Journal of Midwifery & Reproductive Health

JMRH.mums.ac.ir

Comparing the Effects of Progressive Muscle Relaxation and Guided Imagery on Sleep Quality in Primigravida Women Referring to Mashhad Health Care Centers -1393

Nahid Golmakani (MSC)[1], Farnaz Sadat Seyed Ahmadi Nejad (MSC)[2]*, Mohammad Taghi Shakeri (PhD)[3], Negar Asghari Pour (PhD)[4]

[1] Assistant professor, Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran
[2] MSc in Midwifery, Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran
[3] Professor of Biostatistics, Department of Social Medicine , Mashhad University of Medical Sciences, Mashhad, Iran
[4] Assistant Professor, Psychiatry and Behavioral Sciences Research Center, Ebne-sina Hospital, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

ARTICLEINFO

Article type:
Original article

Article History:
Received: 22-Sep-2014
Accepted: 28-Jan-2015

Key words:
Guided Imagery
Muscle Relaxation
Primigravidity
Relaxation
Sleep

ABSTRACT

Background & aim: Decreased sleep quality is a common complaint during pregnancy. Relaxation is one of the non-pharmaceutical treatments for sleep disorders. Different techniques could have different impacts on various biological and mental stressors. Therefore, this study aimed to compare the effects of progressive muscle relaxation and guided imagery on the sleep quality of primigravida women.

Methods: This three-group clinical trial was conducted on 100 primigravida women, referring to Mashhad health care centers in 2014. All women, who met the inclusion criteria, were randomly assigned to three groups: progressive muscle relaxation, guided imagery, and control groups. The intervention groups performed the exercises twice a day for a period of four weeks at home after two sessions of relaxation training (held during two weeks). Then, the quality of sleep was measured using Pittsburgh Sleep Quality Index. For data analysis, ANOVA, Kruskal-Wallis, paired t-test, and post-hoc test were performed, using SPSS version 11.5.

Results: The total score of sleep quality and its components (except use of sleep medication) was significantly lower after the intervention, compared to the pre-intervention period in progressive muscle relaxation and guided imagery groups (P<0.001). Both relaxation techniques were effective in improving sleep quality and its components (P<0.001). However, the effect of guided imagery was more significant than progressive muscle relaxation (P=0.015).

Conclusion: Both guided imagery and progressive muscle relaxation positively affected the sleep quality of primigravida women, although the effect of guided imagery was more significant. It is recommended to integrate guided imagery into pregnancy care for primigravida women with sleep disorders.

► *Please cite this paper as*:
Golmakani N, Seyed Ahmadi Nejad FS, Shakeri MT, Asghari Pour N. Comparing the Effects of Progressive Muscle Relaxation and Guided Imagery on Sleep Quality in Primigravida Women Referring to Mashhad Health Care Centers -1393. Journal of Midwifery and Reproductive Health. 2015; 3(2): 335-342.

Introduction

According to Maslow's hierarchy of needs, sleep is one of the basic human needs (1). Sleep disorders are more common in women than men due to hormonal changes during menstrual cycle, pregnancy, and menopause (2).

Pregnancy is one of the causes of sleep disorders (3). Decreased sleep quality is one of the common complaints during pregnancy (4), mostly occurring in the third trimester of pregnancy as the mother approaches the end of pregnancy. In fact, the incidence of sleep disorders has been reported around 75% in the third trimester (5). Poor sleep quality could be related to preterm labor, low birth weight, blood pressure disorders, glucose tolerance disorders, and depression during and after pregnancy (6-10).

* *Corresponding author:* Farnaz Sadat Seyed Ahmadi Nejad, Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran. E-mail: seyedaf911@mums.ac.ir

The most common therapeutic methods for sleep disorders are pharmaceutical treatments in which by the suppression of the central nervous system, anxiety and stress levels decrease and the patient becomes hypnotic and relaxed (11). However, pharmaceutical methods are contraindicated during pregnancy due to some potential risks for the fetus and their impacts on fetal growth and development (12). Therefore, alternative non-pharmaceutical methods with no side-effects should substitute pharmaceutical methods for the treatment of sleep disorders.

