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Investigating the Effectiveness of Physical Activity on Sleep Quality in Women with Natural Childbirth and Cesarean Section

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Abstract

Background and objective: Pregnancy, childbirth, and motherhood are processes that have important social and emotional consequences for every woman. The purpose of this study was to investigate the effect of physical activity on sleep quality of women with Natural Childbirth and cesarean section.

Methods: Among women referred to Jahrom Health Center in the year 2017-2018 who had childbirth. 210 volunteers were included in the study (110 normal deliveries, 100 cesarean sections). They were divided into active and inactive groups based on their physical activity. The Petersburg sleep questionnaire was used for data collection.

Results: There was a significant difference between the two groups in daily performance variables (p = 0.005) and total sleep quality score (p = 0.001). It was also found that active women with cesarean section had better condition than inactive women with cesarean section. There was a significant difference between the two groups in the variables of sleep disorders (p = 0.005) and total sleep quality score (p = 0.001).

Conclusion: Exercise and physical activity can have a positive effect on the quality of sleep after postpartum and cesarean section. Findings can inform interventions designed to improve postpartum sleep via increasing opportunities for exercise among postpartum women.

Keywords: Sleep Quality, Natural Childbirth, Cesarean Section, exercise

Introduction

Pregnancy, childbirth, and motherhood are processes that have important social and emotional consequences for any woman (1)and are natural and physiological phenomena that from the beginning of human creation, vaginal delivery has been the only natural and common way for a baby to be born (2). Ensuring the health and well-being of mothers and infants as two vulnerable groups have always been of particular importance so that the mortality rate and the health of mothers and infants and the indicators associated with it indicate the state of health in each society (3). Natural Childbirth is in most cases the best type of delivery for the mother, and the cesarean section is usually limited to cases where Natural Childbirth is not possible naturally or is associated with serious risks to the fetus or mother(4). And due to the advancement of medical technology, it has led to the uncontrolled spread of cesarean section in recent decades and is considered as a common surgery in the world and its statistics are increasing (2).

This growing pattern is also observed in Iran. Cesarean section in Iran is estimated to be about 60-60%, which is 3-4 times the recommended amount of the World Health Organization (1). In most cases, cesarean section is due to the fear of labor pains and the complications of Natural Childbirth, while contrary to popular belief, Natural Childbirth is safer than cesarean section, as well as pain, weakness, disability, recovery period and physical problems after cesarean section is higher than Natural Childbirth (5).Cesarean section refers to the removal of the fetus, placenta, and membranes by the incision of the abdominal wall and uterus (1). According to studies, the side effects of the cesarean section are much greater than Natural Childbirth, including fever and infection, bleeding, fluid entering the airways, adhesions in the lungs, uterine bleeding, intestinal obstruction, and increased risk of miscarriage. The uterus showed an increased risk of needing a blood transfusion, the possibility of bladder and gallbladder damage, and psychological complications(4).

Some postpartum mothers suffer from poor quality of life, fatigue, lethargy, sleep problems, physical pain, constipation, sexual problems, and postpartum grief (5). Sleep is an active process that is regulated by the central nervous system, neurotransmitters, and behavioral glands (6). Proper sleep is one of the most important cyclical processes in the circulatory system (7), which plays a major role in public health and quality of life, and improves physical, mental and emotional strength. People benefit physically, reduce the quality of life, and cause psychological problems(8).There is also evidence that poor habits reduce the quality of life and sleep, and in contrast to good habits such as seeing a doctor for a general examination, immunization against diseases, proper diet and physical activity can improve living standards and sleep(7).

insufficient sleep and its disturbances can cause factors such as cognitive-behavioral disorders, fatigue, memory loss, decreased concentration, decreased appetite, stress, aggression, violence and anxiety(9). poor sleep, defined as poor sleep quality or short sleep duration, is associated with post-partum depression Poor sleep quality is common 6 months after delivery(10). Poor sleep among postpartum women is associated with adverse maternal outcomes. (11). In order to achieve quality sleep, people take various actions, most of which are drug treatments(12). One study reported poor sleep quality in the postpartum period(13). The results of

research on exercise and sleep quality in postpartum women are not the same. So that the results of some research show the positive effect of exercise on sleep quality(14, 15).And some studies have not reported a positive effect(10). Therefore, it is necessary to pay special attention to the quality of sleep after childbirth. Exercise has been suggested as one of the several nonpharmacological alternatives to enhance sleep quality(16). several studies have shown that exercise can improve sleep quality(3, 8, 17, 18). Regular physical activity increases the level of health and maintains it (19). According to research, it also increases the level of sleep quality (8, 18). Due to the low number of studies in this field, this study was conducted to evaluate the effectiveness of physical activity on the quality of sleep of women with normal delivery and cesarean section.

