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Araştırma Makalesi/ Research Article

Fizyoterapi Son Sınıf Öğrencileri ve Mezunlarının Adölesan İdiyopatik Skolyoz Hakkında Bilgi Düzeylerinin Değerlendirilmesi

Evaluation of the Knowledge Levels of Physiotherapy Senior Year Students and Graduates About Adolescent Idiopathic Scoliosis

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Özet: Bu çalışmanın amacı fizyoterapi son sınıf öğrencileri ve fizyoterapistlerin Adölesan İdiyopatik Skolyoz (AİS) hakkında bilgi düzeylerinin araştırılmasıdır. Çalışmada Uluslararası Skolyoz Ortopedik Tedavi ve Rehabilitasyon Derneği (Society on Scoliosis Orthopaedic and Rehabilitation Treatment - SOSORT) kılavuzu temel alınarak hazırlanan online bir anket kullanılmıştır. Fizyoterapi son sınıf öğrenciler ve mezun fizyoterapistler sosyal medya grupları kullanılarak çalışmaya katılmaya davet edilmiştir. 120 fizyoterapist ve 40 öğrenci olmak üzere anketi 160 katılımcı tamamlamıştır. Çalışmaya alınan katılımcıların %57,5'i daha önce hiç AİS hastasını tedavi etmediğini ve %89,4'ü fizyoterapi egzersiz müdahalesinin AİS tedavisinde faydalı olabileceğini bildirmiştir. Araştırmaya katılan bireylerin %50,6'sı AİS'in tanımını ve %74,4'ü kanıta dayalı araştırmalara göre hangi konservatif tedavi yönteminin en etkili olduğunu biliyordu; ancak katılımcıların %86,9'unun AİS'in türleri arasında yaygınlığını bilmediği, %69,4'ünün AİS'in genel olarak nasıl doğrulandığını bilmediği ve %68,8'inin AIS için terapötik egzersizlerin neleri içermesi gerektiğini bilmediği belirlendi. Bu çalışmanın sonuçları fizyoterapistlerin ve fizyoterapi son sınıf öğrencilerinin AİS hakkındaki bilgi düzeylerinin yeterli olmadığını ortaya koymuştur. AİS farkındalığını ve temel bilgi düzeyini arttırmak için harekete geçilmesi gerekmektedir.

Anahtar Kelimeler: Adölesan İdiyopatik Skolyoz, Bilgi, Fizyoterapist, Öğrenci, Üniversite.

Abstract: The aim of this study is to investigate the level of knowledge of physiotherapy senior year students and physiotherapists about Adolescent Idiopathic Scoliosis (AIS). In the study, an online questionnaire prepared based on the guidelines of the International Society on Scoliosis Orthopaedic and Rehabilitation Treatment (SOSORT) was used. Physiotherapy senior year students and graduate physiotherapists were invited to participate in the study using social media groups. 160 participants, including 120 physiotherapists and 40 students, completed the questionnaire. 57.5% of the participants included in the study reported that they had never treated AIS patients before, and 89.4% reported that physiotherapy exercise intervention could be beneficial in the treatment of AIS. 50.6% of the individuals participating in the study knew the definition of AIS and 74.4% knew which conservative treatment method was the most effective according to evidence-based studies; however, it was determined that 86.9% of the participants did not know the prevalence of AIS among its types, 69.4% did not know how to confirm AIS in general, and 68.8% did not know what therapeutic exercises for AIS should include. The results of this study revealed that the knowledge level of physiotherapists and physiotherapy senior year students about AIS is not sufficient. It is necessary to increase the training on the subject of increasing the awareness and basic knowledge level of AIS.

Keywords: Adolescent Idiopathic Scoliosis, Knowledge, Physiotherapist, Student, University.

