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CURRENT KNOWLEDGE OF SCOLIOSIS IN PHYSIOTHERAPISTS AND PHYSIOTHERAPY STUDENTS TRAINED IN TURKEY

ORIGINAL ARTICLE

ABSTRACT

Purpose: Present evidence suggests that early detection and correct management is an essential part of scoliosis treatment. Therefore, the physiotherapists and physiotherapy students must have adequate knowledge of scoliosis. The purpose of this study was to evaluate the current knowledge of physiotherapists and physiotherapy students in Turkey on scoliosis.

Methods: A previously designed questionnaire based on International Society on Scoliosis Orthopaedic and Rehabilitation Treatment (SOSORT) guideline consists of two sections was used in this study. The first section included eight questions to evaluate the knowledge level on the definition, cause, development, prevalence, diagnosis, treatment, and bracing of scoliosis. The second section included three multiple-choice questions to analyze the participants' opinions on exercises for scoliosis. All Turkish universities offering physiotherapy degrees and graduated physiotherapists from certain social media groups were invited to participate in the study.

Results: 649 physiotherapists and 497 students completed the questionnaire. Scoliosis is recognized as a 3-dimensional deformity of the spine by 39.8% of the students and 57.2% of the physiotherapists. Only 19.5% of the students and 30.7% of the physiotherapists correctly identified the diagnostic criteria for scoliosis. For therapeutic exercise, 48.7% of the students and 61.3% percent of the physiotherapists identified the appropriate approach, and also 57.3% of the students and 62.6% of the physiotherapists correctly identified the bracing recommendations.

Conclusion: Results of this study showed that physiotherapists and physiotherapy students do not have sufficient knowledge of scoliosis. Action needs to be taken to improve the awareness and basic knowledge level of scoliosis.

Keywords: Education, Knowledge, Physical Therapist, Scoliosis, Turkey, University

TÜRKİYE'DE EĞİTİM GÖREN FİZYOTERAPİ ÖĞRENCİLERİNDE VE FİZYOTERAPİSTLERDE GÜNCEL SKOLYOZ BİLGİSİ

ARAŞTIRMA MAKALESİ

ÖZ

Amaç: Güncel kanıtlar, erken teşhis ve doğru yönlendirmenin skolyoz tedavisinin önemli bir parçası olduğunu göstermektedir. Bu nedenle fizyoterapistlerin ve fizyoterapi öğrencilerinin skolyoz konusunda yeterli bilgiye sahip olmaları gerekir. Bu çalışmanın amacı, Türkiye'deki fizyoterapistlerin ve fizyoterapi öğrencilerinin skolyoz hakkındaki güncel bilgilerini değerlendirmektir.

Yöntem: Çalışmada Uluslararası Skolyoz Ortopedik Tedavi ve Rehabilitasyon Derneği (Society on Scoliosis Orthopaedic and Rehabilitation Treatment - SOSORT) kılavuzu temel alınarak hazırlanan 2 bölümden oluşan online bir anket kullanılmıştır. İlk bölüm skolyozun tanımı, nedenleri, gelişimi, prevalansı, tanısı ve tedavisi hakkında genel bilgi düzeyini değerlendiren 8 sorudan; ikinci bölüm ise skolyoz için egzersizler hakkındaki görüşleri değerlendiren çoktan seçmeli 3 sorudan oluşmaktadır. Lisans düzeyinde fizyoterapi eğitimi alan öğrenciler ve mezun fizyoterapistler sosyal medya grupları kullanılarak çalışmaya katılmaya davet edilmiştir.

Sonuçlar: 649 fizyoterapist ve 497 öğrenci anketi tamamlamıştır. Skolyoz, öğrencilerin %39,8'i ve fizyoterapistlerin %57,2'si tarafından omurganın 3 boyutlu bir deformitesi olarak tanımlanmaktadır. Öğrencilerin sadece %19,5'i ve fizyoterapistlerin sadece %30,7'si skolyoz için tanı kriterlerini doğru bir şekilde tanımlamıştır. Terapötik egzersiz için öğrencilerin %48,7'si ve fizyoterapistlerin %61,3'ü uygun yaklaşımları tanımlamıştır ve öğrencilerin %57,3'ü ve fizyoterapistlerin %62,6'sı korse kullanımı önerilerini doğru bir şekilde tanımlamıştır.

