

Content Analysis of Postgraduate Theses About the Relationship Between Autism Spectrum Disorder and Physical Activity in Türkiye in 2010-2023

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Abstract

The aim of this study is to evaluate the postgraduate theses on the relationship between autism spectrum disorder (ASD) and physical activity registered at the YÖK National Thesis Center between the years 2010-2023 and to examine these theses using the headings of descriptive features, content and methodology. A total of sixty-one (61) theses, forty-four (44) master's theses and seventeen (17) doctoral theses, on the relationship between ASD and physical activity between the years 2010-2023 were included in the study. The data of the study were obtained by using the document review model, which is one of the qualitative research methods, and analyzed by the content analysis method. Within the scope of the findings obtained from the study, it is seen that the postgraduate theses were mostly published between the years 2019-2023 and most of them were completed at Gazi University. The findings obtained show that the master's (49.9%) and doctoral (47%) theses were mostly carried out in Health Sciences Institutes. Thirty-three (33) studies were conducted in the Department of Physical Education and Sports, including twenty-one (21) master's theses (47.7%) and twelve (12) doctoral theses (70.5%). In addition, four (4) master's theses (9%) and two (2) doctoral theses (11.7%) were conducted in the Department of Physical Education and Sports Teaching. A total of twenty-seven (27) studies, nineteen (19) master's theses (41.3%) were conducted by advisors with the title of Assistant Professor, while ten (10) doctoral theses were conducted under the leadership of advisors with the title of Prof. Dr. (%47.6). The sample group of the master's and doctoral studies mostly consists of individuals/children with Autism Spectrum Disorder (ASD). In addition, the sample group in master's theses (51.5%) and doctoral theses (28.2%) consisted of parents. Of the master's theses in the years 2014-2018 and 2019-2023, 29-30% were studies completed in the field of motor skills and 11-12% in the field of social skills. Of the doctoral theses in the years 2019-2023, 36.8% were studies completed in the field of motor skills and 15.7% in the field of social skills. It was seen that the examined master's and doctoral theses were mostly completed in metropolitan cities such as Istanbul and Ankara. Again, it was understood that postgraduate theses were mostly completed in special education and rehabilitation centers. Quantitative research was mostly applied in postgraduate theses (79.5% of master's degrees, 64.6% of doctoral studies) and the majority used the criterion sampling method (47.7% of master's degrees, 76.4% of doctoral studies). It was also seen that both master's and doctoral theses were conducted in experimental and case study research models. While test battery (41%) and scale (17.9) were used in master's theses, observation form (19.9) and scale (19.9) were used in doctoral theses. Finally, criterion sampling and random sampling methods were preferred in both master's and doctoral theses. As a result, it was seen that the studies completed on individuals with Autism Spectrum Disorder (ASD) increased between 2019-2023 and focused especially on motor skills and social skills.

Keywords: Autism spectrum disorder, physical activity, postgraduate theses.

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Türkiye'de 2010-2023 Yılları Arasında Otizm Spektrum Bozukluğu ve Fiziksel Aktivite Arasındaki İlişkiye İlişkin Lisansüstü Tezlerin İçerik Analizi

Özet

Bu çalışmanın amacı, 2010-2023 yılları arasında Türkiye Ulusal Tez Merkezi'ne kayıtlı otizm spektrum bozukluğu (OSB) ile fiziksel aktivite arasındaki ilişkiye yönelik lisansüstü tezlerin değerlendirilmesi ve bu tezlerin tanımlayıcı özellikler, içerik ve yöntem bilgisi başlıklarını kullanarak incelenmesidir. 2010-2023 yılları arasında OSB ile fiziksel aktivite arasındaki ilişkiye yönelik kırk dört (44) yüksek lisans tezi ve on yedi (17) doktora tezi olmak üzere toplam altmış bir (61) tez araştırmaya dâhil edilmiştir. Araştırmanın verileri nitel araştırma yöntemlerinden doküman incelemesi modeli ile elde edilmiş ve içerik analizi yöntemi ile analiz edilmiştir. Çalışmadan elde edilen bulgular kapsamında lisansüstü tezlerin çoğunlukla 2019-2023 yılları arasında yayımlandığı ve çoğunun Gazi Üniversitesi'nde tamamlandığı görülmektedir. Yüksek lisans (%49,9) ve doktora (%47) tezlerinin çoğunlukla Sağlık Bilimleri Enstitülerinde gerçekleştirildiği elde edilen bulgular arasındadır. Beden Eğitimi ve Spor Anabilim Dalı'nda yirmi bir (21) yüksek lisans tezi (%47,7) ve on iki (12) doktora tezi (%70,5) olmak üzere otuz üç (33) çalışma gerçekleştirilmiştir. Bununla birlikte Beden Eğitimi ve Spor Öğretmenliği Anabilim Dalı'nda ise dört (4) yüksek lisans (%9) ve iki (2) doktora (11,7) tezi yapılmıştır. Toplam yirmi yedi (27) çalışma, on dokuz (19) yüksek lisans tezi (%41,3) Dr. Öğretim Üyesi unvanlı danışmanlar tarafından yürütülürken, on (10) doktora tezi Prof. Dr. (%47,6) unvanlı danışmanların önderliğinde gerçekleştirilmiştir. Yüksek lisans ve doktora çalışmalarının örneklem grubunu çoğunlukla Otizm Spektrum Bozukluğu (OSB) olan bireyler/çocuklar oluşturmaktadır. Ayrıca, yüksek lisans tezlerinde (%51,5) ve doktora tezlerinde (%28,2) örneklem grubu ebeveynlerden oluşmuştur. Yüksek lisans tezlerinin, 2014-2018 ve 2019-2023 yıllarında %29-30'u motor beceriler, %11-12'si ise sosyal beceriler alanında tamamlanan çalışmalardır. Doktora tezlerinin, 2019-2023 yıllarında %36,8'i motor beceriler, %15,7'si ise sosyal beceriler alanında tamamlanan çalışmalardır. İncelenen yüksek lisans ve doktora tezlerinin çoğunlukla İstanbul ve Ankara gibi büyükşehirlerde yapıldığı görülmüştür. Yine lisansüstü tezlerin çoğunlukla özel eğitim ve rehabilitasyon merkezlerinde tamamlandığı anlaşılmıştır. Lisansüstü tezlerde çoğunlukla nicel araştırma uygulanmış (yüksek lisansların %79,5'i, doktora çalışmalarının %64,6'sı) ve çoğunluğu ölçüt örnekleme yöntemini kullanmıştır (yüksek lisansların %47,7'si, doktora çalışmalarının %76,4'ü). Ayrıca hem yüksek lisans hem de doktora tezlerinin deneysel ve durum çalışması araştırma modellerinde yapıldığı görülmüştür. Yüksek lisans tezlerinde test bataryası (%41) ve ölçek (17,9) kullanılırken, doktora tezlerinde gözlem formu (19,9) ve ölçek (19,9) kullanılmıştır. Son olarak hem yüksek lisans hem de doktora tezlerinde ölçüt örnekleme ve rastgele örnekleme yöntemleri tercih edilmiştir. Sonuç olarak, 2019-2023 yıllarında Otizm Spektrum Bozukluğu (OSB) olan bireylerle ilgili tamamlanan çalışmaların arttığı ve özellikle motor beceriler ve sosyal beceriler alanına odaklanıldığı görülmüştür.