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INTRODUCTION

Adolescent Idiopathic Scoliosis (AIS) is a common spinal condition that affects many young individuals around the world (Ruiz et al., 2022). AIS is defined as a three-dimensional spinal deviation with a greater than 10° Cobb angle of unknown etiology occurring in adolescents who are 10 years and older (Negrini et al., 2018). It is characterized by an abnormal curvature of the spine that often leads to chronic pain, mobility issues, and respiratory problems (Ruiz et al., 2022). In addition, AIS is associated with decreased quality of life, cosmetic deformity, and visible disability, as well as progressive functional limitations. (Théroux et al., 2017). According to the International Scientific Society on Scoliosis Orthopedic and Rehabilitation Treatment (SOSORT) guidelines, AIS affects around 3% of the general adolescent population. Still, some authors report a prevalence up to 12% (Negrini et al., 2018). AIS is more common in girls than boys (Theroux et al., 2013). Among all types of scoliosis, idiopathic scoliosis represents approximately 80% of the cases and is the most common spinal deformity among adolescents (Negrini et al., 2018). Almost 10% of those diagnosed with AIS will require some form of treatment; usually observation or scoliosis-specific exercises (SSE) for mild curves, braces for moderate curves and spinal surgery for severe curves (Cobb angle >50). Up to 0.1% of the population is at risk of requiring surgery (Drake et al., 2014). Physiotherapists are susceptible to evaluate and manage adolescents presenting with AIS (Theroux et al., 2013). Physiotherapy is one of the most common treatments used to manage AIS, and it is crucial that physiotherapists have a comprehensive understanding of the condition to effectively treat and manage their patients. The evaluation of knowledge levels of physiotherapy senior students and graduates on AIS is an important topic of research that seeks to assess the current understanding of AIS among physiotherapists.

A previous study conducted by Drake et al designed a 10-question multiple choice survey to establish the knowledge of scoliosis diagnosis and treatment. In this study a total of 178 physiotherapy students completed consent and met inclusion criteria for the study across the in the USA. Results were poor, showing a mean overall correct score of 43%. Only 15 students (8%) answered 70% of the survey questions correctly. Results from this study indicate that physiotherapy students within the United States are not trained in knowledge related to the 2011 SOSORT Guidelines (Drake et al., 2014). In other study completed in Poland by Ciazynski et al., also tested the knowledge of physiotherapy students in this field. The students had already covered conservative treatment methods for scoliosis in their syllabus. The results show most students (94.6%) were aware of at least one conservative treatment method in this study (Ciazynski et al., 2008). A recent study conducted by Akgül, H., et al in all Turkish colleges teaching physiotherapy degrees and graduated physiotherapists from social media were invited to take part in the study. The results found that 19.5% only of the students and 30.7% of the physiotherapists correctly identified the diagnostic criteria for scoliosis. Also, for therapeutic exercise, around half of the students and more than half of the physiotherapists did not identify the appropriate approach. Overall, the study found that physiotherapists do not have enough knowledge of scoliosis (Akgül et al., 2022).

There are lack of studies highlighting the significance of physiotherapy in managing the AIS, and lack of studies that examined the importance of evaluating the knowledge levels of physiotherapy senior students and graduates on AIS, and the potential implications for patient care. Our work aims to providing an in-depth analysis of the knowledge levels of physiotherapists on AIS. Our study aims to identify areas of strength and weakness in the knowledge levels among physiotherapists and determine the adequacy of the current physiotherapy knowledge in preparing students to identify and manage AIS in Turkey.

MATERIALS AND METHODS

Participants

Considering the current number of senior year students from the Physiotherapy and Rehabilitation department and physiotherapists in Turkey, it was determined that a sample should be taken from 380 people according to the minimum sample calculation. The survey questions were sent to 400 people, and 160 answered them. As a result, the study was carried out with 160 volunteer participants, who are senior year students and physiotherapists of the Physiotherapy and Rehabilitation Department of different universities in Turkey.

Questionnaire development

The questionnaire was developed by the researchers by combining the information provided in the 2011 SOSORT guidelines. Then, it was evaluated for content validity by faculty members who were experts in their fields (physiotherapist, Turkish language literature, public health) and who were not included in the study. In terms of content validity, all faculty members were asked to give a score between 1 and 5 for each question, and questions with 2.5 or fewer points were deleted. The questionnaire, which started with 26 questions at the beginning, was finalized as 19 questions.