Behavioral therapy is one of non-pharmaceutical methods for sleep problems. Relaxation, which relieves external stressors, has been widely applied in recent years and is considered a simple, feasible and useful behavioral approach (13-15). There are various relaxation techniques such as progressive muscle relaxation, guided imagery, massage, hypnotism, yoga, music therapy, and breathing techniques (7). Progressive muscle relaxation is a widely-applied method, which has been shown to be effective in decreasing physical and cognitive stress and improving self-confidence (14, 16).

In a study by Watanabe et al. (2006), guided imagery could decrease stress and increase the emotional stability of the participants (17). Different relaxation techniques have different impacts on various biological and emotional stressors. However, little research has been performed to determine which method is most effective (13).

Pregnancy is a stressful event for women. Stress rate increases in the third trimester of pregnancy and near the labor time. In fact, stress is an indispensable cause of poor sleep quality (13). Morine et al. (2006) introduced methods of improving sleep quality such as progressive muscle relaxation to decrease somatic stress and guided imagery, as well as meditation, for removing distractive thoughts during sleep (18).

Malekzadegan et al. (2010) showed the effectiveness of progressive muscle relaxation in improving sleep disorders during the third trimester of pregnancy (19). The main principle of progressive muscle relaxation is the individual's sitting position. In other words, the head should be placed along the trunk, the vertebral column should be straight, and the curves should be filled.

During pregnancy, considering the enlargement of the abdomen, the mentioned sitting position without displacement is probably not easy for women, and the supine position could press the uterine vessels (12, 15). It seems that guided imagery is of priority since it requires no specific sitting position and could be simply performed in a limited amount of time (13, 14).

Guided imagery is a cognitive-behavioral technique in which the individual is guided in imagining a series of experiences for controlling stress and balancing negative thoughts (20). In a study by Krakow et al. (2001), mental imagery was considered a well-tolerated method by patients with post-traumatic stress disorders, suffering from nightmares (21). Also, Schaffer et al. (2013) showed a significant correlation between the sleep quality of mothers with premature neonates and mental distress; as the results showed, sleep quality improved by guided imagery (22).

Kwekkeboom et al. (2008) did not report a significant association between pain reduction and progressive muscle relaxation or guided imagery in cancer patients (23). However, Urech et al. (2010), who compared the effects of progressive muscle relaxation and guided imagery on the mental, cardiovascular, and endocrine status of pregnant women, showed that guided imagery resulted in lower heart rate and more relaxation, compared to the other technique (24).

Regarding the high incidence of sleep disorders during pregnancy and their adverse effects on maternal and fetal health, it is impossible to apply pharmaceutical approaches during pregnancy. Therefore, it is necessary to find safe methods for improving pregnant women's sleep quality. The present study aimed to compare the effects of progressive muscle relaxation and guided imagery on the sleep quality of pregnant women in Mashhad in 2014.

Materials and Methods

In the present three-group clinical trial, health care center No. 1 was selected among five health care centers of Mashhad via random sampling. Based on the number of clients, two health care centers, affiliated to health center

No. 1, were selected via non-probable sampling. Subjects who met the inclusion criteria were introduced to the study. Data were collected using a demographic form, an obstetric checklist, and Pittsburgh Sleep Quality Index (PSQI).

PSQI is an international instrument for assessing sleep quality. This scale evaluates a person's attitude towards sleeping quality in the last four weeks. It includes 9 questions in 7 components of subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleep medication, and daytime dysfunction. The items are scored using a Likert scale, ranging from 0 to 3 (3= the highest negative score). The total score is calculated by summing the scores of components, ranging from 0 to 21; scores ≥ 5 indicate poor sleep quality (25).

