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EFFECTIVENESS OF FOOT REFLEXOLOGY AND BACK MASSAGE IN IMPROVING THE QUALITY OF SLEEP AMONG POST CAESAREAN MOTHERS

Manjuri. A. E. *[1], Fathima Latheef [2]

[1]Ph. D Scholar, Saveetha University, Chennai, Principal, SSSIHMS College of Nursing, Bangalore, Karnataka, India

[2]Professor & Principal, Columbia College of Nursing, Bangalore, Karnataka, India

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***Corresponding author**

E-mail: aemanjuri@gmail.com

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ABSTRACT

Childbirth is one of the challenging occasions in a woman's life. The aim of the study was to evaluate the effectiveness of the foot reflexology and back massage in improving the quality of sleep among the post caesarean mothers. A true experimental-repeated measures design with simple random sampling technique was used to study the control and experimental groups. The quality of sleep was assessed on 120 post caesarean mothers with 40 samples in each group of control, back massage and foot reflexology. Modified Pittsburg Sleep Quality Index Scale was used to assess the quality of sleep. After the pretest, back massage and foot reflexology was given for three consecutive days in the evening for the respective group. The results revealed that the day 2, day 3, and day 4 of back massage and foot reflexology quality of sleep were significantly different from the control day 2, day 3 and day 4 except on day 1. There is an improvement in the quality of sleep from day 1 to day 4. When comparing the pretest and the posttests, the quality of sleep of the control, back massage and foot reflexology day 3, day 4 (posttests) were highly significantly different from control, back massage and foot reflexology day 1 except on day 2. The improvement in the foot reflexology and back massage was better than the control group. The chi square of control and back massage were 13.132, 41.645 whereas chi square of foot reflexology was 101.234. Hence the foot reflexology was better in improving quality of sleep than back massage.

Keywords: Quality of sleep, Back massage, Foot reflexology, Effectiveness, Post caesarean.

INTRODUCTION

Motherhood is the greatest role of women. Childbirth is a new life transition for the women. All birth cannot be natural deliveries. Sometimes it is necessary to rescue the mother and baby from impending disaster through medical assistance. Caesarean section is a maneuver to deliver the baby through a transabdominal incision in the uterus. At global level the rate of caesarean section is on the rise. India is also experiencing a rapid increase in institutional deliveries. According to WHO, the caesarean section rate of above 15% has not been acceptable, where as in India the prevalence rate has been 18%. Clearly these rates are unacceptably high all over the globe. Sleep is the absence of thought waves or knowledge non-deliberately[1]. Post caesarean mothers commonly report changes in sleeping quality and quantity. The sleep complaints were associated with wound pain, uterine contraction pain, and breast-feeding. During puerperium period the new mothers, often sacrifice their sleep to adapt to the new routines and responsibilities of breast feeding the newborn[2]. The post caesarean mother needs to perform more activities in order to take care of the newborn and her. Therefore she is subjected to more needs and problems during this transitional period[3]. Despite the technological advancement in health care, routine procedures in postoperative period remain inadequate and thus require complementary therapies and interventions. In recent years many complementary therapies such as message, soothing music, relaxation, mind body techniques, herbal medicines, hypnosis, therapeutic touch and reflexology were used. Complementary therapies are commonly used treatment modalities in present days as it does not have side effects and also it is effective. Complementary therapies maintain the balance and body's natural equilibrium. Once the body is in balance and relaxed it can help to deal effectively with life's stress and strain every day. Back massage is a traditional method of promoting relaxation. Reflexology is based on the ancient massage technique that applies pressure on parts of the feet or sometimes the hands and ears, to clear the vital energy pathways that can become blocked due to the stresses and strains of life. The feet as a whole correspond to the whole body. By working in the feet it is possible to find out which areas of the body are out of balance and treatment can be given to rebalance body by stimulating its own healing mechanism. The aim of the study was to study the effect of back massage and foot reflexology on quality of sleep among post caesarean mothers.

MATERIALS AND METHODS

True experimental-repeated measures design was used for this study. One hundred and twenty post caesarean mothers were included in this study. The post caesarean mothers were randomly selected. Permission was obtained from the authorities of the hospital to carry out study. The post caesarean mothers were randomly assigned to control, back massage and reflexology groups 40 in each group (40+40+40). Informed consent was obtained from them for their enrollment in the study. This study was approved by the Institutional Human Ethics Committee of Saveetha University ((2013/IEC/SU; Dated 15 October 2013). The inclusion criteria for samples were post caesarean mothers who had slept the whole night with stable vitals and without postoperative complications. Post caesarean mothers with postoperative complications and who were suffering with diabetes, hypertension and bleeding disorders and injuries to the foot were excluded.