Anahtar Kelimeler: Otizm spektrum bozukluğu, fiziksel aktivite, lisansüstü tezler.

Introduction

Autism spectrum disorder (ASD) is defined as a complex neurodevelopmental disorder characterized by limitations in social communication and interaction skills, as well as repeated behaviors (APA, 2013). A very widespread neurodevelopmental disorder, currently the incidence of ASD is 1 in every 36 children (Maenner et al., 2020) and there is no definite treatment (DeFilippis & Wagner, 2016). Participation in physical activity is known to have many benefits for individuals with ASD. When the relevant research is investigated, physical activity was understood to assist the development of psychological (Durmuş et al., 2021; İlkim et al., 2018; Liu et al., 2016; Richmond, 2001), social (Gürkan & Koçak, 2020), mental (Durmuş ve Sarol, 2023; Gürkan ve Koçak, 2023) and physical (Fragala-Pinkham et al., 2011; Healy et al., 2013; Sorensen et al., 2014) health of individuals with ASD, in addition to increasing their quality of life (Garcia-Villamizar & Dattilo, 2011; Sarol & Çimen, 2015).

Considering the benefits obtained by individuals with ASD due to physical activity education, parents of children with autism support participation in physical activity and the participation of individuals with autism in sports has increased. In this context, the demand for sports clubs where physical activity education can be obtained for individuals with autism is increasing. The increase in demand for sports clubs has caused an increase in the number of sports clubs catering to individuals with autism (Akbulut, 2019). The Federation of Special Athletes stated there were 70 sports clubs in 2012 and more than 600 in 2021. This situation shows the importance given to sports education for individuals with autism. Additionally, sports training for individuals with autism may be provided by foundations and societies. For example, there is a sports coordination unit within the Autism Foundation. With the aim of supporting diverse skills like physical health, daily life skills and sporting skills among individuals with autism, the sports coordination unit organizes a variety of programs during weekdays, on weekends and periodically (summer holidays, semester break).

The positive change in perspectives and approaches to individuals with special needs within society in recent years, especially in Türkiye, and attention paid to areas where individuals are successful/talented (Ünlü et al., 2017) is thought to be effective in this process. Within this scope, many symposiums have been organized including foreign academics and employees working in the field related to the benefits provided to individuals with ASD by participation in physical activity. For example, the online symposium entitled “Developmental Approaches to Early Intervention and

Motor Skill-Focused Interventions” was organized with cooperation between İstanbul Bilgi University Disability Studies Area of Excellence and Department of Child Development, Federation of Autism Associations and Antalya Special Athletes Youth and Sports Association. Additionally, İstanbul Bilgi University, Turkish Autistic Support and Education Foundation (TODEV) and Antalya Special Athletes Youth and Sports Association organized the “Physical Education and Sports Workshop for Students with Autism”.

Reflections of workshops and seminars held for individuals with autism can be seen in academic studies. Additionally, universities have begun to provide a variety of lessons with the aim of educating sports trainers to be able to work with individuals with autism. For example, the Department of Recreation in the Faculty of Sports Science in Gazi University provides lessons about “*recreation for disabled individuals*”, “*therapeutic recreation*” and “*autism and sports*”. Again in Gazi University, the Department of Physical Education and Sports Teaching in the Faculty of Sports Science has a lesson called “*adapted physical education and sport*”. These programs have increased the number of academic studies from both a practical and theoretical perspective. In line with this, the number of master’s and doctoral theses investigating the relationship between ASD and physical activity have significantly increased in recent years.