The reliability of PSQI was calculated by Cronbach's alpha (α=0.73) (26). In Iran, Hossein Abadi et al. (2008) has confirmed the validity (r=0.88) and reliability of PSQI (r=0.84), using test-retest (27). This instrument is applicable for evaluating sleep quality during pregnancy (26) and its reliability in present study was calculated to be 0.77.

The inclusion criteria were as follows: 1) primigravidity; 2) gestational age of 29-32 weeks; 3) singleton pregnancy; 4) low-risk pregnancy; 5) no history of infertility; 6) no prior history of mental or physical diseases; 7) no history of drug addiction; 8) literacy (minimum of junior high education); 9) no stressful events within the last six months; 10) Pittsburgh score ≥ 5 (patients with sleep disorders); 11) no treatments for sleep disorders before pregnancy, 12) no night shifts during the study period; and 13) no relaxation methods during pregnancy.

The exclusion criteria were as follows: 1) unwillingness to continue participation in the study; 2) not performing relaxation exercises once a week; and 3) obstetric problems or stressful events during the study period.

In order to calculate the sample size, the formula used in previous two-group studies, which evaluated sleep quality, was applied and post-intervention values reported in these studies were used (19, 21). In order to determine the sample size in the guided imagery group, 8.21±3.99 and 12.76±4.63 were considered for the intervention and control groups, respectively. In the progressive muscle relaxation group, 5.08±1.86 and 8.31±4.24 were considered for the intervention and control groups, respectively. Therefore, the sample size was calculated to be 100, considering CI=95% and power=90% (10% dropout).

Informed consents were obtained from the participants, and the subjects were randomly assigned to three groups of progressive muscle relaxation (n=33), guided imagery (n=33), and control (n=34) by drawing lots. The names of the three groups were written on three pieces of paper: A) progressive muscle relaxation, B) guided imagery, and C) control; then, a third party (a midwife at the center) selected one piece by chance.

In order to prevent data contamination (i.e., exchange of information between the participants), each 10-day period was allocated to a particular intervention. Sampling continued to the end of the study. Training sessions were held for groups of 3-5 participants during two weeks (45-60 minutes per session) for two intervention groups. The sessions started with an introduction to the study, sleep hygiene, and training of relaxation techniques to each group.

Progressive muscle relaxation was instructed based on Jacobson's method by relaxing and contracting 8 muscle groups (modified for abdominal muscles in pregnancy). Guided imagery was instructed by encouraging positive feelings of peacefulness and safety and guiding individuals to imagine beautiful scenes; educational films were also presented by the researcher. At the end of sessions, a booklet and a CD about the presented content and relaxation techniques were given to each group for practicing at home.

The subjects were asked to do the exercises twice a day (once in the morning and once before sleeping at night) for a period of 4 weeks and mark the exercise checklist. During the second session, the content of the first session was repeated and the participants were asked to do the exercises. The researcher assessed the checklists to answer the subjects' questions and be assured about the accuracy of techniques.

If the exercises were accurately performed and the checklist was completed in the first and

Table 1. Comparison of demographic characteristics at baseline

Groups	Guided imagery	Progressive muscle relaxation	Control	P-value
Maternal age ($\overline{X} \pm SD$)	25.90±4.64	25.30±4.11	25.64±4.47	0.85*
BMI ($\overline{X} \pm SD$)	24.70±2.80	24.30±2.08	23.85±2.20	0.35*
Gestational age ($\overline{X} \pm SD$)	29.77±1.37	29.67±1.15	29.77±1.14	0.93*
Average daily sleep time (min)($\overline{X} \pm SD$)	26.62±23.86	22.47±20.58	19.03±20.41	0.36*
Average daily exercise duration (min) median (IQR)	0(1.62)	0(2.75)	0(1.75)	0.87**

* ANOVA test
**Kruskal-Wallis test

second sessions, the one-week interval between the first and second sessions was also considered in the four-week period. However, if the exercises were not performed correctly and the subjects were willing to continue the study, the researcher repeated the instructions.

