusion of amputee and visually impaired athletes in the games. Goalball, which was a demonstration sport in the 1972 Paralympic Games, was introduced in 1976. Shooting sports were added to the games, while volleyball was introduced as a

demonstration sport. Additionally, the 1976 Toronto Paralympic Games were the first Olympic Games to be televised (Brittain, 2012; Polvonovich, 2021).

CONCLUSION AND RECOMMENDATIONS

Looking at the conducted studies, enhancing the quality of life for individuals with intellectual disabilities based on their general characteristics, increasing their participation in activities, facilitating their communication with society, and adapting plans and activities according to their developmental characteristics are crucial aspects. Physical exercises for individuals with intellectual disabilities are highly important in enhancing their daily life quality, overcoming obstacles, fostering communication, and positively contributing to their personalities. Sports and physical activities for individuals with disabilities provide numerous benefits, including solidarity, self-control, quick decision-making skills, moral education, experiencing feelings of love, the joy of success, sharing the sadness of failure, developing personality confidence, and good adaptation to social life. Considering the impact of sports on society, athletic activities for individuals with intellectual disabilities can be beneficial to both individuals and their communities.

Special education should be provided to students in this regard. Measures should be taken to facilitate the involvement of individuals with intellectual disabilities in sports, and these actions should be carried out through mass media channels. All social groups should be informed, and awareness regarding this matter should be raised. In the current review, Physical Education and Sports Policy should be made suitable for individuals with disabilities, and awareness should be created about the concept of special education and sports to make more appropriate decisions. It's essential for educational policies to approach this issue scientifically and develop strategies for improvement.

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Chapter 13

EVALUATION OF THE OPINIONS OF HEAD COACHES, TECHNICAL DIRECTORS AND NATIONAL ATHLETES ON THE NEW RULES APPLIED IN TAEKWONDO

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Abstract

Taekwondo is one of the most popular sports, with 208 nations worldwide participating in the International Taekwondo Organization. Taekwondo branch has a structure that can be a model for other martial arts since it has many rules and these rules are applied sensitively by athletes and referees. However, in taekwondo, it is seen that the rules have been updated and changed very frequently in recent years. The perspectives of head coaches, technical directors, and A national team athletes concerning the new taekwondo rules made in June 2022 by World Taekwondo Federation were investigated in this study. The descriptive research design was used in this study. 5 open-ended questions specified by the researchers and experts. The research study group comprises of 94 voluntary participants, including active head coaches (n=56), technical directors (n=11), and A national team athletes (n=27) in the taekwondo branch. The data obtained from the research were analyzed with the SPSS 26.00 package program. Frequency and descriptive analyzes were performed for descriptive statistics. According to the research findings, head coaches and athletes preferred the round winning system, one of the regulations that will be revised in 2022. It has been determined that head coaches are more satisfied with this system than technical directors. It has been seen that the round winning system, which is the most different rule applied in Taekwondo, was liked by 64% by head coaches, 9% by technical directors, and 26.5% by national athletes. When the answers given by the technical directors regarding the rule of giving gam-jeom to the kicks made while in the clinch position were examined, 62% of them stated that they

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liked this new rule, and 80% stated that this rule was good but there were referee mistakes. As a result of this research conducted on the head coaches, technical directors and A national team athletes in Taekwondo, all three groups were satisfied with some of the updated rules that governed, and not satisfied with some of them.

Keywords: Taekwondo, athletes, head coaches, technical directors, new rules

Introduction

Taekwondo's "Tae" represents kicks, "Kwon" represents punches, and "Do" represents morality. Taekwondo is an international combat sport in which adult participants can compete, and its popularity has grown even more since its inclusion in the Olympic Games in 2000 (Güder et al., 2022; Mavi Var, 2022). Taekwondo is one of the most popular sports, with 208 nations worldwide participating in the international taekwondo organization. The fact that the regulations are the identical all around the world is a crucial strong component for taekwondo's well-being and growth (Sevinc Yilmaz, & Mavi Var, 2020; Sevinç Yilmaz et al., 2022).

Competitions are held at the regional, national, and worldwide levels based on the athletes' age, gender, skill level, and weight category (Baykan, 2020; İmamoglu et al., 2017). Taekwondo, often known as Olympic taekwondo, is a full-contact sport in which the victor is determined by a high score or knockout. When a kick or punch enters the permissible points zone, points are awarded. In Taekwondo tournaments, kicking skills often get more points (80%-90%) than punching methods. Athletes must generate enough force from these strokes to score points (Koh, & Wattkinson, 1999; Catikkas, 2016; Atasoy et al., 2018). Various training regimens should be implemented in order for athletes to give the required performance (Marangoz, 2022). As Taekwondo is a sport that requires motor abilities such as power, strength, speed, agility, and flexibility, athletes' performance will improve by implementing training methods that promote these characteristics. In their study, Aydemir et al. (2021) reported the influence of athletes' motor skill improvement on competition performance.

