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BODY AWARENESS LEVEL OF PEDIATRIC PHYSIOTHERAPISTS AND ITS RELATIONSHIP WITH THEIR BODY STRUCTURE AND FUNCTIONS

ORIGINAL ARTICLE

ABSTRACT

Purpose: The physical and psychological loads that physiotherapists working in the field of pediatric rehabilitation are exposed to during therapy sessions can lead to limitations in body structure and functions that exceed the stress threshold. Examining the relationship of pediatric physiotherapists' body awareness with body structures and functions can reveal the effects of loads they are exposed to on their body-mind connection. This study aims to examine the relationship of body awareness of physiotherapists working in pediatric rehabilitation with their body structure and functions.

Method: The study included 100 pediatric physiotherapists. The participants' level of body awareness was assessed by the Body Awareness Questionnaire (BAQ). The exposed forces, mental functions and dynamic balance were evaluated using the Physiotherapist Occupational Injury Questionnaire (POIQ), the Warwick Mental Well-Being Scale (WEMWBS), and the Functional Reach Test (FRT), respectively. Trunk, upper extremity, chest cage flexibility were assessed and Body Mass Index (BMI) were also calculated.

Results: The participants had a mean age of 28.25±3.715 (min-max:23-41). A significant relationship was found between the levels of body awareness and mental well-being (r=0.217; p=0.003). The BAQ, BAQ-1 and BAQ-2 and WEMWBS scores were correlated (p<0.05). There were no relationships between body awareness and trunk, upper extremity, chest flexibility, dynamic balance, and BMI (p>0.05).

Conclusion: The levels of body awareness among pediatric physiotherapists, who work in a profession relying on both mental and physical strength, are directly associated with their mental well-being.

Keywords: Awareness, Balance, Body Mass Index, Flexibility, Physiotherapist.

PEDİATRİK FİZYOTERAPİSTLERİN VÜCUT FARKINDALIK DÜZEYLERİ VE VÜCUT YAPI VE FONKSİYONLARI İLE İLİŞKİSİ

ARAŞTIRMA MAKALESİ

ÖZ

Amaç: Pediatrik rehabilitasyon alanında çalışan fizyoterapistlerin terapi seansları sırasında maruz kaldıkları fiziksel ve ruhsal yükler vücut yapı ve fonksiyonlarında stres eşiğini aşan kısıtlılıklara yol açabilmektedir. Pediatrik fizyoterapistlerin vücut farkındalıklarının vücut yapıları ve fonksiyonları ile ilişkisini incelemek, maruz kaldıkları yüklerin vücut-zihin bağlantıları üzerindeki etkilerini ortaya çıkarabilir. Bu çalışma, pediatrik rehabilitasyonda çalışan fizyoterapistlerin vücut farkındalıklarının vücut yapıları ve fonksiyonları ile ilişkisini incelemeyi amaçlamıştır.

Yöntem: Çalışmaya 100 pediatrik fizyoterapist dahil edildi. Katılımcıların beden farkındalık düzeyleri Beden Farkındalığı Anketi ile değerlendirildi. Maruz kaldıkları kuvvetler, mental iyilik durumları ve dinamik denge durumları sırasıyla Fizyoterapistlerin Mesleki Yaralanma Anketi (FMYA), Warwick Mental İyi Oluş Ölçeği (WMİOÖ) ve Fonksiyonel Uzanma Testi ile değerlendirildi. Gövde, üst ekstremite, göğüs kafesi esneklikleri ölçüldü ve Vücut Kütle Indeksi (VKİ) de hesaplandı.

Sonuçlar: Katılımcıların yaş ortalaması 28,25±3,715 (min-maks:23-41) idi. Beden farkındalık düzeyleri ile mental iyilik hali arasında anlamlı ilişki bulundu (r=0,217; p=0,003). VFA alt boyutlarından VFA-1 ve VFA-2, WMİOÖ puanı ile ilişkiliydi (p<0,05). Beden farkındalığı ile gövde, üst ekstremite, göğüs esnekliği, dinamik denge ve VKİ arasında ilişki yoktu (p>0,05).

