

## Correlation of Anxiety-Depression and Sleep Quality in Mothers of Children with Cystic Fibrosis and Asthma

Mitra Safa <sup>1</sup>, Soheila Khalilzadeh <sup>2</sup>,  
Firoozeh Talischi <sup>1</sup>, Saeideh Alizadeh <sup>2</sup>

<sup>1</sup> Clinical Tuberculosis and Epidemiology Research Center, <sup>2</sup> Pediatric Respiratory Diseases Research Center, NRITLD, Masih Daneshvari Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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Correspondence to: Khalilzadeh S

Address: NRITLD, Shaheed Bahonar Ave,

Darabad, TEHRAN 19569, P.O.:19575/154, IRAN

Email address: soheilak@yahoo.com

**Background:** Cystic fibrosis and asthma are considered among the chronic respiratory diseases. Taking care of the sick child by the mother-which is usually the main care taker- can be associated with high loads of stress and result in behavioral problems like anxiety, depression and change in sleep quality. This study aimed at evaluating the correlation between depression-anxiety and sleep quality in mothers of children suffering from cystic fibrosis and asthma hospitalized in Masih Daneshvari Hospital.

**Materials and Methods:** This was an analytical descriptive cross-sectional study conducted on 148 subjects (mothers of children with cystic fibrosis and asthma hospitalized in Masih Daneshvari Hospital) during 2008-2010. Data were collected using a questionnaire for demographic characteristics, sleep quality and Hospital Anxiety and Depression Scale (HADS). Pittsburgh sleep quality index questionnaire (PQSI) was developed by Dr. Buysse and colleagues at the University of Pittsburgh's Western Psychiatric Institute and Clinic in the late 1980s. The PSQI was created after observing that most patients with psychiatric disorders had sleep disorders as well. Also, required data regarding the pulmonary function of patients was extracted from their medical records.

**Results:** In this study, high levels of anxiety and depression and poor sleep quality requiring clinical intervention were seen in 37.2%, 29.1% and 39% of mothers, respectively. A significant association was detected between sleep quality and depression-anxiety (P-value<0.005). Also, depression-anxiety was significantly correlated with number of children and smoking (P-value<0.005). A total of 20% of mothers suffering from depression and 14.3% of mothers with anxiety disorder had a history of cigarette smoking (P-value<0.005). No significant association was found between substance abuse and occupation with depression-anxiety. Susceptibility was only correlated with anxiety (P-value<0.005).

**Conclusion:** Our study showed a significant association between sleep quality and depression-anxiety in mothers of children suffering from cystic fibrosis and asthma. Greater attention should be paid to prevent development and aggravation of these conditions in susceptible mothers who are the main care taker of their sick child with chronic diseases.

**Key words:** Anxiety, Depression, Sleep disorder, Cystic fibrosis, Asthma

### INTRODUCTION

Cystic fibrosis and asthma are considered chronic respiratory diseases. Patients with these conditions usually suffer from respiratory problems, recurrent infections and difficulty in clearance of pulmonary secretions.

Development of these conditions in children has significant effects on the mental health of parents especially mothers who are usually the main care taker of the sick child (1). Research demonstrates that development of chronic respiratory conditions in children can be associated with

sleep disorders and depression-anxiety in parents. Also, stress caused by taking care of the child can result in development of sleep disorders in mothers (2). In other words, presence of any chronic disease in a child is sufficient to cause a disorder in the mother (3). On the other hand, many studies' findings support the association of behavioral disorders and sleep disturbances (4). In fact, chronic respiratory disease in a child results in disturbed sleep and increased anxiety in mothers. There is an undeniable fact that behavioral problems like anxiety and depression can result in sleep disorders and vice versa. Also, a significant association has been detected between these factors and mental health of the care taker, marital satisfaction of parents and treatment compliance in the sick child (5).

Taking care of a child suffering from a chronic condition is challenging and can be associated with lots of tensions and stress resulting in behavioral changes and development of anxiety, depression and sleep disturbances especially in mothers who have a history of previous behavioral or sleep disorders.

Studies show that asthma and cystic fibrosis can cause sleep disorders in children and their parents and depression-anxiety disorders in their mothers. For example, in a study conducted on the parents of children with eczema and asthma, it was revealed that mothers who wake up in the middle of the night and spend at least 45 minutes with their children are more likely to report sleep disorders (6).