Considering the increase in the incidence of ASD and benefits of physical activity, it appears that many postgraduate theses were completed about the relationship between ASD and physical activity. Within this scope, the aim of the study was to assess the postgraduate theses about the relationship between ASD and physical activity registered in the Council of Higher Education (YÖK) National Thesis Center from 2010 to 2023. These theses were investigated under the subheadings of descriptive features (*type of thesis, year, etc.*), content (*sample group, thesis content, etc.*) and methodological information (*research type, design, etc.*).

Methods

Research pattern

Data for the study were obtained using the document investigation model. Document investigation is frequently chosen in qualitative research to analyze aural, visual or written materials containing information related to the case or events identified for study (Sıgır, 2021). Document investigation may be used in qualitative studies as a data collection method on its own or in combination with other data collection methods (Yıldırım & Şimşek, 2018).

Collection of data

The theses investigated in the study were accessed in the YÖK National Thesis Center database. In the advanced search screen of the YÖK National Thesis Center, the year interval 2010 to 2023 was entered, with the key words of ‘autism spectrum disorder and physical activity’, ‘autism spectrum disorder and sport’ and ‘autism spectrum disorder and exercise’ used. Theses accessed as a result of the screening were downloaded to a computer in .pdf format. The descriptive features of the theses were entered into the Excel program and theses were first listed by year. Within the scope of descriptive statistics, theses were investigated according to type of thesis, publication year, name of university, name of institute, department/branch, advisor academic title, and language. Within the scope of content in the postgraduate theses, sample group, thesis content, city where the study was completed, and environment of the study were assessed.

Finally, methodological information of the theses was analyzed based on research type, research design, data collection tools, data analysis technique/method(s) and sampling method. In line with this, a total of 61 theses, 44 master’s theses and 17 doctoral theses, were analyzed within the scope of the research.

Analysis of data

In the study, descriptive features like thesis type, year and institute name, content information like sample group, thesis content, and environment where the study was completed and additionally methodological information like research type, design and data analysis methods were classified using the content analysis method. Content analysis is defined as “*first conceptualization of data, then rational organization of the emerging concepts and determination of themes explaining the data*” (Yıldırım and Şimşek, 2018).

Within the scope of the research, with the aim of investigating postgraduate theses related to ASD and physical activity in the YÖK National Thesis Center from 2010 to 2023, *Thesis Assessment Categories* were created by the researchers (Table 1).

Based on the data obtained, the theses were numbered and then the researchers first created 3 categories of descriptive features, content information and methodological information. Data obtained in these categories were placed in tables according to categories and subcategories in the Excel program. In the table, information for each subcategory was placed in the relevant columns. The researchers investigated the postgraduate theses in detail and noted the relevant categories. Within this scope, the data obtained were included in categories and subcategories written in detail by the researchers and the findings of the study were obtained.

Table 1: Thesis Assessment Categories

<i>Categories</i>	<i>Subcategories</i>
Descriptive Features	Thesis type
	Publication year
	University
	Institute
	Department/branch
	Advisor academic title
Content	Language
	Sample group
	Thesis content
	City of study
Methodological Information	Environment of study
	Research type
	Research design
	Data collection tools
	Data analysis technique/method(s)
Results	Sampling method

Results

For the postgraduate theses investigated within the scope of the study, the distribution of data related to descriptive features (thesis type, publication year, university, institute, etc.), content (sample group, thesis content, etc.) and methodological information (research type, data collection tools, etc.) are shown in figures and tables.

Descriptive features

Based on descriptive features of the studies, the data about thesis type, publication year, university, institute, branch, advisor academic title and language are presented in tables and figures.

