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ARAŞTIRMA / RESEARCH

Evaluation of Parental Anxiety and Depression Related to Clubfoot Deformity: Parental Concern about Their Child's Deformity

Clubfoot Deformitesine İlişkin Ebeveyn Kaygısı ve Depresyonunun Değerlendirilmesi: Ebeveynin Çocuklarının Deformitesi ile İlgili Endişesi

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Abstract

Objective: Having a child diagnosed with clubfoot and the anxiety about not being able to walk may have different effects on the mother and father. The present study aims to determine the anxiety and depression levels in parents of children with clubfoot before and after the child started walking and detect differences between mothers and fathers in terms of anxiety and depression.

Material and Methods: Parents of the children were administered the sociodemographic form, Beck Depression Inventory (BDI), and Beck Anxiety Inventory (BAI) before the first consultation (pre-consultation) and after the child started walking (post-consultation).

Results: Mothers' BAI and BDI scores (13.05±10.14, 11.26±8.75, respectively) were significantly higher than fathers (7.93±8.02, 7.32±6.45) in pre-consultation (p<0.010, p=0.010). At post-consultation, there was no significant difference between mothers and fathers for both BAI and BDI. Mothers' BAI and BDI scores were significantly lower post-consultation (6.73±6.18, 6.73±4.39 respectively) than pre-consultation (13.05±10.14, 11.26±8.75) (p<0.010, p=0.010). Fathers' anxiety and depression levels did not change post-consultation. There was a positive strong correlation between prenatal timing of diagnosis and post-consultation BAI scores of mothers (0.628, p=0.029).

Conclusion: Mothers may be more prone to anxiety and depression than fathers to clubfoot diagnosis. After the child starts walking, levels of anxiety and depression decrease in mothers of children with clubfoot. The anxiety of the mother increases with the delay in learning that there is a suspicion of clubfoot in prenatal terms.

Keywords: Congenital talipes equinovarus, congenital clubfoot, maternal psychological status, parents.

Özet

Amaç: Clubfoot (çarpık ayak) teşhisi ve çocuklarının yürüyememe ihtimalinin olması anne ve babalar üzerinde kaygı ve anksiyete açısından farklı etkilere neden olabilir. Bu çalışmanın amacı, clubfoot (çarpık ayak) deformitesi bulunan çocukların ebeveynlerinin çocukları yürümeye başlamadan önceki ve yürümeye başladıktan sonraki kaygı ve depresyon düzeylerini belirlemek ve anne ve babalar arasındaki kaygı ve depresyon farklılıklarını saptamaktır.

Gereç ve Yöntem: Ebeveynlere sosyodemografik bilgi formu, Beck Depresyon Ölçeği (BDÖ) ve Beck Anksiyete Ölçeği (BAÖ) ilk görüşmeden önce (konsültasyon öncesi) ve çocuk yürümeye başladıktan sonra (konsültasyon sonrası) uygulandı.

Bulgular: Ön görüşmede annelerin BAÖ ve BDÖ puanları (sırasıyla 13,05±10,14, 11,26±8,75) babalardan (7,93±8,02, 7,32±6,45) anlamlı derecede yüksekti (p<0,010, p=0,010). Konsültasyon sonrası anne ve babalar arasında hem BAE hem de BDE için anlamlı bir fark yoktu. Annelerin BAÖ ve BDÖ puanları konsültasyon sonrası (sırasıyla 6,73±6,18, 6,73±4,39) konsültasyon öncesine (13,05±10,14, 11,26±8,75) göre anlamlı derecede düşüktü (p<0,010, p=0,010). Babaların anksiyete ve depresyon düzeyleri konsültasyon sonrası değişmedi. Annelerin prenatal tanı zamanı ile konsültasyon sonrası BAÖ puanları arasında pozitif yönde güçlü bir korelasyon vardı (0,628, p=0,029).

Sonuç: Clubfoot deformitesi ile doğan çocukların anneleri, babalara göre kaygı ve depresyona daha yatkın olabilir. Clubfootlu çocukların annelerinde görülen kaygı ve depresyon düzeyleri çocuk yürümeye başladıktan sonra azalmaktadır. Doğum öncesi dönemde clubfoot şüphesinin olma ihtimali anne tarafıından ne kadar geç öğrenilirse annenin kaygısı o kadar artmaktadır.

Anahtar Kelimeler: Konjenital çarpık ayak, konjenital clubfoot, maternal psikolojik durum, ebeveynler.