Tartışma: Hem mental hem de fiziksel güce dayalı bir meslekte çalışan pediatrik fizyoterapistlerde beden farkındalığı düzeyleri mental iyilik halleri ile doğrudan ilişkilidir.

Anahtar Kelimeler: Beden Kütle İndeksi, Denge, Esneklik, Farkındalık, Fizyoterapist.

INTRODUCTION

Physiotherapists working in the field of pediatric rehabilitation are experts in the evaluation, identification, diagnosis, and treatment of movement disorders and physiological problems. They carry out a comprehensive treatment process aimed at normalizing limitations caused by physical, mental, sensory, and cognitive problems occurring between the newborn and adolescent stages. The rehabilitation process typically continues throughout a child's life, focusing on orthopedics, congenital malformations, neurology, neuropsychiatry, respiratory, and premature conditions (1). Physiotherapists working in this field perform a series of activities that require physical and mental strength including lifting, transfer activities, direct contact with the patient, and manual approaches (2). It is a profession that is open to physical and mental injury due to professional responsibilities such as being in direct contact with the patient, prolonged exposure to certain positions, intense working conditions, direct communication with the child and family in solving the problems experienced by a disabled child, and multidisciplinary management of this process (3,4). It is important to evaluate the physical and mental states of physiotherapists working in the field of pediatric rehabilitation and to reveal its relationship with body awareness, which is a key concept in body-mind interaction, in defining the measures to be taken for occupational injuries.

Body awareness is the ability to perceive the physical and mental states occurring in one's body (5). It is provided through proprioceptive, interoceptive, exteroceptive, and vestibular sensory inputs. Thanks to these inputs, an individual forms a body image based on the feedback acquired about their body. Therefore, changes in the body's structure and functions can impact body awareness directly. The International Classification System of Functioning and Disability (ICF) evaluates body structures and functions as a whole with physical and mental components in a biopsychosocial framework (6).

Body awareness is related to body structures and functions due to its physical, emotional, and social dimensions. In ICF core sets, there are parameters related to flexibility, anthropometric evaluations, balance, and mental well-being in body structure and functions. Body awareness refers to the ability to evaluate various components, which can effectively protect and enhance the professional performance of physiotherapists, their interactions with patients, and their overall health. Also, these assessments can be beneficial in explaining body awareness when associated with personal factors such as occupation, injury history, and providing information about both physical and mental states. Studies examining the relationship between body awareness and these parameters are available in the literature (7,8); however, the effect in occupational branches has been examined very limitedly. It has been demonstrated that the injury management skills of dancers are related to body awareness (9). Occupational injuries and body awareness of physiotherapists have not been investigated deeply. Tekeli et al. examined the occupation-related musculoskeletal disorders of physiotherapists working in different fields and reported that this load was higher in physiotherapists working in pediatric rehabilitation than in other fields (4). In this respect, the working conditions of individuals and the differences in the physical and mental loads they are exposed to make it necessary to examine body awareness about occupation. This situation suggests that job-related differences, and physical and mental experiences may have different effects depending on occupations (10,11). Physiotherapists working in the field of pediatric rehabilitation may experience emotional exhaustion and burnout because they also work intensively with children's families. Studying the relationship between body awareness and structure and function may help physiotherapists to improve their stress coping skills, maintain emotional health, and provide better support to patients and their families.

The negative impact of occupational injuries on mental functions is too significant to be denied (12,13). It has been demonstrated that increasing body awareness reduces stress and burnout, and promotes positive attitudes in healthcare professionals (14,15). Mental impact also affects body structures. In this respect, the relationship between flexibility, balance, body mass index, and body awareness is an issue that needs to be evaluated

as a whole. On the other hand, revealing the physical effects of body awareness is very important in protecting the health of those engaged in professional processes. However, there is no study in the literature investigating body awareness specifically among physiotherapists working in pediatric rehabilitation. In this respect, the study has aimed to examine the relationship between body awareness levels of physiotherapists working in the field of pediatric rehabilitation and body mass index, balance, flexibility, muscle shortness, exposed forces, and mental well-being. The results of the study may also contribute to the development of training programs and interventions that will help physiotherapists working in the field of pediatric rehabilitation to improve body awareness and reduce work-related physical and emotional impact.

