International Journal of Sport, Exercise and Health Research

Research Article

IJSEHR 2022; 6(1): 13-22

www.sportscienceresearch.com
Received: 16-11-2021
Accepted: 13-03-2022

A Delphi Study on the Evaluation and Rehabilitation of Spinal Pain in Children and Adolescents with Overweight and Obesity

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Abstract

The present study aims to reach experts on spinal pain in children/adolescents with obesity and to conduct a Delphi study on the methods used in the evaluation and rehabilitation of the process. Experts experienced in rehabilitation of spinal pain and children/adolescents with overweight/obesity. To collect data, using e-mails, the 16-question form containing assessment and rehabilitation approaches for spinal pain and obesity was sent to clinicians and researchers working on spinal pain in children or adolescents with overweight, obesity. Delphi tour consisted of two rounds. Participants' responses in two rounds were calculated as percentages and numbers. 132 experts were invited, 14 experts participated in the first round and 10 experts participated in the second round. In the first round, eleven experts from Turkey, two experts from Cyprus, one expert was from Malta; in the second round nine experts from Turkey, one expert was from Cyprus. Back pain(n=9), neck pain(n=4), low back pain(n=10) as the spinal pain areas where children/adolescents with obesity often experienced pain in the first round; in the second round, back pain(n=3), neck pain(n=3), low back pain(n=7) were reported. In the evaluation methods of pain, Visual Analog Scale(n=11), Faces Pain Scale(n=7), Numeric Rating Scale(n=4) were used. It was reported that Visual Analog Scale(n=7); Faces Pain Scale(n=2), Numeric Rating Scale(n=2) were used in the second round. Considering the exercises given for spinal pain rehabilitation, in the first round, for spinal stabilization exercises(n=6), resistance exercises(n=12), aerobic exercise bicycle(n=8), walking(n=8); in the second round; resistance exercises(n=5), aerobic exercise bicycle(n=5), reported that they recommended walking(n=8). With all these results, it is seen that different approaches are used in the evaluation and rehabilitation methods of spinal pain in children/adolescents overweight/obesity. This study may guide the development of common ideas in assessment-rehabilitation methods of spinal pain in children/adolescents overweight/obesity in clinics.

Keywords: Obesity, Delphi study, Spinal Pain.

INTRODUCTION

In childhood and youth, overweight and obesity is among the severe health problems with the problems it brings [1]. The increasing prevalence in many countries poses an alarming situation. Childhood or adolescence overweight or obesity may continue in adulthood [1]. As a result of the increase in sedentary life in childhood/adolescence, the change in eating habits, the balance between energy intake and expenditure is disrupted and may lead to secondary problems, such as pain, diabetes, cardiovascular diseases, and changes in psychological status from a young age to adulthood. With all these problems, families apply to clinics and seek solutions. Health professionals, on the other hand, use different methods concerning prevention, evaluation and treatment [1-3].

Various reasons, such as changes in eating habits in adolescents and adolescents, increased sedentary life, deterioration of natural spinal curvature with gravity force and change in posture due to the abdominal region of the area with increased fat, may cause spinal pain in this population [2-6]. There is not enough enlightening literature information on assessment and treatment methods in spinal region pain seen in childhood/adolescent with overweight/obesity. Obtaining information concerning the methods used in the world countries in the evaluation and rehabilitation of spinal pain in childhood/adolescent with overweight/obesity, which is one of the crucial issues of the World Health Organization, is significant in terms of developing common solutions. In this study, we aim to obtain expert opinions using the Delphi method on the approaches applied in the world for the evaluation and rehabilitation of spinal pain in children or adolescents with overweight or obesity, and to analyze the results obtained in line with this information.