1. Introduction

Clubfoot, also referred to as congenital talipes equinovarus, is a common musculoskeletal anomaly in which the muscle intervenes as a bone malformation, with a global incidence rate of 1 per 1000 live births despite minor geographical differences (1). The foot is in supination, adduction, and varus during standing position. Clubfoot develops early in pregnancy and is frequently discovered as early as 13 weeks (2). About 60% to 70% of the time, it is identified on the 18 to 20-week screening ultrasound, depending on geography and socioeconomic status (3, 4). Although clubfoot can be suspected before birth, the actual diagnosis is not determined until after the baby is born (5).

Chronic illness in childhood has important negative effects on a child's emotional well-being and child adjustment (6-8) but anxiety amongst parents of children with chronic diseases has been a focus of research in limited studies (9, 10). A child's chronic illness may also influence the parent's emotional well-being and overall adjustment (11, 12). Parents deal with not only the child's illness management and treatment plan, but also carry out their caregiver roles (11, 12). A meta-analytic review showed that caregivers of children with chronic illness have more parental stress when compared to caregivers of healthy children (11). Therefore, parents are at risk for psychological problems. A diagnosis of clubfoot might have a negative impact on the mother's and family's psychological well-being (13). According to Radler et al., mothers in the United States would like to know about their child's likely foot deformity during pregnancy (4). It is likely that having a prenatal suspicion of clubfoot, as well as the possibility of not being able to walk, would increase some of the anxiety and depression symptoms experienced by these parents. Considering that treatment success increases especially in cases such as positive communication methods used during treatment and satisfaction of the family from the treatment, the importance of anxiety and depression levels of families increases (14, 15).

In a study, the parents of children with clubfoot showed more stress and depressive symptoms when compared to the control group in their reaction to the birth of their babies (13). Furthermore, this study also implemented an intervention program providing informational and emotional support to these parents. It was reported that parents gave positive feedback about this intervention program. This result emphasized the importance of providing support for parents in hospitals and special clinics (6, 13, 16). Parents may also have worries about the child's ability to walk and the child's future motion. In a study that investigated parents' reactions to the treatment of clubfoot, although parents showed higher stress to the treatment plan, their stress decreased significantly during the treatment (17). There should be an important emphasis on educating parents about the good long-term results of treatment.

According to our clinical experience, having a child diagnosed with clubfoot and the possibility of not being able to walk may have different effects on the mother and father. To examine the anxiety and depression levels of the families in more detail, not only the mothers' but also the fathers' anxiety and depression levels should be examined.

The present study aims to determine the anxiety and depression levels in parents of children with clubfoot before and after the child started walking and detect differences between mothers and fathers in terms of anxiety and depression.

2. Materials and Methods

2.1. Study Design

This study was a prospective study. The institutional ethics board (Istanbul Medipol University, Non-Interventional Research Ethics Committee, Decision Number: 16.09.2021/957) approved the study, and consent forms were obtained from participants' parents in accordance with the Declaration of Helsinki.

2.2. Participants

Parents of newborns who presented to a private orthopedic outpatient clinic with the complaint of clubfoot and whose examination revealed no further orthopedic/neurologic pathology between October 2021 and January 2022 were included in the study. The inclusion criteria are as follows; 1- to get consulted for the first time with a pediatric orthopedic physician or counselor, 2- have a newborn diagnosed with clubfoot, 3- aged from 25 to 38 years old. Families were excluded if they met with an orthopedic provider in the newborn nursery or had multiple known congenital anomalies and if they had psychiatric diagnoses /psychiatric treatments. 65 parents were screened and informed about the study. 57 mothers and 47 fathers agreed to participate and filled out the forms. Parents of the newborns were administered the sociodemographic data collection form, Beck Depression Inventory (BDI), and Beck Anxiety Inventory (BAI). In the present study, the total scores were obtained. All the participant parents filled out the questionnaires before the first consultation (pre-consultation) and after the child started walking (post-consultation). Following the initial appointment, the parents were informed of their child's clubfoot deformity and that there is a potential that he or she may be able to walk normally like their peers. In addition, the families were taught physiotherapy treatments such as stretching and strengthening exercises (15). All the children in the study began to walk within developmental limits (Table 1). The flow chart is given in Figure 1.

2.3. Questionnaires

A sociodemographic data collection form was developed by the investigators to collect data related to the independent variables of the study. Age, gender, and birth rank of the child, the prenatal week that the child was diagnosed with clubfoot, the month of start walking of the child, parents' age, occupation, and education level.