The researcher contacted the participants at the end of the first, second, third, and fourth weeks and emphasized the importance of doing regular exercises. After four weeks, sleep quality was assessed using PSQI in all groups, and the pre- and post-intervention results were compared. If the participants experienced other sleep disorders (such as apnea, nightmares, narcolepsy, and restlessness leg syndrome, or severe insomnia), they were referred to psychiatrists.

In order to observe ethical considerations, after the recompletion of PSQI, the instructional booklet was given to the control group, as well. In total, two participants were excluded from the study due to migration, two due to unwillingness to continue the study, and one due to unavailability; finally, the data of 95 participants were analyzed.

Descriptive and analytical tests were performed, using SPSS version 11.5. If the data were normally distributed, parametric ANOVA test and paired t-test were applied; if not, Kruskal-Wallis and Wilcoxon tests were performed. If ANOVA and Kruskal-Wallis tests were significant, post-hoc tests were applied for the comparison between the two groups.

Results

The participants were not significantly different in terms of age, body mass index (BMI), gestational age, daily sleep duration, or daily exercise time (P>0.05) (Table 1). They were also similar in terms of sleep distractors such as light (P=0.98) and noise (P=0.92). One-way ANOVA showed no significant difference in the mean score of sleep quality before the intervention between the three groups (P=0.17); however, the difference was significant after the intervention (P<0.001).

In order to compare the two groups separately, Tukey test was performed. The results indicated a significant difference between the two intervention groups (P=0.015). Paired t-test also showed a significant difference between the pre- and post-intervention periods in these groups (P<0.001) (Table 2). There was a significant difference in the score of different PSQI components before and after the intervention, as well (P<0.001) (Table 3). Also,

Table 2. Comparison of mean PSQI scores in the three groups before and after the interventions and the resulting changes

Groups	Before the intervention $\overline{X} \pm SD$	After the intervention $\overline{X} \pm SD$	The amount of change $\overline{X} \pm SD$	P-value
Guided imagery	9.79±2.48	4.56±1.56	5.16±2.27	P<0.001*
Progressive muscle relaxation	8.88±2.15	5.90±1.89	3.00±1.91	P<0.001*
Control	8.76±2.56	12.56±2.12	-3.66±2.67	P<0.001*
P-value	P=0.17	P<0.001**	P<0.001**	

*Paired t-test
**ANOVA test

Table 3. Comparison of changes in sleep quality components in the three groups

Components of sleep quality	Guided imagery	Progressive muscle relaxation	Control	P-value
	The amount of changes	The amount of changes	The amount of changes	
	Median (IQR)	Median (IQR)	Median (IQR)	
Subjective sleep quality	-1(1)	0(1)	1(1)	P<0.001*
Sleep latency	-1(2)	0(1)	0(1)	P<0.001*
Sleep duration	-1(2)	-1(1)	1(1)	P<0.001*
Sleep efficiency	-1(1)	-1(1)	1(2)	P<0.001*
Sleep disturbances	0(1)	0(1)	0(0.75)	P<0.001*
Daytime dysfunction	-1(1)	-1(1)	1(1)	P<0.001*

*Kruskal-Wallis test

there was a significant difference in the components of sleep quality between the control and intervention groups (P<0.001).

The two intervention groups showed a significant difference in terms of sleep latency (P=0.02) and sleep duration (P=0.03); guided imagery had a more significant impact on these components, compared to progressive muscle relaxation. However, no significant difference was found in other components between the two intervention groups. As use of sleeping medications underwent no change after the study, it is not mentioned in Table 3.

Discussion

This study was conducted to compare the effects of progressive muscle relaxation and guided imagery on the sleep quality of primigravida women. The total score of sleep quality and its components was studied before and after the study in the groups. In the present study, both progressive muscle relaxation and guided imagery improved the sleep quality of pregnant women; however, sleep quality was more desirable in the guided imagery group, compared to the progressive muscle relaxation group.

The scores of sleep components also improved in both intervention groups. Sleep latency and sleep duration showed significant differences between these two groups; guided imagery was more effective than progressive muscle relaxation. This difference could be related to the mechanism of progressive muscle relaxation that involves learning the differences between feelings of contraction and relaxation and the person`s skill in coordinating the contraction and relaxation of different muscles (by increasing knowledge about neuromuscular impulses) (15).