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METHODOLOGY

Clinicians or researchers working on body mass index (BMI), overweight or obesity in childhood or adolescence were invited to this study. An e-mail describing the study was sent to this e-mail addresses of the article authors who were searched from Pubmed, Web of Science, Science Direct, Scopus, Google Scholar and Cochrane databases. The words method we investigated (obesity OR overweight OR pediatric obesity OR morbid obesity) AND (childhood OR child OR adolescent OR teenager OR teens OR youth OR adolescence) AND (neck pain OR back pain OR low back pain OR backache OR backache OR cervical pain OR neck ache OR neckache). The subjects to be included in this study were physicians, physiotherapists, academics or clinician who approved to participate in this study, working on BMI, overweight, childhood or adolescent obesity, spinal pain and who had at least one article in the above databases. Experts who did not want to participate in this study and did not respond to the e-mail sent by us in any of the two rounds were not included in the study. In Delphi studies, it is generally recommended that at least seven experts participate in the research for each round [7]. Thus, the feedback of at least seven experts for both rounds was considered sufficient concerning results. The questionnaire includes 24 questions about rehabilitation approaches. After the first round of Delphi, answers were received anonymously and the opinions stated in the first round were listed, a new form was designed again, and the second Delphi round was held 15 days later. After receiving the answers to the second Delphi questionnaire, the statistics of the questionnaire questions were calculated. SPSS 21 program was used while evaluating the results. The mean and standard deviation values of the variables were calculated using this program.

RESULTS

Delphi Tour

In this study, 132 experts were invited. Participation rate in the 1st round was 10.5% (n=14). 92.9% (n=13) of the specialists participating in this study were physiotherapists and 7.1% (n=1) were medical doctors. 78.5% of the experts (n=11) from Turkey, 14.2% (n=2) from Cyprus, 7.1% (n=1) were from Malta**.**

In this study, 10 of the 14 experts who participated in the 1st round responded to the questionnaire sent in the 2nd round. All of the experts were physiotherapists (n=10). 90% of the experts (n=9) from Turkey and; 10% (n=1) were from Cyprus. The flow diagram was given in Figure-1.

In both rounds, it was observed that the most commonly used method in the evaluation of obesity was BMI, and the most commonly used method in pain assessment was the Visual Analogue Scale (VAS). The rate of rehabilitation program duration was at most six weeks; the weekly frequency rate was at most three times a week. The exercise type was mostly aerobic- cycling, walking, strengthening-theraband, spinal stabilization exercises, and range of motion exercises. It was determined that the rate of exercise duration was 30-45 minutes at most. The participants' characteristics and results of the answers in the 1st and 2nd rounds are given in Tables 1, 2, 3 and 4.

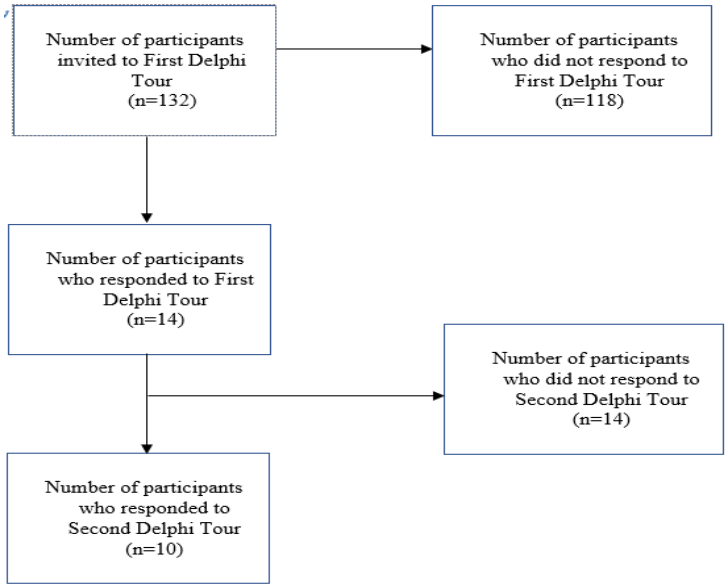

Figure 1: Flow Diagram

Table 1: Participant characteristics

		Round 1 (n=14)	**Round 2 (n=10)**
Status	Researcher	7 (50%)	5 (50%)
	Clinician	7 (50%)	5 (50%)
Job	Physiotherapist	13 (92.9%)	10 (100%)
	Doctor of medicine	1 (7.1%)	0
Country	Turkey	11 (78.5%)	9 (90%)
	Cyprus	2 (14.2%)	1 (11.1%)

