

The effect of chair massage on stress perception of hospital bedside nurses

MARY KAY BRENNAN, MS, RN, LMBT
RITA DeBATE, PhD, MPH, CHES

ABSTRACT

Studies have shown that hospital bedside nursing is a stress loaded occupation (Breakwell, 1990, Keane, Ducette, & Adler, 1985, MacNeil & Weisz, 1987, Sawatsky, 1996) but little research has been done on the use of techniques to help reduce stress perception in nursing. Massage therapy has been shown to be an effective intervention in stress management. The goal of this study was to determine if a ten-minute on-site chair massage was more effective at reducing the stress perception of hospital bedside nurses than a ten-minute break. Eighty-two nurses at a small suburban hospital on the maternity, medical-surgical, telemetry, and critical care nursing units were enrolled in the study and randomized to either the control group, who took a ten minute break, or the massage group, who received a 10 minute chair massage. Stress perception was assessed using the Perceived Stress Scale (PSS) in an experimental pretest - posttest design and analyzed using t-tests for independent samples. Stress perception was significantly lower in the massage group after the chair massage ($P < .05$) and not significantly changed in the control group. The results of this study support the effectiveness of chair massage in the reduction of stress perception for this population. Further research is warranted to study the feasibility of providing chair massage on a regularly scheduled basis on a nursing unit as well as its impact on other aspects of a nursing position, such as, job satisfaction, retention, absenteeism, injury, and worker's compensation claims. Additionally, it would be beneficial to study the effects of chair massage with individuals in other occupations that are identified as being high stress positions.

SIGNIFICANCE OF THIS STUDY

While much research has focused on stress levels and/or perceptions in nursing, little attention has been given to stress management techniques to reduce these levels/perceptions. Massage therapy is one technique that has been found to be effective in reducing anxiety and job stress (Field, Quintino, Henteleff, Wells-Keife, & Delvecchio-Feinberg, 1997).

Stress is a complex issue that includes physiological and psychological components. One's perception of stressful situations, or stressors, as well as one's personal coping skills, factor into the level of stress response (Pollock, 1984). Stress, itself, is the physical or psychological response that we have to the internal or external stressors that we perceive (Peddicord, 1991). Numerous studies have focused on the stress levels of critical care nurses with varied results. When stress is linked to cases of burnout, it has been found that critical care nurses did not differ from non-critical care nurses. This may be due to a greater ability to deal with stress in general on the part of the critical care nurses (Keane, Ducette, & Adler, 1985). Another study suggests that as hospitals develop effective orientations to critical care units and provide adequate staffing to these units, the stress levels for the critical care nurses falls below that of the non-critical care nurses (MacNeil & Weisz, 1987). Thus, for measuring stress perception in nurses, it seems appropriate to study nurses from various nursing units, including critical care nurses.

Job stress among nurses has received more attention in recent years (Breakwell, 1990). Bedside nurses, identified, by some, as being in stress-loaded jobs, could provide information on the effectiveness of a 10-minute chair massage session on stress perception.

OBJECTIVES

The purpose of this study includes two aims:

Aim 1: assess the effect, if any, that massage therapy has in reducing stress perception in bedside nurses as compared to the standard "coffee break" traditionally allowed in a nurse's schedule during the day.

Aim 2: consider the feasibility of providing massage therapy within this time frame and in this setting.

LITERATURE REVIEW

Little research has been done on the use of interventions to help reduce stress perception in nursing, although it is an area that is gaining recognition. Some

