



# Comparing Anxiety, Depression, and Stress in Consanguineous Versus Non-Consanguineous Parents of Children With Deafness in Baqiyatallah Hospital's Cochlear Implant Center From 2007 to 2009

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## Abstract

**Background:** The birth of a child with a hearing disability is a stressful event in the family. Since consanguineous marriages are associated with the incidence of congenital hearing loss, it is expected that such parents will experience greater psychological problems.

**Objective:** The current study investigated and compared anxiety, depression, and stress in parents of children with severe hearing loss who have undergone cochlear implantation with a focus on the relation between parents (consanguineous vs. non-consanguineous).

**Methods:** This cross-sectional study was conducted on all 180 couples (360 individuals) who had become parents and attended Baqiyatallah hospital's Cochlear Implant Center from 2007 to 2009. The participants included two groups of consanguineous (125 couples) and non-consanguineous (55 couples) parents. After providing consent to participate in this study, the participants completed the short form of the Depression and Anxiety and Stress Scale questionnaire (DASS-21). Data analysis was done using SPSS 17 and t test.

**Results:** The participating parents had high levels of depression, anxiety, and stress. Depression and anxiety were significantly higher among the consanguineous parents ( $P=0.001$  and  $P=0.005$ , respectively). However, stress levels were not significantly different between the 2 groups. Moreover, compared to the fathers, the mothers had higher levels of depression, anxiety, and stress ( $P<0.05$ ).

**Conclusion:** Based on these findings, it may be concluded that the birth of a child with hearing loss can be the source of psychological problems in parents, particularly in consanguineous parents. Furthermore, mothers are more psychologically vulnerable than fathers.

**Keywords:** Depression, Anxiety, Consanguinity, Parents, Child, Deafness

## 1. Background

Congenital hearing loss is a global issue. Generally, the birth of a child with a congenital hearing disability is very stressful for the family.<sup>1,2</sup> As Morse states, about 90% of children with hearing impairments are born to parents who are completely healthy hearing-wise.<sup>3</sup> Thus, such an event is very distressing. Under these circumstances, the family's adaptive resources are challenged, which can disrupt the familial systems balance and create different types of

psychological distress in family members, particularly the parents.<sup>4</sup> Such a state is considered a severe shock to the family, and feelings of hopelessness, sorrow, anger, and denial ensue.<sup>5,6</sup>

Child disabilities such as hearing loss can lead to stress and depression in the parents.<sup>7-9</sup> One issue that can be raised in this domain is the assessment of the parents' role in creating this disability.

Literature has shown that the parents of children with

hearing loss suffer from feelings of sorrow, self-blame, and anger. They experience greater stress than parents of healthy children. This difference persists even upon adjusting for educational status and income.<sup>10</sup>

Parents may feel guilty; in the mother, the guilt is about the cause of deafness, and in the father, it is about failing to protect the family. The parents' feelings of guilt harm the disabled child's growth and development.<sup>11</sup> Bearing in mind the role of hereditary factors in creating this disorder<sup>12-14</sup> and the greater possibility of hereditary disorders in consanguineous marriages, more than likely there is a greater tendency toward feelings of guilt in consanguineous parents,<sup>15-17</sup> resulting in a higher rate of psychological disorders (anxiety and depression) in them.

## 2. Objective

To the best of the authors' knowledge, few studies in the literature have investigated the problems present in parents of children with hearing loss. Therefore, the objective of this research was to examine and compare the levels of anxiety, depression, and stress in 2 groups of consanguineous and non-consanguineous parents of children with hearing loss attending Baqiyatallah hospital's Cochlear Implant Center.

## 3. Methods

This cross-sectional study was conducted from 2007 to 2009 on all parents of children with congenital hearing loss (180 couples) who attended Baqiyatallah hospital's Cochlear Implant Center and had undergone cochlear implantation; the convenience method of sampling was used. Informed consent was obtained from all parents who participated in this study. The minimum sample size with alpha 5% and beta 20% was 46 couples in each group.

The participants were divided into 2 groups. The first group consisted of 125 couples with consanguinity (referred to as consanguineous parents in this study). The second group comprised 55 couples who had no blood relations (referred to as non-consanguineous parents in this study).