BDI is a self-report inventory that consists of 21 questions. Each answer is scored on a scale value of 0 to 3, totaling up to 63 (18). The total score is graded as follows: 0-9 no/minimal depression, 10-16 mild depression, 17-29 moderate depression, 30-63 severe depression. The inventory is reliable and valid in the Turkish population (19).

BAI is a 21-item Likert-type scale to measure the anxiety (20). Each item is scored on a scale of 0 (not at all) to 3 (seriously affected). The total score is graded as follows: 0-7 minimal, 8-15 mild, 16-25 moderate, and 26-63 severe

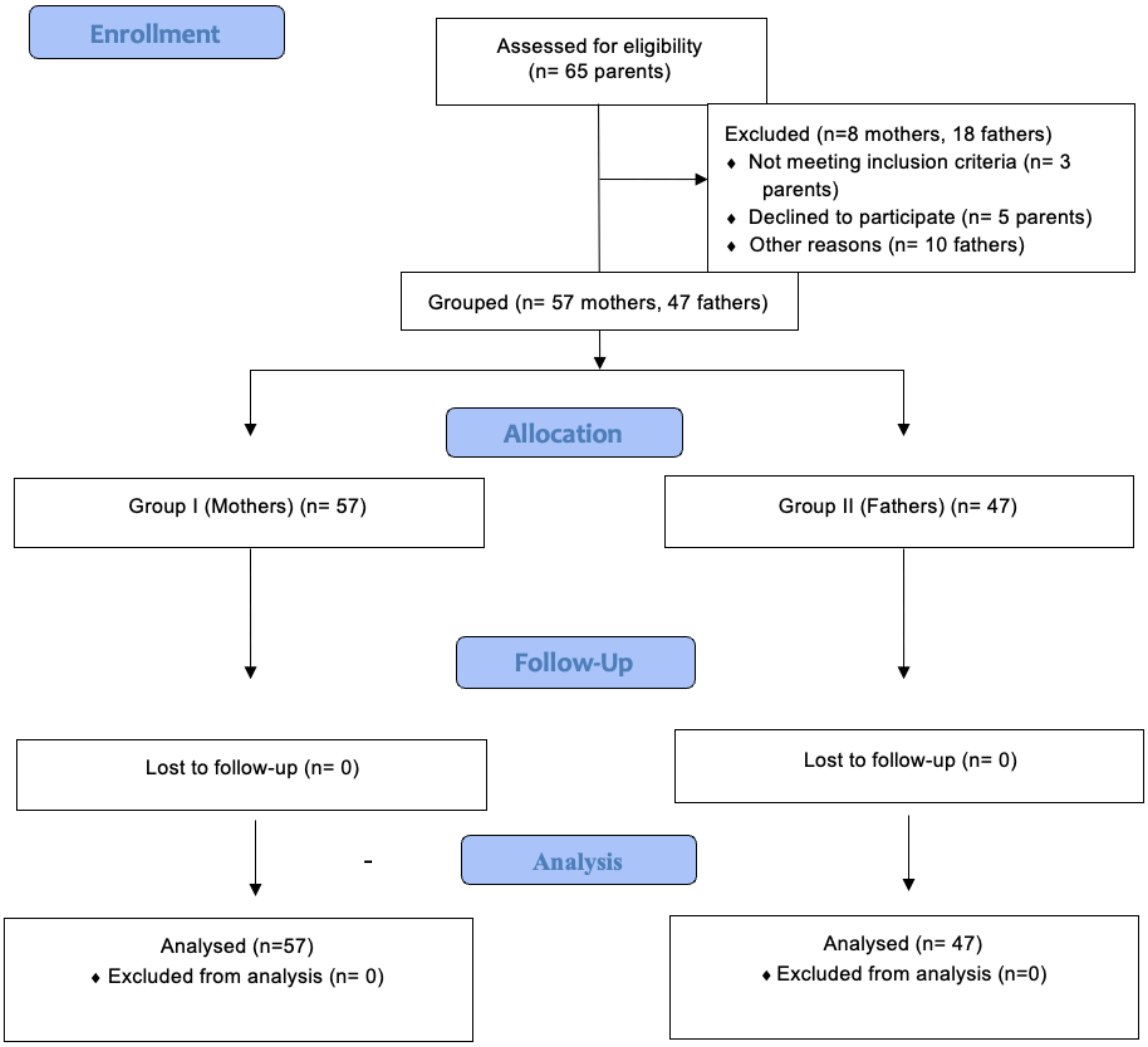

Figure 1. Flow diagram of the study.

anxiety. Turkish version of the inventory is reliable and valid to use (21).

