


# Evaluation of depression, anxiety, and stress status in parents of patient with congenital clubfoot treated with Ponseti method

## A prospective study

Mustafa Abdullah Özdemir, MD<sup>a,\*</sup> , Duran Topak, MD<sup>a</sup>, Celaledin Turgut, MD<sup>b</sup>, Mikail Telek, MD<sup>a</sup>, Fatih Doğar, MD<sup>a</sup>

### Abstract

Congenital diseases have been reported to increase the incidence of depression, anxiety, and stress among parents. In this study, we aimed to investigate the depression, anxiety, and stress status in parents of patients with congenital clubfoot before and after treatment with the Ponseti method. A total of 20 patients diagnosed with congenital clubfoot at our clinic and treated with the Ponseti method were included in this study. The Depression Anxiety Stress Scale-21 (DASS-21) was used to evaluate the depression, anxiety, and stress status of the parents before and after treatment. We considered the following parameters to investigate the effects of these on the parents: the educational level of the parents; economic status of the family; gender; birth order of the child in the family; time of diagnosis (prenatal or postnatal). The mean DASS and subdomain scores after treatment were significantly lower than those before treatment ( $P < .05$ ). Moreover, there was a significant difference in the pre- and posttreatment mean DASS and depression scores of the participants in terms of the education level ( $P < .05$ ). The pre- and posttreatment DASS and depression scores of the participants with an education level of primary school and below were lower than those of the participants with an education level of secondary and high school. Parents may be less concerned during this process if they are fully informed by the orthopedic surgeons about the treatment protocol and the near-perfect results of the Ponseti method as well as are counseled by healthcare professionals.

**Abbreviation:** DASS 21 = Depression Anxiety Stress Scale-21.

**Keywords:** congenital clubfoot, DASS-21, parents, Ponseti method

## 1. Introduction

Congenital clubfoot is one of the most prevalent musculoskeletal deformities that requires treatment, and its approximate incidence is 1–2 per 1000 live births.<sup>[1]</sup> This deformity can progress into adulthood, leading to adverse outcomes among patients if not treated at an early stage.<sup>[2]</sup>

Notably, treatment using the Ponseti method is considered the gold standard for congenital clubfoot.<sup>[3]</sup> The use of surgical treatment for this disorder has significantly decreased because of the success of this method.<sup>[4]</sup> However, treatment involving this method is a long-term and challenging process that requires hospital visits for several weeks.

Children's health is of great importance to parents and the healthcare system. Congenital diseases have been reported to

increase the incidence of depression, anxiety, and stress among parents.<sup>[5,6]</sup> Accepting the deformity during the neonatal period and coping with the long-term treatment of the disease can be psychosocially exhaustive for parents of children who are diagnosed with congenital clubfoot. Anxiety and stress can add to the burden on parents, affecting their quality of life and thereby their children's development.

There are a limited number of studies in the literature that have examined the psychological effects of the Ponseti method on children's parents and caregivers. In one of these studies, parents were asked to state their feelings about their child's foot deformity; another study examined the parents' stress and anxiety levels before and after treatment.<sup>[7,8]</sup> Unlike previous studies in the literature, the present study used the Depression Anxiety Stress Scale-21 (DASS-21). In the present study, we aimed to

The authors have no funding and conflicts of interest to disclose.

Written informed consent was obtained from all participants who participated in this study.

All data generated or analyzed during this study are included in this published article.

This study was approved by Kahramanmaraş University Faculty of Medicine Clinical Research Ethics Committee. (Session: 2020/05, Date: 04.03.2020, Decision No: 12).

<sup>a</sup> Kahramanmaraş Sutcu Imam University, Faculty of Medicine, Department of Orthopaedic and Traumatology, 46040, Kahramanmaraş, Turkey, <sup>b</sup> Kahramanmaraş Sutcu Imam University, Faculty of Medicine, Department of Psychiatry, 46040, Kahramanmaraş, Turkey.