Materials and Methods

Study Population

The present study was conducted in Jahrom city. Women who went to the Jahrom Health Center, who had given birth in the past year, formed a statistical population of the present study, of which 210 volunteered to study and according to the type of delivery in two groups of Natural Childbirth (110 people) and cesarean section (100 people).Among the statistical samples, women who had at least 3 sessions of physical activity per week were considered active(8). Accordingly, the Natural Childbirth group included (40 people active and 70 inactive) and the cesarean section included (45 active and 55 inactive).The criterion for entering the study was having a birth in the past year. First, all of them were given informed consent to participate in the study, and then the questionnaires were distributed. The Petersburg Sleep Questionnaire was used to gather information.

Ethical Considerations

The authors of this article, while observing the rules and provisions of ethical regulations, including the Helsinki Declaration and obtaining informed consent from the participants and full assurance of the confidentiality of the collected information and complete freedom to participate in the study as well as leaving the study, conducted the present study. The study approved by the Research Ethics Committee of the Jhrom University of Medical Science (ethics code: IR.JUMS.REC.1399.045).

Petersburg Sleep Questionnaire

To measure sleep quality, the Petersburg Sleep Questionnaire was used (which included 9 questions: 7 components of mental quality of sleep, delayed sleep, duration of sleep, efficiency and effectiveness of sleep, sleep disturbance, amount of sleeping pills, dysfunction). It examines in the morning. All of the above components are calculated based on the results of the questionnaire.

The score of each question is in the form of a Likert and between 0 and 3, and a score of 3 on each scale indicates the maximum negative. The overall score of this questionnaire is between 0 and 21, and high scores indicate low sleep quality. A score above 5 indicates poor sleep quality. Its reliability and validity have been confirmed in various studies, which have a reliability of 0.83 and validity between 86.5 and 89.6 (20).

Statistical Analysis

In this study, mean and standard deviations were used as descriptive statistics (mean ± SD). And also Mann-Whitney U test was used for inferential statistics. The significance level

was considered to be P<0.05. All data analysis was done using SPSS software version 18.

Results

Demographic characteristics of research subjects such as age, height, and weight are shown in Table 1.

The results showed that in all variables of sleep quality, women with active Natural Childbirth have a lower score than women with inactive Natural Childbirth and have a better condition. There was a significant difference between the two groups only in the Daytime dysfunction variables (p = 0.005) and the overall score of sleep quality (p = 0.001) (Table 2).

Table 1. Demographic characteristics of subjects in research groups

	Group	Age (Year)	Weight (Kg)	Height (Cm)
Natural Childbirth	Active	24.59 ±5.37	55.85 ±10.77	163.25 ±7.62
	Inactive	28.76 ±4.78	57.92±9.14	158.20±11.32
cesarean section	Active	25.00 ±4.49	56.64 ±9.37	162.71±8.78
	Inactive	25.42±6.23	54.89±12.99	163.68±9.51
Overall	Active	24.80±4.90	56.25±10	162.98±8.16
	Inactive	27.31±5.64	56.61±10.93	160.56±10.81

Table 2. Comparison of sleep quality of women with active and passive Natural Childbirth

Variable	Group	S. D ±Mean	P
Subjective sleep quality	Active	1.55 ± 0.84	0.317
	Inactive	1.84 ± 1.14	
Sleep latency	Active	1.07±0.82	0.980
	Inactive	1.08±0.90	
Sleep duration	Active	0.59±0.57	0.574
	Inactive	0.72±0.97	
Habitual sleep efficiency	Active	1.66±1.17	0.062
	Inactive	2.28±1.13	
Sleep disturbances	Active	0.92±0.47	0.380
	Inactive	1.04±0.45	
Use of sleeping medication	Active	0.70±0.72	0.630
	Inactive	0.80±0.70	
Daytime dysfunction	Active	0.40±0.50	0.005*
	Inactive	1±0.86	
Overall sleep quality	Active	6.85±1.26	0.001*
	Inactive	8.84±1.46	

* Significant difference between the two meanings

The results showed that there in all variables of sleep quality except the mental quality of sleep, women with active cesarean section have a lower score than women with inactive cesarean section and are in a better condition. There was a significant difference between the two groups only in the variables of sleep disorders (p = 0.005) and the total score of sleep quality (p = 0.001) (Table 3).

Table 3. Comparison of quality of sleep of women with active and inactive cesarean section

Variable	Group	S. D±Mean	P
Subjective sleep quality	Active	1.89±0.91	0.695
	Inactive	1.78±0.85	
Sleep latency	Active	1.07±0.85	0.743
	Inactive	1.15±0.89	
Sleep duration	Active	0.60±0.49	0.116
	Inactive	0.89±0.65	
Habitual sleep efficiency	Active	1.78±1.10	0.124
	Inactive	2.31±1.15	
Sleep disturbances	Active	0.96±0.42	0.029*
	Inactive	1.26±0.45	
Use of sleeping medication	Active	0.46±0/57	0.345
	Inactive	0.63±0.59	
Daytime dysfunction	Active	0.60±0.99	0.292
	Inactive	0.84±0.50	
Overall sleep quality	Active	7.35±0.91	0.001*
	Inactive	8.89±1.48	

* Significant difference between the two meanings

The results showed that in all variables of sleep quality, active women have a lower score than inactive women and have better conditions. In Daytime dysfunction variables (p = 0.007), sleep disorder (p = 0.041), efficiency (p = 0.015), and total score of sleep quality (p = 0.001), there was a significant difference between the two groups (Table 4).