The tool consists of demographic profile of the post caesarean mother and baby. Modified Pittsburg Sleep Quality Index scale was used to assess the quality of sleep. The Modified PSQI scale consists of components such as sleep efficiency, sleep duration, sleep latency, sleep disturbances, use of sleep medication, day time sleep and subjective sleep quality. The total score is 21. On the day of operation rapport was maintained with the post caesarean mother. The mother was instructed about the assessment of the sleep in the night. Using the structured interview schedule demographic variables was collected. She was explained about the implementation of the respective interventions on the next day evening. On the first postoperative day using PSQI scale the quality of sleep was evaluated. On the same day evening for the experimental groups, foot reflexology and back massage group respective intervention was administered for each day for three consecutive days. In the foot reflexology group the post caesarean mother was made to lie down at the back (supine position) in the bed. The mother was instructed to relax and close the eyes. The feet were cleaned with hot water. Cream was used to promote smooth moments. In the beginning and end of the sessions relaxation techniques were used. The points on the foot are related to organs such as brain, spine, cardiac, reproductive, liver, solar plexus and insomnia point. These points were stimulated with the thumb and finger walking technique. The foot reflexology was given for 15 minutes in each foot for three consecutive days and assessed for the quality of sleep each day morning using PSQI scale. In the back massage group the post caesarean mother was made to lie down in side lying position with the help of pillow below the abdomen and between the legs in the bed. The back was dried using a towel after cleaning with the hot water. Powder was used to facilitate smooth strokes. Effleurage-stroking technique was used starting from the illac crest till supra clavicular region. The massage was given for 15 minutes for three consecutive days in the evening and assessed for the quality of sleep each day morning using PSQI scale. For the control group the quality of sleep was assessed without the intervention. After providing the respective intervention for the three days in the evening the posttest was carried out on the fourth day morning. The mothers expressed that they felt relaxed after the intervention in both the foot reflexology and back massage group.

Statistics

The quality of sleep of post caesarean mothers in control and experimental groups were analysed by Kruskal –Wallis one way analysis of variance on ranks. Friedman repeated measures analysis of variance on ranks was used for the comparison of medians of day 1 to day 4 of control and experimental groups. A probability of 0.05 or less was taken as statistically significant. The analysis and plotting of graphs were carried out using SigmaPlot 12 (Systat Software Inc.,USA).

RESULTS

The demographic variables assessed in this study were age, education, religion, occupation, type of family and housing. Statistically no significant difference was found between the control, back massage and foot reflexology group. This shows the homogeneity of the participants in the control, back massage and foot reflexology group (Table 1). Data analysis was done using the nonparametric test (Kruskal-Wallis and Friedman repeated measures). Figure 1 depicts the overall quality of sleep in control, back massage and foot reflexology group of post caesarean mothers in pretest and posttests. The medians of control day 1, back massage day1 and foot reflexology day 1 were 11, 10, 11 respectively. The day 1, 25 percentile value of control, back massage and foot reflexology groups were 10, 9, 9.5 whereas 75 percentile values of all the groups were same. There was no significant difference observed among the groups ($p = 0.246$) on day 1. Similarly the medians of control day 2, back massage day 2 and foot reflexology day 2 were 10, 9, 9 respectively. The day 2, 25 percentile value of all the three groups were 9.5, 8, 8 whereas 75 percentile value of control, back massage and foot reflexology groups were 12, 11, 10 respectively. There was significant difference observed among the groups ($p < 0.001$). The back massage as well as foot reflexology day 2 quality of sleep was significantly different from control day 2. The medians of control day 3, back massage day 3 and foot reflexology day 3 were 10, 8, 7 respectively. The day 3, 25 percentile value of all the three groups were 9, 7, 6 whereas 75 percentile value of control, back massage and foot reflexology groups were 11, 10, 7 respectively. There was statistically significant difference among the groups ($p < 0.001$). The back massage as well as foot reflexology day 3 quality of sleep was significantly different from control day 3. The medians of control day 4, back massage day 4 and foot reflexology day 4 were 10, 7, 6 respectively. The day 4, 25 percentile value of all the three groups were 9,7,6 whereas 75 percentile value of control, back massage and foot reflexology groups were 11,9,7 respectively. There was significant difference observed among the groups ($p < 0.001$). The back massage as well as foot reflexology day 4 quality of sleep was significantly different from control day 4.