Tartışma: Bu çalışmanın sonuçları fizyoterapistlerin ve fizyoterapi öğrencilerinin skolyoz hakkında yeterli bilgi düzeyine sahip olmadığını ortaya koymuştur. Skolyoz farkındalığını ve temel bilgi düzeyini arttırmak için harekete geçilmesi gerekmektedir.

Keywords: Eğitim, Bilgi, Fizyoterapist, Skolyoz, Türkiye, Üniversite

INTRODUCTION

Scoliosis results in the abnormal alignment of the head and lower limbs (1) and is defined as a 3-dimensional deformity of the spine (2). The cause of scoliosis is unknown in more than 80% of scoliosis cases which is termed as "idiopathic scoliosis (IS)" (2). Surgery is only recommended for some severe IS cases and has many pitfalls. Early detection and interventions are required, to control the progression of the deformity and avoid surgery (3). The American Academy of Orthopedic Surgeons (AAOS) indicates the benefits of early diagnosis, non-operative treatment, and school screening programs. AAOS also recommends screening girls twice at age of 11 and 13 and boys once at the age of 13 or 14 (4). Even though countries like Japan and South Korea conduct the school screening programs as recommended by AAOS, the health authorities of Canada and the United Kingdom (UK) do not recommend it (4). Present practice shows that early detection of scoliosis gives an advantage in decision making in regard to having conservative treatment and avoiding surgery (5). Recognition of clinical signs related to scoliosis and appropriate referral strategies should be fulfilled (6). However, previous research suggests that healthcare professionals may have insufficient knowledge about scoliosis with respect to diagnosis and treatment (7).

Currently, scoliosis education is not specified in the national physiotherapy core curriculum in Turkey. Course descriptions and objectives for the treatment of scoliosis differ between the universities. Because the national physiotherapy core curriculum does not require scoliosis education, basic knowledge related to IS is unknown among physiotherapists and/or physiotherapy students in Turkey. Therefore, the purpose of this research study was to assess the current knowledge of physiotherapists and physiotherapy students on scoliosis in aspects of the definition, diagnosis, and treatment using a validated online survey.

METHODS

Study Design

This study was designed as a descriptive study. This trial was conducted at the Faculty of Health Science, Marmara University, between 01.10.2019 - 02.02.2020 for a period of four months. Ethical approval was obtained from the Scientific Research Ethics Committee of the Faculty of Medicine of Marmara University prior to the study. The study was conducted in accordance with the Declaration of Helsinki.

Subjects

Participants were Turkish university students who were in their final year of a bachelor's degree for physiotherapy or graduated physiotherapists. Exclusion criteria were any students who were not in their final year for bachelor's degree or participants who did not complete the entire questionnaire. After taking the online informed consent, participating physiotherapists questioned about education, working status, area of work, graduation year, total working experience, and if they had any experience with scoliosis before, and students questioned about education status.

Materials

The previously developed (8) and validated (9) questionnaire, which consists of two distinct sections, was translated to Turkish and used in this study (Appendix 1). The first section included eight questions based on definition, cause, development, prevalence, diagnosis, treatment, and bracing of scoliosis. The second section included three multiple-choice questions to analyze the participants' opinions on beneficial or detrimental exercises for patients with scoliosis.

The questionnaire was transformed into an online survey platform. Graduated physiotherapists from certain social media groups were invited to participate in the study and the questionnaire was distributed to the physiotherapists via these social media groups. Also, physiotherapy students in Turkish universities who met the inclusion criteria were invited to participate in the study and the questionnaire was distributed with the help of the academic staff of that university. After this period access to the survey was closed and descriptive analysis was done via the online survey system.