Contestants wear chest protection, head protectors, helmets, groin protectors, arm and foot protectors, and mouth guards before entering the competition arena. Inside the taekwondo suit, groin, arm, and foot protectors are worn. It is not permitted for contestants to wear anything other than helmets on their heads (Song et al., 2010; Bezci, 2016; Var et al, 2018). The goal of a taekwondo tournament utilizing hand and foot kicking methods is to score psychologically and tactically rather than physically (Bridge et al., 2014; Güder, 2022). As can be

observed from the preceding comments, the rules should also contribute to the players' safety and health. Some injuries are unavoidable in competition, but the rules should attempt to assist contestants in making the competition as safe as possible by balancing their health and the fairness of the sport.

The World Taekwondo Federation is working to make taekwondo better, safe and enjoyable for watching by constantly updating the rules in the taekwondo branch. Different and new rules were added to Taekwondo in June 2022. These are the rules of winning the round, giving gam-jeom to the hits made while in the clinch (hugging) position, keeping the leg up for more than 3 seconds, and winning the round when there is a difference of 12 points (WTF, 2023). How these new and different rules, which have not been applied in taekwondo before, are met by athletes and coaches has been the subject of curiosity of this research. Based on the "Do" philosophy, every suggested change should prioritize justice, honesty, safety, respect, player and spectator happiness, and the use of technology to improve taekwondo events, if possible. The World Taekwondo Federation (WT) has changed its rules since its inception and will continue to be for the growth of taekwondo in the future. WT should continue to cooperate with all national taekwondo federations, and all ideals should be kept so that rule changes benefit taekwondo throughout the world.

Materıal And Method

Design of Study

The descriptive research design was used in this study. 5 open-ended questions specified by the researchers and experts. "Google Forms" was used to create demographic information as well as 5 open-ended questions on the subject.

Aim of Study

The rules in taekwondo have been constantly changing in recent years. Fort this reason the perspectives of head coaches, technical directors, and national athletes concerning the new taekwondo rules made in June 2022 by World Taekwondo Federation were investigated in this study.

Research Group

In this research, a total of female (n=6, 38%) and male (n=50, 64%) head coaches (n=56, 60%), female (n=1, 6%) and male (n=10) , 13%, a total of technical directors (n=11, 12%) and female (n=9, 56%) and male (n=18, 23%) national athletes (n=27, 29%) were participated. Thus, a total of (n=94, 100%) participants, female (n=16, 100%) and male (n=78, 100%), were participated in this research. When the average age of the participants were examined; female

head coaches (40.17±.75), male head coaches (44.24±1.82). The average age of female technical director (45±,) and male technical directors (42.60±1.43). The average age of female national athletes (19.66±2.39) and male national athletes (21.83±2.99). Thus, the average age of the females were participated in this research was (28.94±11.07) and the average age of the male was (38.86±9.63).

The local ethics committee approved the experimental procedure, and we collected all data following the latest ethical standards of the Helsinki Declaration. All participants provided informed consent approved by the local ethics committee. Journal writing rules, publication principles, research and publication ethics rules, journal ethics rules were followed in the presentstudy. Liability for any infringements that may appear regarding the article belongs to the authors. The ettics approval of this study was acquired from the ethics committee of Erzincan Binali Yildirim University (Approval code: E-88012460-050.01.04-263028).

Table 1: Demographic Information of Participants in The Study

Variables	Female		Male		General		Female Age average	Male Age average
	f	%	f	%	f	%	x±sd	x±sd
Head Coaches	6	38	50	64%	56	60	40,17±,75	44,24±1,82
Technical Directors	1	6	10	13%	11	12	45±,	42,60±1,43
National Athletes	9	56	18	23%	27	29	19,66±2,39	21,83±2,99
Total	16	100	78	100%	94	100	28,94±11,07	38,86±9,63

Data Collection Tool

In this study to develop open-ended questions specified by the researchers. Open-ended question survey was included 5 questions. Questionnaires were sent to the participants via whatsapp application. The questions were as follows:

1. What do you think about winning the round system in taekwondo?
2. What do you think about banning to lift the leg for more than 3 seconds in taekwondo?
3. What do you think about winning rounds when there is a difference of 12 points in taekwondo?
4. What do you think about giving gam-jeom to the hits made to the opponent while in the clinch (hugging) position in taekwondo?
5. What do you think about updated penalty and objection rights regarding the new rules implemented in taekwondo?

Analysis of Data

The data of the research were analyzed with SPSS 26.00 package program. Frequence and descriptives analysises (Table 1, Table 2, Table 3, Table 4, Table 5, Table 6) was performed for descriptive statistics (Alpar, 2020; Cevahir, 2020).