nurses, however, have recognized the need for stress management techniques with activities such as a wellness day organized by nurses, for nurses (Tennant, Farmer, Larose, Lindsay, Marchesseault, & Narayan, 1997). Numerous strategies of stress management have been identified, such as breath work, biofeedback, meditation, and progressive muscle relaxation (Peddicord, 1991). Most recently, Lawler and Cameron (2002) did a study that found an initial reduction in stress perception for college students who received chair massage when compared to those who watched television. This change, however, was not borne out over time. Massage therapy was found to have positive effects on anxiety, depression, and positive well-being as well as other measures with older adults (Sharpe, 2002). Katz, Wowk, Culp, and Wakeling (1999) have done a pilot study using a 15-minute chair massage therapy session as the intervention in measuring pain and tension in hospital nurses with positive results. Further research in the emerging use of massage therapy for stress management is needed as well as a beneficial, convenient timeframe for the intervention. Given that a bedside nurse in a hospital setting is usually allotted two 15 minute breaks and one 1/2 hour lunch break during an eight hour shift, scheduling a 10 minute chair massage session within one of the 15 minute breaks may be manageable and found to be beneficial.

MATERIALS/METHODS

Subjects

After receiving approval from the hospital system's Research Review Committee and Institutional Review Board, meetings with the hospital administrators and the Nurse Managers of the nursing floors were scheduled to explain the study. A flyer announcing the study, including the inclusion and exclusion criteria, was posted in the nurses' lounges on the four nursing units. Inclusion criteria included those nurses with at least six (6) months, full time practice of bedside nursing in this hospital. Exclusion criteria included those who regularly receive massage therapy on their own as well as anyone with medical exclusions for chair massage. Bedside nurses were recruited on a voluntary basis to participate in the study. Those who responded first and who met criteria were the sample. A sign up form to participate in the study, based on the established schedule, was available from the nurse manager of the unit. Participants were assigned a number to use on all written materials of the study at the time of enrollment. The list of names with corresponding numbers was held in confidence by the nurse manager so as to avoid bias on the part of the investigator during the study. Sample size was 82 participants, randomly assigned to the massage group or the control group. This was done according to the randomization plan as attached in Appendix I.

Instruments

Subjects signed a voluntary informed consent form, including a non-disclosure

disclaimer, and filled out a demographic questionnaire which included age, gender, marital status, shift generally worked, years of nursing practice, degree received (Associate, Diploma, or Baccalaureate), and additional training or certification (CCRN, ACLS). The demographic questionnaire was used to determine the similarities/disparities in the two groups. The Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983), a 14-question survey, was used to assess each individual's response to stress. The PSS has a reliability of 0.87 of Cronbach's alpha, adequate short-term test-retest, and concurrent and predictive validity (Sawatzky, 1996). A low score on the PSS reflects low stress perception. The pre-test PSS was completed by the subjects prior to being told if they were in the massage group or the control group to prevent any influence of the randomization schedule on the pre-test. The treatment used was a ten-minute chair massage session provided by a Licensed Massage and Bodywork Therapist. The control group took a self-directed ten-minute break. Immediately following the break or massage treatment, the PSS was again administered.

Methods

The study was conducted over a period of four days on four nursing floors at the hospital, with one day scheduled per nursing unit. Two hour blocks of time were designated during each day for each of the three shifts typically used in staffing, 12:30-2:30 p.m., 8:00-10:00 p.m., and 12:30-2:30 a.m. Thus, the study was scheduled to take place on nursing unit A during the first day with two hours scheduled during 1st shift, two hours scheduled during 2nd shift, and two hours scheduled during 3rd shift. The same study times were used on day two on nursing floor B, day three on nursing floor C, and day four on nursing floor D and a quiet room was designated on each of the nursing units for the massage sessions. For each two-hour period of time, with the randomization plan, up to four massage sessions could be provided and four other nurses would be assigned to the control group. In one day, then, twenty-four nurses could participate in the study with twelve randomized to the massage group and the other twelve randomized to the control group for a total of up to 96 nurses for the total study.