Statistical Analysis

Statistical analysis was performed using 'Statis-

tical Package for Social Sciences' (SPSS) Version 11.5 (SPSS inc., Chicago, IL, ABD). The collected data was extracted from an online survey platform and imported into SPSS software and descriptive analyses were performed in SPSS separately for physiotherapists and students for each question. In all analyzes, data are given as number of people and percentage or mean and standard deviation.

RESULTS

Following the completion of the study period, 649 physiotherapists and 497 students had completed the questionnaire. Sixty point seven percent (60.7%) of the physiotherapists stated that they were clinicians, 10.5% were academicians, 12.6% were both academicians and clinicians and 16.2% were freelance workers. The mean professional experience time was 5.24 ± 6.18 years. The distribution of the number of physiotherapists by graduation years shown in the figure (Fig. 1). Forty-five percent of physiotherapists stated that they worked in the field of pediatrics, 41% in neurology, 38% in orthopedy, 35% in general physiotherapy. Sixty percent of the participants had an undergraduate degree. A total of 13% of the participants reported that they received additional training in scoliosis management after undergraduate education. The frequency of the participants encountering with the patient with scoliosis is shown in Table 1.

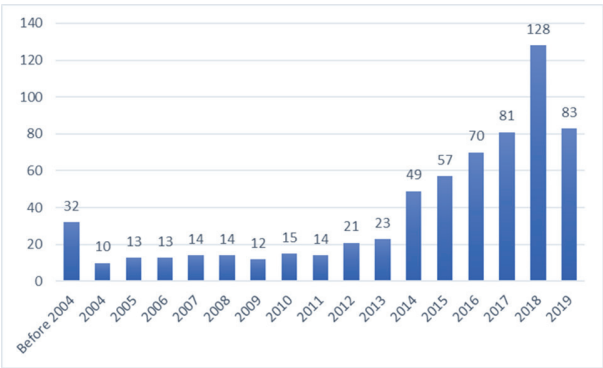

Figure 1. Distribution of the Number of Physiotherapists By Graduation Years

Question 1 (definition): what is idiopathic scoliosis?

Within this question, participants were asked to recognize that scoliosis is a 3-dimensional deformity. Fifty-seven point two percent (57.2%) of the physiotherapists and 39.8% of the students selected scoliosis to either be a 3-dimensional deformity of the spine (Fig. 2).

Table 1. Frequency of Participants Encountering with Scoliosis Patients

	Number of Physiotherapists	Percentage (%)
Never	58	8.9
Several Times a Year	273	42.1
Several Times a Month	209	32.2
Several Times a Week	92	14.2
Everyday	17	2.6

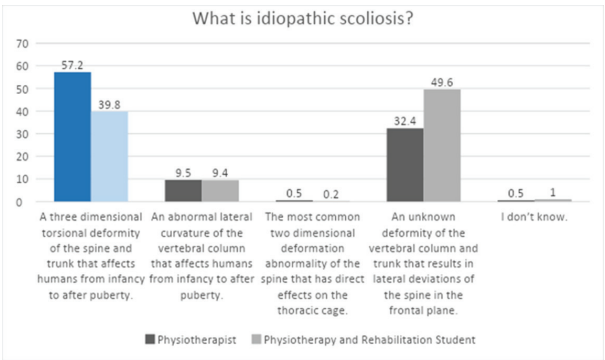

Figure 2. Answers Given to the "What Is Idiopathic Scoliosis?" Question

Question 2 (cause): what causes idiopathic scoliosis?

Within this question, participants were asked to recognize that IS has no specific cause that can be established and it can be multifactorial. Fifty-two point seven percent (52.7%) of the physiotherapists and 41% of the students selected the correct answer.

Question 3 (development): when does idiopathic scoliosis commonly develop?

Within this question, participants were asked to recognize that idiopathic scoliosis may develop at any time during childhood and adolescence. Question 3 was the question with the highest correct response rate. Seventy-five point five percent (75.5%) of the physiotherapists and 56.1% of the students selected the correct answer.

Question 4 (prevalence): how prevalent is idiopathic scoliosis among patients with scoliosis?