On the other hand, in guided imagery, the individual can considerably decrease mental stress by the power of imagination. This method assures people about their ability to control tension and stress by the power of body and mind (20). In a study by Schaffer et al. (2013), guided imagery was effective in improving the sleep quality of mothers with premature neonates (22). Also, Krakow et al. (2001) showed the effectiveness of this technique in improving the sleep quality of patients with post-traumatic stress disorders (21); these findings were in agreement with the present results.

In the study by Schaffer et al. (2013), the intervention was done daily for 8 weeks (22), while in the present study, it was performed twice a day for four weeks. Therefore, it seems that doing more frequent relaxation exercises in shorter periods could be more effective than doing exercises in longer periods. In the study by Krakow et al. (2001), guided imagery was instructed to patients with nightmares and the subjects were followed-up after 3 and 6 months (21). However, in the present study, patients were followed-up after 4 weeks.

Comparison of the present study with the findings by Schaffer and Krakow showed that guided imagery could be effective in shorter periods. Malekzadegan et al. (2010) reported the effectiveness of progressive muscle relaxation in improving the sleep quality of pregnant women (19). As Saeedi et al. indicated (2013), progressive muscle relaxation improved the sleep quality of patients undergoing hemodialysis (28).

The two mentioned studies applied progressive muscle relaxation by the contraction and relaxation of 16 muscle groups in 20 minutes, while in the current research, muscle relaxation was effectively performed on 8 muscle groups during 10 minutes. In the study by Malekzadegan et al. (2010), the participants were in the third trimester of pregnancy and the exercises were performed twice a day for 4 weeks, which was similar to the present study.

Indeed, relaxation considerably changes the activity of central nervous system, influences the physiologic response of patients to tension (16), and prevents negative thoughts and emotions such as anxiety and tension. Sometimes, muscle relaxation is combined with other mental techniques (behavioral and cognitive). Also, two methods of progressive muscle relaxation and guided imagery are combined as one single method. Therefore, considering the synergistic effect, the therapeutic efficacy may increase (13). In this regard, Stremler et al. (2006) and Isenberg et al. (1993) combined these two relaxation methods and applied them in the intervention group; however, it could not be said which method is preferred for improving sleep quality (29, 30).

Also, Urech et al. (2010) compared the effects of progressive muscle relaxation and guided imagery on mental, cardiovascular, and endocrine status of pregnant women and reported more relaxation and lower heart rate in the guided imagery group, compared to others; however, no significant difference was found in other variables (23). In their study, participants were trained in one session and were followed-up within 20 min after the exercises. The results indicated the effectiveness of this method even after only one session of guided imagery.

Contrarily, Kwekkeboom et al. (2008) reported no significant difference between progressive muscle relaxation and guided imagery in terms of pain relief in cancer patients during a 2-day period of relaxation. They recommended that patients select one method, based on their physical ability, level of energy, and type and severity of pain (23). In their study, a cross-over design was applied for reducing the effect of intervening and grounding variables, while if the subjects were followed-up longer, a probable difference might have been found.

It should be noted that there are major differences in the effects of relaxation techniques in different populations and it is impossible to recognize the characteristics of patients for whom relaxation techniques are effective.

The limitations of this study were participants' personal differences in response to relaxation methods and the accuracy of checklists, which were completed daily by the participants at home; unfortunately, the researcher had no control on the accuracy of the data. The strength of this study was weekly telephone contacts with participants for answering their questions and keeping track of their progress. It is recommended that the effects of progressive muscle relaxation and guided imagery on delivery outcomes and sleep quality be evaluated in the postpartum period.