Inclusion criteria were congenital hearing loss in the child, the absence of other associated disabilities, and consent to participate in the study. Exclusion criteria were the presence of a severe associated disease in the child and a history of recognized psychiatric disorders in the parents prior to the child's birth. After obtaining written informed consent from the parents, the mean levels of depression, anxiety, and stress were assessed in the 2 (consanguineous and non-consanguineous) parent groups using the DASS-21 scale.

### 3.1. The Short Form Depression, Anxiety, and Stress Scale

The Short Form Depression, Anxiety, and Stress Scale (DASS-21) created by Lovibond and Lovibond.<sup>18</sup> The original scale contains 42 items. The subject declares his/her agreement with the items by tick-marking a 4-point Likert scale (never, sometimes, often, and almost always). The short form of this scale was used in the current study.

Antony et al confirmed the presence of the 3 factors of depression, anxiety, and stress in this version through factor analysis. The alpha coefficients were calculated as follows: 0.92 for the depression subscale, 0.95 for the anxiety subscale, and 0.97 for the stress subscale.<sup>19</sup> Samani and Joukar examined the validity and reliability of the Persian version of DASS-21.<sup>20</sup> Accordingly, the convergent, divergent, and construct validities of the subscale were confirmed, and its reliability was estimated at the following alpha coefficients for the subscales of depression, anxiety, and stress: 0.81, 0.97, and 0.78, respectively.

All statistical calculations were done using SPSS 17 software. The descriptive analysis of the qualitative data was done by obtaining frequency and percentage, and inferential analysis was done using the student *t* test for independent groups in order to compare the means of depression, anxiety, and stress among mothers and fathers. The level of significance was considered at 0.05.

## 4. Results

In the current study, 180 couples (125 consanguineous and 55 non-consanguineous couples) participated. 180 children underwent cochlear implant surgery. Of these, 86 (47.8%) were girls and 94 (52.2%) were boys. The mean age of the children was 4.93 (SD ±1.73) years. The mothers' average age was 30.93 (SD ± 5.5) years. The average age at marriage among the mothers was 20.27 (±3.28) years. The average age of the fathers was 36.10 (± 5.6) years, and the average age at marriage of the fathers was 25.79 (±3.94) years. Ninety-five children (52.8%) were the first born, 58 (32.3%) were the second, 18 (10%) were the third, 7 children were the fourth (3.9%), 1 was the fifth (0.6%), and 1 was the sixth (0.6%) born child.

The scores of the 3 DASS-21 subscales can be classified into 5 general categories. These 5 categories and their relevant domains are shown in Table 1.

In Table 2, the frequency distribution and percentages of the 2 groups of parents have been illustrated for the 5 categories.

As seen in Table 2, only 7.2% of consanguineous parents reported stress levels in a normal range. This figure is 14.5% among the non-consanguineous parents. For depression, 10.4% of the consanguineous and 16.3% of the non-consanguineous parents scored normal. The stress levels reported in the normal range were 3.2% and 3.6% for the consanguineous and non-consanguineous parents, respectively. Overall, 64% of consanguineous and 43.6%

**Table 1.** Classification of DASS-21 Scores and Range of Each Category

	Range of Scores		
	Stress	Depression	Anxiety
Normal	0-7	0-4	0-3
Mild	8-9	5-6	4-5
Moderate	10-12	7-10	6-7
Severe	13-16	11-13	8-9
Extremely severe	>17	>14	>10

**Table 2.** Distribution of Anxiety, Depression, and Stress in 5 Categories of DASS-21 in 2 Groups of Consanguineous and Non-consanguineous Parents of Children With Hearing Loss