\*Correspondence: Mustafa Abdullah Özdemir, Kahramanmaraş Sütçü İmam Üniversitesi Tıp Fakültesi Avşar Mahallesi Batı Çevreyolu Blv. No:251A,

46040-Onikişubat-Kahramanmaraş, Türkiye (e-mail: drmustafaazdemir46@gmail.com).

Copyright © 2022 the Author(s). Published by Wolters Kluwer Health, Inc. This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial License 4.0 (CCBY-NC), where it is permissible to download, share, remix, transform, and build up the work provided it is properly cited. The work cannot be used commercially without permission from the journal.

How to cite this article: Özdemir MA, Topak D, Turgut C, Telek M, Doğar F. Evaluation of depression, anxiety, and stress status in parents of patient with congenital clubfoot treated with Ponseti method: A prospective study. *Medicine* 2022;101:44(e31654).

Received: 7 July 2022 / Received in final form: 12 October 2022 / Accepted: 13 October 2022

<http://dx.doi.org/10.1097/MD.00000000000031654>

investigate the depression, anxiety, and stress status among parents of patients with congenital clubfoot before and after treatment with the Ponseti method.

investigate the effect of sociocultural levels on depression, anxiety, and stress status.

## 2. Methods

The parents of patients treated with the Ponseti method were enrolled in this study. This prospective study was approved by the Ethics Committee (Kahramanmaraş Sütcü Imam University, Faculty of Medicine Ethics Committee, No: 2020/12) on March 4, 2020. All participants were required to be from families with an appropriate sociocultural level to be able to complete a questionnaire, and they agreed to participate in the study. Patients with underlying neuromuscular diseases, those who required additional surgical intervention, those whose parents were not alive, those who did not comply with the standard Ponseti treatment method, and those who refused to participate were excluded from the study. Detailed consent was obtained from all participants. Parents of 20 patients diagnosed with congenital clubfoot at our clinic and treated with the Ponseti method were included in the study.

DASS-21 was used to determine the psychological effects of the Ponseti treatment method on the parents. We considered the following parameters to investigate the effects on the parents: education level of the parents; economic status of the family; gender; the birth order of the child in the family; and time of diagnosis (prenatal or postnatal).

DASS-21 is a reliable scale that is widely used to measure the symptoms of depression, anxiety, and stress among adults.<sup>[9,10]</sup> According to various clinical studies, this scale is highly sensitive.<sup>[11–13]</sup> It can be administered by a psychiatrist or a healthcare provider.<sup>[14]</sup> The Turkish version of DASS-21 has been reported to be effective and reliable in the literature.<sup>[15]</sup> Because of this reason and the easily applicable short format, DASS-21 was used in the present study.

DASS-21 comprises 3 self-report scales that assess depression, anxiety, and stress; moreover, there are 7 items in each scale. Participants were asked to respond to the questions by circling a number from 0 (does not apply to me at all) to 4 (applies to me very much or most of the time). Self-reported scores were calculated by totaling the obtained scores.

The first questionnaire was administered to all parents by a psychiatrist before the first casting procedure, which was conducted at the time of diagnosis and within the first 10 days after the birth of children for all patients. The casting procedure was performed on a weekly basis as per the standard Ponseti method. The cast was continuously used for 3 weeks; this was followed by percutaneous achilles tenotomy at week 5. A second questionnaire was administered to all parents by a psychiatrist after 3 months of the completion of the plaster casting treatment.

Parents were classified as those with primary school or lower and secondary school or higher education levels in order to

### 2.1. Statistical analyses

The Statistical Package for Social Sciences Version 25.0 software was used to analyze the data obtained during this study. Descriptive statistical methods (number, percentage, mean, standard deviation, minimum, median, and maximum) were used to evaluate the data. Furthermore, the hypothesis of normal distribution for the data was analyzed using the Kolmogorov–Smirnov test, and data homogeneity was evaluated using the Levene’s test. Parametric tests were used for normally distributed measurements. The independent sample *t* test (a parametric test) was used to compare the mean values of 2 independent groups to determine whether there was statistical evidence indicating that the associated population means were significantly different. In contrast, the paired samples *t* test was used to compare the means of 2 measurements obtained from the same individual, object, or related units. Notably, the paired samples *t* test is also a parametric test.