Within this question, participants were asked to recognize that approximately 80% of scoliosis patients are idiopathic scoliosis. Forty-one point nine percent (41.9%) of the physiotherapists and 37.6% of the students selected the option "I don't know".

Question 5 (diagnosis): how is idiopathic scoliosis diagnosed?

Participants were able to select more than one option in this question. Within this question, participants were asked to recognize that idiopathic scoliosis is diagnosed with physical examination and X-ray. Twenty-two points three percent (22.3%) of the physiotherapists and 9% of the students selected both "Physical Examination" and "X-Ray" options.

Question 6 (diagnosis): how is the diagnosis of idiopathic scoliosis commonly confirmed?

Within this question, participants were asked to recognize that idiopathic scoliosis is commonly confirmed when the Cobb angle is ≥ 10° and axial rotation can be recognized. Thirty point seven percent (37%) of the physiotherapists and 19.5% of the students selected the correct answer.

Question 7 (treatment): what should the treatment of idiopathic scoliosis using therapeutic exercise include?

Within this question, participants were asked to recognize that the treatment of idiopathic scoliosis using therapeutic exercise which includes the adaptation of old techniques and the addition of new forms that focus on auto-correction in three dimensions to prevent/limit progression. Sixty-one point three percent (61.3%) of the physiotherapists and 48.7% of the students selected the correct answer.

Question 8 (bracing): when is bracing recommended for patients with idiopathic scoliosis?

Within this question, participants were asked to recognize that bracing is recommended for patients with a 20° (±5) Cobb angle that has an elevated risk of progressing. Sixty-two point six percent (62.6%) of the physiotherapists and 57.3% of the students selected the correct answer.

The physiotherapists and students within the study were asked three questions about which physical activity they thought was most beneficial and most harmful for patients with scoliosis. In addition, these questions assessed the participant's knowledge regarding the recommended treatment modalities referenced in the 2016 SOSORT guidelines (10). In terms of beneficial physical activity for scoliosis, 58.1% of the physiotherapists and 54.9% of the students reported that swimming would be effective for scoliosis (Fig. 3). In terms of harmful physical activity for scoliosis, 63.2% of physiotherapists and 75.2% of students reported that martial sports would be harmful for scoliosis. The participants were asked if they knew anything about any of the nine most popular IS conservative treatment methods. Twenty-three point six (33.6%) of the physiotherapists and 20.5% percent of students could not recognize any of the nine most popular methods. Schroth was the most known method among all methods (Fig. 4).

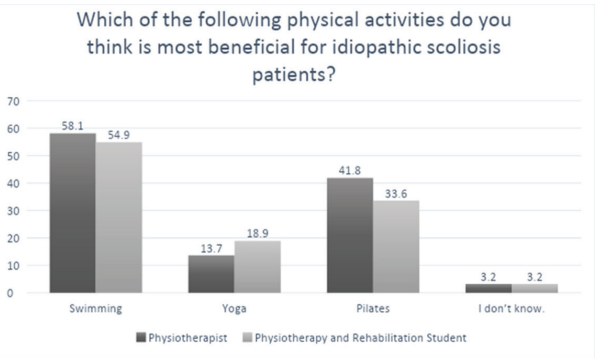

Figure 3. Answers Given to the "Which Of The Following Physical Activities Do You Think Is Most Beneficial For Idiopathic Scoliosis Patients?" Question

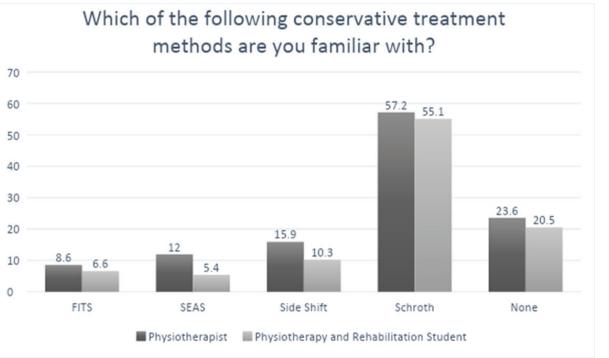

Figure 4. Answers Given to the "Which Of The Following Conservative Treatment Methods Are You Familiar With?" Question