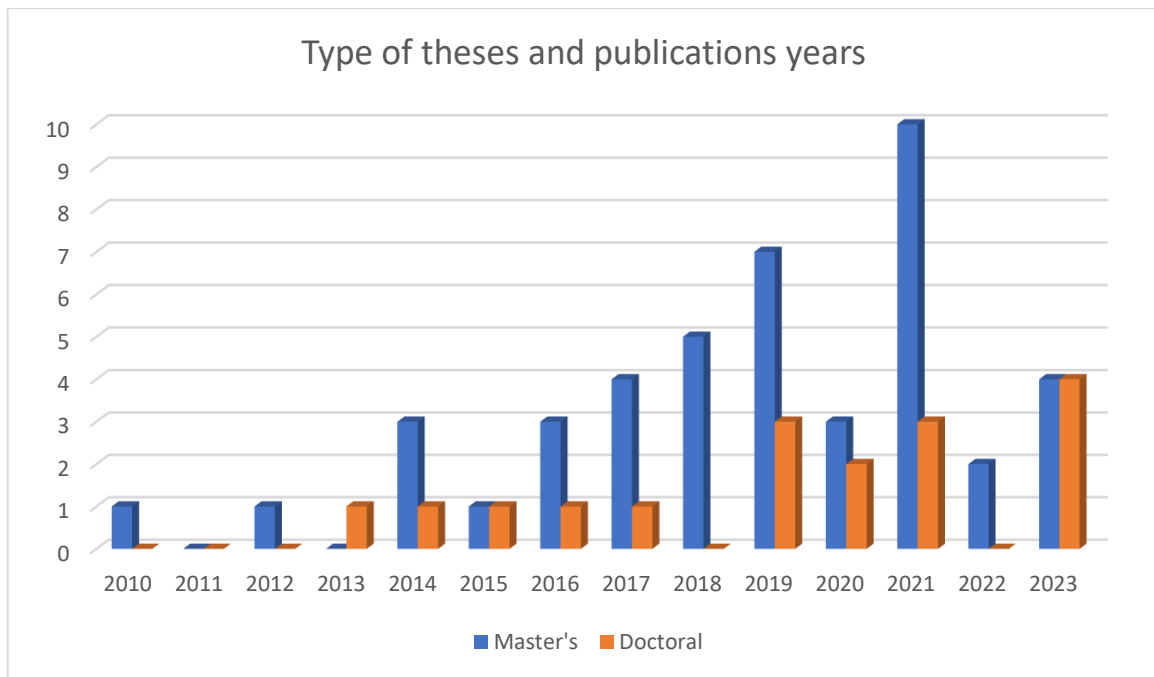


Figure 1. Type of Theses and Publication Years

When Figure 1 is examined, there was 1 study in 2010, with no masters or doctoral theses completed in 2011. In 2012, there was only 1 master's thesis, with only 1 doctoral study in 2013. When 2014 is examined, there were 3 masters and 1 doctoral study completed. In 2015, there was 1 masters and 1 doctoral thesis each. In 2016, 3 master's theses were completed, with only 1 doctoral study performed. In 2017, the number of master's theses was 4, with only 1 doctoral thesis published. In 2018, 5 master's theses were completed with no study completed at doctoral level. In 2019, there were 7 master's theses and 3 doctoral studies completed. In 2020, 3 master's theses were completed, while 2 thesis studies were completed at doctoral level. It is notable that in 2021 there were 10 master's theses and 3 doctoral theses completed. Finally, in 2022, there were only 2 studies completed at master level. And, in 2023 4 master's theses and 4 doctoral theses completed.

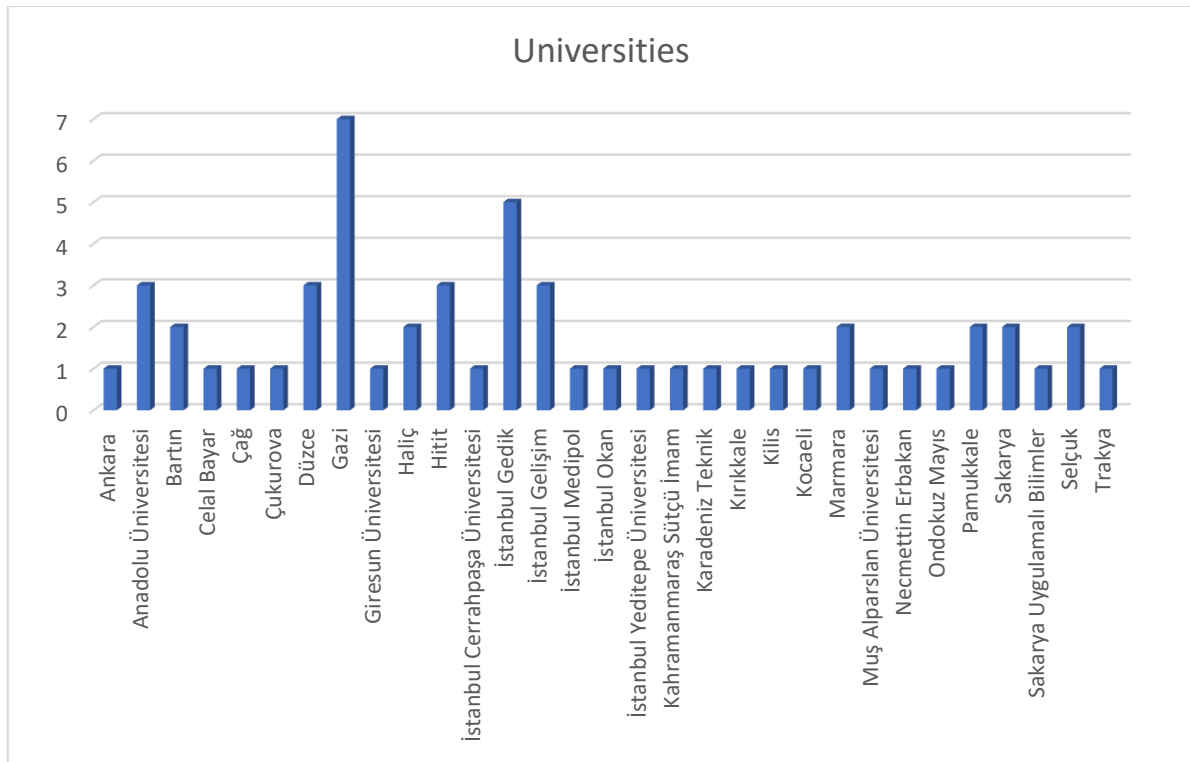


Figure 2. Universities

When the universities where the postgraduate studies were performed are investigated (Figure 2), it appears only one study each was completed in state universities including Ankara University, Celal Bayar University and Trakya University and in private universities like İstanbul Okan University, Yeditepe University and İstanbul Medipol University. Two postgraduate thesis studies were completed in diverse universities like Marmara, Ondokuz Mayıs, Selçuk, and Bartın. Among the findings, three postgraduate theses were completed in Düzce, Hitit, İstanbul Gedik and İstanbul Gelişim Universities. The highest number of postgraduate studies (7) was from Gazi University.

Table 2. Institutes

Master's Institute	f	%	Doctoral Institute	f	%
Health Sciences	22	49.9	Health Sciences	8	47
Postgraduate Education Sciences	8	18.1	Educational Sciences	4	23.5
Social Sciences	7	15.8	Postgraduate Education Sciences	4	23.5
Educational Sciences	7	15.8	Social Sciences	1	5.8
Total	44	100	Total	17	100

When the institutes of the thesis studies are examined (Table 2), 22 master's studies (49.9%) and 8 doctoral studies (47%) were completed within health sciences institutes. Additionally, 7 master's (15.8%) and 4 doctoral (23.5%) studies were completed within educational sciences institutes. While 8 master's (18.1%) and 4 doctoral (23.5%) studies were completed within

postgraduate educational sciences institutes, 7 master's theses (15.8%) and 1 doctoral (5.8%) thesis were completed within social sciences institutes.

