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Depression, Anxiety, and Stress among Mothers of Healthy Children and Mothers of Children with Cochlear Implants

Sima Falakflaki, Seyed Mohammad Kalantarkousheh

Abstract— Background: The birth of a disabled child is one of the resonant factors that can cause family disorders. Mothers who have disabled children experience different levels of anxiety and stress. Decreased hearing, meanwhile, is one of the major reasons for disability. Parents have different concerns about their children's development and social relations. Cochlear implantation is a new way to cure deafness and enables the disabled child to hear, talk, and communicate. This research intends to compare the outbreak of depression, anxiety, and stress among mothers who have healthy children and those of cochlear implantation children. Additionally, the research examines if cochlear implantation surgery can alleviate mothers' concerns and emotional problems. Methods: There were 250 mothers (125 mothers of healthy children and 125 mothers of cochlear implantation children) evaluated in this descriptive-analytic study. Mothers between 19-40 years of age with children (healthy or decreased hearing) between 1-12 years of age were selected for participation. Evaluation was conducted by a Dass 21 option questionnaire and the results were statistically analyzed by SPSS software. Results: Both groups of mothers were matched according to age and education level ($p>0.05$). Results showed a meaningful difference ($p<0.01$) in the amount of depression, anxiety, and stress of mothers of healthy children compared with mothers of cochlear implantation children. Conclusion: The amount of depression, anxiety and stress in mothers of cochlear implantation children is more than mothers of healthy children. Parents of children with decreased hearing face and tolerate pressures caused by the difficulties with their children in addition to pressures in everyday life which include verbal communication disorders and educational problems, costs of rehabilitation, hearing aids and cochlear implantation. These pressures cause tremendous concern for parents. In addition, their children's occupation, education and social future, the lengthy rehabilitation programs as well as problems the children face in society can also increase parental stress.

Index Terms: Anxiety, Cochlear Implantation, Depression, Mothers of Healthy Children, Stress

1 INTRODUCTION

ACCORDING to the World Health Organization (WHO), mental health is defined as the complete ability to perform social, mental, and physical roles in life. This organization believes that mental health means something beyond lack of illness or disability. Thus, someone who does not feel sad is considered to be mentally healthy. The main basis of mental health is in fact the ability to enjoy life. Since mental health is the Foundation of human development, it should be accepted that mental health is a crucial part of life. Hygiene means health, but health does not only mean lack of illness. A healthy person should be happy and satisfied in addition to having a healthy body (Craddock, et al., 2010).

Indeed, mental health as the ability to have a harmonious and concerted relationship with others, to change and correct individual environment, to justly, logically, and appropriately solve personal conflicts and tendencies. Being aware of the features of healthy people and those of people who have mental disorders can be helpful for diagnosis (Herrman, Saxena, & Moodie, 2005). Excessive decrease in mental health, meanwhile, can bring some problems for an individual. In other words, a person becomes ill because s/he is mentally ill. The

mentally ill feel as if they have lost their balance and vitality in life. Various functions such as thought, emotion, memory, intelligence, and determination become disordered.

Currently, depression is a prevalent disease. WHO, in its report, were estimated around more than 150 million people in the world suffer from depression. This number is increasing daily. About half of these patients are not aware of their disease or have been diagnosed with another disease (Herrman, et al., 2005). Anxiety disorders such as depression are one of the most prevalent mental disorders which include anxiety, stress and fear disorders that occur after social hurts. Anxiety is a condition with a feeling of great fear and physical symptoms such as increases in heart rate and perspiration. These conditions and symptoms indicate an increase in activities of the autonomic nervous system (Saraceno, 2004). Stress is a condition that appears as a result of a conflict between the individual and his environment and can cause incongruity between the supplies of a situation and biological, mental, and social resources of the individual (Hassed, 2005).

The existence or nonexistence of mental health can affect not only the individual but the family. A mother's mental situation has a deep effect on the entire family. Although most women have positive feelings about motherhood, this situation (being a mother) may have negative effects on mental health indicatives such as depression, anxiety, and stress caused by responsibilities toward their children. It seems that the upbringing of babies and children is considered to be a

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difficult duty even for educated parents of healthy children. One of the resonant factors that can cause depression, anxiety, and stress disorders in a family is the birth of a disabled child. Children that are mentally or physically disabled certainly place tremendous pressure on parents, particularly the mother (Berge, Patterson, & Rueter, 2006).