In this study, we observed that the scores the patients received based on DASS and its subdomains before and after treatment provided an assumption of normal distribution ( $P > .05$ ) in addition to indicating whether there was a statistically significant difference between the mean scores analyzed using the dependent sample *t* test. To determine the adequacy of the sample size used in this study, G. Power was calculated with a confidence level of 95% and  $\alpha = 0.05$  using the Power-3.1.9.2 program. Standardized effect sizes were calculated from 40 samples used in the study and 2 measurements. The obtained power levels were found to be  $> 80\%$ , and the number of samples used in the study was sufficient.

## 3. Results

Distributions in terms of the relevant variables used in the study are presented in Table 1. A review of the patient distribution revealed that 50% of the patients were women; 70% were the first child; 65% had primary school or lower level education; 42.5% had a household income equal to the minimum wage and 57.5% had a household income twice the minimum wage; and 80% were prenatally diagnosed with congenital clubfoot.

DASS-21 included the following 3 subdomains: depression, anxiety, and stress. We calculated the Cronbach’s alpha reliability coefficients for the internal consistency of the scale and its subdomains. Accordingly, the pretreatment Cronbach’s alpha reliability coefficients for the main scale and the depression, anxiety, and stress subdomains were 0.941, 0.811, 0.857, and 0.874, respectively, whereas after

**Table 1**  
Data of the study participants.

		N	%
Gender	Female	20	50.0
	Male	20	50.0
Birth order	First child	28	70.0
	Others	12	30.0
Educational level	Primary school or lower	26	65.0
	Secondary to high school	14	35.0
Economic status	Household income equal to the minimum wage	17	42.5
	Household income twice the minimum wage	23	57.5
Time of diagnosis	Diagnosed postnatally	32	80.0
	Diagnosed prenatally	8	20.0

**Table 2**  
Reliability of DASS and its subdomains.

	Number of survey items	Pretreatment Cronbach's $\alpha$	Posttreatment Cronbach's $\alpha$
DASS	21	0.941	0.879
Depression	7	0.811	0.619
Anxiety	7	0.857	0.712
Stress	7	0.874	0.738

DASS = Depression Anxiety Stress Scale.

**Table 3**  
Comparison analysis between pre- and posttreatment.

		(Pre- to post treatment)					
		$\bar{x}$	SD	$\bar{x}$	SD	<i>t</i>	<i>P</i>
DASS	Pretreatment	35.30	13.84	19.60	7.00	17.706	.000*
	Posttreatment	15.70	7.95				
Depression	Pretreatment	11.28	4.69	6.65	2.74	15.342	.000*
	Posttreatment	4.63	2.71				
Anxiety	Pretreatment	11.60	5.19	6.73	2.83	15.038	.000*
	Posttreatment	4.88	3.03				
Stress	Pretreatment	12.43	4.89	6.23	2.58	15.278	.000*
	Posttreatment	6.20	3.03				

*t*: Dependent sample *t* test statistic. DASS = Depression Anxiety Stress Scale.

\**P* < .05.

**Table 4**  
Comparison of DASS and subdomain scores in terms of gender pre- and posttreatment.

	Gender	<i>N</i>	Min	Max	$\bar{x}$	SD	<i>t</i>	<i>P</i>
DASS	Female	20	0.00	32.00	17.50	8.96	1.452	.155
	Male	20	1.00	23.00	13.90	6.53		
Depression	Female	20	0.00	11.00	5.20	3.11	1.359	.182
	Male	20	1.00	8.00	4.05	2.16		
Anxiety	Female	20	0.00	11.00	5.45	3.63	1.207	.237
	Male	20	0.00	7.00	4.30	2.23		
Stress	Female	20	0.00	12.00	6.85	3.13	1.371	.178
	Male	20	0.00	9.00	5.55	2.86		

*t*: Independent sample *t* test statistic. DASS = Depression Anxiety Stress Scale.