Table 3. Thesis Branches

Master's Branch	f	%	Doctoral Branch	F	%
Physical Education and Sports	21	47.7	Physical Education and Sports	12	70.5
Physical Education and Sports Teaching	4	9	Physical Education and Sports Teaching	2	11.7
Coaching Education	4	9	Movement and Training	2	11.7
Physiotherapy and Rehabilitation	3	6.8	Disability Studies	1	5.8
Recreation	2	4.5			
Psychology	2	4.5			
Movement and Training	1	2.2			
Recreation Management	1	2.2			
Sports Science	1	2.2			
Sports Physiology	1	2.2			
Performance and Fitness in Sports	1	2.2			
Psychosocial Fields in Sports	1	2.2			
Sports Management	1	2.2			
Sport Management Science	1	2.2			
Total	44	100	Total	17	100

When Table 3 is investigated, it is notable that 21 master's (47.7%) and 12 doctoral (70.5%) theses, a total of 33 studies, were in branches of the Physical Education and Sports department. There were 4 master's (9%) and 2 doctoral (11.7%) theses completed in branches of Physical Education and Sports Teaching. Among master's theses, 3 were in Physiotherapy and Rehabilitation (6.8%), 2 in Psychology (4.5%) and 2 in Recreation (4.5%) branches. At master's level there was 1 study in Movement and Training (2.2%), 1 in Recreation Management (2.2%), 1 in Sports Science (2.2%), 1 in Sports Physiology (2.2%), 1 in Sports Management (2.2%) and 1 in Sports Management Science (2.2%). At doctoral level, there was 1 study in Disability Studies (5.8%) and 2 in Movement and Training (11.7%).

Table 4. Academic Title of Thesis Advisors

Master's advisor academic title	f	%	Doctoral advisor academic title	f	%
Dr. Lecturer	19	41.3	Prof.	10	47.6
Assoc. Prof.	17	36.9	Dr. Lecturer	8	38
Prof.	10	21.7	Assoc. Prof.	3	14.2
Total	46	100	Total	21	100

**It was identified that one author had two advisors.*

When the subcategories for the academic titles of advisors for postgraduate studies are considered (Table 4), 19 master's (41.3%) and 8 doctoral (43.8%) studies, a total of 27 studies, were completed with advisors with the title Dr. Lecturer. It appeared that 17 master's (36.9%) and 3 doctoral (14.2%) level studies had associate professor advisors. Advisors with the title professor

supervised 10 master's (21.7%) and 10 doctoral (47.6%) studies. Additionally, the majority of postgraduate theses (59) were written in Turkish, while only 2 postgraduate theses were written in English.

Content

In this section, information about the sample group, thesis content, city of implementation and environment of application for the postgraduate studies is presented in tables.

Table 5. Thesis Sample Groups

Master's sample groups	f	%	Doctoral sample groups	f	%
Parent	926	51.5	Individual/child with ASD	220	47
Individual/child with ASD	706	39.3	Parent	132	28.2
Other	94	5.2	Child with ND	72	15.3
Child with ND	50	2.7	Trainer	44	9.4
Teacher	20	1.1			
Total	1796	100	Total	468	100

**Child with ND: Child with normal development*

When Table 5 is examined, it appears 706 individuals/children with ASD participated in master's studies (39.3%) and 220 individuals/children with ASD participated in doctoral studies (47%). A total of 1058 parents comprised the sample groups, with 926 parents participating in master's studies (51.5%) and 132 parents participating in doctoral studies (28.2%). At master's level, 20 teachers (1.1%), 50 children with ND (2.7%) and 94 other individuals (5.2%) were included in the sample groups. Among doctoral level studies, sample groups comprised 72 children with ND (15.3%) and 44 trainers (9.4%).

Table 6. Thesis Topics

Thesis type	Topics	2010-2013		2014-2018		2019-2023	
		f	%	f	%	f	%

Masters	Academic skills	1	14.3			2	5.5
	Cognitive skills			2	8.3		
	Problems experienced with study field and process					2	5.5
	Physical fitness			1	4.2	2	5.5
	Physical activity level			1	4.2	2	5.5
	Physical activity participation					3	8.3
	Communication skills			1	4.2	2	5.5
	Motor skills	2	28.6	7	29.2	11	30.4
	Motor performance			1	4.2		
	Self-care skills	1	14.3	1	4.2	1	2.7
	Problem behaviors	2	28.6	3	12.5		
	Psychological effect					1	2.7
	Social skills	1	14.3	3	12.5	4	11.1
	Social competence			1	4.2		
	Leisure satisfaction					1	2.7
	Improving effect of sport			1	4.2		
	Attitude					1	2.7
	Life satisfaction					1	2.7
	Quality of life			2	8.3	2	5.5
	Parent perceptions and stress level					1	2.7
Total	7	100	24	100	36	100	
Doctoral	Academic skills					1	5.2
	Cognitive skills					2	10.5
	Physical fitness			1	16.7	1	5.2
	Physical activity habits			1	16.7		
	Physical activity facilitating factors			1	16.7		
	Physical activity obstructing factors			1	16.7	1	5.2
	Physical development			1	16.7	7	36.8
	Communication skills					2	10.5
	Motor skills					3	15.7
	Problem behaviors	1	100			1	5.2
	Social skills						
	Quality of life						
	Total	1	100	6	100	19	100

When the subcategories for thesis content are examined (Table 6), at master's level from 2010 to 2013 there were 2 studies about motor skills (28.6%) and 2 studies about problem behaviors (28.6%). From 2014-2018, 7 master's theses examined motor skills (29.2%), 3 examined problem behaviors (12.5%) and 3 examined social skills (12.5%). From 2019-2023, there were 11 master's theses about motor skills (30.4%) and 4 in the field of social skills (11.1%). When doctoral theses are investigated, from 2019-2023, 7 studies were about motor skills (36.8%) and 3 were in the social skills field (15.7%).