DISCUSSION

In this study, we evaluated the knowledge level among physiotherapists and physiotherapy students on the definition, diagnosis, and treatment of IS. Previous research that assessed healthcare providers' knowledge of scoliosis was limited in the literature and this is the first study evaluating the level of knowledge and awareness of IS among physiotherapists and physiotherapy students in Turkey. In conclusion, a deficiency in foundational knowledge regarding IS was noted in physiotherapists and physiotherapy students in Turkey. Drake et al. reported that only 8% of physiotherapy students studying in the United States gave correct answers to 70% of the questions in the questionnaire prepared according to the SOSORT guidelines. They concluded that the students did not receive an education planned according to the SOSORT guidelines (8). Jason Black et al. reported that only 7% of 206 physiotherapy students in the United Kingdom answered more than 50% of the questions about scoliosis, and there was a clear lack of knowledge about the definition and treatment of IS (9). In a study conducted in Poland, the knowledge of IS was insufficient in physiotherapy students, despite the education program including the SOSORT guidelines (11). In a study evaluating the knowledge level of physiotherapists about scoliosis in South Africa, Du Toit reported that 16.5% of the participants gave correct answers to 70% of the questions, and physiotherapists lacked foundational knowledge of IS (7).

Understanding the 3-dimensional structure and etiology of scoliosis is necessary to determine the rehabilitation protocol correctly (12). The definition of scoliosis was correctly identified by 57.2% of the physiotherapists participating in this study and 52.7% selected the correct answer about etiology. Du Toit et al. (7) reported that 48% of physiotherapists in South Africa correctly defined IS and 73.5% correctly identified the etiology of IS. Similar to our study, 52% of physiotherapy students in the UK answered the question about etiology correctly. However, only 8% of physiotherapy students in the UK defined of scoliosis correctly, as compared to 39.8% of physiotherapy students in Turkey (8).

Healthcare professionals should be aware that IS can develop at any time in childhood or adolescence (10). In our study, we reported 75.5% of the physiotherapists and 68.2% of the physiotherapy students recognized when IS may develop in children. In the study conducted by Du Toit et al., 86% of the physiotherapists knew when IS may develop in children (7). In the study conducted by Black et al., more than 50% of physiotherapy students were able to correctly identify the patient group with the highest risk of diagnosis (9). Knowing the prevalence of scoliosis as well as defining the patient group with the highest risk is very important in terms of early diagnosis. Although the number of correct answers seems to be high in our study, this rate is quite low when we consider the importance of early diagnosis. Early diagnosis of IS allows for earlier effective, non-operative treatment options for patients leading to greater possibilities for stopping the progression of the curve (13). Also, disease prevalence estimates are clinically useful for diagnostic decision-making (14). Among 11 questions, the question related to the prevalence of scoliosis had the highest rate of the "I don't know" response marked by participants, which indicates physiotherapist and physiotherapy students lack information in the didactic musculoskeletal curriculum.

When we examine the answers given about the diagnosis of IS, most of the participants in both groups think that the diagnosis can be made by x-ray and physical examination. When asked about how to confirm the diagnosis of IS, many of the participants gave the wrong answer. Only 30.7% of the physiotherapists and 25.4% of the students stated that the diagnosis would be confirmed in the presence of a Cobb angle of 10 ° and above and axial rotation. Due to the insufficient knowledge of the 3-dimensional structure of scoliosis and the lack of radiology education in physiotherapy schools, our participants may have given the wrong answers to this question. Musculoskeletal imaging is an increasingly important diagnostic tool for physiotherapists (15). For this reason, physiotherapists and students should have the ability to interpret the imaging technique correctly in addition to physical examination for accurate early diagnosis of IS.

Therapeutic exercise and bracing are one of the most important parts of IS treatment. Scoliosis-specific exercises are mentioned within the scope of therapeutic exercises in the professional guidelines. Especially, Schroth-based physical therapy protocols have shown effectiveness in reducing the Cobb angle for patients with IS (10,16,17).

