

## A Comparison Between the Mothers of Cochlear Implanted Children and Mothers of Children with Hearing Aid in the Level of Depression, Anxiety and Stress

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### ABSTRACT

Considerable evidence suggests that parenting stress affects parent-child relationships. Although, some of the parents of hearing impaired children do not show symptoms of stress, anxiety, and depression, these problems are highly seen among others and it may have negative impact on their child. There for, the main aim of this study is to evaluate the level of depression, anxiety and stress in mothers of deaf and cochlear implanted children. Two groups of mothers whose children were between 5-8 years old were compared by depression, anxiety, stress scale (DASS-21). After gathering the data statistical analysis was done through multi variate analysis of variances (MANOVA). According to test results of DASS-21 scale, mothers of hearing aid children reported more depression, anxiety and stress than the mothers of cochlear implanted children. In addition, child's age was a negative predictor of parental stress. Cochlear implantation decreases the level of depression, anxiety and stress in mothers of cochlear implanted children. However, the mothers of hearing aid children significantly show the symptoms of psychological problems. This finding has been confirmed by different researches. For example a study in 2008(1) explored the correlates of parenting stress in parents of deaf children. Cochlear implantation plays an important role in improvement of the psychological parameters in mothers of hearing loss children.

**Key words:** Depression, Cochlear implant, Anxiety, Stress, Hearing aid.

### INTRODUCTION

Parenting stress has a negative impact on parent-child relation and important child outcomes. Early childhood deafness presents unique and long-term challenges for parents, including communication difficulties, increased medical/ audio logical care and educational challenges<sup>2</sup>. Several studies have examined the rates of parenting stress among parents of young deaf children. However, contradictory finding have emerged<sup>3</sup>.

In one study in 1990, both general and context-specific measures of parenting stress in 96 parents of young deaf children and 118 parents of

aged and gender matched hearing impaired children were done<sup>4</sup>. Higher levels of stress were found on both the general and context – specific measures. Parents in this study reported higher levels of stress and these elevated levels of stress were related to more symptoms of depression and anxiety.

Another study has compared the amount of stress among parents of deaf and normal hearing children but no significant differences is found<sup>5</sup>. According to this study, different factors like parents' educational level, child's age and early identification of childhood deafness may play an important role in decrease stress among parents of deaf children. In spite of the fact that some of the parents of hearing

impaired children do not show symptoms of stress, anxiety and depression<sup>5</sup>, these problems are highly seen among others. So, this study is done with the aim of assessing the level of stress, anxiety and depression in mothers of cochlear implanted (C.I) children and deaf children who use hearing aids.

## MATERIALS AND METHODS

The mothers of 45 patients who had received cochlear implant device and rehabilitation at least 1 year before were compared with the mothers of 36 hearing aided children. As matching groups in different aspects like parents' education level, child's age,...was necessary, we were forced to select all of the patients who had registered in our cochlear implant center and had the criteria which are discussed below:

- ' Child age between 5-8 years old
- ' Parents committed to educating their children
- ' No additional disability in both groups of children also, no other disable child had to be seen in both family groups.

In order to evaluate the parents of cochlear implanted and deaf children, depression, anxiety, stress scale(DASS-21) was used. The full scale of DASS consist of 42 questions, but the shorter form has 21 questions. This test was fitted and performed on parents of persian speaking cochlear implanted and hearing aid children. The internal consistency or item total correlation was used to assess the reliability of depression, anxiety and stress scale. Results showed significant reliability in all 3 parameters. The internal consistency of the

parameters were as follow: In stress scale, it was between 0.64 to 0.78. Also, in depression and anxiety were 0.54 to 0.81 and 0.63 to 0.75 respectively. In addition,  $\alpha$  coefficient 0.84 for stress, 0.89 for depression and 0.8 for anxiety indicated a significant validity of the scale.

The depression scale includes items that measure symptoms typically associated with dysphoria mood ( e.g., sadness, worthlessness). Anxiety scale, includes items that are primarily related to symptoms of physical arousal, panic attacks and fear. e.g., trembling or faintness). Finally, stress scale includes items that measure symptoms such as tension, irritability and a tendency to over react to stressful events<sup>6,7</sup>.

The tests were all done by the same experienced psychologist. After gathering the data statistical analysis was done via multi variate analysis of variances(MANOVA). Also, statistical analysis software spss version 16 was used.

## RESULTS

The table below, shows the amount of depression, anxiety, and stress that the mothers of cochlear implanted and hearing aid children experience. As it was predicted, mothers of hearing aid children reported more stress, anxiety and depression ( $p < 0.01$ ) than did mothers of cochlear implanted children. For example, the mean score of depression in mothers of cochlear implanted children was 11.15, whereas in mothers of hearing aid children was approximately 5 scores more .

**Table 1: Descriptive statistics of mothers of cochlear implanted and hearing aid children**

Group	Depression	Anxiety	Stress	Age (months)	
Cochlear implant	Mean	11.15	10.71	19.42	50.17
Number	45	45	45	45	
Std. deviation	10.86	9.43	1.12543 (E)	1.25323 E1	
Hearing aid	Mean	16.67	15.33	25.33	35.55
Number	36	36	36	36	
Std. deviation	11.43	9.95	7.79	1.95	
Total	Mean	13.60	12.76	22.04	43.67
Number	81	81	81	81	
Std. deviation	11.39	9.88	1.02468 E1	1.75270 E1	

Correlation matrix is illustrated in the above table. According to high positive correlation of 3 variates (correlation is significant at 0.01 level) MANOVA was used to test the hypothesis.