\**P* < .05.

treatment, these coefficients were 0.879, 0.619, 0.712, and 0.738, respectively (Table 2).

### 3.1. Pre- and posttreatment evaluation based on DASS-21

According to the results of the analysis, it was determined that there was a statistically significant difference between the mean scores of the parents before and after treatment in terms of DASS and its subdomain scores (*P* < .05). The mean DASS and subdomain scores after treatment were significantly lower than those before treatment (*P* < .05) (Table 3).

### 3.2. Evaluation in terms of gender

There was no significant difference in the pre- and posttreatment mean DASS and subdomain scores of the parents in terms of gender (*P* > .05) (Table 4).

### 3.3. Evaluation in terms of the patients' birth order in the family

There was no significant difference in the pre- and post-treatment mean DASS and subdomain scores of the parents in terms of birth order (*P* > .05).

### 3.4. Evaluation in terms of the parents' educational level

There was a significant difference in the pre- and posttreatment mean DASS and depression scores of the parents in terms of the education level (*P* < .05). The pre- and posttreatment DASS and depression scores of parents with primary school or lower education level were lower than those of parents with secondary and high school education levels (Table 5). There were no significant differences in the pre- and posttreatment mean DASS and mean anxiety and stress scores among parents in terms of their educational level (*P* > .05).

### 3.5. Evaluation in terms of economic status

There was no significant difference in the pre- and post-treatment mean DASS and subdomain scores of the parents in terms of economic status (*P* > .05).

### 3.6. Evaluation in terms of the time of diagnosis

There was no significant difference in the pre- and posttreatment mean DASS and subdomain scores of the parents in terms of the time of diagnosis (*P* > .05).

**Table 5**  
**Comparison of DASS and its subdomain scores in terms of the parents' level of education pre- and posttreatment.**

		Level of education	N	Min	Max	$\bar{x}$	SD	t	P
Pretreatment	DASS	Primary school and below	26	2.00	55.00	31.69	13.99	-2.376	.023*
		Secondary to high school	14	25.00	61.00	42.00	11.15		
	Depression	Primary school and below	26	1.00	16.00	9.73	4.03	-3.144	.003*
		Secondary to high school	14	7.00	20.00	14.14	4.61		
	Anxiety	Primary school and below	26	0.00	21.00	10.58	5.43	-1.744	.089
		Secondary to high school	14	6.00	20.00	13.50	4.24		
Stress	Primary school and below	26	0.00	19.00	11.38	5.22	-1.894	.066	
	Secondary to high school	14	8.00	21.00	14.36	3.61			
Posttreatment	DASS	Primary school and below	26	0.00	29.00	13.77	8.01	-2.193	.034*
		Secondary to high school	14	7.00	32.00	19.29	6.71		
	Depression	Primary school and below	26	0.00	9.00	3.92	2.48	-2.364	.023*
		Secondary to high school	14	2.00	11.00	5.93	2.70		
	Anxiety	Primary school and below	26	0.00	11.00	4.27	3.17	-1.769	.085
		Secondary to high school	14	1.00	11.00	6.00	2.48		
	Stress	Primary school and below	26	0.00	10.00	5.58	3.13	-1.824	.076
		Secondary to high school	14	3.00	12.00	7.36	2.56		

t: Independent sample t test statistic. DASS = Depression Anxiety Stress Scale.

\* $P < .05$ .

#### 4. Discussion

The results of the present study suggested that the presence of congenital clubfoot disease and the use of the Ponseti method are sources of depression, anxiety, and stress among parents, and the resulting psychological effects were alleviated after treatment. Parents with higher education levels were more likely to be affected during this process.