	Stress		Depression		Anxiety	
	Non-consanguineous Parents	Consanguineous Parents	Non-consanguineous Parents	Consanguineous Parents	Non-consanguineous parents	Consanguineous Parents
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Normal	4 (3.6)	8 (3.2)	18 (16.3)	26 (10.4)	16 (14.5)	18 (7.2)
Mild	14 (12.7)	26 (10.4)	20 (18.2)	18 (7.2)	22 (20)	28 (11.2)
Moderate	20 (18.2)	56 (22.4)	34 (31)	54 (21.6)	24 (21.8)	44 (17.6)
Severe	44 (40)	94 (37.6)	16 (14.5)	72 (28.8)	32 (29.1)	96 (38.4)
Extremely severe	28 (25.4)	66 (26.4)	22 (20)	80 (32)	16 (14.5)	64 (25.6)
Total	110 (100)	250 (100)	110 (100)	250 (100)	110 (100)	250 (100)

of non-consanguineous parents reported having stress levels above average (severe and extremely severe). These figures were reported at 60.8% and 34.5% in the 2 groups, respectively, for the variable of depression. The stress variable in the 2 groups was reported at 64% and 65.4%, respectively.

Table 3 shows the frequency distribution and percentage of the 2 groups of mothers and fathers in the 5 categories of DASS-21 severity ratings.

As shown in Table 3, only 13.9% of the fathers and 6% of the mothers reported anxiety at normal levels. For the depression variable, a normal level was reported by 17.8% of fathers and 6.6% of mothers. Moreover, only 3.9% of fathers and 2.8% of mothers had normal stress levels. Overall, about 45% of fathers and 70.5% of mothers reported above average (severe and extremely severe) levels of anxiety. The corresponding levels for the depression variable were reported by 42.2% of fathers and 63.3% of mothers. For the stress variable, these figures were reported at 56.7% of fathers and 72.2% of mothers.

The scores of the 3 variables of depression, anxiety,

and stress in the 2 groups of consanguineous and non-consanguineous parents are illustrated in Table 4.

According to the results of the chi-square test as well as the Fisher exact test, consanguineous parents have significantly higher levels of anxiety ( $P=0.005$ ) than non-consanguineous parents. Moreover, the reported depression levels in consanguineous parents are significantly higher than in the non-consanguineous parents ( $P=0.001$ ). However, there was no significant difference between the 2 groups' stress levels ( $P=0.168$ ).

The results of the DASS questionnaire scores for the 2 groups of fathers and mothers show significant differences between the fathers and mothers in all 3 variables of anxiety ( $P=0.001$ ), depression ( $P=0.002$ ), and stress ( $P=0.015$ ), such that the levels of all 3 are higher in mothers than in fathers.

## 5. Discussion

Parents of disabled children do not have normal lives; they have special duties that are far more difficult than those of the parents of normal children. Such a situation

**Table 3.** Distribution of Anxiety, Depression, and Stress in 5 Categories of DASS-21 in 2 Groups of Mothers and Fathers of Children With Hearing Loss

	Stress		Depression		Anxiety	
	Mothers	Fathers	Mothers	Fathers	Mothers	Fathers
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Normal	5 (2.8)	7 (3.9)	12 (6.6)	32 (17.8)	9 (6)	25 (13.9)
Mild	11 (6.1)	29 (16.1)	14 (7.8)	24 (13.3)	21 (11.6)	29 (16.1)
Moderate	34 (18.9)	42 (23.3)	40 (22.2)	48 (26.5)	23 (12.7)	45 (25)
Severe	76 (42.2)	62 (34.4)	56 (31.1)	32 (17.8)	79 (43.8)	49 (27.2)
Extremely severe	54 (30)	40 (22.3)	58 (32.2)	44 (24.4)	48 (26.5)	32 (17.8)
Total	180 (100)	180 (100)	180 (100)	180 (100)	180 (100)	180 (100)

**Table 4.** Comparison of Anxiety, Depression, and Stress in 5 Categories of DASS-21 in 2 Groups of Parents of Children With Hearing Loss