2.4. Statistical Analysis

The normal distribution of continuous variables was assessed using the Shapiro-Wilk test. A paired sample t-test was used to compare the pre and post-consultation outcomes and a Student t-test was used to compare the mothers' and fathers' anxiety and depression outcomes. Pearson correlation was used for the correlation relations for normal distributed data. Correlation coefficient values were accepted as<0.3=low correlation, 0.31–0.70=moderate correlation, and>0.70=high correlation (22). Statistical analysis was performed with IBM SPSS Statistics for Windows, Version 21.0. A p value <0.05 was considered statistically significant. the G-Power version 3.1.9.2 to calculate the sample size. The sample size was calculated to include 90 individuals in total, 45 mothers and 45 fathers in each group, under the assumptions of d=0.5, α=0.05, and β=0.20 (23).

3. Results

AA total of 57 parents completed questionnaires. Most of the cohort (35/57, 61%) received prenatal consultation and learned of clubfoot anomaly suspicion, while 39% (22/57) found out at birth about their child's deformity. Demographic data are noted in Table 1.

When comparing the anxiety and depression levels of parents, BAI and BDI scores of mothers (13.05±10.14, 11.26±8.75 respectively) were significantly higher than fathers (7.93±8.02, 7.32±6.45 respectively) in pre-consultation examination (p<0.010, 0.010 respectively) (Table 2). In the post-consultation examination, there were no significant differences between mothers and fathers for both anxiety and depression levels.

When comparing the anxiety and depression levels of parents in pre- and post-consultation, mothers' BAI and BDI scores were significantly lower in post-consultation (6.73±6.18, 6.73±4.39 respectively) than in pre-consultation (13.05±10.14, 11.26±8.75 respectively) (p<0.010, 0.010 respectively). The fathers' anxiety and depression levels did not change at pre- and post-consultation (Table 2).

The change in the percentage of mothers and fathers

Table 1. Demographics of the Participants

Characteristics	Parents (n=57)
Who completed questionnaires (n)	
Both parents	47
Only Mother	10
Only Father	0
Age (years, mean ± SD)	
Mothers	28.05±3.28
Fathers	29.28±3.40
Education level (n)	
Mothers	
Secondary School	5
High School	23
University	29
Fathers	
Secondary School	11
High School	15
University	21
Occupation (n)	
Mothers	
Employee	22
Unemployed	35
Fathers	
Employee	47
Unemployed	0
Timing of diagnosis	
Prenatal (n)	35
Prenatal timing of diagnosis (weeks, mean ± SD)	20.6±2.2
At birth (n)	22
Child's gender (n)	
Male	45
Female	12
Month of start walking (months, mean ± SD)	13.8±0.7

Table 2. BDI, BAI Scores of the Parents

Variables	Mothers (n=57) mean ± SD	Fathers (n=47) mean ± SD	p values
First BAI	13.05±10.14[α]	7.93±8.02	**<0.001** *
Second BAI	6.73±6.18	6.41±6.92	0.90
First BDI	11.26±8.75[α]	7.32±6.45	**0.01** *
Second BDI	6.73±4.39	5.50±5.63	0.52

Abbreviations. BAI, Beck Anxiety Index; BDI, Beck Depression Index; SD, standard deviation.

α Statistically significant in comparison of the mothers' pre and post consultation scores, Paired sample T-test, p<0.05.

* Statistically significant in comparison of the mothers' and fathers' scores, Student T-test, p<0.05.

in each clinical subtype of the BDI and BAI pre and post-counseling was given in Figure 2.

There was a positive moderate correlation between prenatal timing of diagnosis and mothers' anxiety score in the post-consultation (r=0.628, p=0.029). The correlation between the outcomes, prenatal timing of diagnosis, and month of starting walking is shown in Table 3.

4. Discussion

In this study, the anxiety and depression levels of the parents in families with clubfoot anomaly were evaluated, and it was found that mothers were more prone to anxiety and depression than fathers and that the anxiety and depression scores of fathers did not change before and after the consultation. After the children started walking, levels of anxiety and depression decreased in mothers of children with clubfoot. In addition, it was observed that the anxiety of the mother in post-consultation positively strongly correlated with the delay of learning that there was a suspicion of clubfoot in prenatal terms.