METHODS

The study is a descriptive research design and was conducted between April 2022 and January 2023. It was approved by Karadeniz Technical University Scientific Research Ethics Committee with the decision numbered 24237859-312 dated 29.04.2022.

A total of 100 volunteer pediatric physiotherapists (39 females and 61 males), aged between 23 and 50 years, with at least one year of experience in the field of pediatric rehabilitation, had not undergone surgery in the last year, were not pregnant, had no history of acute trauma, did not receive psychiatric treatment, and did not have an infectious and malignant tumoral disease, were included in the study. Participants were informed about the study before the evaluation and signed the informed consent form.

Sociodemographic characteristics (age, gender, years of experience, and the number of weekly session hours) were recorded. The Body Awareness Questionnaire (BAQ) was used to measure body awareness levels, a form adapted from the Physiotherapist Occupational Injury Questionnaire (POIQ) was used to determine the burdens physiotherapists are exposed to, the Functional Reach Test (FRT) was used to measure the relationship between body awareness and dynamic balance states from bodily processes, and Warwick Mental Well-Being Scale (WEMWBS) was used to evaluate the relationship between body awareness and mental well-being from mental functions. To determine the relationship between body awareness and body structure, trunk, upper extremity; rib cage flexibilities were measured. Body mass index (BMI) was calculated by dividing body weight by the square of height and grouped according to the World Health Organization Classification system. Below 18.5 kg/ m^2: Underweight, between 18.5 - 24.9 kg/ m^2: Normal weight, 25 - 29.9 kg/ m^2: Overweight, between 30 - 39.9 kg/m^2: Obese, over 40 kg/ m^2: Severely obese (morbidly obese)" (16).

Data Collection

Occupational Injury of the Physiotherapists: Since there is no reliable and validated questionnaire in Turkish, the type, area and frequency of the occupational injuries and exposed forces were assessed using a form adapted from the Physiotherapist Occupational Injury Questionnaire (POIQ) developed by Holder et al. in 1999 (10).

Body Awareness Questionnaire (BAQ): The 18-item questionnaire developed by Shields et al. in 1989 was developed to determine the level of normal or abnormal sensitivity. BAQ consists of 4 sub-dimensions. These are changes in body process (BAQ-1), sleep-wake cycle (BAQ-2), prediction of onset of illness (BAQ-3), and prediction of body reactions (BAQ-4), and each item is scored on a 7-point Likert scale. A higher total score indicates better body awareness. The Turkish validity and reliability of the scale were shown by Karaca and Bayar (2021) (17).

Warwick-Edinburg Mental Well-Being Scale (WEMWBS): The 14-itemed scale was developed by Tennant and colleagues in 2007 to measure spiritual well-being. The items are scored on a 5-point scale (1: strongly disagree, 2: disagree, 3: slightly disagree, 4: agree, 5: strongly disagree). The total score is between 14-70, where higher scores indicate better mental well-being. Turkish adaptation of the scale was performed by Keldal (18).

Physical Measurement Procedures

Flexibility is the ability of joints to move at large angles and increased flexibility is directly related to improved mobility and reduced risk of injury. Muscles that do not have sufficient flexibility can cause shortening and mechanical low back pain. Evalua-

tion of flexibility and shortness of upper extremity and thoracic muscles, which are frequently used in pediatric rehabilitation, is important in terms of injury risk (19). While flexibility can be considered as an element of static balance, dynamic balance refers to the ability to maintain body balance while in motion. Therefore, tests that assess dynamic balance, such as the Functional Reach Test, are important for pediatric physiotherapists to protect their occupational health and provide better service to patients.

Functional Reach Test (FRT): The test developed by Duncan et al. is widely used for dynamic balance assessment (13). The subject is asked to stand sideways on the wall with the shoulder 90 flexed, elbow extended, and fist closed without touching the wall with the arm on the wall side. The assessor marks the level of the 3rd metacarpal head on the wall. The person is asked to lie forward with feet steady while maintaining balance. The location of the 3rd metacarpal head is marked again. The distance between the first and last position is measured. The average of the last two trials is taken (19).