The incidence of congenital anomalies ranges between 2% and 4% in live-births.<sup>[16,17]</sup> A significant number of such anomalies can be prenatally diagnosed with the help of technological advancements and new screening methods. It is widely known that congenital anomalies are associated with psychological effects, including fear, stress, anger, and guilt, among the parents of affected children.<sup>[18,19]</sup> As previously reported, incidence of conflicts within the families and divorce may be higher among parents with chronically disabled children; therefore, it is important to identify and resolve the psychological problems faced by the parents to ensure the physical and mental development of the children.<sup>[20]</sup> The results of the present study indicate that congenital clubfoot disease and the Ponseti method are associated with elevated levels of depression, anxiety, and stress among such parents. There was a significant decrease in the psychological effects experienced by the parents after treatment.

To the best of our knowledge, no study has examined the education level of the parents and the economic status of the family to determine the effects of congenital clubfoot disease and the Ponseti method. The present study indicated that this method was more likely to be associated with depression in parents with higher levels of education. This could be attributable to the fact that as the level of education increases, the sense of responsibility and awareness increases. Regarding the economic status, there was no significant difference between depression, anxiety, and stress levels experienced by high- and low-income families. Previous studies have reported that congenital diseases are associated with financial difficulties in parents,<sup>[21,22]</sup> and this finding is consistent with the results of the present study. The fact that the healthcare system in Turkey covers all treatment costs may have led to the difference between the results of the present study and the literature.

Some studies suggest that mothers are more affected by congenital anomalies than fathers.<sup>[23,24]</sup> Similarly, in the present study, mothers experienced higher levels of depression, anxiety, and stress than fathers; however, this difference was not statistically significant. The factors underlying this result include the physical and anxiety-related changes experienced by mothers during the transition to parenthood, greater role of mothers in

children's development than fathers, and greater role of fathers in business life in addition to their relatively lower involvement in childcare.

Various studies have explored the effect of the time of diagnosis (prenatal or postnatal) of congenital diseases on parents. Brosig et al compared the parents of children diagnosed with a congenital heart defect before birth to those of children diagnosed after birth. Parents who were prenatally informed about the disease reported higher distress levels after 6 months of diagnosis.<sup>[25]</sup> Another study reported that the time of diagnosis of congenital anomalies was not associated with any difference in the psychological stress levels of the parents.<sup>[26]</sup> Hoehn et al investigated the effects of the time of diagnosis of congenital heart disease on fathers; the fathers who were prenatally informed about the disease experienced less distress compared to those who were informed postnatally.<sup>[27]</sup> There is no consensus in the literature on this subject. Although there was no statistically significant difference between parents regarding the time of diagnosis in the present study, those who were informed about the disease prenatally reported higher levels of depression, anxiety, and stress. The lack of statistically significant results may be related to the limited number of participants in the study.

Studies in the relevant literature have revealed that parents of children with congenital diseases needed medical information and psychological support. Prenatal counseling may help decrease the levels of anxiety among such parents.<sup>[28]</sup> Moreover, multidisciplinary counseling by healthcare professionals may help decrease the parental anxiety.<sup>[29]</sup> Studies on the timing of counseling reported that most parents preferred to receive counseling immediately after diagnosis.<sup>[30–32]</sup>

Although the present study was designed as a prospective study, the lack of a control group with parents of healthy children and the limited number of participants were the main limitations of the study. Moreover, although the study examined the effects of the Ponseti method, treating congenital clubfoot disease is a long-term process. Large-scale studies examining the changing psychological effects on parents in the later years of treatment could further contribute to the literature.

According to the study results, congenital clubfoot disease and the Ponseti method are probably associated with depression, anxiety, and stress in parents and may further adversely affect the physical and psychological development of the child. Parents with higher education levels are more likely to be affected in such conditions. Parents may be less concerned during this process if they are fully informed by the orthopedic surgeons about



the treatment protocol and the near-perfect results of the Ponseti method as well as are counseled by healthcare professionals.