Conclusion

As providing maternal and neonatal health is the main goal of socioeconomic development in a community, it is possible to prevent poor maternal and neonatal outcomes and improve the sleep quality of pregnant women by using non-pharmaceutical methods. Via these measures, high expenses imposed on national health systems and economics could be decreased. According to this study, the applied relaxation techniques were effective in improving sleep quality, although guided imagery was more useful. Therefore, considering the importance of health promotion in pregnant women, it is recommended to establish a plan for assessing and detecting sleep problems, besides routine prenatal care. Through such plans, it will be possible to instruct appropriate relaxation techniques such as guided imagery, which has no side-effects and is easy to be trained by midwives at health care centers. In fact, pregnant women by using these techniques can improve their sleep quality during pregnancy.

Acknowledgments

This study, which was registered in IRCT (code: IRCT2014042917488N1), is the result of an M.Sc. thesis of midwifery, approved by the

Vice-Presidency for Research at Mashhad University of Medical Sciences (MUMS) (approval code: 922247). The authors would like to thank MUMS for the financial support and the mothers for participation in this study.

References

1. Sadock BJ, Kaplan H, Sadock V. Kaplan & Sadock's synopsis of psychiatry behavioral sciences. Rezaee F.10th ed. Tehran: Arjmand; 2007. 149-154.
2. Moline M, Broch L, Zak R. Sleep problems across the life cycle in women. Current Treatment Options in Neurology. 2004; 6(4):319-330.
3. Schutte-Rodin S, Broch L, Buysse D, Dorsey C, Sateia M. Clinical guideline for the evaluation and management of chronic insomnia in adults. Journal of clinical sleep medicine: JCSM: official publication of the American Academy of Sleep Medicine. 2008;4(5):487-504.
4. Tsai SY, Lin JW, Kuo LT, Thomas KA. Daily sleep and fatigue characteristics in nulliparous women during the third trimester of pregnancy. Sleep. 2012;35(2):257-٢62.
5. Okun ML, Luther JF, Wisniewski SR, Wisner KL. Disturbed sleep andinflammatory cytokines in depressed and nondepressed pregnant women: an exploratory analysis of pregnancy outcomes. Psychosomatic Medicine. 2013; 75(7): 670-681.
6. Chang JJ, Pien GW, Duntley SP, Macones GA. Sleep deprivation during pregnancy and maternal and fetal outcomes: isthere a relationship?. Sleep Medicine Reveiw. 2010;14:107-114.
7. Williams MA, Miller RS, Qiu C, Cripe SM, Gelaye B, Enquobahrie D. Associations of early pregnancy sleep duration with trimester-specific blood pressures and hypertensive disorders in pregnancy. Sleep. 2010; 33(10): 1363-1371.
8. Jahanpak N, Razmjou N, Rezaei Ardani A, Mazloum SR, Bonakdaran S. The Relationship between Sleep Duration and Glucose Challenge Test Results in Pregnant Women without Risk Factors of Diabetes. Iranian Journal of Obstetrics, Gyneocology And Infertility. 2013;16(60):9-17. (Persian)
9. Parsaie Rad E, AmirAliAkbari S, Sadeghnia K, AlaviMajd H. Relationship between sleep disorder and pregnancy depression in primigravidae referring to health– treatment centers of Ahvaz Jundishapur University of Medical Sciences in 2010. Journal of Shahid Sadoughi University of Medical Sciences. 2011;19(4):454-462. (Persian)
10. Alipour Z, Lamyian M, Haji Zadeh E. Sleep quality in late pregnancy and postpartum depression. Iranian Journal of Obstetrics, Gyneocology And Infertility. 2012; 14(8):39-47. (Persian)
11. Timby BK. Fundamental of nursing skills and concepts. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009. 463-471.
12. Cunningham F, Leveno K, Bloom S, Hauth J, Rouse D, Spong C. Wiliams Obstetrics. 23rd ed. Tehran: Golban; 2010. 409-414.
13. Hamid N. The effect of relaxation and mental imagery and relaxation therapy on anxiety and hopefulness in women with breast cancer in Ahvaz. Asian Journal of Pharmaceutical and Clinical Research. 2012;2(1):10-15.
14. Alwan M, Zakaria A, Rahim MA, Hamid NA, Fuad M. Comparison between Two relaxation methods on competitive state anxiety among college soccer teams during pre-competition stage. International Journal of Advanced Sport Sciences Research. 2013;1(1):90-104.
15. Davis M. Tutorial relaxation and stress reduction. Tehran: Tabib; 2005. 78-81.
16. Everly GS, Lating JM. A clinical guide to the treatment of the human stress response. 3rded. New York: Springer; 2012. 186-189.
17. Watanabe E, Fukuda S, Hara H, Maeda Y, Ohira H, Shirakawa T. Differences in relaxation by means of guided imagery in a healthy community sample. Alternative Therapies in Health and Medicine. 2006; 12(2):60-68.
18. Morin CM, Bootzin RR, Buysse DJ, Edinger JD, Espie CA, Lichstein KL. Psychological and behavioral treatment of insomnia:Update of the recent evidence (1998-2004). Sleep. 2006; 29(11): 1398-1414.
19. Malekzadegan A, Moradkhani M, Ashayeri H, Haghani H. Effect of relaxation on insomnia during third trimester among pregnant women. Iran Journal of Nursing. 2010; 23(64):52-58. (Persian)
20. Apóstolo J, Kolcaba K. The effects of guided imagery on comfort, depression, anxiety, and stress of psychiatric inpatients with depressive disorders. Archives of Psychiatric Nursing. 2009; 23:403-411.
21. Krakow B, Hollifield M, Johnston L, Koss M, Schrader R, Warner TD, et al. Imagery rehearsal therapy for chronic nightmares in sexual assault survivors with posttraumatic stress disorder: A randomized controlled trial. The Journal of American Medical Association. 2001; 286(5):537-545.
22. Schaffer L, Jallo N, Howland L, James K, Glaser D, Arnell K. Guided imagery: an innovative approach to improving maternal sleep quality. The Journal of Perinatal & Neonatal Nursing. 2013; 27(2): 151-159.
23. Kwekkeboom KL, Wanta B, Bumpus M. Individual difference variables and the effects of progressive muscle relaxation and analgesic imagery