Table 1. Survey questions and categories

1.	What is idiopathic scoliosis?
2.	What causes idiopathic scoliosis?
3.	When does idiopathic scoliosis commonly develop?
4.	How prevalent is idiopathic scoliosis among scoliosis patients?
5.	How is the diagnosis of idiopathic scoliosis commonly confirmed?
6.	The treatment of idiopathic scoliosis using therapeutic exercise should include?
7.	When is bracing recommended for patients with idiopathic scoliosis?
8.	According to evidence based research, what has been proven to be the most effective form of conservative management in idiopathic scoliosis?
9.	What physical activity do you think would be most beneficial to patients with idiopathic scoliosis?
10.	What physical activity do you think would be most harmful to patients with idiopathic scoliosis?
11.	What method of conservative treatment of idiopathic scoliosis are you most familiar with?
12.	What are your criteria for sending an adolescent with idiopathic scoliosis to surgery?
13.	Would you feel confident evaluating idiopathic scoliosis using the Adam's forward bending test and the scoliometer?
14.	Would you feel confident in providing educational support to a client presenting with idiopathic scoliosis?
15.	Would you feel confident in the management of a client with idiopathic scoliosis?
16.	Have you ever treated an adolescent idiopathic scoliosis patient before?
17.	Are you interested in orthopedic rehabilitation, manual therapy, or musculoskeletal rehabilitation?
18.	Have you received any training on the conservative treatment of adolescent idiopathic scoliosis?
19.	Do you feel scoliosis specific physiotherapy exercise interventions can be beneficial in the management of idiopathic scoliosis?

The first eight multiple-choice questions (definition, cause, development, extent, diagnosis, treatment, orthotics, and conservative management) tested physical therapists' knowledge of AIS based on the 2011 SOSORT Guidelines (Negrini et al., 2012). Questions 9–12 consisted of questions that allowed physiotherapists to choose more than one option. The last 7 questions consisted of Likert-type questions with yes, no, and don't know options. In addition, the participants included in the study were also asked questions about the institution they work for, their education level, and demographic information.

Data collecting

The survey was transferred to the online platform using the Google Forms web survey platform (Google LLC, Mountain View, CA, United States). Surveys were shared via WhatsApp and participants' emails. Participants anonymously answered the online questionnaire between February 1, 2022, and January 1, 2023.

Ethical Aspects of Research

The study was approved by the local ethics committee (Date: January 28, 2021, and No. E. 2227) and was performed in accordance with the Declaration of Helsinki. Electronic informed consent was obtained from the participants before the survey, and they were informed about the right to withdraw without giving any reason.

Statistical analysis

Statistical analyses of the research were calculated using "IBM® SPSS© 24 software (SPSS, Inc., Chicago, IL, USA)". Descriptive statistics were expressed using percentage and number values.

RESULTS

The descriptive data of the association and the institution that the individuals participating in the study are members of are given in Table 2. Among the participants, 75% were physiotherapists, while 90% were not affiliated with any professional association. In addition, other percentage and number values of the data are given (Table 2).

Table 2. The institution they work for and the association they are a member of

The institution where they work	**n**	**(%)**
Special education and rehabilitation center	37	23.1
University (scholar)	18	11.3
A public or private hospital	31	19.4
own clinic	7	4.4
University Hospital	14	8.8
Not working	13	8.1
Student	40	25.0
Association of which they are members		
Turkey Physiotherapists Association	14	8.8
Orthopedic Physiotherapists Association	1	0.6
Anatolian Lymphedema Association	1	0.6
Not member	144	90.0
Total	**160**	**100**

The answers given by the participants to the questions about AIS treatment are shown in Table 3. 57.5% of the individuals included in the study stated that they had never received treatment for AIS patients, 76.3% did not receive any training on conservative treatment of AIS, and 86.9% stated that they were interested in orthopedic rehabilitation, manual therapy, or musculoskeletal rehabilitation. 48.8% of the participants were confident in providing educational support to a patient who presented with AIS; 54.4% were confident when evaluating an AIS patient and using the forward bend test; and 51.9% were confident in the treatment of an AIS patient. reported. In addition, 89.4% of the participants reported that physiotherapy exercise intervention could be beneficial in the treatment of AIS (Table 3).

