

## A study on Chronic Pain and Sleep Quality in Mothers

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### Abstract

**Objective:** Chronic pain is one of the most important medical problems that affect many people every year. The highest prevalence of chronic pain is in adulthood. Sleep problems are one of common symptoms of chronic pain. The aim of this study was to compare sleep quality in mothers with chronic pain and healthy mothers.

**Methods:** This study was comparative and its statistical population was included all women referred to the Pain Clinic of Imam Hossein Hospital, Tehran, Iran. Among them, 159 persons were selected using convenience sampling method. Pittsburgh Sleep Quality Index, Von korff Pain Intensity Scale and demographic information Form were used to collect data. Data analysis was done using t-test and one way analysis of variance.

**Results:** The results showed that sleep quality in mothers with chronic pain was significantly different from healthy mothers, and with increase in pain intensity, sleep quality decreased.

**Conclusions:** Results of this study have implications on need pay attention to quality of sleep in mothers with chronic pain and its impact on daily routine and their duties as a parent.

**Keywords:** chronic pain, mothers, sleep quality, pain intensity, medical problems.

### Introduction

Pain is a mental concept that every person experiences in life and can be defined as an unpleasant feeling that is related to actual or potential harm (Rolfe, 2014). Pain is divided into acute and chronic pain in terms of duration. Conditions derived from chronic pain are defined as an unpleasant sensory or emotional experience that lasted at least six months (Binkley, Finch, Hall, Black and Gowland, 1993). Chronic pain is one of the most important medical problems in the world that afflicts millions annually. All over the world, chronic pain is the most important cause of

human suffering that seriously affects quality of human life (Rubin, 2007). One type of chronic pain is musculoskeletal pain. Chronic musculoskeletal pain relates to injuries to the muscles, tendons, ligaments, joints, cartilage or spine, which can affect various organs of the body including the lower back, neck, shoulders, arms and legs (Whitting & Zarnikha, 2013).

The incidence of chronic pain in 25-44 age group is 20 percent, a large number of these adults are parents (Solgi, Dehghani & Kavosian, 2015). Various studies have shown that chronic pain is an example of external factors that can affect individual function in their family (Namagh, Momeni Javid & Hosseinian, 2013). Pain and chronic illness can make it difficult to play role of parental care in these patients. Childbirth demands, such as cleaning the child, lifting or moving the baby, feeding and bathing, as well as emotional

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demands such as keeping the children with multiple needs, playing with them, tolerating behaviors, and meeting their needs, can be a big challenge for a mother (Tehranchi, Dehghani & Tahmasian, 2013). This is due to the fact that childcare is a challenging task for people with a healthy condition and the constraints of a physical illness will make this challenge more difficult (Sitnick, Masyn, Ontal & Conger, 2016).

On the other hand, chronic pain is associated with a wide range of psychiatric disorders such as anxiety and depression (Aili, Nyman, Hillert & Svartengren, 2015; Turk, Fillingim, Ohrbach & Patel, 2015), disability in daily routine, physical activity and quality of life (Arabi & Bagheri, 2017), social and interpersonal dysfunction and difficulties in family and job performance (Breivik, Collett, Ventafridda, Cohen, & Gallacher, 2006; Prefontaine & Rochette, 2013). One of the common problems co-occurring with chronic pain is sleep difficulties (Tang, 2008).

Sleep is a natural function of organism that maintains the health and function of body (Tranmer, Minard, Fox & Rebelo, 2003), as well as an opportunity to repair and rebuild body tissues and organize daily activities (Stockert, 2009). Research on pain perception and inappropriate sleep quality in people with chronic diseases have shown that there is a direct correlation between development of pain and sleep quality in adult with chronic pain (Vega & Miro, 2013). As pain perception can increase sleep latency and night-time awakening, inadequate sleep can also increase perceived pain and reduce its tolerance (Sitnick et al, 2016; Prefontaine & Rochette, 2013). Sleep problems have been reported in 67-88 percent of patients suffering from chronic pain, and at least 50 percent of people with insomnia suffer from chronic pain (Finan, Goodin & Smith, 2013). Sleep problems in these patients appear as irregular patterns of sleep and awakening, reduced sleep duration and sleepiness during day (Jakobsson & Hallberg, 2002). Many

studies have focused on the role and importance of sleep in nervous-behavioral functions such as emotion regulation, immune system and memory consolidation (Irwin, Olmstead, Carrillo, Sadeghi, FitzGerald, Ranganath & Nicassio, 2012). and several studies indicate the effects of sleep quality on positive and negative affect (Garcia et al, 2016).