The massage sessions were done using a specially designed massage chair with the subjects fully dressed and were provided by one of four licensed massage therapists over the course of the four days. The sessions consisted of massage applications to the back, neck, shoulders, arms, and hands. The massage techniques used were effleurage (short and long gliding strokes), petrissage (kneading), friction (moving across the muscle fibers), and vibration (gently shaking of the muscle) as defined in Swedish massage, as well as compression. The sessions followed a specific routine of massage for all of the subjects for consistency as follows:

- 1) three gliding strokes applied to the upper trapezius muscle, from the posterior neck to the outer aspects of the shoulder;
- 2) three gliding strokes down both sides of the spinous processes from the neck to the sacrum;

- 3) three, one handed kneading strokes to the bilateral upper trapezius muscles;
- 4) vibration to the upper trapezius muscles for 30 seconds;
- 5) petrissage, using the therapist's thumbs, on either side of the cervical vertebrae up to the occipital ridge;
- 6) petrissage, using the thumb, along the occipital ridge;
- 7) effleurage of the upper trapezius muscle from the occipital ridge to the outer aspect of the shoulder;
- 8) heel of the hand compressions down along the erectors on either side of the spinous processes from the neck to the sacrum;
- 9) thumb friction along the top of the posterior iliac crest;
- 10) heel of the hand compression downward on the top of the posterior iliac crest;
- 11) heel of the hand compressions back up along the erectors on either side of the spinous processes to the scapula;
- 12) thumb petrissage along the edge of the medial edge of the scapula;
- 13) friction at the attachment of levator scapulae muscle at the scapula;
- 14) friction along the inferior border of the scapular spine;
- 15) friction along the superior border of the scapular spine;
- 16) two effleurage strokes to the right arm from the wrist to the shoulder;
- 17) petrissage to the dorsal aspect of the right hand;
- 18) friction between the right carpals;
- 19) friction between the right hand metacarpals;
- 20) petrissage to the palmar aspect of the right hand;
- 21) one handed petrissage to the right lateral forearm, wrist to elbow;
- 22) one handed petrissage to the right medial forearm, wrist to elbow;
- 23) one handed petrissage to the right bicep muscle;
- 24) one handed petrissage to the right tricep muscle;

The arm sequence was then repeated on the left side and the session ended with two effleurage strokes down both sides of the spine from the neck to the sacrum.

A brief follow-up survey, including the PSS, to assess the duration of any effects of the massage was given to the participants with instructions to complete it within 24 hours and return to the nurse manager. A gift certificate for a 30-minute massage was given to the participants who returned this survey. Again, the participants used only their study number on this survey and the nurse manager provided the investigator with the list of corresponding names, without the study numbers, of those who returned this follow-up survey, so that the gift certificates could be awarded. All participants were given envelopes in which to place all the completed surveys and forms prior to submitting them.

DATA ANALYSIS

Pre-treatment and post-treatment stress perception rankings from the Perceived

Stress Survey were analyzed using t-tests for dependent samples. The median ranking on the pre-study PSS questionnaire was compared to the post-study PSS questionnaire for both the control group and the massage group. The data was also compared between groups using a t-test for independent samples. The data from the demographic questionnaire was analyzed with age and years in nursing practice expressed in means and the rest of the demographic information determined by the number of respondents from both the control group and the massage group fitting each particular category. The 24-hour follow-up survey was analyzed using a t-test for independent samples for the PSS data. The two questions related to duration of effect were measured by the number of responses for both groups and calculated to percentages. Data analyses were carried out using SPSS for Windows, Release 10.0 (SPSS Inc, Chicago IL) with $p < .05$.

RESULTS

Table 1 shows the demographic data for the participating nurses. The mean age of the total population was 34.17 ± 9.32 years with the range being from 23 to 62 years. The mean age for the control group was 32.93 ± 9.36 years while that for the massage group was slightly higher at 35.41 ± 9.24 years. No statistically significant difference was found between the two groups for age ($p = .229$). The mean years of nursing practice was 8.37 ± 7.60 for the total population with the control group mean at 7.24 ± 7.05 and the massage group mean, again slightly higher, at 9.5 ± 8.05 . The difference in years of experience was not statistically significant, however ($p = .178$). 95% of the participants were women, which may be reflective of the general population in this hospital setting for bedside nurses. The rest of the demographic information shows fairly equal education levels for the two groups as well as areas of bedside practice and additional training or certification. The total number of participants was eighty-two out of a possible ninety-six per the timetable established, an 85% participation rate.