The correct and incorrect answers given by the participants to the questions about the knowledge level of AIS are shown in Table 4. Of the individuals included in the study, 50.6% defined the definition of AIS, 58.8% knew what causes AIS, 80.6% knew when it developed, 55.6% knew when to offer orthoses for it, and 74.4% knew which conservative treatment method was the most effective according to evidence-based studies.

It was determined that 86.9% of the participants did not know the prevalence of AIS among its types, 69.4% did not know how AIS was generally confirmed, and 68.8% did not know what therapeutic exercises for AIS should include (Table 4).

Table 3. Level of interest in Adolescent Idiopathic Scoliosis

Questions	Yes		No		Don't know	
	n	(%)	n	(%)	n	(%)
Have you ever treated an adolescent idiopathic scoliosis patient before?	68	(42.5)	92	(57.5)		-
Are you interested in orthopedic rehabilitation, manual therapy, or musculoskeletal rehabilitation?	139	(86.9)	21	(13.1)		-
Have you received any training on the conservative treatment of adolescent idiopathic scoliosis?	38	(23.8)	122	(76.3)		-
Would you feel confident providing educational support to a client presenting with idiopathic scoliosis?	78	(48.8)	33	(20.6)	49	(30.6)
Would you feel confident using Adam's forward bend test and the Scoliometer?	87	(54.4)	25	(15.6)	48	(30.0)
Would you feel confident in the management of a client with idiopathic scoliosis?	83	(51.9)	21	(13.1)	56	(35.0)
Do you feel scoliosis specific physiotherapy exercise interventions can be beneficial in the management of idiopathic scoliosis?	143	(89.4)	5	(3.1)	12	(7.5)

Table 4. Adolescent Idiopathic Scoliosis knowledge level

Questions	True		False	
	n	(%)	n	(%)
What is idiopathic scoliosis?	81	50.6	79	49.4
What causes idiopathic scoliosis?	94	58.8	66	41.3
When does idiopathic scoliosis commonly develop?	129	80.6	31	19.4
How prevalent is idiopathic scoliosis among scoliosis patients?	21	13.1	139	86.9
How is the diagnosis of idiopathic scoliosis commonly confirmed?	49	30.6	111	69.4
The treatment of idiopathic scoliosis using therapeutic exercise should include?	50	31.3	110	68.8
When is bracing recommended for patients with idiopathic scoliosis?	89	55.6	71	44.4
According to evidence-based research, what has proven to be the most effective form of conservative management in idiopathic scoliosis?	119	74.4	41	25.6

The individuals participating in the study were asked which exercises were most beneficial and harmful for AIS patients. The answers given by the participants to the questions for which they were given the opportunity to mark more than one option are shown in Figure 1. Participants said the most beneficial exercises were pilates, swimming, and yoga, respectively; they answered that the most harmful exercise is martial arts (Figure 1).

The individuals participating in the study were asked about their familiarity with conservative treatment types for AIS. The answers given by the participants to the questions for which they were given the opportunity to mark more than one option are shown in Figure 2.

Most of the participants answered that they were familiar with the Schroth method (Figure 2).