On the other hand, parenting and childcare is a difficult activity that requires a lot of psychological and physical energy in a way that occurrence of a chronic and debilitating disease may bring many problems for a mother. It can reduce quality of parenting and mother-child interaction. (Poole, Hare, Turner-Montez, Mendelson & BettySkipper, 2013). For example, in qualitative studies conducted by Helseth and Ulfsaet (2005), one of the biggest challenges reported by mothers with chronic pain is the feeling of being divided into tasks of addressing their health needs and their willingness to perform activities related to their children's daily needs. These mothers reported that their diseases affect their energy and ability. As a result, their strengths are reduced and then the time and energy they need to devote to their children decreases. Mothers with multiple sclerosis and Rheumatoid arthritis also reported having less time for their children (White, Mendoza, White, & Bond, 2009).

Regarding the effect of pain on quantity of sleep, as well as the effect of sleep on performance of daily and routine tasks and its relationship with other psychological variables affecting parent-child communication, it seems that research on sleep quality is necessary in mothers with chronic pain and its comparison with non-chronic pain mothers. In this way, a clear perspective on the relationship between these variables can be found, and ultimately, effective therapeutic interventions can be used for these patients. The aim of this study, then, was to compare sleep quality in mothers with chronic pain and non-chronic pain and its relationship with pain intensity through testing the following hypotheses:

1. There is a difference between sleep quality in mothers with chronic pain and those without chronic pain.
2. In mothers with chronic pain, with increase in pain intensity, sleep quality is decreased.

## Method

### Participants

Method of this study was comparative and statistical population was all women referred to the pain clinic of Imam Hossein Hospital in Tehran in the summer of 2018. The sample size of chronic pain patients was 78 who were selected from patients referring to the Pain Clinic, using a targeted and convenience sampling method (only those with chronic musculoskeletal pain were chosen). Sample of non-chronic pain mothers was 81 people who were selected from normal population and among the fellows of patients. Regarding the importance of variables such as age and socioeconomic status in the effect of chronic pain on the psychological status of patients (Breivik et al., 2006), the sampling process was done regarding the homogeneity of mothers with chronic pain and non-chronic pain in the above variables. In this way, individuals were selected in terms of age average. Criteria for entering the study was diagnosing musculoskeletal pain disorder in patients by the physician for at least six months, not affected by other physical illnesses (such as cardio-vascular disease, cancer, etc.), and not affected by psychiatric disorder such as anxiety and mood disorders. Initially, informed consent forms were given to the participants and all necessary information, including the aims, confidentiality, and non-disclosure of participants' information were given to them.

### Procedure

This study was conducted between May and September 2018. After collecting the questionnaires, data were analyzed using SPSS, v.24 software. In order to report the descriptive data, mean and

standard deviation were used; in order to determine the difference between participants in sleep quality, *t*-test was used, and also to determine the difference in sleep quality in groups with different pain intensity, one-way ANOVA was utilized.

### Measures

Pittsburgh Sleep Quality Index (PSQI):

This scale was created in 1989 by Buysse and his colleagues at the Pittsburgh Psychiatric Institute. This scale consists of 19 questions that are self-reporting, which evaluates sleep quality through seven characteristics. The seven characteristics are: sleep quality, sleep loss, sleep duration, sleep adequacy, sleep disturbance, use of sleep medications, and daily dysfunction, which are graded in a 4-point Likert scale from 0 to 3, and ultimately a total score which yields the sum of scores for sub-scales. The higher score on this scale shows lower quality of sleep (the total score of sleep quality was considered in this study). Buysse and his colleagues (1998) reported Cronbach's alpha coefficient for this scale 0.83 (Buysse, Reynolds, Monk., Berman, & Kupfer, 1998). In Iran, the scale is standardized by Mansoori and his colleagues who achieved the Cronbach's alpha coefficient 0.88 for this scale (Mansoori, Tavakoli, Mohammadi, Farokhan, Mokhaeri, & Fotouhi, 2012).