Trunk Flexion and Hamstring Length: The person stands on a block with a height of 15 cm. They attempt to touch their toes without bending their knees. Flexibility of the lumbar region, hamstring muscles, and gastrocnemius muscle are evaluated with the test. The distance between the fingertip and the wooden block surface is measured by using a tape, and values below the block surface are recorded as positive, while values above as negative in centimeters (16).

Trunk Hyperextension Flexibility: While the person stands facing the wall with the pelvis and torso in full contact with the wall, the distance between the wall and the sternal notch is measured. The pelvis is supported, and the trunk is asked to bend backward from the waist. The distance between the sternal notch and the wall is measured again, and by subtracting this value from the initial measurement, the extent of the movement is recorded in centimeters (16).

Trunk Lateral Flexion Flexibility: While the person is standing with arms straight next to the trunk, the 3rd fingertip projection on both sides is marked on the body. The test is repeated separately on both sides. First, it is asked to tilt the trunk to one side. The imprint of the third fingertip is marked, and the distance between the first imprint and this one is noted in centimeters. During the test, it is important not to lead to flexion, hyperextension, and rotation of the trunk (16).

Trunk Rotation Flexibility: The initial distance between the shoulder and the wall is measured while the person to be evaluated facing the wall and the pelvis is in full contact with the wall. While one shoulder and pelvis maintain contact with the wall, the distance of the other shoulder from the wall is measured and the initial value is subtracted from the final value and recorded in centimeters (16).

Thoracic Cage Flexibility: To assess thoracic cage flexibility, the difference in axillary, epigastric, and subcostal circumference is recorded with an inflexible tape measure while the person is standing upright on feet and arms abducted at maximal inspiration and maximal expiration (20).

Statistical Analysis

In the study, the collected data has been analyzed by using the IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp. Mean, standard deviation, frequency, and percentage values have been calculated by benefiting from the descriptive statistics. The Kolmogorov-Smirnov test was used to determine whether the data were normally distributed. Pearson's correlation analysis has been used to analyze the relationship between body awareness level and loads, anthropometric measurements, dynamic balance, and mental well-being for normally distributed data and Spearman's correlation analysis has been used for non-normally distributed data. For all data, $p<0.05$ has been accepted as a significance level.

To calculate sample size studies examining the relationship between body awareness and emotional state were taken as reference since there is no study in the literature examining the relationship between similar parameters in pediatric physiotherapists. A positive relationship was found between body awareness level (BAQ) score and emotional state (Beck Depression Inventory) in the study of Kalkışım et al. ($r = 0.127$, $p = 0.030$)

Table 1. Distribution of Sociodemographic Data

Variables	**n (%)**
Gender	
Female	39 (39)
Male	61 (61)
Body Mass Index Classification	
Underweight	3 (3)
Normal	64 (64)
Overweight	29(29)
Obese	4 (4)
Experience classification (years)	
1-5	36 (36)
5-10	10 (10)
More than 10	54 (54)
	Mean ± SD
Age	28.2 ± 3.7
Experience (years)	4.7 ± 3.2
BMI	23.68 ± 3.386
Height length (cm)	173.41 ± 9.360
Body weight (kg)	71.38 ± 14.034

BMI: Body Mass Index; cm: centimeter, kg: kilogram, n: Number; SD: Standard Deviation; %: Percent.

(21). A significant relationship was found between body awareness level and performance emotional states in athletes in a different study (r = .47, P < .01). For our study to be closest to the sample group and parameters, the study of Kalkışım et al. was taken as reference and it was predicted that there would be a relationship of around r = 0.30 between mental well-being and body awareness level G*power version 3.0.10 (Axel Buchner, Universität Kiel) was used for sample calculation. Correlation p H1: 0.5477 was calculated. In this case, it was calculated to be at least 37 people. However, since there were also sub-dimensions of the BAQ in the study, this number was determined as at least 100 people for a descriptive study.