The knowledge that a newborn child has a congenital abnormality can be extremely stressful for parents (24, 25). This anxiety can affect the mother of a newborn kid's psychological well-being, which can affect the bonding with that child (13). Previous studies have discussed how families must adjust to the loss of their "ideal child" and how this can be difficult to cope with (13). In this study, e-examination anxiety and depression levels of mothers were found to be significantly decreased after the child started walking. Previous studies (14, 15) have reported that there may be a relationship between the motivation level of the family and the success and satisfaction of clubfoot treatment. This situation will be remarkable in the future, in terms of problems that may be encountered in clubfoot treatment and the progress of the treatment with high motivation. Because the mother provides the baby's physical and psychological requirements through the prenatal and postnatal periods, these periods develop with a deep attachment. This may make the mother feel responsible for any physical deformity that the child may develop (13, 25).

To the best of our knowledge, there are limited studies in the literature assessing separately the anxiety and depression levels in mothers and fathers of children with the clubfoot diagnosis (26). Most studies on parental anxiety are conducted with other congenital anomalies both the mother and father as if they were one person (27, 28). Van Gampelaere et al. (29) investigated parental stress, anxiety, and trait mindfulness in parents of children diagnosed with type I diabetes and discovered that the outcomes were different for mothers and fathers. According to some research, mothers are more predisposed than fathers to congenital defects (30, 31). The distinction between mother and father suggests that different coping strategies and treatment progression should be used for the mother and father. Given that today's caregivers are largely mothers and fathers, and both parents spend more time with their children, it's critical to analyze both parents' impact status independently. While the anxiety and depression levels of the mothers were higher than the fathers' before

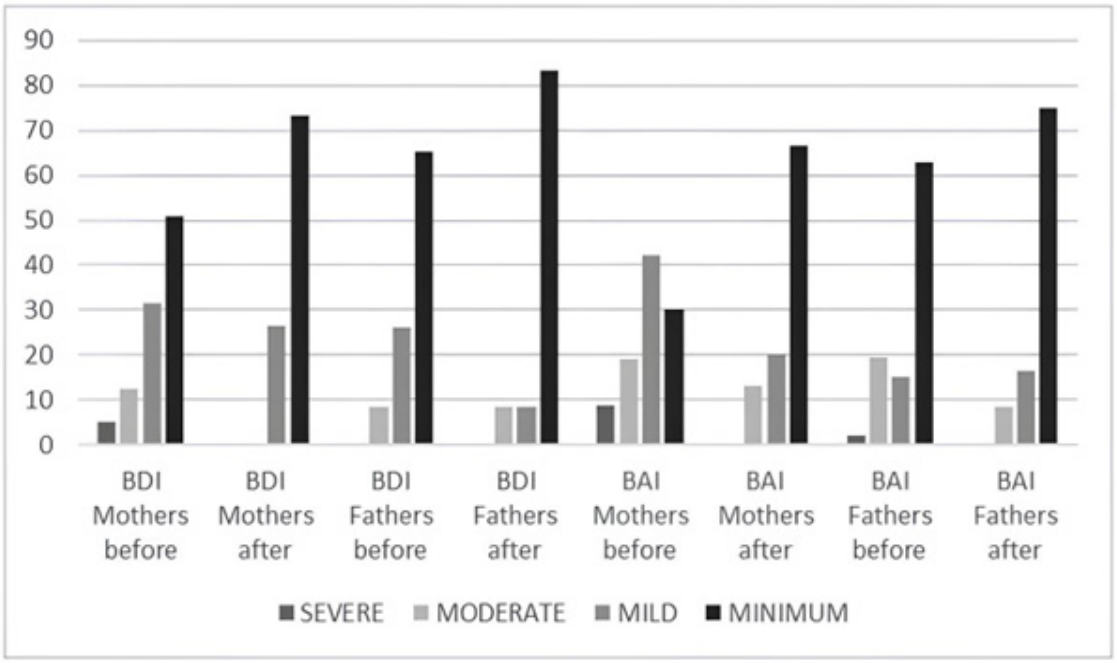

Figure 2. The Change of The Percentage of Mothers and Fathers in Each Clinical Subtype of The BDI And BAI Pre- and Post-Counseling

Abbreviations. BAI, Beck Anxiety Index; BDI, Beck Depression Index

Table 3. Relationship between the Outcomes, Prenatal Timing of Diagnosis and Month of Start Walking