		Mean	SD	df	t	P Value
Anxiety	Consanguineous parents	9.15	2.22	358	2.796	0.005
	Non-consanguineous parents	8.34	3.13			
Depression	Consanguineous parents	10.86	3.31	358	3.238	0.001
	Non-consanguineous parents	9.72	2.97			
Stress	Consanguineous parents	11.38	4.03	358	1.381	0.168
	Non-consanguineous parents	10.76	3.67			

can be a source of stress. The current study compared the levels of anxiety, stress, and depression in 2 groups of consanguineous and non-consanguineous parents of children with hearing loss. Based on the results, the levels of all 3 subscales in the 2 groups were high; however, anxiety and depression were significantly higher in the consanguineous parents. This finding reveals the negative effects of these parents' exposure to the problem of congenital hearing loss which, according to the current findings, reach maximum levels in consanguineous families. Generally speaking, and as reported by Uskun and Gundogar, levels of stress and anxiety are greater among parents of disabled children compared to the general population.<sup>21</sup> However, levels of depression and anxiety show greater increases in consanguineous parents. As a possible explanation of this difference, the dissimilarity in perspectives between the 2 groups can be indicated. Accordingly, one reason behind differences in reactions toward stressful circumstances is differences in the parents' cognitive interpretation in describing the cause of their child's hearing loss. Consanguineous parents are more likely to blame themselves for their child's disability. This self-blame can be an important source of an anxious and moody reaction to the stressful situation. Conversely, non-consanguineous parents have fewer tendencies toward such biases in tracing their child's problem. This explanation cannot be confirmed by this study, however, because the variables related to the parents' attitudes towards their child's hearing loss were not assessed. Therefore, it is recommended that the parents' attitudes toward the etiology of their child's hearing loss be measured and the roles of these attitudes in the aforementioned differences be investigated in future studies.

No significant difference was observed between the 2 groups in the stress subscale. This finding may be described by referring to the definition of stress. In short, Shirom believed that stress is an individual's perception of the environment's demands (stressful factor) and one's available capacities and resources for confronting them.<sup>22</sup> Selye also defines stress as the imbalance between demands and resources.<sup>23</sup> Hence, both groups find themselves facing a relatively similar crisis. In other words, both groups report an almost similar level of stress, although they may view the problem, assess the situation, and assess the resources for confronting such stressful circumstances differently.

According to the data analysis, mothers experience significantly higher levels of depression, anxiety, and stress. Other studies have shown differences in the mental health of men and women.<sup>24</sup> Dogan observed similar results in his study. In his opinion, mothers of disabled children are a lot more vulnerable to psychiatric symptoms.<sup>1</sup> Noohi et al concluded that, although cochlear implantation in children has been effective in reducing depression and anxiety in their mothers, these levels were higher in the mothers than in the general population even after the

## Review Highlights

### What Is Already Known?

Child disabilities such as hearing loss can lead to stress and depression in the parents. There is a greater possibility of hereditary disorders occurring in the children of consanguineous marriages. The parents' feelings of stress and depression harm the disabled child's growth and development.

### What This Study Adds?

Due to the role of hereditary factors in the occurrence of a child's congenital deafness, parents in consanguineous marriages may have a greater tendency to develop psychiatric disorders from feelings of guilt, and this may harm the process of improvement in children with disabilities.

child's surgery.<sup>7</sup> 2 factors can be addressed in describing the difference between mothers and fathers: (1) difference in attitudes and reactions of the mothers and fathers toward exposure to their child's hearing loss. Higher levels of stress in mothers may also indicate higher environmental demands or differences in assessing their resources for confronting the demands of these stressful circumstances; (2) gender differences in anxiety and depression scores: for example, according to Forooqi et al, women generally score higher on the scales of anxiety, depression, and stress.<sup>25</sup> Imam et al also obtained the same results in their research on the short form of the scale.<sup>26</sup> Therefore, this significant difference may be largely attributed to gender differences in the DASS-21 scores, not differences in attitudes between mothers and fathers toward their child's problem. Hence, it is recommended that the variance of gender be controlled when comparing the 2 groups of fathers and mothers in future research.

## 6. Conclusion

Based on the current results, it may be concluded that having a child with hearing loss can be a source of cognitive problems in parents, particularly those with blood relations; thus, these parents need cognitive support. Moreover, the mothers of children with hearing disabilities are more psychologically vulnerable than the fathers and, naturally, need more support.

## Authors' Contributions

SN designed the study; MG collected and analyzed data and EDM prepared and submitted manuscript.

## Conflict of Interest Disclosures

The authors declare that they have no conflicts of interest.

## Ethical Approval

This study was approved by Baqiyatallah University of Medical Sciences Ethics Committee.

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