*Von korff Pain Intensity Scale:*

This scale was created by Von korff (1990) to measure pain intensity. The scale is seven phrases and measures pain intensity, stability, or duration of pain and pain-related disability in a range of 0 to 10 degrees, in which 0 means "painless" and 10 means the "worst pain". The score of the seven sentences are aggregated. Minimum score is 0 and maximum is 70. The score between 0 and 20 is a low chronic pain, the score between 20 and 35 is moderate, and the score higher than 35 means the high amount of chronic pain. Fielding and Wong (2012) reported

Cronbach's alpha coefficient for this scale 0.68. In Iran, the scale is standardized by Posht Mashhadi who achieved 0.78 as its Cronbach's alpha coefficient (Posht Mashhadi, 2001).

#### *Demographic Information Questionnaire:*

This questionnaire is a researcher-made tool in which questions such as patient's age, level of education, therapeutic measures taken for disease, history of other diseases and psychological treatment have been used. Given the fact that the questionnaire contains the individual information of the participants, there is no need to review validity and reliability.

### Results

In this study, 159 persons were participated, 78 of them had chronic pain and 81 had no chronic pain. Among them, 25 (15 patients and 10 healthy people) had diploma degree, 66 (32 patients and 34 healthy) had BA degree, 12 (7 patients and 5 healthy) had MA degree, and 4 of them (2 patients and 2 healthy) had PhD degree.

In table 1, the mean and standard deviation of age of subjects are presented in terms of their pain status. The results of this descriptive table show that

the average age of two groups is not statistically significant ( $P > 0.05$ ).

For the variable of sleep quality, a Kolmogorov-Smirnov goodness of fit test was  $P = 0.81$ . Kurtosis of -0.879 to 0.383 and skewness of 0.044 to 0.192 were calculated for this variable. The Kolmogorov-Smirnov goodness of fit test indicated that the variable of sleep quality did not differ from a normal distribution.

To investigate the first hypothesis of study, t-student test was used for independent group.

The results show that there is significant difference between the studied groups in the field of sleep quality and mothers with chronic pain have lower sleep quality.

To investigate the second hypothesis, one-way ANOVA was used to determine the difference sleep quality in patients with low, moderate, and high pain intensity. Results indicated that the variances between datasets are homogenous at the significance level of 0.069, based on results of the Levene's test and a test for equality of error variances (value = 3.142).

As shown in Table 3, the results of one way ANOVA show that the differences in the sleep quality scores in three groups with low, moderate

**Table 1:** Same average age of participants.

Group	N	Minimum	Maximum	Mean	Std. Deviation	Test
Chronic pain	78	30	50	39.96	4.76	$P = .857$
Non-chronic pain	81	28	54	39.75	6.91	$T = -.181$

**Table 2:** Mean, standard deviation and t-test results of sleep quality scores in mothers with chronic pain and mothers without chronic pain.

Group	N	Mean	Std. Deviation	df	t	Sig.
Chronic pain	78	15.141	2.283	157	16.094	.002*
Non-chronic pain	81	9.555	2.091			

Note: \* $p < 0.01$

**Table 3:** One-way ANOVA results to evaluate the difference in sleep quality in groups with low, moderate and high pain intensity

Source	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups	198.565	2	99.283	36.702	.001*	0.495
Within Groups	202.883	75	2.705			
Total	401.449	77				

\* $p < 0.01$



**Table 4:** Result of Tukey's post hoc test in groups with low, moderate and high pain intensity groups

groups		Mean Difference	Std. Error	Sig.
low	moderate	-2.158*	.45	.005
	high	-3.825*	.45	.003
moderate	low	2.158*	.45	.005
	high	-1.666*	.47	.002
high	low	3.825*	.45	.005
	moderate	1.666*	.47	.002

and high pain intensity are significant, with an effect size of 0.495. So, Tukey's post hoc test was used to compare groups.

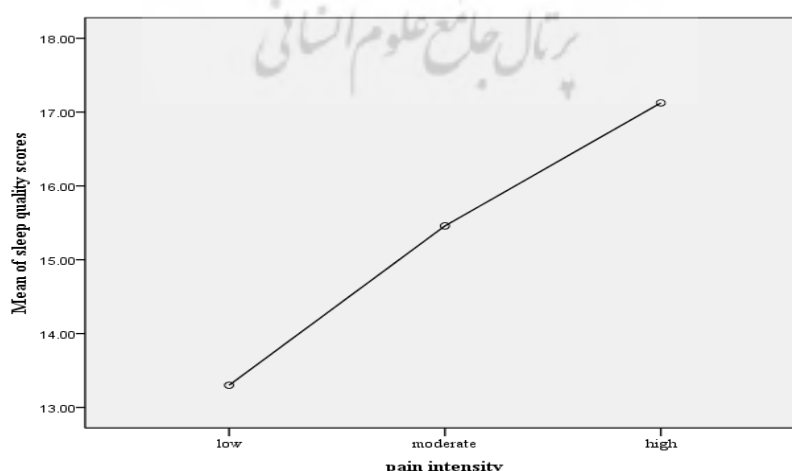
The results of Tukey's post hoc test showed that sleep quality scores were significantly different in the mothers with chronic pain with moderate-high, low-high and low-moderate pain severity. In Figure 1, decrease in sleep quality with increasing pain intensity is shown.