Mothers who have disabled children incur physical disorders, depression, anxiety, stress, and nervous pressures and have lower self-confidence compared with other mothers. They feel lonely and have trouble in their relationships with others (Khamis, 2007). Mothers of disabled children experience different levels of anxiety and stress that are related to their parental expectancies. Additionally, parents of these children experience lower physical and mental health because disabled children need more support. Further, most of them suffer from different aches and problems such as backaches, headaches, migraines, intestinal pain, anxiety, anger, feelings of guilt, sadness, social isolation, sleep deprivation and depression (Murphy, Christian, Caplin, & Young, 2007). Research has shown that parents of disabled children experience more mental pressure or stress, and this stress is related with irregular behaviors, depression, social and economic situations, sex, occupation and income, marital compatibility, and mental well-being (Dabrowska & Pisula, 2010; Dempsey, Keen, Pennell, O'Reilly, & Neilands, 2009).

Decreased hearing is one of the major reasons for disability in children. The birth of a baby with decreased hearing can cause stress, tension, and other mental disorders for the family. Kricos (2000) indicated that decreased hearing is the most stressful disability that can appear in a family and parents express concern about their children's development and social relationships. Specifically, fields that are more related to hearing functions such as education, emotional health, and social support cause more concern for the family (Meinzen, Lim, & Choo, 2008; Quittner, et al., 2010).

In Iran, different research has specified that mothers of decreased hearing and mentally retarded children suffer from decreased mental health, high stress and depression (Kouhsali, Mirzamani, Khani, & Karimlou, 2007; Narimani, Mohammadian, & Rajabi, 2007). In some statistical research, the dispersion of deaf people in Iran was between 2000-3000 people, approximately 1.5% of people in a society are deaf or have decreased hearing (Ajalloueyan, Amirjalali, Yousefi, Raeessi, & Hassanalifard, 2011). Out of every 1000 births, 2 have extreme sensory and permanent neural hearing loss (Ibid). The life of parents of decreased hearing children is full of stressful events. The complication of this disability, being incurable, and its related problems can all cause disorders for the family. Even after identifying their children's disease, parents still experience a great amount of anxiety and stress.

Cochlear implantation, a new way to cure this disability, is a type of treatment suitable for people with extreme or profound hearing loss. This implantation can be effectively used for both decreased hearing children and adults, before and after the age of language learning. It provides the possibility to understand and perceive environmental and verbal sounds by irritating sensory cells of the cochlear. A deaf child is able to hear, talk, and communicate with others after cochlear implantation. Individual and group studies that have examined the

consequences of cochlear implantation on deaf children discovered that cochlear implantation caused improvements in verbal skills, hearing comprehension, and quality of life (Hasanzadeh, Farhadi, Daneshi, & Emamdjomeh, 2002). Horsch and colleagues (1997) indicated that the amount of stress that parents of children with cochlear implantation experience is the same as the amount of stress seen in parents with healthy children. Additionally, they stated that mothers of children with cochlear implants will lose some of their concern after surgery and become more optimistic about life.

According to studies conducted in this field, mothers of deaf children experience a higher outbreak of mental disorders (depression, anxiety and stress) compared to mothers of healthy children (Dabrowska & Pisula, 2010). It should be mentioned that few researches have been conducted on examining mental disorders in mothers of children after their cochlear implantation or have examined if cochlear implantation can remove mothers' concern and emotional problems, in addition to increasing deaf children's abilities.

This research aims at examining the comparison between the amount of depression, anxiety, and stress outbreak in mothers of healthy children and mothers of cochlear implantation children. It should be mentioned that the stress of family members, particularly mothers, can be reduced by the use of some strategies. When the mother of the family is relaxed she will be more successful in facing her child's disability. This issue will increase her compatibility with regards to the situation she is in and provide her with mental health. From the other side, it can increase her ability to face the different problems experienced by her disabled child and as a result the child's abilities will increase.

2. RESEARCH METHODOLOGY

2.1 Sampling and Population

In the present descriptive-analytic research, 250 mothers (125 mothers of healthy children and 125 mothers of cochlea implantation children) were evaluated. The 125 mothers of children who had cochlear implantation surgery were selected by census and voluntarily among families who referred to special centers for cochlear implantation. The 125 mothers of healthy children were selected by random sampling from kindergartens. Mothers who were between 19-40 years of age and children (decreased hearing or healthy) between 1-12 years of age were selected for the study. Evaluation was done by the use of Dass questionnaire. The questionnaire had 21 questions and each question was multiple choices. Participants were asked to indicate the answer by crossing one of the responses that ranged from 'never' to 'always'.

2.2 Research design

Dass questionnaire for depression, anxiety, and stress was developed by Lovibond and Lovibond (1995). This questionnaire has two forms, short and long. The shorter form includes

21 statements that evaluate each factor (depression, anxiety, and stress) by 7 different statements. The long form includes 42 statements where each 14 statements evaluate one of the mental factors (depression, anxiety, and stress). Sahebi, Asghari et al. (2005) have validated the short form for the Iranian population.