## Acknowledgments

The authors would like to thank Enago ([www.enago.com](http://www.enago.com)) for the English language review.

## Author contributions

All the authors declare that they participated in the design, execution, and analysis of the paper, and that they approved the final version.

**Conceptualization:** Duran Topak.

**Data curation:** Mustafa Abdullah Özdemir, Duran Topak.

**Formal analysis:** Mustafa Abdullah Özdemir, Duran Topak, Fatih Dogar.

**Funding acquisition:** Duran Topak, Fatih Dogar.

**Investigation:** Celeleddin Turgut.

**Methodology:** Celeleddin Turgut.

**Project administration:** Celeleddin Turgut, Mikail Telek.

**Resources:** Mikail Telek, Celeleddin Turgut, Fatih Dogar.

**Software:** Celeleddin Turgut, Mikail Telek, Fatih Dogar.

**Supervision:** Fatih Dogar.

**Visualization:** Mikail Telek.

**Writing—original draft:** Mustafa Abdullah Özdemir.

**Writing—review and editing:** Fatih Dogar.

## References

- [1] Wynne-Davies R, Littlejohn A, Gormley J. Aetiology and interrelationship of some common skeletal deformities. (talipes equinovarus and calcaneovalgus, metatarsus varus, congenital dislocation of the hip, and infantile idiopathic scoliosis). *J Med Genet.* 1982;19:321–8.
- [2] Fan H, Liu Y, Zhao L, et al. The correlation of Pirani and Dimeglio scoring systems for Ponseti management at different levels of deformity severity. *Sci Rep.* 2017;7:14578.
- [3] Shabtai L, Specht SC, Herzenberg JE. Worldwide spread of the Ponseti method for clubfoot. *World J Orthop.* 2014;5:585–90.
- [4] Zions LE, Zhao G, Hitchcock K, et al. Has the rate of extensive surgery to treat idiopathic clubfoot declined in the United States? *J Bone Joint Surg Am.* 2010;92:882–9.
- [5] Juniper EF, Guyatt GH, Feeny DH, et al. Measuring quality of life in children with asthma. *Qual Life Res.* 1996;5:35–46.
- [6] Tak YR, McCubbin M. Family stress, perceived social support and coping following the diagnosis of a child's congenital heart disease. *J Adv Nurs.* 2002;39:190–8.
- [7] Roye BD, Vitale MG, Gelijs AC, et al. Patient-based outcomes after clubfoot surgery. *J Pediatr Orthop.* 2001;21:42–9.
- [8] Walter C, Sachsenmaier S, Wünschel M, et al. Clubfoot treatment with Ponseti method—parental distress during plaster casting. *J Orthop Surg Res.* 2020;15:271.
- [9] Evans L, Haerberlein K, Chang A, et al. Convergent validity and preliminary cut-off scores for the Anxiety and Depression subscales of the DASS-21 in US adolescents. *Child Psychiatry Hum Dev.* 2021;52:579–85.
- [10] Crawford JR, Henry JD. The Depression Anxiety Stress Scales (DASS): normative data and latent structure in a large non-clinical sample. *Br J Clin Psychol.* 2003;42:111–31.
- [11] Ronk FR, Korman JR, Hooke GR, et al. Assessing clinical significance of treatment outcomes using the DASS-21. *Psychol Assess.* 2013;25:1103–10.
- [12] Ng F, Trauer T, Dodd S, Callaly T, et al. The validity of the 21-item version of the Depression Anxiety Stress Scales as a routine clinical outcome measure. *Acta Neuropsychiatr.* 2007;19:304–10.
- [13] Wood BM, Nicholas MK, Blyth F, et al. The utility of the short version of the Depression Anxiety Stress Scales (DASS-21) in elderly patients with persistent pain: does age make a difference? *Pain Med.* 2010;11:1780–90.