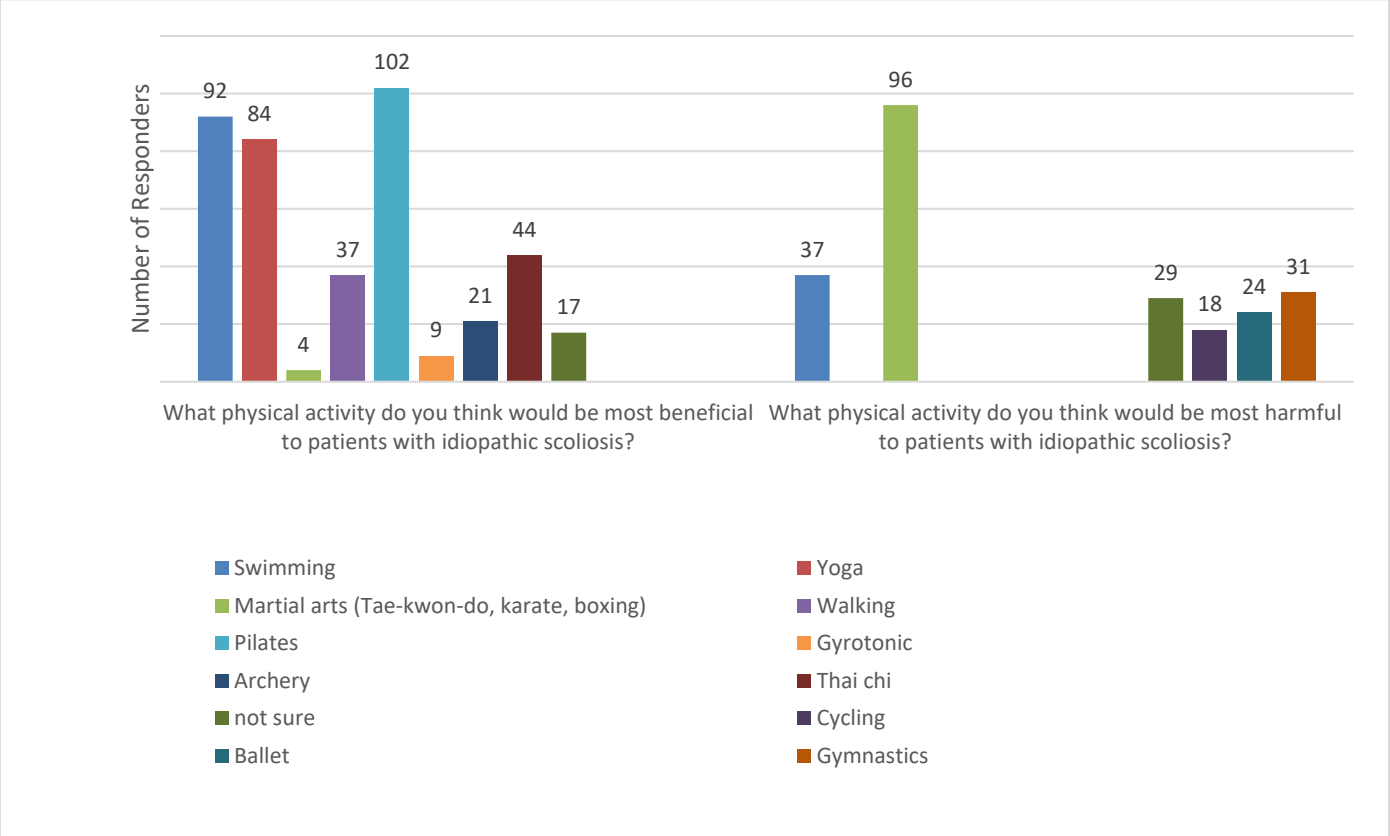

Figure 1: The most beneficial and most harmful exercises for patients with adolescent idiopathic scoliosis