The results from the analysis of the Perceived Stress Surveys show a significant improvement for the massage group ($p = .005$) and a negligible change for the control group ($p = .641$). The mean pretest score for the control group was 25.24 ± 7.12 and the post-test mean was 25.05 ± 7.43 as shown in Table 2. As noted above, a low score on the PSS is reflective of a low perception of stress. Table 2 also shows that the massage group had a pre-test mean score of 25.76 ± 7.29 which was slightly higher than that of the control group, though not statistically significant ($p = .748$). The post-test mean score for this group, however, was much lower at 23.83 ± 6.33 . A total of 60 follow-up surveys were returned. The results from these show that there continued to be lower stress perception for the massage group compared to the control group although, the mean score of 24.12 ± 6.5 for them was slightly higher than the post-test scores. The control group's

mean score on the follow-up survey was higher than that of the pre-test for this group at 25.52 ± 7.15 . Figure 1 illustrates the variations in mean scores between the two groups pre-test, post-test, and follow-up test.

DISCUSSION

As noted in Figure 1, although not statistically significant ($p=.748$) the pre-intervention scores for the massage group (25.75) were slightly higher than those for the control group (25.24). Additionally, the control group's follow-up scores were higher (25.52) than their pre-test scores (25.24) while the massage group's follow-up scores (24.14) were much lower than their pre-test scores (25.76). Post intervention, both groups experienced lower perceived stress scores (when compared to their pre-test ones); however, the scores among the participants in the massage group were significantly lower while the control group had a very small reduction.

In assessing the effects of the intervention on each of the two groups, it would appear that the massage group experienced a significant reduction in stress perception following the intervention and this reduction continued for a period of time (24-hours) after the massage had been completed. Although there was a slight rise in their scores at the follow-up evaluation, the mean score was still below their baseline, or pre-intervention mean score. In contrast, the results of this study reveal that the control group did not experience a significant decrease stress perception following the 10-minute break and their 24-hour follow-up revealed a stress perception that was higher than their baseline. Since the 10-minute break was self-directed, it would appear that the nurses in the control group spent their time as they would during a routine shift break. It is not known if the fact that they were not randomized to the massage group when there was the possible anticipation of receiving a massage and/or if the activities chosen during the break influenced their post and follow up tests. Nonetheless, it is clear that those who received the chair massage did experience a decrease in stress perception.

The 12-hour and 24 -hour self-assessments, support the results from the PSS mean scores. On the whole, for both of the time intervals, the massage group reported feeling more relaxed at a higher rate than the control group. The activities of the nurses who participated in the study at these time intervals are not known nor is it known as to whether these activities influenced their responses on this survey. Additionally, it is not known if there was a higher rate of return of the follow-up survey from the participants in the massage group because of a positive experience with the chair massage and thus, a stronger desire to receive the 30-minute massage gift certificate.

Based on the above data, among this target population of bedside nurses,

receiving a ten-minute chair massage appears to significantly reduce the perception of stress as compared to the a typical 10-minute break experienced by most bedside nurses.

SUMMARY

This study supports the findings of Katz et al (1999) in showing that massage therapy can be effective in reducing stress perception in nurses within the hospital setting during the course of the workday, at least in the short-term. Since stress has been linked to burn-out (Keane et al, 1985) as well as decreased productivity (McLeroy, Green, Mullen, & Foshee, 1984) and increased absenteeism (Seamonds, 1982, 1983), the use of stress reducing interventions might prove to be worthwhile investments on nursing floors not only for the present but for future staffing management. With the nursing shortage predicted to increase over the next decade as baby boomer nurses retire and this age group population predicted to require greater healthcare services, it seems that measures to support nurses would be beneficial. Further study on the longer term effects of chair massage in the workplace setting on stress perception for nurses would be helpful as well as the effects on absenteeism and productivity. Chair massage has been shown to positively effect alertness and math computations (Field, Ironson, et al, 1996). Could this, then, translate into decreased nursing errors, enhanced patient care, and overall increased job satisfaction for hospital bedside nurses? There are implications here for study with other workplace populations who are in stress-loaded jobs, such as traffic control operators, physicians, medical residents, police officers, firefighters, and military personnel.