Lovibond and Lovibond (1995) showed high correlation in using the depression questionnaire by the Dass scale ($r=0.4$) in a wide sample of 717 students. Anthony et al. (1998) reached the same correlation pattern in studying clinical cases. MoradiPanah, Sahebi and Aghebati (2005) have proven the reliability of this design in Iran. They have reported the Cronbach's alpha coefficient in their study at approximately 0.94 for depression, 0.92 for anxiety, and 0.82 for stress.

3 RESULTS

In this research 250 mothers (125 mothers of healthy children and 125 mothers of cochlear implantation children) were evaluated. In both groups, mothers were between 19-40 years of age and their children (decreased hearing or healthy) were between 1-12 years of age. Both groups of mothers were in accordance with regards to age and education ($p>0.05$), which was not statistically significant. The average age of mothers of healthy children was 30 years whereas the average age of mothers of cochlear implantation children was 28 years. In addition, the average age of healthy children was 4 years and the average age of cochlear implantation children was 3 years.

Tables that showed descriptive statistical measures were initially used for descriptive statistics to examine the comparison between the amount of depression, anxiety, and stress outbreak in mothers of healthy children and mothers of cochlear implantation children. Mean and average were used in this table as the central tendency, change ranges, and variance measures. Standard deviation was used as variation measures and kurtosis coefficient and skew coefficient were used as distribution measures. Along with the inferential analyses and the research hypothesis tests, considering normal score distribution and existence of pre-hypothesis of parameter tests, a two-group t-test was used as the strongest parameter test that descriptively compares the means of the two groups.

Statistical measures of depression, anxiety, and stress scores were calculated in both groups. Descriptive data related to these measures is presented in Table 1.

TABLE 1
DESCRIPTIVE STATISTICS OF ANXIETY, DEPRESSION, AND STRESS OF MOTHERS FROM HEALTHY AND COCHLEAR IMPLANTATION GROUPS

Variable	Group	Mean	SD	Distribution Indexes		Cronbach's alpha
				Skewness	Kurtosis	
Anxiety	Cochlear Implantation	5.88	4.39	0.45	-0.59	0.76
	Healthy	4.68	4.12	0.96	0.46	0.80
Depression	Cochlear Implantation	6.60	4.67	0.69	-0.10	0.80
	Healthy	4.74	4.20	0.96	0.08	0.83
Stress	Cochlear Implantation	9.56	4.65	-0.01	-0.47	0.77
	Healthy	7.76	4.29	0.51	-0.06	0.781

According to Table 1 and considering that the amount of skew and kurtosis coefficient is less than standard, it can be stated that the above distribution can be regarded as a normal hypothesis. Thus the mean can be used as the best descriptive statistical measure from a parameter statistical view. Therefore, the independent t-test was used for inferential data analysis. Cronbach's alpha in the present research showed the validity of the Dass questionnaire in evaluating the subscales of depression, anxiety, and stress.

TABLE 2
RESULTS OF THE LEVENE'S TEST FOR ANXIETY, DEPRESSION, AND STRESS IN BOTH GROUPS OF MOTHERS

Scale	F Statistics	Meaningful Level
Anxiety	1.88	0.17
Depression	1.78	0.18
Stress	0.90	0.34

In Table 2 the meaningful level of the Levene's test in the three examined scales is greater than 0.05. However, when the Levene's test is not meaningful, the variance of the groups will not be equal. Thus, the hypothesis which states that the variances of anxiety, depression, and stress are not equal in the two groups of mothers is proven and the parameter test can be used.

TABLE 3
T-TEST RESULTS FOR THE COMPARISON OF THE AMOUNTS OF ANXIETY, DEPRESSION, AND STRESS IN BOTH GROUPS

Variable	Groups	Mean	SD	Meaningful Level	F	t	Degree of Freedom	P
Anxiety	Cochlear Implantation	5.88	4.39	1.88	0.17	2.12	248	0.028
	Healthy	4.68	4.12					
Depression	Cochlear Implantation	6.60	4.67	1.78	0.18	3.29	248	0.001
	Healthy	4.74	4.20					
Stress	Cochlear Implantation	9.56	4.65	0.90	0.34	3.19	248	0.002
	Healthy	7.76	4.29					

According to Table 3, the amount of depression in mothers of healthy children and mothers of cochlear implantation children significantly differed ($p < 0.01$). Therefore, there was a meaningful difference between the amount of depression in mothers of healthy children and mothers of cochlear implantation children. The amount of depression reported in mothers of cochlear implantation children was more than mothers of healthy children. Therefore, the first hypothesis of this research was accepted. Additionally, the anxiety reported by mothers of healthy children and mothers of cochlear children were significantly different. This means that there was a meaningful difference between the amount of anxiety in mothers of healthy children and mothers of cochlear implantation children. Thus, the second hypothesis of the research was also accepted.