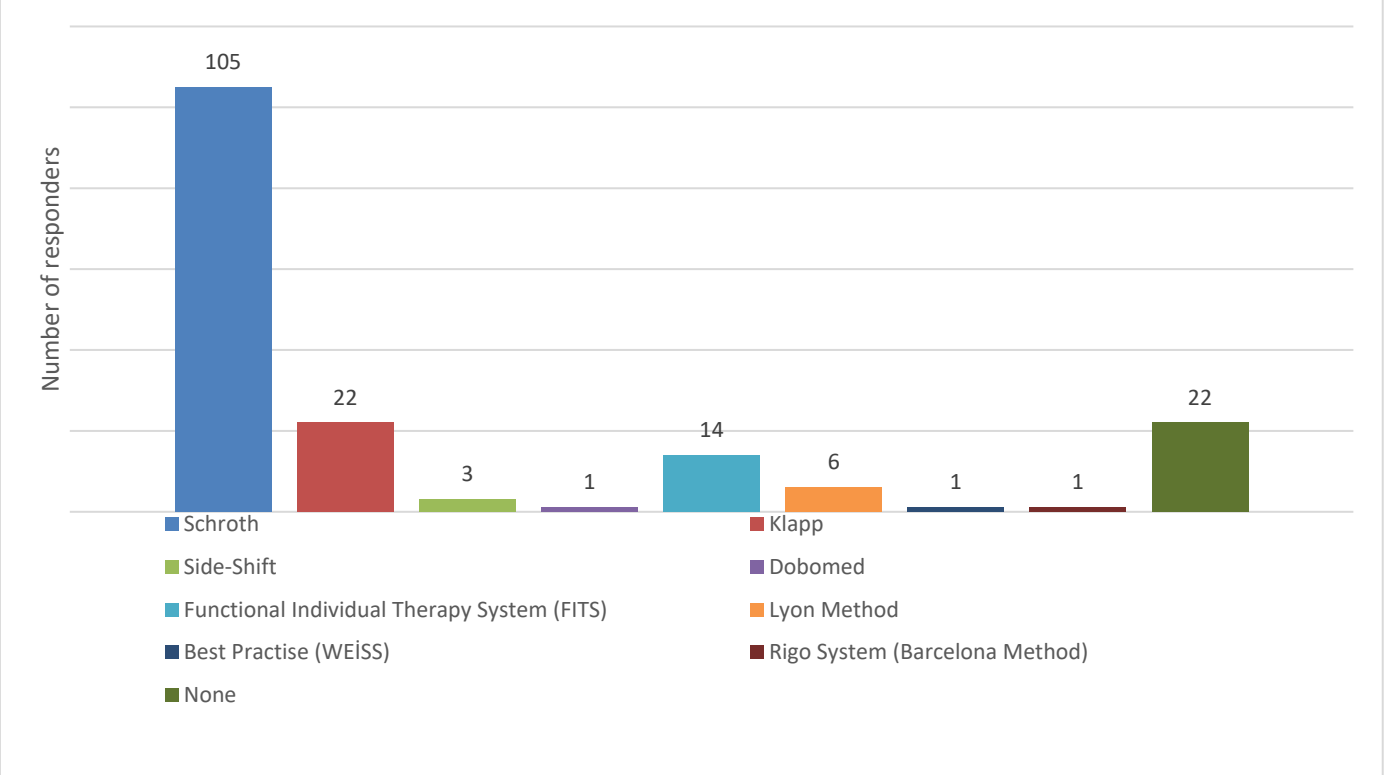

Figure 2. What method of conservative treatment of idiopathic scoliosis are you most familiar with?

The individuals participating in the study were asked about the criteria for sending the AIS patient to surgery. The answers given by the participants to the questions for which they were given the opportunity to mark more than one option are shown in Figure 3. Participants mostly said that they were Cobb angles, rapid increases in curvature in the last 6 months, and pulmonary system anomalies, respectively (Figure 3).