Table 7. City Where Thesis Was Implemented

Master's study cities	f	%	Doctoral study cities	f	%
İstanbul	13	25	Ankara	6	31.5

Ankara	10	19.2	İstanbul	3	15.7
Aydın	3	5.7	Eskişehir	2	10.5
Eskişehir	3	5.7	Düzce	1	5.2
Konya	2	3.9	Batman	1	5.2
Çorum	2	3.9	Ağrı	1	5.2
Düzce	2	3.9	Aydın	1	5.2
Tekirdağ	1	1.9	Edirne	1	5.2
Samsun	1	1.9	Amman (Jordan)	1	5.2
Denizli	1	1.9	Samsun	1	5.2
İzmir	1	1.9	Denizli	1	5.2
Gaziantep	1	1.9			
Trabzon	1	1.9			
Erzurum	1	1.9			
Malatya	1	1.9			
Kahramanmaraş	1	1.9			
Yalova	1	1.9			
Van	1	1.9			
Isparta	1	1.9			
Giresun	1	1.9			
Muş	1	1.9			
Not stated	3	5.7			
Total	52	100	Total	19	100

**Some studies were completed in more than one city.*

When Table 7 is investigated 13 master's theses were completed in İstanbul (25%) and 10 were completed in Ankara (19.2%), with nearly half of studies in metropolitan cities. Additionally, there were 3 master's studies each in Eskişehir (5.7%) and Aydın (5.7%), and 3 master's theses did not state any city (5.7%). When doctoral thesis studies are examined, 6 were completed in Ankara (31.5%), 3 studies completed in İstanbul (15.7%), 2 studies in Eskişehir (10.5%), and 1 study for each Düzce (5.2%), Batman (5.2%), Ağrı (5.2%), Aydın (5.2%), Edirne (5.2%), Amman (5.2%), Denizli (5.2%) and Samsun (5.2%).

Table 8. Environments of Theses

Master's study environments	f	%	Doctoral study environments	f	%
Special Education and Rehabilitation Center	16	32	Special Education and Rehabilitation Center	11	47.7
Private Sports Club	12	24	School	3	13
Not Stated	9	18	Private Sports Club	3	13
University	6	12	University	3	13
School	5	10	Cafe	1	4.3
Facilities belonging to municipalities	1	2	Home	1	4.3
Provincial Directorate of Youth and Sport Center	1	2	Council Centers	1	4.3
Total	50	100	Total	23	100

**Some studies were completed in more than one environment*

When Table 8 is examined, 16 master's theses were completed in special education and rehabilitation centers (32%) and 12 studies were completed in private sports clubs (24%). Among doctoral theses, 11 were completed in special education and rehabilitation centers (47.7%), 3 in private sports clubs (113%) and 3 in schools (13%) and university (13%).

Methodological Information

Information about the research type, design, data collection tools, data analysis methods and sampling methods, included within methodological information, are given as tables.

Table 9. Research Types

Master's research types	f	%	Doctoral research types	f	%
Quantitative	35	79.5	Quantitative	11	64.6
Qualitative	7	15.9	Qualitative	3	17.6
Mixed	1	2.2	Mixed	3	17.6
Not stated	1	2.2			
Total	44	100	Total	17	100

When the research type of postgraduate studies is assessed (Table 9), 35 master's theses were quantitative (79.5%), 7 were qualitative (15.9%) and 1 was mixed (2.2%). Additionally, only 1 master's theses (2.2%) did not state the research type. When doctoral theses are considered, 11 studies were quantitative (64.6%), 3 studies were qualitative (17.6%) and 3 studies used mixed research types (17.6%).

Table 10. Research Designs

Master's research designs	f	%	Doctoral research designs	f	%
Experimental	17	37.7	Experimental	7	35
Not stated	15	33.3	Case	5	25
Case	5	11.1	Not stated	4	20
Screening	5	11.1	Phenomenological	2	10
Phenomenological	2	4.4	Descriptive	1	5
Rotating implementations	1	2.2	Action	1	5
Total	45	100	Total	20	100

**It was identified that 1 study used two research designs*

When Table 10 is examined, of the master's theses, 17 were experimental (37.7%), 5 were case studies (11.1%), 5 were screening studies (11.1%), 2 were phenomenological (4.4%) and 1 used the rotating implementation model (2.2%). For doctoral theses, 7 were experimental (35%), 5 were case studies (25%), 2 were phenomenological (10%), 1 was descriptive (5%) and 1 was action research (5%). However, 15 master's studies (33.3%) and 4 doctoral studies (20%), a total of 19 studies, did not state the research pattern.