	Malta	1 (7.1%)	0
Experience in treatment of overweight and obese adolescent or child	0-1 year	3 (21.4%)	1 (10%)
	2-3 years	3 (21.4%)	3 (30%)
	4-6 years	1 (7.1%)	0
	7-10 years	2 (14.3%)	2 (20%)
	More than 10 years	5 (35.7%)	4 (40%)

Table 2: Rating results

		Round 1 (n=14)	**Round 2 (n=10)**
Obesity assessment method	BMI (kg/m^2)	12 (85.7%)	7 (70%)
	Neck circumference (cm)	2 (14.3%)	1 (10%)
	Waist circumference (cm)	2 (14.3%)	1 (10%)
	Waist to hip ratio	4 (28.6%)	1 (10%)
	Percentile (%)	8 (57.1%)	4 (40%)
	Skinfold	4 (28.6%)	2 (20%)
	Bioimpedance	5 (35.7%)	5 (50%)
	Other (DEXA, BODY-POD)	1 (7.1%)	0
Musculoskeletal system complaints	Back pain	4 (28.6%)	4 (40%)
	Neck pain	2 (14.3%)	1 (10%)
	Low back pain	9 (64.3%)	6 (60%)
	Shoulder pain	1 (7.1%)	0
	Elbow pain	1 (7.1%)	1 (10%)
	Hand-wrist pain	1 (7.1%)	0
	Hip pain	3 (21.4%)	2 (20%)
	Knee pain	11 (78.6%)	8 (80%)
	Foot-ankle pain	3 (21.4%)	4 (40%)
	Muscle strength weakness	5 (35.7%)	2 (20%)
	Increased soft tissue injuries	2 (14.3%)	1 (10%)
Pain areas	Back pain	9 (64.3%)	3 (50%)
	Neck pain	4 (28.6%)	3 (50%)
	Low back pain	10 (71.4%)	7 (70%)
	Hip pain	3 (21.4%)	2 (20%)
	Knee pain	10 (71.4%)	10 (100%)
	Foot-ankle pain	4 (28.6%)	5 (50%)
Experience of pain	<3 months	3 (21.4%)	2 (20%)
	3-6 months	4 (28.6%)	2 (20%)

	6 months-1 year	4 (28.6%)	5 (50%)
	>1 years	2 (14.3%)	1 (10%)
	No specific time duration	1 (7.1%)	0
Assessments of pain intensity	VAS	11 (78.6%)	7 (100%)
	Faces Pain Scale	7 (50%)	2 (28.6%)
	NRS (0-10)	4 (28.6%)	2 (28.6%)
	Borg Scale	2 (14.3%)	0
	McGill Pain Questionnaire	3 (21.4%)	1 (14.3%)
Secondary systematic problems/diseases	Type 1 Diabetes Mellitus	5 (35.7%)	5 (50%)
	Type 2 Diabetes Mellitus	6 (42.9%)	3 (30%)
	Metabolic syndrome	5 (35.7%)	1 (10%)
	Anemia	1 (7.1%)	0
	Polycystic Over Syndrome	2 (14.3%)	1 (10%)
	Hypertension	3 (21.4%)	6 (60%)
	Sleep apnea	3 (21.4%)	1 (10%)
	Asthma	3 (21.4%)	2 (20%)
	COPD	1 (7.1%)	2 (20%)
	Gastrointestinal problems	6 (42.9%)	2 (20%)
	Depression	11 (78.6%)	7 (70%)
	Anxiety	5 (35.7%)	5 (50%)
	Hyperlipidemia	1 (7.1%)	0

(BMI), Body Mass Index (DEXA), Dual Energy X-ray Absorptiometry VAS:Visual Analog Scale (NRS), Numeric Rating Scale (COPD), Chronic Obstructive Pulmonary Disease