### Discussion and Conclusion

The aim of this study was to compare the sleep quality in mothers with chronic pain and healthy mothers. To this end, at first the difference between patient and healthy mothers in the field of sleep quality was examined, and then difference in sleep quality in patient mothers was assessed with regard to changes in pain intensity. The results of this study showed that there is a significant difference between mothers with chronic pain and healthy mothers in terms of sleep quality. This means that

patient mothers had lower sleep quality. Also, in mothers with chronic pain, those who had higher pain intensity had lower sleep quality. Therefore, according to these results, sleep disturbance in mothers with chronic pain is a common problem and by increasing pain intensity, quality of sleep decreases.

Chronic pain is associated with multiple psychological difficulties such as poor quality of sleep, which in turn can cause many problems in people such as difficulties in performing daily activities (Shaver & Iacovides, 2018). This disability and performance impairment will be more difficult for a parent with responsibilities and duties that they should carry on. On the other hand, with increase in pain intensity, sleep difficulties also increase. Parenting is also a difficult task that requires a lot of time and energy and the simultaneous occurrence of chronic disease can cause many problems for a parent in performing this task (Sitnick et al., 2016).

**Figure 1:** decrease in sleep quality with increasing in pain intensity

Patients with chronic pain are at high risk in medical and psychological problems, including anxiety and mood disorders, secondary physical illness, overweight, and sleep disorders (Cheatle, Foster, Pinkett, Lesneski, Qu & Dhingra, 2016). Although there is an internal relationship between chronic pain and sleep, research has found more contribution to sleep disorders caused by chronic pain (Smith & Haythornthwaite, 2004). Sleep problems include: A) increasing the vulnerability of pain after exhausting pain, B) increasing the risk of chronic long-term pain, and C) increasing the likelihood of occurrence of pain on the next day (Finan & Smith, 2013).

About 50 to 90 percent of chronic pain patients report inadequate sleep (Finan & Smith, 2013; Finan, Goodin, & Smith, 2013). Sleeplessness increases an individual's vulnerability to depression (Burke, 2009) and pain, fatigue, sleep problems, and depressed mood that affect all together (Kripke, Garfinkel, Wingard, Klauber & Marler, 2002). Also, if there are deficiencies in the fundamental aspects of sleep, such as sleep durability (start and continued sleep) and sleep quality (feeling tired after awakening), there is a risk for health and an increased risk of disease and death (Kripke et al., 2002; Zhang et al., 2012). Therefore, according to the results of this study, chronic pain and sleep problems are common disorders that can interfere with roles and activities of parents in their routine activities. The results obtained in this study are consistent with results from research of Tang (2008), Aili, Nyman, Hillert, and Svartengren (2015), Irwin et al. (2012), Vega and Miro (2013), and Finan and Goodin (2013) that studied on the quality of sleep in patients with chronic pain. The main difference between this research and other studies was the evaluation of sleep quality in a specific group, that is mothers with chronic pain. Therefore, it could lead to more extensive research to identify the effects of pain and chronic illness on performance of these women as parents.

People often are affected by chronic pain in adulthood and middle age, and mainly in this age, they are married and have children. On the other hand, parenting is a bilateral relationship that disability, poor performance and psychological problems of mother, and in addition to the devastating impact on her performance, it would impact negatively on child growth, academic performance and his/her social function as well as parent-child relationship. So it is necessary to consider sleep problems and impact of these problems on function and daily routine in mothers with chronic pain and using this result in treatment planning of these mothers.

One of the limitations of this study was the lack of examination of other factors and variables that can affect sleep quality in mothers with chronic pain, such as type of occupation and the number of children. Therefore, it is suggested that researchers investigate these variables in future studies. Also it is suggested that other functional areas of a mother that can be affected by chronic pain be investigated in future studies, such as quality of parent-child interaction and parenting skills in mothers with chronic pain compared to healthy mothers.

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