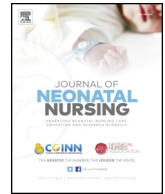




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## Original Article

## Assessing anxiety and depression in parents of preterm infants

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## ABSTRACT

**Purpose:** To measure state and trait anxiety, as well as depression, among parents of preterm infants hospitalized in neonatal intensive care units (NICUs).**Design:** A convenience sample of 200 parents of preterm infants (124 mothers and 76 fathers) hospitalized in two Greek pediatric hospital NICUs participated in the study.**Results:** Among the 200 participating parents, mothers (which constituted 62% of the total sample) experienced higher levels of state anxiety, trait anxiety and depression than the fathers ( $p = 0.04$ ,  $p < 0.001$  and  $p = 0.001$ , respectively). State anxiety scores were also higher in individuals aged  $\geq 40$  years ( $p = 0.038$ ). Other factors that contributed to higher levels of state anxiety, trait anxiety and depression included being unemployed, living in rural areas and having complications during pregnancy.**Conclusion:** The severity of state anxiety, trait anxiety and depression among parents of preterm infants hospitalized in NICUs is influenced by various socio-demographic factors and by clinical characteristics of the infants.

## Introduction

Parents experience heightened anxiety and depression following the birth of a preterm infant (Pace et al., 2016). Recent studies have shown that the number of preterm births is increasing, a trend that can be attributed to several causes, including maternal and fetal medical conditions, environmental exposures, infertility treatments, as well as socioeconomic and behavioral factors (Romero et al., 2014).

A preterm infant's hospitalization in a neonatal intensive care unit (NICU) can be a period of great distress. Stressful factors that may aggravate the parents' pre-existing anxiety include the infant's altered appearance and behavior, unfamiliarity with the medical jargon and complex medical technology used by healthcare professionals, the uncertainty of their infant's survival (Romero et al., 2014) and the loss of their parental role (Alkozei et al., 2014). Under these circumstances, parents, especially mothers, can experience a range of negative emotional reactions, including sorrow, fear, grief, disappointment, anger and helplessness. There is also a risk of long-term psychological problems, including depression, anxiety, feelings of isolation and fear for the infant's future well-being (Howe et al., 2014).

Parents should be encouraged early on to express any feelings of guilt, anxiety, inadequacy or anger and ask for help. This will give them

time to address these negative emotions, understand that they are normal reactions, experienced by most parents, and ultimately help them adjust to the situation and accept their infant (Perry et al., 2013).

## Methods

The present study was carried out in the NICUs of two public Greek pediatric hospitals ('H Agia Sophia' and 'Panagiotis and Aglaia Kyriakou'). The study sample consisted of 200 parents of preterm infants (born before 36 weeks of gestation) hospitalized in the aforementioned NICUs. Parents with an inadequate knowledge of the Greek language or a medical history of significant mood disorders were excluded from the study. Parents were asked to give their informed consent and then completed the study questionnaire. Before the initiation of the study, its protocol was approved by the Ethics Committees of both hospitals.

All parents completed the State-Trait Anxiety Inventory for adults (STAI) self evaluation questionnaire, that quantifies temporary state anxiety and longstanding trait anxiety (Spielberger et al., 1970), as well as the Zung Self-Rating Depression Scale (SDS) questionnaire, which measures depression (Zung, 1967). Besides these psychometric instruments, various socio-economic characteristics of the parents and

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clinical characteristics of the infant were recorded.

#### Description of the psychometric instruments employed

Ch. Spielberger's **State-Trait Anxiety Inventory for adults (STAI)** is a well-established instrument that **measures anxiety** in adults. STAI can distinguish between temporary (state) anxiety, and enduring and more generalized (trait) anxiety, helping researchers differentiate anxiety from depressive syndromes.

STAI comprises of 40 questions which mainly assess feelings of unease, worry, tension, and stress. The questions are equally divided into positive and negative expressions of emotion. Every item is answered on a Likert-type four point rating scale, which for state anxiety measures intensity (not at all, somewhat, moderately so, very much so) and for trait anxiety measures frequency (almost never, sometimes, often, almost always). The total (state and trait) anxiety score is calculated by adding the points awarded for each item and ranges from 20 to 80. Each participant can be assigned to one of four categories of anxiety severity, according to his/her total score. Specifically, a score less than 40 is considered normal (no anxiety), 40–47 is considered mild anxiety, 48–55 is considered moderate anxiety and a score over 55 is considered severe anxiety.

Depression was assessed using the **Zung Self-Rating Depression Scale (SDS)**, which comprises of 20 self-report questions and is widely used as a psychometric instrument for measuring **depression-related symptoms**. SDS can also be used for monitoring changes in depression severity over time, by assessing the differences in the intensity of depression-related symptoms. It takes around 10 min to complete. Every item is phrased as a positive or negative statement and is scored on a Likert-type four point rating scale, where 4 is assigned to the least-desirable response. The total depression score is calculated by adding the individual scores, and ranges from 20 to 80.

This total depression score can then be converted into an SDS index which ranges from 0.25 to 1.0. Raw scores are usually interpreted as follows: < 40, within normal range – no depression; 40–47, mild depression; 48–55, moderate depression; 56–80, severe depression.

The trait anxiety scale's reliability is high, with a Cronbach's alpha coefficient of 0.832, whereas the state anxiety scale's reliability is even higher, with a Cronbach's alpha coefficient of 0.921. The SDS depression scale is also characterized by a high degree of internal consistency and high reliability, with a Cronbach's alpha coefficient of 0.895.