Table 2. Distribution of Measured Data

Variables	**Mean ± SD**	**Min-Max**
Patient contact time (hours)	35.6 ± 10.7	6-60
Number of injuries (times)	2.4 ± 1.3	1-8
Number of injured sites	5.6 ± 2.4	1-8
BAQ	94.5 ± 14.5	52-124
BAQ-1	31.4 ±5.4	14-42
BAQ-2	36.5 ± 6.9	19-49
BAQ-3	34.0 ± 6.4	8-45
BAQ-4	20.4 ± 4.6	4-29
WEMWBS	50.3 ± 13.1	14-140
FRT	30.2 ± 9.3	11-49

BAQ: Body Awareness Questionnaire, BAQ-1: Attention to changes in body process and responses, BAQ-2: Prediction of body responses, BAQ-3: Awareness of sleep-wake cycle, BAQ-4: Prediction of illness onset, WEMWBS: Warwick Mental Well-Being Scale, FRT: Functional Reach Test, SD: Standard Deviation, Min: Minimum, Max: Maximum.

Table 3. Analysis of the Relationship between Body Awareness and Exposed Loads

Exposed powers	BAQ		BAQ-1		BAQ-2		BAQ-3		BAQ-4	
	r	p	r	p	r	p	r	p	r	p
Weight lifting	0.50	0.685	0.02	0.862	-0.10	0.396	0.02	0.865	-0.04	0.767
Staying in the same position for a long time	0.03	0.835	-0.10	0.396	-0.09	0.445	-0.02	0.849	-0.01	0.983
Manual Therapy	-0.01	0.921	-0.01	0.912	-0.15	0.220	-0.01	0.954	0.01	0.956
Repetitive Motion	0.12	0.328	0.04	0.714	-0.07	0.559	0.07	0.581	0.09	0465
Overhead Activities	0.01	0.914	-0.03	0.832	-0.01	0.929	-0.09	0.441	-0.01	0.936
Reach	0.05	0.671	-0.02	0.851	-0.09	0.423	-0.08	0.508	0.01	0.953
Climbing Stairs	0.06	0.594	0.05	0.680	0.06	0.605	0.12	0.311	0.09	0.452
Crouching	0.13	0.278	0.12	0.315	0.03	0.792	0.26	**0.032***	0.08	0.520
Walking	0.02	0.867	0.06	0.631	-0.03	0.834	0.14	0.245	0.04	0.764
Working in an unsuitable or confined space	0.06	0.621	-0.15	0.226	0.05	0.676	0.01	0.907	-0.06	0.615
Patient Transfer	0.09	0.479	-0.04	0.760	0.02	0.869	0.07	0.548	0.09	0.429
Number of body regions exposed to injury	0.06	0.611	0.01	0.964	-0.09	0.453	0.01	0.957	0.15	0.189
Patient contact time	0.04	0.650	0.09	0.360	0.18	0.063	0.2	0.120	0.08	0.416
Professional experience	0.10	0.303	0.08	0.408	0.11	0.253	0.031	0.760	0.07	0.471

BAQ: Body Awareness Questionnaire, BAQ-1: Attention to changes in body process and responses, BAQ-2: Prediction of body responses, BAQ-3: Awareness of sleep-wake cycle, BAQ-4: Prediction of illness onset.

RESULTS

The 39% of the participants were female and 61% were male, aged between 23-41 (min-max) years. Their professional experience ranged between 1-16 years. Nineteen percent of the participants had a musculoskeletal injury once in the last 2 years, 54% had a musculoskeletal injury more than once, and 27% had no injury at all. The injured body regions were distributed as in the follwing: only upper extremity (16%), only lower extremity (8%), spine (7%), both lower and upper extremity (4%), both lower extremity and spine (4%), both upper extremity and spine (41%), both lower and upper and spine (19%). Thirty two percent of those who had injuries consulted a doctor and 67.6% did not. The places where the injuries occurred were; 22.5% private hospitals, 5.6% state hospitals, 69% private education and rehabilitation centers, and 2.8% different environments. Sociodemographic data is shown in Table 1.

The average weekly patient contact time of the participants was 35.6±10.6 hours. The average injury frequency was 2.3±1.25 per two years. The average number of injured regions was 5.6±2.4. The distribution of measurement data related to patient contact time, number of injuries and number of injured sites is given in Table 2.

A very weak relationship was found between sleep-wake cycle awareness (BAQ-3) and crouching, one of the forces exposed (r=0.255; p=0.03). No correlation was found among exposed forces and other body awareness sub-dimensions (p>0.05) (Table 3).