There was a meaningful difference between the amount of stress in mothers of cochlear implantation children and mothers of healthy children. Mothers of cochlear implantation children reported more stress than mothers of healthy children. Therefore, the third hypothesis was also accepted.

4 DISCUSSION AND CONCLUSION

The present descriptive-analytic study compared the amount of depression, anxiety, and stress in mothers of healthy children with mothers of cochlear implantation children.

Findings of the present research showed a meaningful difference between the mental health of the studied groups. The amount of stress, anxiety, and depression was more in mothers of cochlear implantation children than mothers of healthy children.

Most research in this field compared the mental health situation of mothers of deaf children to mothers of healthy children or those with other physical or mental disabilities. According to Dehkordi and colleagues (2011), mothers of deaf children experienced more stress than mothers of healthy children. In a study by Amini and others (2011), most mothers of deaf children exhibited normal explicit anxiety. Mothers of deaf children were more depressed than mothers of healthy children (Javadi, Lavasani, & Haghghatgoo, 2011).

The results of other studies showed that although some mothers were able to contend well with problems, in general, mothers of disabled children experienced higher depression, anxiety, stress, and other nervous pressures and had lower self-confidence. These mothers usually felt lonely and had problems communicating with other people (Khamis, 2007).

A deaf child is able to hear, talk and communicate with other people after cochlear implantation. Examining cochlear implantation consequences on deaf children, individual and group studies have shown that cochlear implantation positively effects the improvement in verbal skills, hearing comprehension, and life style of the deaf child (Hassanzadeh, et al., 2002). Hoseinabadi and colleagues (2008) have shown that individuals with decreased hearing will have an improved psychological situation in addition to decreased anxiety and depression after cochlear implantation and language learning.

The increase of deaf children's personal social skills after cochlear implantation can be effective in decreasing their parents' stress and concerns. Mothers of cochlear implantation children will have less concern after surgery and more hopeful outlook for life.

Horsch's (1997) study states that the amount of stress mothers of cochlear implantation children experience is the same as mothers of healthy children. The amount of depression, anxiety, and stress shown by mothers of cochlear implantation children was more than mothers of healthy children. The findings and results of other researches agreed with the results of the present research. Quittner and others (1991) concluded that parents of children with cochlear implantation experienced a higher level of stress and had lower psychological conformity compared to parents of children with normal hearing. In addition, in a similar study (Santhi, Prakash, Ravichandran, Susan,

& Winnie, 2013), a higher outbreak of stress and depression was reported in mothers of deaf children that underwent cochlear implantation and children who used hearing aids. However the amount of stress and depression was greater in mothers of children who used hearing aids compared with mothers whose children had cochlear implants. This finding indicated that mothers' stress and depression decreased after their children had cochlear implantation surgery.

It seems that the reason why such conclusions were not found in the present research and other similar researches was that parents of decreased hearing children experienced pressures caused by their decreased hearing child's situation in addition to other pressures related to their common life. Problems such as verbal communication disorders, educational problems, costly hearing rehabilitation, hearing aids, and cochlear implantation can cause stress and concern for the parents. The child's future occupation, education and social situation, rehabilitation programs and problems such children face in society also increase parents' stress. In addition to the decreased hearing child's problems other major struggles that could threaten the parents' mental health included the way for the children's education, coping with disappointment, struggling with negative thoughts and emotions, and the difficult levels of rehabilitation.

Therefore, it seemed that factors such as the different needs of decreased hearing children, the need to be supported by their parents were deterrents for mothers of cochlear implantation children to decrease their mental disorders. On the other side when the child's abilities such as verbal abilities, communicative abilities, educational abilities, and useful enjoyment of hearing aid equipment increased, parents experienced less pressure and became more hopeful to see their child's success. These factors show the necessity of diagnosis and apropos rehabilitation intervention in decreased hearing children and the necessity for consultation sessions with parents in order to decrease their stress and counseling sessions to teach ways to learn how to support their children (Behpajhooh & Ramezani, 2004).

Although the current study concluded that the amount of depression, anxiety, and stress was higher in mothers of cochlear implantation children compared to mothers of normal children, it did not mean that their anxiety, stress, and depression would not decrease after the surgery. Rather, this indicated that these mothers still experienced higher stress, anxiety, and depression compared to other mothers even after the decrease. This was one of the limitations of the current research. A suggestion for future studies was to conduct a comparison of the amounts of anxiety, stress, and depression in these mothers

before and after the implantation. The present research has only focused on mothers, not on fathers. Therefore, further researches can also focus on fathers. Another suggestion is to conduct this research regarding the Gender of these children.

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