	BeckA_M_ pre	**BeckD_M_ pre**	**BeckA_M_ post**	**BeckD_M_ post**	**BeckA_F_ pre**	**BeckD_F_ pre**	**BeckA_F_ post**	**BeckD_F_ post**	**Prenatal timing of diagnosis**
	r	***r***	***r***	***r***	***r***	***r***	***r***	***r***	***r***
	p	***p***	***p***	***p***	***p***	***p***	***p***	***p***	***p***
BeckD_M_pre	**.569**								
	<0.01								
BeckA_M_post	**.792**	.687							
	<0.01	.005							
BeckD_M_post	.066	.195	.420						
	.815	.487	.119						
BeckA_F_pre	.056	.087	-.040	-.195					
	.707	.562	.903	.543					
BeckD_F_pre	.169	.225	.211	-.063	**.575**				
	.257	.129	.511	.846	**<0.01**				
BeckA_F_post	.087	.361	.325	-.157	.438	.426			
	.788	.248	.329	.646	.178	.192			
BeckD_F_post	.107	.380	.475	.214	.594	**.744**	**.757**		
	.741	.223	.140	.527	.054	**.009**	**.004**		
Prenatal timing of diagnosis	.246	.259	**.628**	.034	-.047	.087	.010	.255	
	.160	.139	**.029**	.916	.802	.643	.979	.477	
Month of start walking	.314	.034	.063	-.130	-.345	-.490	-.381	-.504	-.311
	.219	.898	.837	.671	.248	.089	.248	.114	.301

the consultation, there was no difference between the depression and anxiety levels of the mothers and fathers after the child started walking due to the decreased anxiety and depression levels of the mothers in post-consultation. This shows the mothers are more concerned about their children's clubfoot deformity and the fathers are less affected by the situation. Therefore, the mothers' and fathers' depression and anxiety levels should be researched separately.

In a study comparing parental anxiety in families with suspected clubfoot prenatally versus families with children diagnosed with clubfoot at birth, it was discovered that knowing about the suspicion of clubfoot during the prenatal period did not affect anxiety levels (5). In this study, there was a positive strong correlation between prenatal timing of diagnosis and post-consultation anxiety levels of mothers. The earlier the possibility of clubfoot diagnosis in the prenatal term is discovered, the lower the anxiety level of the mothers following the child's start to walk. Since mothers who learn that there is a risk of clubfoot in the earlier period before birth are exposed to the psychological burden created by this information for a longer period, their anxiety levels may be reduced more with the relief experienced after the child starts walking. This situation once again underlined the importance of prenatal examination (3, 24).

Limitations of the study

This study has several limitations. The possible effects of the educational levels of the parents should be considered and included statistically. Both BDI and BAI scores may be affected by the severity of the deformity, therefore the classification of the clubfoot deformity should be considered for further studies. The vulnerability of the measurement tools by so many parameters out of the deformity of the child can be another limitation of this study.

5. Conclusion and Recommendations

As a conclusion, in our study, mothers experience more worry and despair as a result of having a child with clubfoot than fathers. Suspicion of clubfoot as early as feasible during pregnancy may help reduce mothers' anxiety. It is beneficial to know there is a high possibility for her child to walk for the mother in terms of decreasing anxiety and depression levels in the future and positive progress of the treatment.

6. Contribution to the Field

The fact that parents, especially mothers, know in advance that their children will be able to walk without experiencing abnormality at the end of the treatment may increase the participation and continuity of the treatment and increase the success of the treatment. For this reason, especially mothers should be informed about possible outcomes from the beginning of treatment in children with clubfoot deformity, and anxiety and depression levels should be reduced.

Ethical Aspect of the Research

The institutional ethics board (Istanbul Medipol University, Non-Interventional Research Ethics Committee, Decision Number: 16.09.2021/957) approved the study, and consent forms were obtained from participants' parents in accordance with the Declaration of Helsinki.

Conflict of Interest

The authors report no conflicts of interest.

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Author Contribution

Idea/Concept: GL, AB, DT; **Design:** GL, AB, ET, SG; **Control/Supervision:** AB; ET **Sources and Funding:** AB, DT, ET; **Materials:** GL, DT, SG; **Data Collection and/or Processing:** GL, AB, DT, SG; **Analysis and/or Interpretation:** GL, AB, DT, SG; **Literature Review:** GL, SG; **Writing the Article:** GL, DT, SG; **Critical Review:** GL, AB, DT, ET.

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