Therefore, it seems necessary that the care takers of such children be evaluated in terms of sleep quality and behavioral changes. This study aimed at evaluation of the correlation of anxiety-depression and sleep quality and role of confounding factors like smoking and substance abuse in mothers of children with cystic fibrosis and asthma hospitalized in Masih Daneshvari Hospital.

## **MATERIALS AND METHODS**

This analytical descriptive cross sectional study was conducted on 148 mothers of children suffering from cystic

fibrosis and asthma hospitalized in Masih Daneshvari Hospital who were the main care taker of their sick child. In this study, data was collected using a questionnaire including demographic data, Pittsburgh sleep quality index (PQSI) and Hospital Anxiety-Depression Scale (HADS). Consent was obtained from the mothers and they were reassured regarding the confidentiality of information. Questionnaires were filled out in a calm, stress-free environment. If the mothers were literate, they filled out the questionnaire themselves and if not, the questioner would fill it out for them. In addition, the necessary information regarding the pulmonary function of patients was extracted from their medical records. After completion of the questionnaires, the collected data were analyzed using statistical softwares and the correlation between the variables was assessed using chi square and ANOVA tests.

PQSI questionnaire was developed by Dr. Buysse and coworkers at the University of Pittsburgh's Western Psychiatric Institute and Clinic in the late 1980s. The PSQI was created after observing that most patients with psychiatric disorders had sleep disorders as well. This is a self-report questionnaire that evaluates sleep quality and disturbances over the previous month. This questionnaire has 19 individual items in 7 categories: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The scores of all 7 categories are added up and evaluated. This questionnaire has 90% sensitivity for detection of sleep disorders (7).

HADS questionnaire is best known for evaluation of anxiety and depression in hospitalized patients. This questionnaire has 14 questions in 2 domains of anxiety and depression and the cut-off point of 11 for both is considered within the disease range. This questionnaire has been translated to Farsi (Persian) by Dr. Montazeri and colleagues and showed acceptable psychometric properties when used for cancer patients. Acceptance rate of the questionnaire by the patients was 99% and Cronbach's alpha coefficient was reported to be 0.78 for anxiety and 0.86 for depression domains (8, 9).

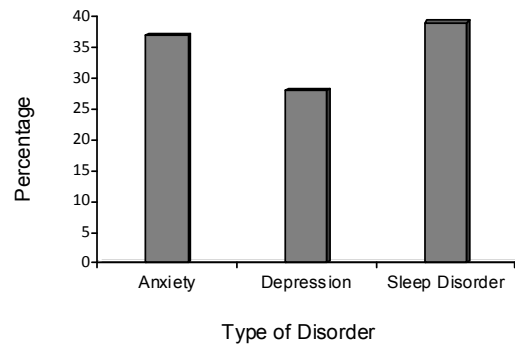
**RESULTS**

In this study, high levels of anxiety and depression and poor sleep quality requiring clinical intervention were seen in 37.2%, 29.1% and 39% of mothers, respectively. A significant association was detected between sleep quality and depression-anxiety (P-value<0.005). Also, depression-anxiety was significantly correlated with number of children and smoking (P-value<0.005). A total of 20% of mothers suffering from depression and 14.3% of mothers with anxiety disorder had a history of cigarette smoking (P-value<0.005). No significant association was found between substance abuse and occupation with depression-anxiety. Susceptibility was only correlated with anxiety (P-value<0.005).

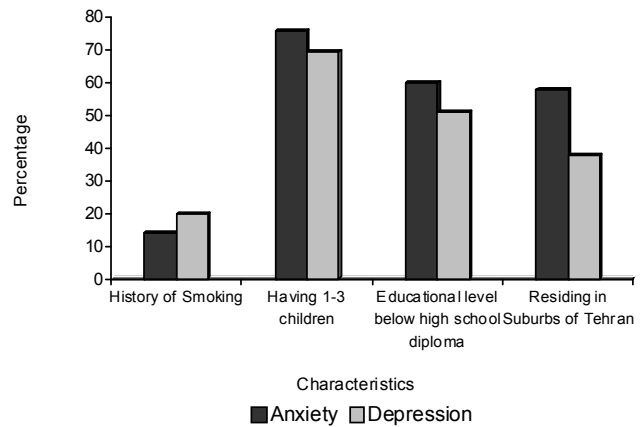
The mean age of mothers was 34 yrs (range 18 to 55 yrs). In this study, a significant correlation was detected between sleep quality and depression-anxiety of mothers (P-value<0.005). Results are presented in the table 1 and figures 1 and 2. No significant association was found between substance abuse and occupation with depression or anxiety.