- [14] Allen J, Annells M. A literature review of the application of the Geriatric Depression Scale, Depression Anxiety Stress Scales and post-traumatic Stress Disorder Checklist to community nursing cohorts. *J Clin Nurs.* 2009;18:949–59.
- [15] Yıldırım A, Boysan M, Kefeli MC. Psychometric properties of the Turkish version of the Depression Anxiety Stress Scale-21 (DASS-21). *Br J Guid Coun.* 2018;46:582–95.
- [16] Mcphee SC. Home to hospital transfer: concerns of women in rural NSW who plan a homebirth. Australia: Monash University; 2015.
- [17] Abeywardana S, Sullivan EA. Congenital anomalies in Australia 2002–2003. AIHW National Perinatal Statistics Unit; 2008.
- [18] Hearsby SJ, McCarthy MC, Muscara F, et al. Psychosocial risk in families of infants undergoing surgery for a serious congenital heart disease. *Cardiol Young.* 2014;24:632–9.
- [19] Skari H, Malt UF, Bjornland K, et al. Prenatal diagnosis of congenital malformations and parental psychological distress—a prospective longitudinal cohort study: prenatal diagnosis of anomalies and psychological distress. *Prenat Diagn.* 2006;26:1001–9.
- [20] Risdal D, Singer GHS. Marital adjustment in parents of children with disabilities: a historical review and meta-analysis. *Res Pract Pers Sev Disabil.* 2004;29:95–103.
- [21] Wallace V, Honkalampi K, Sheils E. Anxiety and depression in parents of children born with esophageal atresia: an international online survey study. *J Pediatr Nurs.* 2021;60:77–82.
- [22] Raj M, Paul M, Sudhakar A, et al. Micro-economic impact of congenital heart surgery: results of a prospective study from a limited-resource setting. *PLoS One.* 2015;10:e0131348.
- [23] BaileyDE Jr, Landerman L, Barroso J, et al. Uncertainty, symptoms, and quality of life in persons with chronic hepatitis C. *Psychosomatics.* 2009;50:138–46.
- [24] Skari H, Skreden M, Malt UF, et al. Comparative levels of psychological distress, stress symptoms, depression and anxiety after childbirth—a prospective population-based study of mothers and fathers. *BJOG.* 2002;109:1154–63.
- [25] Bevilacqua F, Palatta S, Mirante N, et al. Birth of a child with congenital heart disease: emotional reactions of mothers and fathers according to time of diagnosis. *J Matern Fetal Neonatal Med.* 2013;26:1249–53.
- [26] Fonseca A, Nazaré B, Canavarro MC. Parental psychological distress and quality of life after a prenatal or postnatal diagnosis of congenital anomaly: a controlled comparison study with parents of healthy infants. *Disabil Health J.* 2012;5:67–74.
- [27] Hoehn KS, Wernovsky G, Rychik J, et al. Parental decision-making in congenital heart disease. *Cardiol Young.* 2004;14:309–14.
- [28] Marokakis S, Kasparian NA, Kennedy SE. Prenatal counselling for congenital anomalies: a systematic review. *Prenat Diagn.* 2016;36:662–71.
- [29] Aite L, Trucchi A, Nahom A, et al. Multidisciplinary management of fetal surgical anomalies: the impact on maternal anxiety. *Eur J Pediatr Surg.* 2002;12:90–4.
- [30] Alkazaleh F, Thomas M, Grebenyuk J, et al. What women want: women's preferences of caregiver behavior when prenatal sonography findings are abnormal. *Ultrasound Obstet Gynecol.* 2004;23:56–62.
- [31] Asplin N, Wessel H, Marions L, et al. Pregnant women's experiences, needs, and preferences regarding information about malformations detected by ultrasound scan. *Sex Reprod Healthc.* 2012;3:73–8.
- [32] Lalor JG, Devane D, Begley CM. Unexpected diagnosis of fetal abnormality: women's encounters with caregivers. *Birth.* 2007;34:80–8.