interventions on cancer pain. Journal of Pain and Symptom Management. 2008; 36(6): 604-615.
24. Urech C, Fink NS, Hoesli I, Wilhelm FH, Bitzer J, Alder J. Effects of relaxation on psychobiological wellbeing during pregnancy: A randomized controlled trial. Psychoneuroendocrinology. 2010; 35(9):1348-1355.
25. Buysse D, Reynolds C, Monk T, Berman S, Kupfer D. The Pittsburgh Sleep Quality Index (PSQI): A new instrument for psychiatric research and practice. Psychiatry Research. 1989; 28 :193-213.
26. Skouteris H, Wertheim EH, Germano C, Paxton SJ, Milgrom J. Assessing sleep during pregnancy: a study across two time points examining the Pittsburgh Sleep Quality Index and associations with depressive symptoms. Women's Health Issues. 2009; 19(1):45-51.
27. Hosseinabadi R, Noroozi K, Poorismaili Z, Karimloo M, Maddah SS. Acupoint massage in improving sleep quality of older adults. Journal of Rehabilitation. 2008; 9(2):8-14. (Persian)
28. Saeedi M, Ashktorab T, Saatchi K, Zayeri F, Amir Akbari SA. The effect of progressive muscle relaxation on sleep quality of patients undergoing hemodialysis. Journal of Critical Care Nursing. 2012; 5(1): 23-29. (Persian)
29. Stremler R, Hodnett E, Lee K. A behavioral-educational intervention to promote maternal and infant sleep: apilot randomized controlled trial. Sleep. 2006; 29(12):1609-1615.
30. Eisenberg DM, Delbanco TL, Berkey CS, Kaptchuk TJ, Kupelnick B, Kuhl J, et al. Cognitive behavioral techniques for hypertension: are they effective? Annals of Internal Medicine. 1993; 118(12):964-972.