Table 3: Rehabilitation contents

		Round 1 (n=14)	**Round 2 (n=10)**
Duration of rehabilitation program	4 weeks	1 (7.1%)	1 (10%)
	6 weeks	5 (35.7%)	4 (40%)
	8 weeks	1 (7.1%)	1 (10%)
	10 weeks	2 (14.3%)	2 (20%)
	12 weeks	3 (21.4%)	1 (10%)
	6 months	2 (14.3%)	0
Aerobic exercise frequency	2 days	1 (7.1%)	0
	3 days	8 (57.1%)	5 (50%)
	4 days	1 (7.1%)	0
	5 days	1 (7.1%)	3 (30%)
	6 days	1 (7.1%)	1 (10%)
	7 days	2 (14.3%)	1 (10%)
Exercise type	Aerobic-arm ergometer	3 (21.4%)	2 (20%)

	Aerobic-bicycle	8 (57.1%)	5 (50%)
	Aerobic-treadmill	2 (14.3%)	2 (20%)
	Aerobic-walking	8 (57.1%)	8 (80%)
	Resistant-terabant	9 (64.3%)	6 (60%)
	Resistant-weights	3 (21.4%)	2 (20%)
	Diaphragmatic breathing exercises	2 (14.3%)	1 (10%)
	Spinal stabilization exercises	6 (42.9%)	7 (70%)
	Range of motion exercises	6 (42.9%)	4 (40%)
	Aerobic and resistant exercises	6 (42.9%)	3 (30%)
Exercise time	20 minutes	1 (7.1%)	0
	30 minutes	2 (14.3%)	3 (30%)
	30-45 minutes	7 (50%)	5 (50%)
	45-60 minutes	4 (28.6%)	2 (30%)
Frequency of resistant exercise	2 days	6 (42.9%)	1 (10%)
	3 days	6 (42.9%)	4 (40%)
	4 days	1 (7.1%)	0
	5 days	1 (7.1%)	3 (30%)
Rehabilitation program recommendations	Aerobic exercises	11 (78.6%)	6 (60%)
	Resistive strengthening exercises	4 (28.6%)	3 (30%)
	Spinal stabilization exercises	6 (42.9%)	8 (80%)
	Balance-coordination exercises	6 (42.9%)	1 (10%)
	Proprioceptive neuromuscular exercises	6 (42.9%)	0
	Stretching exercises	8 (57.1%)	6 (60%)
	Respiratory exercises	3 (21.4%)	1 (10%)
	Yoga	1 (7.1%)	0
	Pilates	3 (21.4%)	4 (40%)
	Basketball	1 (7.1%)	0
	Football	1 (7.1%)	0
	Isometric exercises	5 (35.7%)	4 (40%)
	Manual therapy	6 (42.9%)	5 (50%)
	Hot application	2 (14.3%)	2 (30%)
	Electrotherapy	4 (28.6%)	2 (30%)
	Classic masage	2 (14.3%)	1 (10%)
	Virtual reality applications	2 (14.3%)	2 (30%)
Check of compliance exercise	Accelerometer	2 (15.4%)	2 (30%)
	Pedometer	2 (15.4%)	1 (10%)

	Exercise diary	5 (38.5%)	3 (30%)
	Calling parent by phone	2 (15.4%)	3 (30%)
	Video call by phone	1 (7.7%)	0
	Face to face interview with the child	6 (46.2%)	6 (60%)
	Face to face interview with the child and family	8 (61.5%)	6 (60%)
	Metabolic holter	1 (7.7%)	0
Incorporate to exercises into environment	Basketball	5 (35.7%)	4 (40%)
	Football	7 (50%)	5 (50%)
	Gymnastics	4 (28.6%)	1 (10%)
	Daily routine with physical activity-daily go up-down the stairs	6 (42.9%)	3 (30%)
	Daily routine with physical activity-walking to school	9 (64.3%)	5 (50%)
	Daily routine with physical activity daily rides with music rhytm	4 (28.6%)	1 (10%)
	Bike	6 (42.9%)	3 (30%)
	Swimming	9 (64.3%)	8 (80%)
	Yoga	1 (7.1%)	1 (10%)
	Dance	4 (28.6%)	3 (30%)
Daily number of steps	10.000	9 (64.3%)	7 (70%)
	12.000	2 (14.3%)	3 (30%)
	15.000	2 (14.3%)	0
	Individual step goals	1 (7.1%)	0
Continue exercises after rehabilitation programme	<3 months	1 (7.1%)	1 (10%)
	3-6 months	3 (21.4%)	4 (40%)
	6 months-1 year	5 (35.7%)	1 (10%)
	>1 year	4 (28.6%)	3 (30%)
	Depends on the child and conditions	1 (7.1%)	1 (10%)