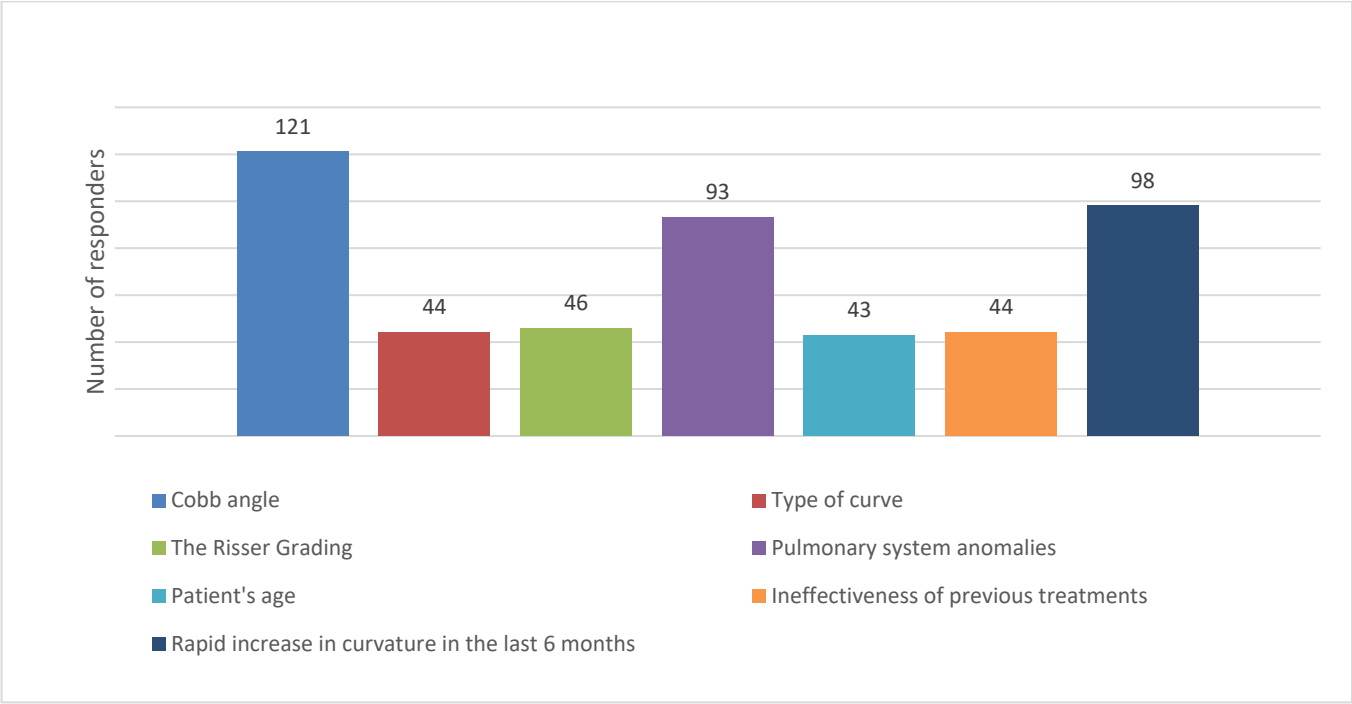

Figure 3. Criteria for sending an adolescent with idiopathic scoliosis to surgery

DISCUSSION

In our study, we evaluated the knowledge levels of 4th-year students and graduate physiotherapists of the Department of Physiotherapy and Rehabilitation about AIS through an online questionnaire. The study measuring the knowledge of healthcare professionals about scoliosis was limited. One of the groups with the best information in the studies was physiotherapists (Çolak et al., 2020). This study is one of the few that measures physiotherapists' AIS knowledge in detail.

SOSORT-based questions were asked of the participants in the form of a questionnaire. Considering the results, the lack of knowledge of physiotherapists and senior students in Turkey about AIS has attracted attention. In a study conducted in the USA, only 8% of the physiotherapists who filled out the questionnaire answered 70% of the SOSORT-based questions correctly (Drake et al., 2014). In the study of Jason Black et al. in the United Kingdom, he reported that only 7% of 206 physiotherapy students answered more than 50% of the questions about scoliosis correctly and that there was a lack of clear information about its treatment (Black et al., 2017). There are also studies proving that physiotherapists lack basic knowledge about scoliosis in Poland and South Africa (Ciazynski et al., 2008; Du Toit et al., 2020). When we look at the answers given to SOSORT supported questions in our study, the success of answering the questions correctly can be expressed as approximately 50% of the questions in general. However, the number of correct answers about the prevalence of AIS (13.1%), how it is

confirmed (30.6%), and what is required in exercise therapy (31.2%) is quite low.

Based on these results, it may be thought that those who could not answer the questions correctly did not receive a SOSORT-based education during their undergraduate education. One of the important influencing factors may be that the graduates do not work in a business field where they will gain sufficient experience in the field of AIS. The majority of the respondents (23.1%) work in special education centers where pediatric rehabilitation is provided. Only 4.4% work in their own clinic. Because others work in institutions, it may be a little more difficult to reach the scoliosis patient.