Table 11. Data Collection Tools

Master's data collection tools	f	%	Doctoral data collection tools	f	%
Test Batteries	16	41	Scale	6	19.9

Scale	7	17.9	Observation form	6	19.9
Interview form	6	15.3	Test batteries	5	16.6
Survey	5	12.8	Interview form	4	13.3
Performance form	2	5.2	Diary	3	9.9
Observation form	1	2.5	Field notes	3	9.9
Responsible behavior checklist	1	2.5	Video recordings	1	3.3
Social skills assessment system	1	2.5	Social behavior list	1	3.3
			Report	1	3.3
Total	39	100	Total	30	100

**Some studies used more than one data collection tool.*

When Table 11 is investigated, among master's theses, 16 used test batteries (41%), 7 used scales (17.9%), 6 used interview forms (15.3%) and 5 used surveys (12.8%). Also, among studies at master's level, 2 used performance forms (5.2%), 1 used a responsible behavior checklist (2.5%) and 1 used a social skills assessment system (2.5%). For doctoral theses, 6 used observation forms (19.9%), 6 used scale (19.9%), and 5 used test batteries (16.6%) to obtain data. Additionally, 4 studies used interview form (13.3%), 3 used diary (9.9%), 3 used a field notes (9.9%) and 1 used reports (3.3%), video recording (3.3%) and social report list (3.3%) to record data for doctoral theses.

Table 12. Thesis Data Analysis Methods

Master's data analysis methods	f	%	Doctoral data analysis methods	f	%
Wilcoxon	10	12.8	Content analysis	5	17.2
Mann-Whitney	9	11.5	Wilcoxon	5	17.2
ANOVA	7	8.9	Mann-Whitney	5	17.2
Shapiro Wilk	6	7.6	Graphical analysis	4	13.7
Independent T	5	6.3	Descriptive analysis	3	10.3
Kolmogorov-Smirnov	5	6.3	Kolmogorov-Smirnov	1	3.4
Pearson correlation	4	5	Video	1	3.4
Samples T	3	3.8	ANOVA	1	3.4
Paired Samples T	3	3.8	Thematic analysis	1	3.4
Kruskal-Wallis	3	3.8	Not stated	3	10.3
Content analysis	3	3.8			
Chi-square	2	2.5			
Frequency	2	2.5			
Tukey HSD post hoc	2	2.5			
Thematic analysis	2	2.5			
Descriptive analysis	2	2.5			
LSD post hoc	1	1.2			
Student's T	1	1.2			
Regression	1	1.2			
MANOVA	1	1.2			
Levene	1	1.2			
Descriptive statistics	1	1.2			
Not stated	4	5			
Total	78	100	Total	29	100

**Some studies used more than one data analysis method*

When data analysis methods are considered (Table 12), for master's theses, 10 used Wilcoxon (12.8%), 9 Mann-Whitney (11.5%), 7 ANOVA (8.9%), 6 Shapiro Wilk (7.6%), 5 independent T (6.3%) and 5 Kolmogorov-Smirnov (6.3%). These were followed by 4 studies using Pearson correlation (5%), 3 using sample T (3.8%), 3 using content analysis (3.8%), 3 Kruskal-

Wallis (3.8%) and 3 using paired sample T (3.8%). Additionally, at master's level, 2 studies used Tukey HSD post hoc (2.5%), 2 used chi-square (2.5%), 2 used frequency (2.5%), 2 used thematic analysis (2.5%), and 2 used descriptive analysis (2.5%). Other research methods used for master's these included 1 study using LSD post hoc (1.2%), 1 using Student T (1.2%), 1 using regression (1.2%), 1 using MANOVA (1.2%), 1 using Levene (1.2%) and 1 using descriptive statistics (1.2%). When the data analysis methods for doctoral theses are examined, 5 studies used content analysis (17.2%), 5 used Wilcoxon (17.2%), 5 used Mann-Whitney (17.2), 4 used graphical analysis (13.7%) and 3 used descriptive analysis (10.3%). Additionally, 1 study used Kolmogorov-Smirnov (3.4%), 1 used video (3.4%) and 1 used ANOVA (3.4%) at doctoral level. However, 4 master's theses (5%) and 3 doctoral theses (10.3%) did not state the data analysis method.

Table 13. Thesis Sampling Methods

Master's sampling method	f	%	Doctoral sampling method	f	%
Criterion sampling	21	47.7	Criterion sampling	13	76.4
Not stated	18	40.9	Random sampling	2	11.7
Random sampling	4	9	Convenient sampling	1	5.8
Convenient sampling	1	2.2	Not stated	1	5.8
Total	44	100	Total	17	100

When the sampling methods for the postgraduate theses are investigated (**Table 13**), 21 studies at master's level used criterion sampling (47.7%), 4 used random sampling (9%) and 1 used convenient sampling (2.2%) methods. Among doctoral studies, 13 used criterion sampling (76.4%), 2 used random sampling (11.7%) and 1 used convenient sampling (5.8%) methods. However, 18 master's theses (40.9%) and 1 doctoral thesis (5.8%) did not state the sampling method.

Discussion and Conclusion

In this research, the aim was to investigate postgraduate theses about the relationship between ASD and physical activity, registered at the YÖK National Thesis Center from 2010 to 2023. Within this scope, the descriptive features, content, and methodological information for the theses included in the research were investigated.

When the these are examined, within the 13-year period, 44 master's theses and 17 doctoral theses, a total of 61 postgraduate theses, were published about the relationship of ASD and physical activity. Compared to previous years, it appears the number of postgraduate theses investigating the correlation of ASD and physical activity have increased in the last 13 years (Görgün ve Melekoğlu, 2016). In this case, the increasing prevalence of ASD with each passing year and increasing awareness about individuals in ASD in our country and world may be effective (Cremin et al., 2021; Çitil et al., 2021; Yasar & Cronin, 2014)). Additionally, the skills obtained by individuals with ASD as a result of physical activity participation (Ruggeri et al., 2020), satisfaction as a result

of participation (Healy et al., 2013) and desire to participate again (Sarol et al., 2022b) are also effective, as understood from the results of the studies. It is thought that postgraduate theses completed about the relationship of individuals with ASD and physical activity will be effective in increasing awareness of this topic, developing solutions and revising current policies.