The total score of the BAQ and sub-dimensions

Table 4. Analysis of the Relationship Between Body Awareness and Mental Well-Being

	BAQ		BAQ-1		BAQ-2		BAQ-3		BAQ-4	
	r	p	r	p	r	p	r	p	r	P
WEMWBS	0.27**	**0.030**	0.26**	**0.008**	0.29**	**0.040**	0.22*	0.280	0.74	0.465
FRT	-0.10	0,288	-0.05	0.608	-0.04	0.658	-0.18	0.067	-0.02	0.825

BAQ: Body Awareness Questionnaire, BAQ-1: Attention to changes in body process and responses, BAQ-2: Prediction of body responses, BAQ-3: Awareness of sleep-wake cycle, BAQ-4: Prediction of illness onset WEMWBS: Warwick Mental Well-Being Scale. FRT: Functional Reach Test.

Table 5. Analysis of the Relationships Between Body Awareness and BMI and Trunk Flexibility Measurements

Body Awareness	BAQ	
	r	p
BMI (kg/m²)	-0.04	0.663
Trunk flexion (thirty-flexion test) (°)	-0.04	0.715
Trunk hyperextension flexibility (°)	-0.07	0.488
Trunk lateral flexion flexibility right (°)	-0.02	0.856
Trunk lateral flexion flexibility left (°)	-0.03	0.752
Body rotation flexibility right (°)	-0.02	0.882
Flexibility of trunk rotation left (cm)	0.17	0.178
Thoracic Cage Flexibility (cm)		
Axillary (DI-DE) (cm)	-0.11	0.285
Subcostal (DI-DE) (cm)	0.01	0.922
Epigastric (DI-DE) (cm)	0.05	0.624

DI: Deep inspiration, DE: Deep expiration; BMI: Body Mass Index., cm: centimeter, kg: kilogram, (°): derece, BAQ: Body Awareness Questionnaire.

were not significantly correlated with the number of regions exposed to injury, patient contact time, and professional experience (p>0.05) (Table3).

A low-level significant correlation has been found between BAQ and WEMWBS total scores (r=0.217; p<0.05). In terms of sub-dimensions, the relationship between BAQ-1 (attention to changes in body process and responses), BAQ-2 (sleep-wake cycle) and WEMWBS was significant (p<0.05). No significant relationship was found between BAQ-3 (prediction of onset of illness) and BAQ-4 (prediction of body reactions) and WEMWBS scores (p>0.05) (Table 4).

The BAQ was not correlated with FRT (r=-0.107; p= 0.288), as well as with the areas exposed to injury (p>0.05) (Table 4).

There was no significant correlation between the BAQ and BMI, trunk flexibility, and thorax flexibility (p>0.05) (Table 5).

DISCUSSION

Body awareness is a key factor in explaining the mental effects of bodily processes. Since occupational exposure affects the body and mind negatively as a whole, it is important to reveal the relationship between body structure and functions and body awareness. In this study, it has been found that the body awareness levels of physiotherapists working in the pediatric rehabilitation field, where there is a high level of physical and mental workload, are associated more with mental well-being than physical parameters.

A limited number of studies have been found in the literature regarding the workload physiotherapists are exposed to. In the related literature, mostly physical injuries were examined. Salik et al. found that musculoskeletal injuries of physiotherapists were mostly in the waist, wrist, shoulder, and neck regions. The most common factor causing injury has been patient transfer (22). Vieira et al. reported manual therapy techniques as the most common factor causing injury in the waist, neck, and back regions (23). This condition has been found to have both the upper extremities and the spine being highly injured areas. This result has shown that physiotherapists working in the field of pediatric rehabilitation were mostly affected by the structures and functions in the upper extremities and spine. In addition, Iqbal et al. reported that the quality of life of physiotherapists decreased at a rate of %71 due to pain problems after they started their profession (24). In this study, the rate of suffering at least one injury within 2 years after starting the profession was found to be 19%, and the rate of suffering more than one injury was 57%. This result has shown that physiotherapists working in the field of pediatric rehabilitation are vulnerable to injury.

The amount of the exposed load varies according

to profession. A study conducted in Nigeria reported that musculoskeletal disorders were common among physiotherapists. It has been suggested that weightlifting, patient transfers, and manipulation are the methods that physiotherapists are frequently exposed to, and they cause these injuries (2, 25).