The control, back massage and foot reflexology pretest day 1 and control, back massage and foot reflexology posttests day 2, day 3, day 4 were compared. There was statistically significant difference among the control days ($\chi2 = 13.132$; $p < 0.001$). The quality of sleep of control day 3, day 4 (posttests) were significantly different from control pretest day 1 except on day 2. There was significant difference observed among the back massage days ($\chi2 = 41.645$; $p < 0.001$). The quality of sleep of back massage day 3, day 4 (posttests) were significantly different from back massage pretest day 1 except on day 2. There was significant difference observed among the foot reflexology days ($\chi2 = 101.234$; $p < 0.001$). The quality of sleep of foot reflexology day 3, day 4 (posttests) were significantly different from foot reflexology pretest day 1 except on day 2. There was a progressive improvement in all the three groups from day 1 pretest onwards. The improvement in the foot reflexology and back massage was better than the control group. The chi square of control and back massage were 13.132, 41.645 whereas chi square of foot reflexology was 101.234. Hence the foot reflexology was better in improving quality of sleep than back massage (Table 2).

DISCUSSION

During the postnatal period, most of women experience alterations in the quality of sleep. The physiological and hormonal changes that postpartum women experience place them at risk of decreased maternal performance[4]. Insomnia and short sleep duration were found to be very common both before and after pregnancy[5]. The postpartum women were classified as poor sleepers during the early postpartum period. The mothers reported approximately 3 hours of sleep each night[6]. Postpartum mothers with self-reports of poor sleep quality had a low perceived ability to cope with motherhood-related issues. They also had negative expectations about the future[7]. Most postpartum women have disturbed sleep due to physical discomfort, perceived stress, co-sleeper disturbance, and marital dissatisfaction[8].

Subjective assessments of sleep may be more accurate predictors of postpartum depression symptoms than wrist

actigraphy. It also supports disrupted sleep may contribute to the development and extent of postpartum depression symptoms[9]. First-time mothers who wake up too early and sleep irregularly in the night should be assessed for potential postpartum depressive symptoms[10]. Identification of both infant and maternal sleep problems during infancy can be relevant to reduction of postnatal depression and improved family functioning[11].

A detailed analysis was done in the present study on the quality of sleep, all the seven components of the sleep such as sleep efficiency, sleep duration, subjective sleep, sleep latency, sleep disturbances, sleep medicine, day time sleep dysfunction among the post caesarean mothers. On the day 1 the overall quality of sleep of control, back massage and foot reflexology group were not significant. The day 2, day 3, and day 4 of back massage and foot reflexology quality of sleep were significantly different from the control day 2, day 3 and day 4. There is an improvement in the quality of sleep from day 1 to day 4.

Sleep complaints are common among the mothers of infants and fragmented sleep is associated with postnatal depression. Psychosocial sleep-focused interventions offered in the perinatal period improved the maternal mood and infant nocturnal total sleep time and infant night wakes[12]. Poor infant sleep is linked to postpartum depression and stress. Hence interventions designed should improve the maternal sleep, mood and infant sleep to prevent the postpartum depression[13]. There are several interventions that have been used in treating the sleep problems.

In the present study back massage and foot reflexology were given for post caesarean mothers in the respective group in the evening for three consecutive days. When comparing the pretest and the posttests, the quality of sleep of the control, back massage and foot reflexology day 3, day 4 (posttests) were highly significantly different from control, back massage and foot reflexology day 1 except day 2. The improvement in the foot reflexology and back massage was better than the control group. The chi square of control and back massage were 13.132, 41.645 whereas chi square of foot reflexology was 101.234. Hence the foot reflexology was better in improving quality of sleep than back massage.

Literature published on the relationship between foot reflexology, back massage and quality of sleep is scant. The above findings were consistent with the similar study; evidence support that foot reflexology was effective in pain relief and improved quality of sleep among post caesarean mothers[14]. Foot reflexology had significantly improved the quality of sleep among normal delivery mothers[15]. Back massage in the postnatal period among the normal delivery mothers significantly improved the quality of sleep[16]. There are several herbal remedies that have been used in treating sleep problems. In postpartum mothers lavender inhalation aromatherapy is reported to have a hypnotic effect, act as a mood stabilizer, and enhance the positive feelings about their infants. Taiwanese postnatal women with poor sleep quality were treated with lavender tea and the participants perceived less fatigue and depression and showed greater bonding with their infant compared with the control group, suggesting that the positive effects of lavender tea were limited to the immediate term[17]. Chamomile is widely used as a folk remedy for its presumed sedative-hypnotic effects. Chamomile tea was recommended to postpartum women as a supplementary approach to alleviate depression and sleep quality problems limited to the immediate term[18]. Aroma therapy with *Citrus arantium* on post caesarean pain and vital signs among 80 women, reported that the use of *Citrus arantium* was effective in reducing pain after caesarean section[19].