**Table 1.** Demographic characteristics of subjects.

Variable	Number (percentage)
Age	18-55 yrs(mean 34 yrs)
Number of children	1-3: 81%
	4-6: 14%
	More than 7: 5%
Place of residence	Tehran:51%
	Suburbs of Tehran: 26%
	Other cities:23%
Level of education	Illiterate: 8%
	Below high school diploma: 37%
	High school diploma or higher: 55%
Substance abuse and smoking	Yes: 7%
	No: 93%
Occupation	Housewife: 70%
	Employee: 8%
	Worker: 4%
	Stylist,tailor,saleswoman and etc: 18%
History of susceptibility	Yes: 72%
	No: 28%



**Figure 1.** Prevalence of depression and anxiety disorders in mothers of children with asthma and cystic fibrosis



**Figure 2.** Demographic characteristics and depression-anxiety of mothers of children with asthma and cystic fibrosis

**DISCUSSION**

Our study results demonstrated that a significant correlation exists between sleep quality and depression-anxiety in mothers of children with cystic fibrosis and asthma. Of 148 understudy subjects, anxiety, depression and sleep disorders were detected in 37.2%, 29.1% and 39%, respectively. Our study results were in accord with those of previous studies. Yilmaz et al. in their study in 2008 proved that having a sick child with a chronic disease can result in development of anxiety, depression and poor sleep quality in mothers (1).

Yuksel and colleagues in 2008 concluded that mothers of asthmatic children had a high score of anxiety and

depression compared to controls which can affect their sleep quality (10).

In another study conducted by Moore et al. in 2006 on effect of childhood eczema and asthma on parental sleep and well-being, it was revealed that severity of sleep disorder in parents of children with eczema and asthma had a direct correlation with their level of anxiety and especially in mothers it was associated with a greater level of depression (11).

In a study by Hysing et al. in 2008 on sleep in children with chronic illness and its relation to emotional and behavioral problems, no significant difference was detected in sleep duration of sick children compared to healthy subjects. However, complaints regarding trouble falling asleep and midnight awakenings were higher among children with chronic illnesses (12).

Mothers of children with cystic fibrosis mention that they are always worried and concerned about their sick children but still manage to go on with their daily routine (13).

Family members of patients with chronic diseases (i.e. cystic fibrosis, asthma, diabetes and mental retardation) scored the same as healthy controls in the standard Questionnaire on Resources and Stress--Short Form (QRS-S) and in aspects like family conflicts (14).

In another study, 36 patients with CF were demographically compared with controls in terms of psychosocial adaptation. Mental disorders were more frequently detected among patients and were correlated with the mental health of parents and healthy family relations (15).

On the other hand, CF and asthmatic patients may face organ transplantation. In a study by Serrano-Ikkos and Lask, 81 CF children and their parents were mentally evaluated and followed up. A total of 20% of children on the waiting list of organ transplantation were suffering from psychiatric disorders and 60% of the parents showed signs of depression in the questionnaire. One third of them had marital problems and 20% reported chaotic

functioning. Half the children made it to the transplant phase. Severe physical disability was associated with better prognosis and longer survival and parental hostility to partner was correlated with a shortened post-transplant survival and life-span in children (16).

Sleep disturbances (especially obstructive sleep apnea) can be easily overlooked and manifest as anxiety, depression, car accident, aggravation of cardiac ischemia, high blood pressure and high pulmonary artery pressure (17).

It should be noted that this study was conducted on patients hospitalized in a referral center and family of sick children should be followed up for longer durations.

In conclusion, depression and anxiety in the mothers taking care of their sick child suffering from CF or asthma can be associated with different levels of disturbed sleep quality due to the stressful nature of this task (18). This can adversely affect the caretaker's function and performance at different aspects of their daily life (19). Since according to the literature females are more susceptible to development of depression and anxiety disorders, it is necessary to carefully watch mothers who are the main care taker of their children with chronic illnesses to prevent the occurrence or aggravation of such conditions in them.

Families of patients with chronic diseases undoubtedly develop problems in their psychosocial interactions over time and as the result, their quality of life will decrease. It is not possible to change patient's quality of life by only treating his/her pulmonary condition. Non-pharmaceutical interventions like group therapy and family therapy are also required to reduce patients' stress and create hope in them. By doing so, we might be able to break this vicious circle the patient is involved in. Expert physicians and efficient new drugs are not sufficient for treatment of these patients and psychological interventions along with non-pharmaceutical measures are strongly recommended to regain both physical and mental health in them.

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