When the universities where postgraduate theses were completed are investigated, most theses about ASD and physical activity were concluded to come from Gazi University. It is thought that the selection of the areas of interest of postgraduate students and the areas of expertise of postgraduate thesis advisors employed in universities affect this topic. Johansson et al. (2014) stated that advisors had an important effect on the postgraduate educational process and supported the postgraduate student in many areas. Orellana et al. (2016) determined that advisors had many responsibilities toward postgraduate students and one of these responsibilities was to guide them about the research topic. A study in Türkiye concluded that advisors were effective in determining the thesis topics of postgraduate students (Yucelsen et al., 2015).

When another descriptive feature in the research of the institute where the theses were completed is examined, in both master's and doctoral fields, most theses were completed in health sciences institutes, with educational sciences institutes in second place. It is thought that the program and student numbers included within the institutes were effective. Similarly, most postgraduate theses were completed in the physical education and sports branch. Physical education and sports branch was followed by physical education and sports teaching, coaching education, and movement and training branches. It is thought that the greater number in these branches compared to other branches played an important role.

When the titles of postgraduate thesis advisors are investigated, most were Dr. Lecturers for master's theses, while there were equal numbers of advisors who were Professors and Dr. Lecturers for doctoral theses. Within this scope, it may be said that Dr. Lecturers focus more on ASD and physical activity topics for master's theses.

When examining the content of postgraduate theses regarding sample groups, most master's theses were completed with parents. Parents play an important role in the lives of children with ASD (Rankin et al., 2016). Parents, beside their children for the purpose of support through all positive/negative processes they encounter during their lives, may make decisions in the name of their children in many circumstances and may express their children's feelings (Finke et al., 2019). In the majority of studies investigating the relationship between ASD and physical activity, parents express opinions representing their children and communicate their experiences (Durmuş & Sarol, 2023; Gürkan & Koçak, 2023; Sarol et al., 2022b; Pan & Frey, 2006; Brown et al., 2020). For

doctoral theses, it appears samples comprised individuals/children with ASD mostly. When investigated in terms of topic headings in theses, doctoral theses studied the topic of motor skills. Data were collected through observation forms by working directly with individuals with ASD about the topic and applying a variety of test batteries. There are many studies completed in this way in the literature (Barak et al., 2019; Sarabzadeh et al., 2019).

The majority of postgraduate theses, at both masters and doctoral levels, were completed in metropolitan cities (*Ankara, İstanbul, Aydın, Eskişehir*). It is thought that this situation is due to the number of lecturers and study fields in universities located in these cities and the higher number of postgraduate students attending these universities compared to other provinces.

The final section in the content heading of our research comprised the environment in which postgraduate theses were completed. When the environment where the studies were completed is investigated, both master and doctoral theses were mainly performed in special education and rehabilitation centers. Special education and rehabilitation centers were followed by private sports clubs and schools. Special education and rehabilitation centers play an important role in supporting the personal, social and physical development of individuals with ASD (Sarol et al., 2022b; Mengi, 2020). When the literature is investigated, most studies appear to benefit from special education centers to reach their samples (Durmuş & Sarol, 2023; Yarımkaya et al., 2022; Koçak et al., 2023). It is thought that special education and rehabilitation centers gathering parents and individuals with ASD at a single point and ease of access to these people were effective in this.

The final heading in our research findings comprised the methodological information of the postgraduate theses. Within this scope, first the research type was investigated. The majority of both master's and doctoral theses chose the quantitative research type. It was identified that the qualitative research type was chosen less often. The quantitative research approach is a method used to investigate groups with high population especially and that allows generalization to larger groups beyond the studied sample (Holton & Burnett, 2005; Sarol et al., 2022a). The current theses were shaped within this scope and the quantitative method was mostly chosen. For research designs of theses, experimental and case study types were chosen for both master's and doctoral theses. For data collection tools in the theses, the majority used test batteries, scales and observation forms. Considering the high frequency of selecting the quantitative research model, many different statistical analyses were used for data analysis in the theses (Wilcoxon, ANOVA, Mann-Whitney, etc.). The final section about methodological information examined the sampling methods of the postgraduate theses. Both master's and doctoral theses were identified to frequently used the criterion sampling method. The frequent use of the criterion sampling method is due to the fact that

some important criteria about the subject to be studied are used to determine the general goal of the relevant sampling method and the general framework of the research is created accordingly (Palinkas et al., 2015).

In conclusion, the relationship between ASD and physical activity is a current issue in sports science at the graduate thesis level. In this study, which was limited using the database of the YÖK National Thesis Center, it is seen that the number of theses completed in the context of ASD and physical activity has increased in recent years. Many different universities and branches have researched this topic, important examples have been reached within the scope of theses, and the theoretical framework of theses has been quite comprehensive. It is recommended that future studies pay attention to existing graduate theses and complete studies with different topics and sample selections. It is thought that every study that has been done and will be done in this field will have positive effects for individuals with ASD and their families.

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Ethics

The research was performed with the permission of University Social and Human Sciences Research Ethics Committee.

Data availability statement

No data was used for the research described in the article.

Author contribution statement

The study has only one author.

Declaration of competing interest

The author declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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