Table 1: Association and description of post caesarean mothers according to their demographic variables

Demographic variables		Group						Chi square test
		Foot reflexology(n=40)		Back massage(n=40)		Control(n=40)		
		n	%	n	%	n	%	
Age	< 20 years	8	20.0%	10	25.0%	11	27.5%	$\chi2$=2.65 P=0.62
	21 - 25 years	19	47.5%	20	50.0%	14	35.0%	
	> 25 years	13	32.5%	10	25.0%	15	37.5%	
Education	No formal education	5	12.5%	2	5.0%	5	12.5%	$\chi2$=2.70 P=0.95
	Primary	4	10.0%	6	15.0%	4	10.0%	
	Secondary	23	57.5%	24	60.0%	24	60.0%	
	Graduation and above	8	20.0%	8	20.0%	7	17.5%	
Religion	Hindu	33	82.5%	38	95.0%	35	87.5%	$\chi2$=3.81 P=0.43
	Others	7	17.5%	2	5.0%	5	12.5%	
Occupation	Housewife	36	90.0%	34	85.0%	30	75.0%	$\chi2$=4.40 P=0.61
	Coolie	2	5.0%	3	7.5%	7	17.5%	
	Others	2	5.0%	3	7.5%	3	7.5%	
Type of family	Nuclear	16	40.0%	20	50.0%	22	55.0%	$\chi2$=3.12 P=0.53
	Joint	18	45.0%	16	40.0%	16	40.0%	
	Extended	6	15.0%	4	10.0%	2	5.0%	
Housing	Own house	23	57.5%	29	72.5%	24	60.0%	$\chi2$=2.22 P=0.32
	Rented house	17	42.5%	11	27.5%	16	40.0%	
Family Income (Rs.)	<10000	13	32.5%	26	65.0%	24	60.0%	$\chi2$=10.59 P=0.22
	10000 - 15000	16	40.0%	10	25.0%	10	25.0%	
	15001 - 20000	7	17.5%	2	5.0%	4	10.0%	
	>20000	4	10.0%	2	5.0%	2	5.0%	

Table 2: Comparison of quality of sleep in pretest and posttests of control and experimental groups

SL. No.	Group	Quality of sleep	Pretest Median (25 – 75) Percentile	Posttest Median (25 -75) Percentile			Friedman Repeated Measures/ Significant
			Day 1	Day 2	Day 3	Day 4	
1.	Control	Sleep efficiency	1.5 (1-3)	1 (0-1)	1 (0-1)	1 (0-1)	28.902 P < 0.001
	Back massage		1 (0-1)	0 (0-0.5)	0 (0-1)	0 (0-0)	24.840 P < 0.001
	Foot reflexology		1 (0-1)	0 (0-1)	0 (0-0)	0 (0-0)	55.931 P < 0.001
2.	Control	Sleep duration	3 (2-3)	1 (1-3)	1 (1-2)	1 (1-2)	29.967 P < 0.001
	Back massage		2 (1-3)	1 (1-2)	1 (1-2)	1 (1-1)	14.650 P < 0.002
	Foot reflexology		2 (1-3)	1 (1-2)	1 (1-1)	1 (0.5-1)	41.664 P < 0.001
3.	Control	Sleep latency	1 (0-2)	1 (1-2)	1.5 (1-2)	1 (1-2)	8.233 P < 0.041
	Back massage		1 (1-2)	1 (1-1.5)	1 (0-1)	0 (0-1)	36.820 P < 0.001
	Foot reflexology		2 (1-2)	1 (1-1)	0 (0-1)	0 (0-1)	77.675 P < 0.001
4.	Col	Sleep disturbances	1 (1-1)	1 (1-1)	1 (1-1)	1 (1-1)	21.480 P < 0.001
	Back massage		1 (1-1)	1 (1-1)	1 (1-1)	1 (1-1)	2.400 P = 0.494
	Foot reflexology		1 (1-1)	1 (1-1)	1 (1-1)	1 (1-1)	3.000 P = 0.392
5.	Control	Subjective sleep	2 (2-3)	2 (1-2)	1.5 (1-2)	1 (1-2)	35.758 P < 0.001
	Back massage		2 (2-3)	1 (1-2)	1 (1-1.5)	1 (1-1)	65.051 P < 0.001
	Foot reflexology		2.5 (2-3)	2 (1-2)	1 (0-1)	0 (0-0.5)	101.643 P < 0.001
6.	Control	Use of sleep medicine	1 (1-1)	3 (3-3)	3 (3-3)	3 (3-3)	114.704 P < 0.001
	Back massage		3 (3-3)	3 (3-3)	3 (3-3)	3 (3-3)	120.00 P < 0.001
	Foot reflexology		3 (3-3)	3 (3-3)	3 (3-3)	3 (3-3)	120.00 P < 0.001
7.	Control	Daytime dysfunction	2 (2-2)	1 (1-2)	1 (1-1)	1 (1-1)	86.542 P < 0.001
	Back massage		2 (2-2)	1 (1-1)	1 (1-1)	1 (1-1)	90.319 P < 0.001
	Foot reflexology		2 (2-2)	1 (1-1)	1 (1-1)	1 (1-1)	97.409 P < 0.001
8.	Control	Overall sleep	11 (10-12)	10 (9.5-12)	10 (9-11)	10 (9-11)	13.132 P = 0.004
	Back massage		10 (9-12)	9 (8-11)	8 (7-10)	7 (7-9)	41.645 P < 0.001
	Foot reflexology		11 (9.5-12.5)	9 (8-10)	7 (6-7)	6 (6-7)	101.234 P < 0.001