All statistical analyses were conducted using the SPSS 20 (Statistical Package for Social Sciences 20) computer program. Scale scores are presented as means (standard deviation). Intergroup comparisons were carried out using the *t*-test and ANOVA statistical tests. The level of statistical significance was set at  $p < 0.05$ .

## Results

The study sample consisted of 200 parents of preterm infants, of which 62.0% were female, 93.5% were married and 62.5% were aged 30–39 years old. Most parents were Greek (92.5%), lived in Athens (51.5%), had completed their secondary education (53.5%) and worked as public or private sector employees (46.0%) (Table 1).

Table 2 presents the effect of the various socio-demographic characteristics of the parents on state anxiety, trait anxiety and depression scores. Gender comparisons showed that mothers experienced higher degrees of state anxiety, trait anxiety and depression ( $p = 0.04$ ,  $p < 0.001$  and  $p = 0.001$ , respectively). The effect of the parents' age was studied using the ANOVA statistical test for comparison between the various age groups. Significant differences were noted only regarding state anxiety scores, which were higher among parents aged  $\geq 40$  years ( $p = 0.038$ ). Occupational status influenced parents' scores: homemakers and unemployed parents experienced higher degrees of state anxiety ( $p = 0.011$ ), trait anxiety ( $p = 0.003$ ) and depression ( $p = 0.001$ ). The place of residence was also important: inhabitants of

**Table 1**  
Socio-demographic data of the total sample (n = 200 parents).

Variables		n <sup>a</sup>	%
<b>Gender</b>	Men	76	38.0
	Women	124	<b>62.0</b>
<b>Marital Status</b>	Married	187	<b>93.5</b>
	Single	13	6.5
<b>Age</b>	$\leq 29$ years	52	26.0
	30–34 years	69	<b>34.5</b>
	35–39 years	56	28.0
	$\geq 40$ years	23	11.5
<b>Nationality</b>	Greek	185	<b>92.5</b>
	Other	15	7.5
<b>Residence</b>	Athens	103	<b>51.5</b>
	Urban areas	54	27.0
	Rural areas	43	21.5
<b>Education Level</b>	Basic/Primary Education	7	3.5
	High School/Secondary Education	107	53.5
	University	76	38.0
	Msc/PhD	10	5.0
<b>Occupational Status</b>	Public employee	40	20.0
	Private employee	52	26.0
	Self-employed	26	13.0
	Homemaker	17	8.5
	Unemployed	65	<b>32.5</b>

Higher percentages are marked in bold.

n<sup>a</sup> = number of participants.

**Table 2**  
Effect of the parents' socio-demographic characteristics on state anxiety, trait anxiety and depression.

Variables	State anxiety	Trait anxiety	Depression	
	Mean (SD)	Mean (SD)	Mean (SD)	
<b>Gender</b>	Men	50.1 (12.9)	42.5 (8.0)	36.9 (9.1)
	Women	53.9 (13.1)	47.3 (8.3)	42.0 (10.4)
	P value	<b>0.040</b>	<b>&lt; 0.001</b>	<b>0.001</b>
<b>Age (years)</b>	$\leq 29$	55.6 (11.8)	46.8 (9.0)	43.0 (10.7)
	30–34	49.3 (11.9)	45.3 (8.1)	39.5 (10.2)
	35–39	51.9 (14.7)	45.1 (8.4)	38.2 (9.3)
	$\geq 40$	55.7 (13.4)	43.9 (8.1)	39.5 (10.2)
	P value	<b>0.038</b>	0.536	0.092
<b>Marital Status</b>	Married	52.0 (13.1)	45.2 (8.40)	39.9 (10.2)
	Single	58.9 (11.9)	48.7 (9.25)	42.6 (9.40)
	P value	0.066	0.153	0.356
<b>Nationality</b>	Greek	52.7 (13.0)	45.3 (8.32)	39.9 (10.2)
	Other	48.7 (14.0)	47.6 (10.3)	41.7 (10.2)
	P value	0.256	0.322	0.516
<b>Residence</b>	Athens	51.7 (13.1)	44.9 (9.13)	38.6 (10.5)
	Urban areas	48.9 (13.0)	45.5 (7.69)	40.0 (8.94)
	Rural areas	58.5 (11.4)	46.8 (7.82)	43.5 (10.4)
	P value	<b>0.001</b>	0.471	<b>0.033</b>
	<b>Education Level</b>	Basic/Primary Education	54.5 (18.2)	51.4 (16.7)
High School/Secondary Education		52.1 (13.1)	43.6 (9.5)	40.5 (10.3)
University		53.2 (12.9)	43.3 (9.8)	40.2 (9.71)
Msc/PhD		47.5 (14.6)	43.4 (10.4)	40.6 (11.4)
P value		0.594	0.235	0.558
<b>Occupational Status</b>	Public employee	52.1 (10.7)	45.2 (7.90)	39.4 (9.85)
	Private employee	51.4 (14.4)	44.5 (8.37)	39.0 (10.3)
	Self-employed	45.8 (11.7)	40.9 (7.85)	33.9 (8.40)
	Homemaker/Unemployed	55.3 (13.1)	47.7 (8.43)	42.9 (9.93)
	P value	<b>0.011</b>	<b>0.003</b>	<b>0.001</b>

P values are marked in bold in cases where p is statistically significant (i.e. < 0.05).

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