In order to plan rehabilitation accurately and effectively, the three-dimensional structure of scoliosis should be well understood (Theroux et al., 2013). The cause of scoliosis was answered correctly by 58.8% of the physiotherapists participating in this study. Similarly, 73.5% of physiotherapists in South Africa and 52% of physiotherapy students in the UK correctly answered the question about the cause of scoliosis (Black et al., 2017; Du Toit et al., 2020).

Among the scoliosis types, AIS constitutes 80% of all varieties (Goldberg et al., 2002; Theroux et al., 2013; Weiss et al., 2022). In our study, it was determined that 86.9% of the participants did not know the prevalence of AIS among other types of scoliosis. He correctly defined the prevalence of AIS among scoliosis types as 80% of physiotherapy students in the UK and only 16% of physiotherapists in South Africa (Black et al., 2017; Du Toit et al., 2020).

Knowing during which periods of life scoliosis may develop is important for timely treatment, so healthcare professionals should be competent on this subject (Meirick et al., 2019). In our study, 80.6% of the participants correctly identified the period during which AIS is usually seen. The results of our study show parallelism with the literature (Black et al., 2017; Du Toit et al., 2020).

In this study, it was found that 69.4% of the participants did not have the correct information when choosing the recommended methods for the diagnosis of AIS. The results of our study were similar to those of previous studies (Black et al., 2017; Du Toit et al., 2020; Weiss et al., 2022). In addition, 51.9% of the participants were found to be confident when treating AIS patients. Lack of knowledge on the part of physiotherapists in evaluating AIS patients may cause self-confidence problems.

Exercise plans are made by physiotherapists in order to prevent the progression of scoliosis rehabilitation and reduce the curvature (Yagci et al., 2018). These exercises are defined by SOSORT as "scoliosis-specific physiotherapy exercises." To talk about the contents of Scoliosis-Specific Physiotherapy Exercises, it can be expressed as Schroth, Schroth Best Practice, Lyon, Scientific Approach to Exercise for Scoliosis (SEAS), Barcelona School of Scoliosis Physical Therapy (BSPTS), Dobomed, Side Shift, and Functional Individual Therapy of Scoliosis (FITS) (Berdishevsky et al., 2016; Negrini et al., 2012; Park et al., 2017).

There are many physiotherapy methods used in the treatment of scoliosis (Weiss et al., 2016). Among these methods, one with a high level of evidence is the Scrotch method (Kuru et al., 2016; Schreiber et al., 2016). In our study, it was seen that the most preferred method of the participants was Schroth, with 65.6%. One of the other preferred treatment methods is orthosis treatment. It is suggested that it is one of the methods that prevents the curvature from reaching the surgical level (Nachemson & Peterson, 1995; Weinstein et al., 2013; Wong et al., 2008). In our study, it was seen that 55.4% made the right choice when considering the appropriate orthoses. However, in this study, it can be said that there is a lack of information to increase orthosis fit among the participants.

In order to get the desired effect from treatment and applications, the AIS evaluation and diagnosis verification parts should be managed effectively (Lonstein, 1994). According to the result of this evaluation, it is decided whether the person needs surgical intervention or not. In general, factors such as the clinical radiographic image, the Risser stage

and its effect on respiratory parameters, and the progression rate are considered (Garcia-Cano et al., 2018; Pérez-Machado et al., 2020).

In our study, the participants chose the Cobb angle, the rapid increase in the curvature in the last 6 months, and pulmonary system anomalies, respectively, as criteria for sending AIS patients to surgery.

According to the results obtained from the study, we can say that the physiotherapist and Department of Physiotherapy and Rehabilitation students are insufficient for AIS rehabilitation. Department of Physiotherapy and Rehabilitation students can be improved in their ability to think and interpret the AİS biomechanically during the education period aimed at eliminating this deficiency. In addition, we think that physiotherapists can increase their competencies by attending courses or seminars about AIS.

In this study, the AIS knowledge levels of 160 people, including senior year physiotherapy students and physiotherapists, were measured. If it had been done with more people, it could have provided more comprehensive data. Additionally, the knowledge levels of physiotherapists and students were not compared. There is a need for studies with detailed analysis on this subject.

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