Findings

The findings created in accordance with the analysis of the data obtained from this research are presented in the tables below.

Table 2: Frequency and Percentage Distribution of Winning The Round System

Variables	Liked		Disliked		The old one was better		Both good and bad	
	f	%	f	%	f	%	f	%
Head Coaches	51	64,5	2	25	3	75	0	0
Technical Directors	7	9	2	25	1	25	1	33,3
National Athletes	21	26,5	4	50	0	0	2	66,7
Total	78	100	8	100	4	100	3	100

Table 2 points out the content analysis of the answers given by the participants to the question about winning the round system. It was concluded that 64,5% of the head coaches participating in the research liked this rule, 75% of them were better than the old one, and 25% disliked. Looking at the answers given by the technical directors, 9% stated that they liked the rule of winning the round, 25% disliked, 25% stated that the old system was better, and 33,3% stated that it was both good and bad. Looking at the answers given by the national athletes participating in the research, 26,5% of the athletes stated that they liked the round-winning system, 50% , 0% stated that the old one was better, and 66,7% stated that it was both good and bad.

Table 3: Frequency and Percentage Distribution of Banning to Lift The Leg For More Than 3 Seconds

Variables	Very good		Bad and unnecessary		Good but incomplete	
	f	%	f	%	f	%
Head Coaches	50	62	6	67	0	0
Technical Directors	9	11	1	11	1	25
National Athletes	22	27	2	22	3	75
Total	81	100	9	100	4	100

When the answers supplied by the participants to the prohibition to elevate the leg for more than 3 seconds in taekwondo are evaluated in Table 3, frequency and percentage distributions are evident. While 62% of the head coaches participating in the research stated that this rule was very good, 67% stated that it was bad and unnecessary. Assessing the answers given by the technical directors; 11% said this rule was very good, 11% said it was bad and unnecessary, 25% said it was good but incomplete. Looking at the answers given by the athletes, 27% stated that it was very good, 22% stated that it was a bad and unnecessary rule, and % determined that it was a good but incomplete rule.

Table 4. Frequency and Percentage Distribution of Winning Rounds When There is a Difference of 12 Points

Variables	Liked		Disliked		Undecided	
	f	%	f	%	f	%
Head Coaches	36	53	10	77	9	75
Technical Directors	7	10	2	15	2	17
National Athletes	25	37	1	8	1	8
Total	68	100	13	100	12	100

Table 4 indicates the frequency and percentage distribution of the answers given by the participants to winning a round when there is a difference of 12 points applied in taekwondo. 53% of the head coaches stated that they liked this rule, 77% disliked this rule, and 75% stated that they were undecided about this issue. When the answers given by the technical directors to this question was examined, it was seen that 10% liked this rule, 15% disliked, and 17% undecided about this rule. National athletes's answers about winning the round when there is a difference of 12 points, it was seen that 37% of them liked this new rule, 8% disliked and 8% were undecided.

Table 5: Frequency and Percentage Distribution of Gam-Jeom Was Given to The Hits Made to The Opponent While in The Clinch (Hugging) Position

Variables	Liked		Good but there are referee mistakes		Disliked		Should be developed	
	f	%	f	%	f	%	f	%
Head Coaches	43	62	4	80	4	27	5	100
Technical Directors	11	16	0	0	0	0	0	0
National Athletes	15	22	1	20	11	73	0	0
Total	69	100	5	100	15	100	5	100

The answers to the question "What do you think about gam-jeom was given to the strikes made to the opponent when in the clinch (hugging) posture" in taekwondo can be found in Table 5. When the answers were given by the head coaches were examined, 62% said that they liked this new rule, 80% said it is good but there are referee mistakes, 7% disleked it, and 100% said that it should be improved. When the answers of the technical directors regarding this rule were examined, it was seen that 16% of them liked this rule. 22% of the national athletes liked this rule, 20% stated that it is good but there are referee mistakes, and 73% disliked this rule.

Table 6: Frequency and Percentage Distribution of Updated Penalty and Objection Rights Regarding The New Rules Implemented in Taekwondo

Variables	Liked		Undecided		Disliked	
	f	%	f	%	f	%
Head Coaches	23	51	28	74	5	45
Technical Directors	4	9	6	16	1	10
National Athletes	18	40	4	11	5	45
Total	45	100	38	100	11	100

Table 6 presents the thoughts of the participants regarding the question "What do you think about updated penalty and objection rights" regarding the new rules applied in taekwondo. 51% of the head coaches liked, 74% undecided, and 45% disliked this rule. When the answers given by the technical directors were examined, 9% liked, 16% undecided and 10% disliked this rule. Monitoring the answers given by the national athletes, 40% liked, 11% undecided and 45% disliked this rule.