Table 4. Comparison of the quality of sleep in active and inactive women (cesarean + natural)

Variable	Group	S. D±Mean	P
Subjective sleep quality	Active	1.72±0.89	0.64
	Inactive	1.81±1.01	
Sleep latency	Active	1.07±0.83	0.81
	Inactive	1.11±0.89	
Sleep duration	Active	0.60±0.53	0.18
	Inactive	0.79±0.85	
Habitual sleep efficiency	Active	1.72±1.12	0.01*
	Inactive	2.29±1.13	
Sleep disturbances	Active	0.94±0.44	0.04*
	Inactive	1.13±0.46	
Use of sleeping medication	Active	0.58±0.65	0.27
	Inactive	0.72±0.65	
Daytime dysfunction	Active	0.50±0.79	0.005*
	Inactive	0.93±0.72	
Overall sleep quality	Active	7.10±1.11	0.001*
	Inactive	8.86±1.45	

Discussion

This study aimed to investigate the effect of physical activity on sleep quality of women with Natural Childbirth and cesarean section. This study found that the daily performance, total sleep quality and sleep disorders in active women was significantly lower than inactive women. So that active women had better sleep quality. This is consistent with the results of a number of studies reporting Sleep quality improves with physical activity and exercise (15, 21, 22). For example, Mir Mohammad Ali et al. (2012), Reported that exercise improves women's postpartum sleep quality(23). Result of another study showed that physical activity can affect the quality of sleep of pregnant women before and after childbirth(24). It has been reported that aerobic exercise can improve sleep quality in the postpartum period(15). research indicated that exercise has a positive impact on the sleep quality of pregnant women(14). The results of a study showed that 12 weeks of gymnastic exercise improves the quality of sleep after childbirth(15).

In contrast, the findings of some studies were inconsistent with the findings of the present study(25, 26). Result of study showed that there are not association between sleep quality in active and inactive pregnant women(25). Haji Kazemi et al. (2000) did not find a significant relationship between exercise and physical activity with the Type of delivery of women (27). Another study showed that there are not relationship between sleep quality and daily physical activity(26). Pilates showed no significant impact on sleep quality for healthy individuals over 40 years old and for postmenopausal women(28). Despite the aforementioned positive impact on sleep quality, the present study did not find evidence to support that exercise may also improve insomnia for pregnant women(14).

Doing physical exercise after the postpartum period is important to adjust the mothers' body from physical changes during pregnancy to a normal condition. Doing exercise not only increases physical strength, but also the mother's mind after giving birth(29). Feelings of depression (30), stress (31), and extreme fatigue (32) are among the most important factors that negatively affect sleep quality and timing. Various studies have shown that exercise programs can greatly improve maternal sleep quality by eliminating or reducing these disorders(33, 34). Tang et al. (2010) also described metabolic changes in the brain as a result of physical activity as a major factor in increasing sleep quality(35). In addition to this research, it should not be forgotten that in the postpartum period, men experience conditions that are commonly known as limiters of physical activity.

There are several mechanisms by which exercise improves sleep quality. The effect of exercise on sleep is associated with anti-depressant effects, reduced anxiety and changes in serotonin levels (36). Exercise through changes in body temperature, increased energy loss, weight loss, increased physical fitness, increased cardiovascular function, changes in cytokine concentrations, increased fatigue, changes in mental symptoms, changes in heart rate, increased hormone secretion, secretion BDNF and changes in body composition can improve sleep quality(37-39). The effects of exercise and sleep on each other are complex and are influenced by physiological and psychological pathways. Physical activity and exercise usually help improve sleep, although it should be noted that factors such as age, gender, fitness level, sleep quality and exercise characteristics (intensity, duration,

time of day, activity environment) are also important. They are effective. In contrast, sleep disorders can reduce exercise ability and increase exercise-related injuries(40) Although there are several strategies for improving sleep quality, it has been shown that physical activity is a good way to improve sleep quality. The present study has limitations such as not examining the effect of specific exercise (type, duration, intensity) that can affect the research results.

Conclusion

Exercise and physical activity can have a positive effect on the quality of sleep after postpartum and cesarean section. Therefore, it is recommended that postpartum women regularly incorporate exercise and physical activity into their daily routines for optimal quality sleep. In other words, it can be said that Findings can inform interventions designed to improve postpartum sleep via increasing opportunities for exercise among postpartum women. it is not possible to claim that the type and program of physical activity can affect the quality of women's sleep after postpartum and that further research is needed.

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