In our study, it was observed that 23% of clinicians and physiotherapy students were not aware of exercises specific to scoliosis. Bracing is the primary non-operative treatment options for scoliosis and is an effective treatment method in preventing the progression of the curvature (10). However, clinicians need to recognize when bracing is warranted and should advocate for patients to wear a brace when warranted. In our study, 40% of the clinicians and 56% of the physiotherapy students answered incorrectly about when the brace should be applied. Considering that 32.2% of physiotherapist participants encounter patients with IS several times in a month, this knowledge level may be insufficient in terms of appropriate treatment and bracing, choosing the right exercise, and preventing the progression of the curvature. Both physiotherapists and students need additional education on appropriate therapeutic exercises and brace recommendations.

We asked several exploratory questions to determine participants' views on which physical activities may be beneficial or harmful for patients with IS. The majority (99.9%) of physiotherapists and students (88.2%) reported that Pilates and swimming were the most beneficial physical activities and that combat sports (63.2% of physiotherapists and 66.2% of students) were the most harmful activity. Early studies have recommended swimming as a beneficial physical activity for the treatment of scoliosis (18). However, recent studies reported that swimming is associated with increased trunk asymmetry and kyphosis, and may increase trunk asymmetry (10,19,20). Swimming is still one of the physical activities commonly recommended by physicians and physiotherapists for the treatment of IS in Turkey and more than half of the students and physiotherapists in this study also reported swimming as a beneficial physical activity. A potential reason for this might be that physiotherapists do not follow up-to-date information in the literature and also, the physiotherapy education curriculums are not modified according to the recent findings in the literature.

Studies investigating the effectiveness of the Pilates method in the treatment of AIS are limited. Araújo et al. reported that Pilates was not effective in decreasing the Cobb angle compared to the control group, but it was effective in alleviating back pain (21). Pilates reduces low back pain and improves core stability (22). However, there is no study in the literature reporting that Pilates is an effective treatment method for individuals with high curvature degrees (21,23).

The primary limitation of our study was the author's inability to control the distribution of the questionnaire to the target population. Most of the physiotherapists participating in the study had 5 years or less of experience. Without knowing the exact demographics of the respondents and the size of the population to which the questionnaire was distributed, no definite conclusion can be drawn about the entire population of physiotherapy students and physiotherapists in Turkey.

Our study indicates that the knowledge levels of both physiotherapists and physiotherapy students are insufficient for IS. The lack of foundational knowledge related to IS may have negative consequences for the clinician with respect to diagnosis, early recognition, and treatment of scoliosis patients. Further research is warranted on IS awareness as well as analyzing curriculum in physiotherapy schools. In order to graduate physiotherapy students with the most current knowledge, skills, and abilities for the treatment of IS, we recommend that musculoskeletal courses within the physiotherapy education curriculum should include professional guidelines. Improving clinician awareness and knowledge about IS may lead to improved patient outcomes. In addition, attending continuing education courses on IS following graduation will ensure that clinicians follow new developments in the literature.

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Conflict of Interest: The authors report no conflict of interest.

Ethical Approval: Approval for the study was granted by the Scientific Research Ethics Committee of the Faculty of Medicine of Marmara University (Approval Date: 31.01.2020 and Approval Number: 17).

Informed Consent: Online informed consent was obtained from participants.

Peer-Review: Externally peer-reviewed.

Authors' contributions: Hakan Akgül: Conceptualization, Methodology, Investigation, Writing - Original Draft. Berivan Beril Kılıç: Conceptualization, Methodology, Investigation, Writing - Original Draft. Halit Selçuk: Investigation, Writing - Original Draft, Writing -Review & Editing. Nimet Sermenli Aydın: Methodology, Investigation, Writing – Original Draft, Writing - Review & Editing. Emel Mete: Methodology, Investigation, Writing - Original Draft, Resources. Dilara Merve Sarı: Methodology, Investigation, Writing – Original Draft. Shawn Drake: Methodology, Writing - Review & Editing. Tuğba Kuru Çolak: Methodology, Writing - Review & Editing, Supervision, Project administration.

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