Dıscussıon And Conclusıon

The findings of this study, which aimed to evaluate the opinions of head coaches and technical directors in taekwondo, as well as the national athletes, regarding the new rules applied in the taekwondo branch, showed that head coaches and athletes liked the "round winning system" from the changed rules in 2022. It has been determined that head coaches are more satisfied with this system than technical directors. It has been seen that the round winning system, which is the most different rule applied in Taekwondo, was liked by 64% by head coaches, 9% by technical directors and 26.5% by national athletes. Looking at these results, it was seen that the technical directors and national athletes liked this new rule less than the head coaches. Based on the new rules, resetting the points in each round and declaring the winner of the two-round winner gives an advantage to the trainers and athletes. For an athlete who lost the first round, resetting the points in the next round can be beneficial in terms of motivation and possibility of winning.

Janowski et al. observed that rule changes impact athletes physically and strategically. The research included 258 competitions held under both old and new regulations. As a result, it has been stated that the new regulations cause athletes to be more active than before. Again, the study found that rule changes affect sports practice and that a minor rule change can be useful in terms of skill and strategy (Janowski et al., 2021). According to Tornello et al. even the slightest technical and tactical difference can change the course of the match (Tornello et al, 2013; Tornello et al., 2014).

In this study results about the rule of lifting the leg for 3 seconds or more was considered good but insufficient by 80% of the athletes. Head coaches (62%) stated that this rule was very good. The establishment of a penalty sentence on this problem was widely appreciated by the taekwondo community in terms of lowering the enjoyment of watching the competition and raising the danger of damage to the participants. On the other hand, regularly changing regulations or tournaments held close to the rule change date may lead referees, athletes, and coaches to fail to properly adjust to the rules of the game (Kavasoglu, Ozer, & Yenel, 2016). This study presents parallelism with the answers of coaches and athletes who gave undecided or negative feedback. This may result in a drop in success and a lack of passion.

Changes or enhancements to competition rules are frequently introduced in defensive or combat sports to strengthen the objectivity of scoring, protect athletes from injuries, decrease injuries, and boost the appeal of competition (Jovanovi, Cirkovic & Kasum, 2001). Changing the score values of appealing

and challenging tactics, particularly in Olympic sports, motivates athletes to be more active and boosts spectators (Jovanovi, Koropanovski, & Kasum, 2010).

According to the new regulations, the athlete is proclaimed the round winner when he obtains a differential of 12 points. According to our findings, 77% of head coaches disliked the new regulation. Similar to our research, the 2015 European Championship was evaluated in the study on wrestling rules, and it was discovered that 30% of the winners were in the first half (round). Furthermore, the shifting rules show that there are good adaptations in learning processes. The application of the circuit system and the change in the score values of the techniques cause an increase in the application rate of high-scoring techniques. The circuit system's installation has caused the athletes to be more active in each circuit. The great performance of the athletes results in beneficial growth for both winners and losers (Unver, 2022).

When the national athletes and head coaches were asked how they felt about the new rule that any hit to an athlete in the clinch position is a penalty point, both athletes (%20) and coaches (80%) said "it is good but there are referee mistakes". Before the rules were updated, in the clinch system, the athlete could apply the foot technique, pushing or punching technique. While this situation increased the risk of injury to the athletes, it also could be caused bad positions and reduced the pleasure of watching. In the updated rules, the technical implementation of the penalty in the clinch system ensures that such negative situations are eliminated. In a research conducted concurrently with our investigation, it was discovered that awarding penalty points to the passive athlete increased the number of methods utilized and the usage of techniques with high difficulty levels (4 and 5 points) (Unver, 2022).

Similar to our study Moenig et al. (2023) was researched the rule and scoring equipment modification ıssues of the world taekwondo competition system. As a results of this study the most important findings are that the majority of coaches prefer the PSS to a conventional, human judging system, despite the negative effects of the PSS on taekwondo techniques applied in competitions. The majority of coaches perceive the general competition rules as too complicated, but they strongly support the present, multiple points scoring rules. Giving players the ability to object to points and penalties, as well as rule modifications involving penalty points, encourages athletes to be more active, coaches to be more effective, to make quick judgments, and to utilize the rules more tactically (Moenig, 2015).

According to the findings of this study conducted on Taekwondo head coaches, technical directors and national team players, it was seen that the participants in all three categories were satisfied with some of the changed rules

and not satisfied with others. Taekwondo rule updates may be argued to be an attempt to maintain this branch current and to encourage athletes to use their performance more efficiently while decreasing injury rates. It is advised to train tactically by incorporating rule changes into training regimens. Furthermore, the findings of this study are expected to give insight on other studies on new taekwondo rules.

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