Table 4: Ratings of questionnaires or scales

		Round 1 (n=14)	**Round 2 (n=10)**
Quality of life	Sf-36	10 (76.9%)	5 (55.6%)
	Notthingham Health Profile	1 (7.7%)	1 (11.1%)
	Weight Related Symptom Measure	1 (7.7%)	1 (11.1%)
	Obesity And Weight Loss Quality Of Life	4 (30.8%)	3 (33.3%)
	PedsQL	1 (7.7%)	0
	More Specific Scales For Children	1 (7.7%)	1 (11.1%)

Sleep assessment	Pitssburg SleepQuality İndex	6 (60%)	4 (50%)
	Sleep Quality Scale	4 (40%)	4 (50%)
	Child Sleep Habits Questionnaire	2 (20%)	0
	Pediatric Sleep Scale	1 (10%)	1 (12.5%)
	Actiagraphy	1 (10%)	0
	Epworth Sleppiness Scale	1 (10%)	0
Psychological well-being	Beck Depression Scale	10 (83.3%)	8 (88.9%)
	Beck Anxiety Scale	5 (41.7%)	6 (66.7%)
	Beck Depression Scale 2	1 (8.3%)	1 (11.1%)
Body image- awareness	Body Shape Questionnaire	3 (30%)	5 (62.5%)
	Multidimensional Body-Self Relations Questionnaire	1 (10%)	0
	Body Image Assessment For Obesity	7 (70%)	3 (37.5%)
	Body Awareness Rating Questionnaire	1 (10%)	3 (37.5%)
Physical activity level	Heart Rate	7 (50%)	5 (55.6%)
	Doubly Labeled Water	1 (7.1%)	0
	Accelerometer	3 (21.4%)	2 (22.2%)
	Pedometer	3 (21.4%)	4 (44.4%)
	Direct Observation	1 (7.1%)	2 (22.2%)
	Diaries	6 (42.9%)	2 (22.2%)
	Surveys	3 (21.4%)	3 (33.3%)
	Metabolic Holter/Armband	1 (7.1%)	0
	MET	1 (7.1%)	0

SF-36:Short Form-36, PedsQL:Pediatric Quality of Life Inverntory, MET:Metabolic Equivalent of Task

DISCUSSION

This study, in which 132 participants were invited, included 14 participants in the first round and 10 participants in the second round. Looking at the results, the methods used in the assessment of obesity assessment methods, pain assessment methods, rehabilitation program content, exercise compliance, the recommended number of steps, quality of life, sleep, psychological well-being, body awareness, physical activity level vary and there is no common standard method. It has been observed that different methods are being used. In addition, 132 participants were invited and 14 participants answered the questions in the first round, suggesting that the number of researchers/clinicians working on spinal pain in children/adolescents with obesity/overweight is low and studies on this area are necessary.

When we look at the obesity assessment methods, the most commonly used methods are BMI and percentile. Tyson *et al*. stated that obesity diagnosis could be challenging in children, and BMI percentile charts are a widely used method in the assessment of obesity in children and adolescents. However, they added that the BMI method has limitations because it does not measure body adiposity directly and that methods, such as DEXA, hip ratio and skinfold, may yield good results in evaluating variables, such as fat ratio and skin fold [8]. In our study, methods, such as waist, waist-hip ratio, skinfold, and DEXA, were used less frequently. It is stated that BMI and percentile methods are frequently used in this population, and the increase in BMI is significant assessment method in increasing the risk of obesity [9]. However, it is seen that methods such as waist, waist-hip ratio, skinfold, and DEXA, may be significant in reaching more objective results by reflecting adipose tissue ratios by including them in the evaluation methods.