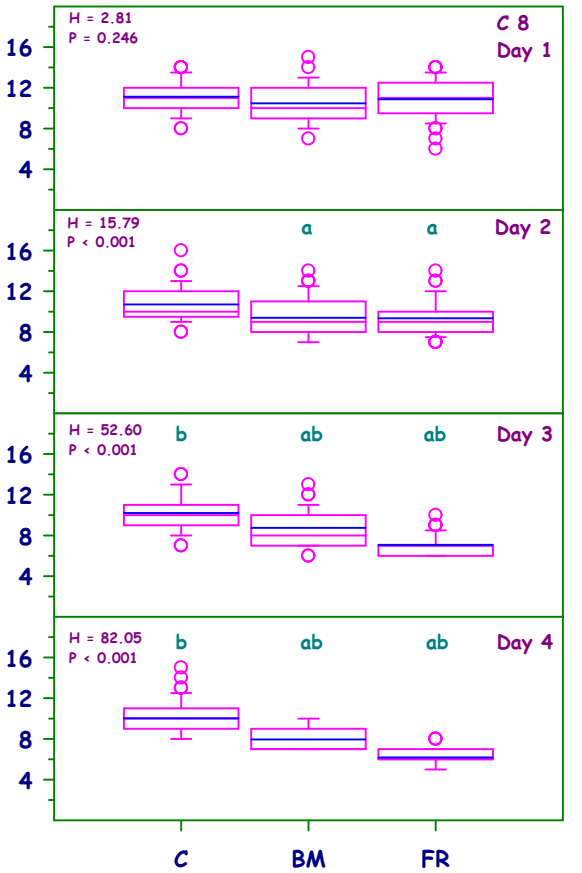

Figure 1: Overall quality of sleep of post caesarean mothers in control (C), back massage (BM) and foot reflexology (FR) groups (n = 40 each). The pink line is the median and the blue line is the mean. The 'H' and 'P' values (Kruskal Wallis Test) are comparing the same day. The pre-test (Day 1) is compared with the post-test (Day 2, Day 3 and Day 4) by Friedman Repeated Measures ANOVA. For C - $\chi 2 = 13.13$ and $P = 0.004$; for BM - $\chi 2 = 41.65$ and $P < 0.001$; for FR - $\chi 2 = 101.23$ and $P < 0.001$. a = Significantly different from C of same duration, b = Significantly different from pre-test (Day 1).

CONCLUSION

The present study focused on evaluation of maternal sleep quality and design early interventions to improve quality of sleep, to increase maternal health among post caesarean mothers. The findings of this study shows that the post caesarean mothers had sleep disturbances and poor sleep quality during the immediate postpartum period. The complementary alternative medicine therapies like back massage, foot reflexology were found effective in improving the quality of sleep. Though both the therapies were effective, foot reflexology was found effective than back massage in improving the sleep among post caesarean mothers and thereby reduce the postpartum depression. Midwives interested in complementary therapies should be encouraged to obtain training in complementary therapies and to apply it in postpartum care.

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