In this study, it has been determined that there was no relationship between body awareness levels and BMI of physiotherapists working in the field of pediatric rehabilitation. More studies are needed to discuss this relationship in different BMI groups. Tekeli et al. reported that the most common cause of injury in physiotherapists working with children was using flexion and rotation postures and staying in the same position for a long time (4). They also found that patient guidance transfer, repetitive motion, and staying in the same position for a long time to be the most common causes of injury in physiotherapists working in the field of pediatric rehabilitation. It has revealed that pediatric physiotherapists were exposed to challenging activities with high intensity. On the other hand, those who were frequently exposed to squatting activity were found to have higher body awareness in the sleep-wakefulness sub-dimension. It is related to the results of Vatansever et al. which revealed the relationship between physical activity level and body awareness (26).

The relationship between body awareness and anthropometry is one of the popular research areas. However, there has been no definite consensus in the literature. In the literature, the relationship between body awareness and BMI has been examined in a healthy population and there has been no definite consensus. Kalkışım et al. found that body awareness was not related to BMI in university students. They also found relationships between circumference measurements and sub-dimensions of body awareness level (21). Erden and Emirzeoğlu found a relationship between body awareness level and height (27). In a different study, no significant relationship was found between body awareness levels and age, anthropometric measurements, and body composition of adult individuals (28). Also in our study, there was no relationship between BMI and BAQ. The relationship between chest cage flexibility and body awareness was also not significant. This may be due to the low number of overweight and obese participants in this study. Our results have provided new data investigating the relationship between chest circumference measurements and body awareness. This study has contributed to the literature by providing data on the relationship between rib cage flexibility and body awareness in an area that has not been studied before. These data can form the basis for future research and help to understand the subject more deeply.

Mental and emotional states vary due to differences in working conditions (29,30). In one study, pediatric physiotherapists were found to have similar burnout levels although their working hours were lower than other occupational groups (psychologists and teachers) (31). In another study in which body awareness, physical activity, depression, and the quality of life of young adults were examined, it was found that participants with relatively high body awareness had fewer mood disorders (32). In a study conducted on athletes, a relationship was found between body awareness levels and emotional states (27). On the other hand, clinical studies show that body awareness affects emotional state. In a study conducted with the hypothesis that an increase in body awareness in patients with heart failure or after transplantation may help individuals recognize worsening heart failure symptoms earlier, no significant difference was found between age, gender, and treatment group in terms of body awareness. In addition, no significant relationship was found between body awareness and negative moods such as anxiety, depression, or anger (33). The relationship between body awareness and emotional state in different populations has been shown in a limited number of studies, but this relationship needs to be investigated in terms of occupational characteristics.

The relationship between body awareness and balance has been examined in the literature but it has not been implemented in different occupations. In another study which examined the relationship between body awareness and balance-related fall risk, body awareness of the group with low fall risk was found to be significantly higher than the others (8). In another study, no relationship was found between body awareness and balance in healthy individuals with different physical activity levels

(26). In this study, no relationship was found between dynamic balance and body awareness level. For the FRT, 15 cm and above indicates a low fall risk (19). In this study, the FRT (30.2 ± 9.3 cm) and BAQ scores (94.5 ± 14.5) of physiotherapists working in the field of pediatric rehabilitation were above the average. This may be due to the young mean age and low experience year in the profession of the study sample. Also, we think that the absence of this relationship could be related with the characteristic of the BAQ which does not include parameters related to balance and posture. It has been revealed that the body awareness levels of physiotherapists working in the pediatric rehabilitation field, a profession relying on mental and physical strength, are directly associated with their mental well-being. This result has shown that body awareness levels of pediatric physiotherapists are related to psychosocial functions rather than body structures such as BMI, upper extremity muscle shortness, trunk flexibility, and dynamic balance.

The study has two limitations. The first limitation is the insufficient number of participants in different BMI and professional experience groups. The relation of body awareness and occupational injury may vary according to different BMI and professional experience of the physiotherapists. The second limitation was that, the relationships between the parameters were examined statistically using only correlation analyses. In further studies, regression analysis methods can be used to examine causal relationships.

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