When examining the pain assessment methods, the most commonly used method was VAS, as well as the Facial Pain Assessment Scale, NRS, and the McGill Pain Questionnaire. Chambliss *et al*. stated that pain assessment in children is difficult concerning cognitive abilities, but VAS is an effective method for determining pain severity for the patient and the evaluator [10]. Newman *et al*. stated that children have more difficulty in understanding VAS compared to the "Facial Pain Assessment" scale, but both methods can be used in the assessment of pain intensity in children. However, pain expression may differ due to cognitive, cultural and ethnic differences in children on the facial pain assessment scale [11]. Hainsworth *et al*. evaluated spinal pain in children with obesity aged 5-12 years with the "Faces Pain Scale" and in the 13-18 age group with a "Numeric Rating Scale" [12]. Although different methods are used in the assessment of spinal pain in children/adolescents with obesity/overweight among researchers and clinicians, this study shows that the most frequently used methods are "VAS, Facies Pain Scale" and these methods are determined by age

groups and valid and reliable questionnaires are lacking in older age groups. This suggests that valid and reliable pain questionnaires can also be used with possible studies.

It has been observed that the areas where the pain is experienced are the waist, knee, back, neck, ankle and hip regions, in order. Although studies in the literature focus on lower extremity pain, this may be because the whole body pain is more in the lower extremity joints, and consequently, the pain is more intense in these joints [2,5,13-22]. However, given the role of the spine in growth and natural angulations, spinal region pain is one of the most significant pains in childhood posture, considering the rates in our study. The findings obtained in this study showed that the time to experience pain extends up to one year, and spinal pain became chronic in children/adolescents with obesity/overweight. Although studies on pain education in children/adolescents with obesity/overweight are not available in the literature, Eccleston *et al*. stated that pain and disability decreased after a 3-week cognitive-behavioral pain management program in 57 adolescents with chronic pain [23]. It is observed that spinal pain becomes chronic in children/adolescents with obesity/overweight, and we suggest that studies on pain education can be conducted.

Musculoskeletal problems accompanying obesity are knee pain, low back pain, back pain, foot-ankle pain, decrease in muscle strength, and systemic and cognitive problems accompanying obesity are mostly depression, anxiety, type 1 and type 2. Diabetes mellitus, gastrointestinal problems, hypertension and sleep apnea were reported. Hypertension, high cholesterol, diabetes mellitus, obstructive sleep apnea, asthma, depression, and fatigue are common in children/adolescents with obesity [24-26]. Our findings are consistent with the literature. Secondary systemic problems in childhood/adolescent obesity may cause these problems to continue and exacerbate also in adulthood [27,28]. Researchers and clinicians have a role in the prevention, evaluation and treatment of secondary problems accompanying obesity.

When the rehabilitation content was examined, the findings indicated that the rehabilitation program for spinal pain and obesity most frequently consisted of at least six weeks; it was reported that aerobic exercises (cycling, walking), strengthening exercises (theraband, weights), spinal stabilization exercises, aerobic and strengthening exercises were given together and range of motion exercises as exercise type. It was observed that the exercise duration was most frequently 30-45 minutes and 45-60 minutes, and the exercise frequency was chosen 2-3 days a week. Although there are no recommended exercise programs for spinal pain and obesity in the literature, when exercise programs for obesity in children/adolescents were examined, Park *et al*. reported that 30-minute aerobic and resistant (8-12 repetitions) exercise program provided improvement in cardiovascular parameters when applied for 12 weeks [29]. They also noted that three days a week, each session was between 30-60 minutes, a 12-week aerobic and resistant exercise program increased VO2max and decreased insulin resistance [30].

Gutin *et al*. stated that four months of aerobic exercise lasting 40 minutes five days a week reduced the percentage of fat by 4.1% in obese children aged 7-11 years [31]. Watts *et al*. determined that aerobic and resistant strengthening exercise program, which lasted for one hour, three days a week for eight weeks, increased functional capacity and muscle strength in children with obesity and decreased the percentage of fat, although there was no significant change in BMI [32]. In the meta- regression study of Stoner *et al*., 20 studies (aerobics, strengthening, resistant exercises, 2-5 days a week, 30-90 minutes varying) involving 1091 adolescent with obesity were examined, and the evidence on the dose of the exercise was low [33]. In the meta-analyzes study of Kelly *et al*., 835 children/adolescents with overweight/obesity recommended an exercise program of 16 weeks, four days a week for 43 minutes on average, and a 3% reduction in BMI Z score was found [34]. The results of the literature are similar to the results of our Delphi study, but it is understood from all this information that there is no clarity about the parameters of the exercise program. On the other hand, it is seen that there are no results regarding the evaluation of musculoskeletal problems, such as pain, strength, and posture. In the light of all this information, it is seen that studies on rehabilitation-exercise program parameters are needed in children/adolescents with obesity/overweight.