**Table 2: Correlation matrix in depression, anxiety and stress**

	Depression	Anxiety	Stess
Depression	1		
Anxiety	0.71**	1	
Stess	0.69**	0.69**	1

Correlation is significant at 0.01 level (2. Tailed)

This diagram is concerned with the comparison between mothers of cochlear implanted and hearing aid children in the level of depression, anxiety and stress that they experience during the time. The data analysis illustrated that mood disorder in mothers of hearing aid children was significantly higher than the second group. Also, the descriptive table (table 1) indicated that the level of depression, anxiety and stress in mothers of cochlear implanted children was much less(0.01)

In order to evaluate the effect of child's age on parental stress, anxiety and depression, 3 liner regressions were done. According to  $p < 0.05$ , a negative relation between child's age(predictor variate) and mothers' stress(criterion variate) was

**Table 3: The comparison between parents of hearing aid and cochlear implanted children**

Source	Dependent variable	Type III Sum of square	df	Mean square	F	Significant
Corrected model	Depression	607.44	1	607.44	4.9	.03
	Anxiety	427.99	1	427.98	4.5	.03
	Stress	698.28	1	698.28	7.1	.009
Intercept	Depression	1581.521	1	1548.152	125.59	.0001
	Anxiety	1366.262	1	1356.626	145.18	.0001
	Stress	4061.195	1	4006.119	410.69	.0001
Group	Depression	6074.47	1	607.44	4.9	.03
	Anxiety	4272.99	1	427.98	4.5	
	Stress	6988.25	1	698.28	7.1	
Error	Depression	9771.9	79	123.96		
	Anxiety	7385.4	79	93.4		
	Stress	7700.9	79	97.4		
Total	Depression	2532.000	81			
	Anxiety	2702.000	81			
	Stress	4780.000	81			
Correctol Wodel	Depression	1039.358	80			
	Anxiety	7812.5	80			
	Stress	8399.8	80			

**Table 4: The effect of child's age on parental stress, anxiety and depression**

Predictor	Criterion	B	b	R	RSquare	t	P
Age	Stress	-0.14	-0.24	0.24	0.05	-2.22	0.02
Age	Anxiety	-0.04	-0.08	0.08	0.007	-0.74	0.45
Age	Depression	-0.008	-0.01	0.01	0.0001	-0.11	0.91

seen. In other word, the level of stress in mothers of older children was significantly less than the mothers of younger children.

Although, child's age was a negative predictor of parents' stress no significant relation between child's age and parents' anxiety or depression was seen.

According to the above table, child's age did not have any significant impact on Mothers' anxiety ( $p > 0.05$ ,  $p = 0.45$ ). The same pattern is seen in child's age and Mother's depression. According to  $p > 0.05$ ,  $p = 0.91$ , we came to a conclusion that the child's age did not predict mothers' depression too.

### DISCUSSION

The present study focuses on a comparison between the psychological parameters of the mothers of children with hearing aid and of children with cochlear implant. Although mothers of both groups showed symptoms of depression, anxiety and stress, these psychological parameters were highly seen among mothers of hearing loss children, who did not have the chance of cochlear implantation ( $p < 0.001$ ).

The specific situation of the parents of hearing impaired children- especially their psychological distress- has been investigated in a number of studies<sup>8-9</sup>. The results of most of them provide initial evidence of increased parental psychological distress<sup>8-10</sup>.

A comparison between mothers of hearing aid and cochlear implanted children indicated that the time of diagnosis of their child's hearing impairment was a grave blow with several psychological distress. Both parental groups showed gradual improvement of the parent's well being in the further course of their child's treatment. A difference between the parental groups was revealed between the time of first information up to

the first adjustment of the C.I/ control of hearing aid. Here, the well being of the parents of the children with cochlear implant showed a more mark improvement upon first information about cochlear implant, but were subsequently clearly stressed by the cochlear implant operation<sup>(2)</sup>. In a study in 2010, all normal hearing parents of deaf children were examined when told of their children hearing loss. Results showed that parents would encounter with this problem in different ways. For example, parents in extremely low socioeconomic conditions spoke to their children less often. Also, they used different communication styles. Clearly conditions of poverty affect how parents communicate with their children<sup>11</sup>.

The results of a study which compared the psychological distress of parents of hearing aid and cochlear implanted children showed that both groups of parents felt distressed, particularly at the time of diagnosis. However, after C.I fitting the parents of cochlear implanted children showed heightened expectations by comparison with the parents of hearing aid children<sup>3</sup>.

### CONCLUSION

In summary, mothers of hearing aid children demonstrate high level of stress in compare with mothers of cochlear implanted children. However, it will significantly be decreased after some medical interventions, like cochlear implantation. So, diagnosis of deaf children in lower ages and doing C.I for them might be the best procedure which has a deep impact on both parents and children. In addition, it is recommended to expand these kind of studies to find stressed mothers of deaf children and help them with their child problem.

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