Although there are few studies in the literature in controlling exercise compliance, in the study of Sothern *et al*., a sign was asked to mark the exercise card if the compliance of children with obesity in terms of activity, duration and frequency to 10-week exercise was performed as indicated in the video [35]. All exercises were recorded during the exercise program period and 100% compliance was reported. However, exercise compliance between 11-52 weeks decreased by 33%. It has been stated that school, sports activities and family responsibilities make it difficult to adapt to exercise [35]. Apete *et al*. evaluated compliance with physical activity using an actiagraphy accelerometer in 252 children and reported that children with normal-weight showed an average of 35% more physically active adaptation than children with overweight/obesity [36]. The findings obtained in this study showed that the participants used face-to-face interviews with the child and the family, exercise diary, accelerometer, and pedometer phone calls to evaluate exercise compliance. Although there are few studies in the literature, the answers given by the participants showed that adaptation to the exercise are evaluated by communicating with the family and the child. Although the duration of continuing exercise after the rehabilitation program extends to one year or longer, it has been reported that this continuation depends on the child and the child's conditions. The recommended number of steps per day was reported between 10,000 and 15,000 in our study. Our results are consistent with the literature [37,38]. Although studies on the population we investigated are limited, it is recommended to take an average of 12,000 steps per day in children and adolescents [38].

When we look at the questionnaires or scales related to the quality of life, sleep, psychological state, body awareness, the physical activity level in the results of our study, SF-36, Obesity and Weight Loss Quality of Life, the Pediatric Quality of Life Inventory (PedsQL) as questionnaires in quality of life assessment; Pitssburgh Sleep Quality index and Sleep Quality Scale in sleep evaluation; Beck Depression Questionnaire and Beck Anxiety Scales in psychological state assessment; Body Shape Questionnaire, body image assessment for obesity, Body Awareness Rating Questionnaire in body awareness assessment; heart rate, pedometer, accelerometer, diaries, and direct observation methods were frequently used in physical activity level assessment. Although the questionnaires used in children/adolescents with obesity/overweight in the studies in the literature are similar to the questionnaires in our study, it is stated that the quality of life of children/adolescents with obesity/overweight decreased, their depressive symptoms increased, their body satisfaction decreased, they were physically inactive, and they had sleep problems. However, evaluation methods for this population are limited and it is recommended to study evaluation methods for this population [39-53].

This study has some limitations. First, few experts working on spinal pain in children/adolescents with overweight/obesity were reached. Thus, the number of participants in this study was small. Secondly, some of the participants who responded in the first round did not participate although a few reminder e-mail were sent to participate in the second round. The 14-day period between the two rounds might lead to not to be remembered, so the participants might not have participated in the second round. Finally, the majority of respondents were from Turkey. Thus, the findings mostly reflect the results of rehabilitation and assessment approaches in Turkey. Therefore, the results may not reflect clinical practice in all countries of the world.

As a result of the researchers' views on the evaluation and

rehabilitation approaches on spinal pain in children/adolescents with overweight/obesity, physiotherapy evaluations are significant in the search for a solution within the scope of rehabilitation for children with overweight/obesity. It has been concluded that it will contribute to the success of the program.

CONCLUSION

In this study, it is seen that different methods were used for the assessment and rehabilitation of spinal pain in children or adolescents with overweight or obesity, and there was no consensus. Delphi process provided sub-parameters for researchers and clinicians working in this population. The results can guide rehabilitation and evaluation for this population.

Conflicts of interest

The authors of this study have no conflicts of interest to report. The research team received no external funding for this study.

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