Given the number of nurses who were able to take the time to participate in the study, it also supports the feasibility of providing this as an alternative to a standard break time during a shift. The 85% participation rate does reflect, however, the unpredictability of hospital bedside nursing. Many of those who were not able to participate, although they had signed up to do so, were faced with patient care responsibilities at the time of their scheduled session. One example of this occurred on the first day during the 1st shift hours on the maternity floor when there were two emergent caesarean sections scheduled sequentially, which pulled staff from post-partum and the nursery as well as those in labor and delivery. Such is the nature of the work in a hospital setting. Would the participation rate increase if chair massage were offered on a frequent basis for a long period of time such that it became a routine part of the workday or would it not be utilized? Further study seems to be warranted given the results of this study and the others on this topic.

ACKNOWLEDGMENTS

This research was supported by funds provided through a grant from the American Massage Therapy Association Foundation. We thank the administrators of Carolinas Medical Center-University, Mr. Spencer Lilly and Mrs. Doris Smith, for their assistance and support of this project. Additional thanks to the massage therapists who provided their expertise to this study, Shari Miller LMBT, Donna Foster LMBT, Tom Bruce LMBT, and Janet Frederick LMBT. Appreciation is also extended to the nurse managers, Peggy Peterson, Cindy Lindsay, and Dina Roberts for their assistance in scheduling the nurses for the study as well as to all eighty-two nurses who took the time to participate.

Table 1. Demographics of Study Participants

Variable	Control Group (n=41)	Massage Group (n=41)	Total (n=82)	p-value
	F(%)	F(%)	F(%)	
Gender				
Male	3(3.65)	1(1.22)	4 (4.87)	1.000
Female	38(46.34)	40(48.78)	78(95.12)	
Education in other field				
2-yr	12(14.63)	6(7.32)	18(21.95)	.022
BA or BSc	2(2.44)	6(7.32)	8(9.76)	
Master's degree	1(1.22)	0	1(1.22)	
Nursing Education				
2-yr associate	20(24.39)	12(14.63)	32(39.02)	.292
2-yr diploma	3(3.65)	1(1.22)	4(4.87)	

3-yr diploma	1(1.22)	8(9.76)	9(10.98)	
BSN	15(18.29)	20(24.39)	35(42.68)	
MSN	2(2.44)	0	2(2.44)	
Area of Current Practice				
Maternity	13(15.85)	12(14.63)	25(30.48)	.755
Medical	7(8.54)	9(10.98)	16(19.52)	
Surgical	3(3.65)	5(6.10)	8(9.75)	
Telemetry/ICU	10(12.20)	8(9.76)	18(21.96)	
Both Med-Surg	7(8.54)	5(6.10)	12(14.64)	
Med-Surg-Tele/ICU	1(1.22)	2(2.44)	3(3.66)	
Average Shift Worked				
Day	11(13.42)	14(17.07)	25(30.49)	.532
Evening	3(3.65)	4(4.87)	7(8.52)	
Night	27(32.93)	23(28.05)	50(60.98)	
Variable	mean ±sd	mean± sd	mean ±sd	
Age	32.93 ±9.36	35.41 ±9.24	34.17± 9.32	.229
Years of Nursing Practice	7.24 ±7.05	9.50 ±8.05	8.37 ±7.60	.178

*tests are significant at $p < .05$

Table 2. Mean Perceived Stress Scores of Study Participants

Study Group	Pre-study stress scores mean±sd	Post-study stress scores mean±sd	p-value
Control	25.24±7.12	25.05±7.43	.641
Massage	25.76±7.29	23.83±6.33	.005*

*tests are significant if $p < .05$

Study Group	Post-study stress scores mean±sd	Follow-up stress scores mean±sd	p-value
Control	25.05±7.43	25.52±7.15	.586
Massage	23.83±6.33	24.12±6.5	.702

*tests are significant if $p < .05$

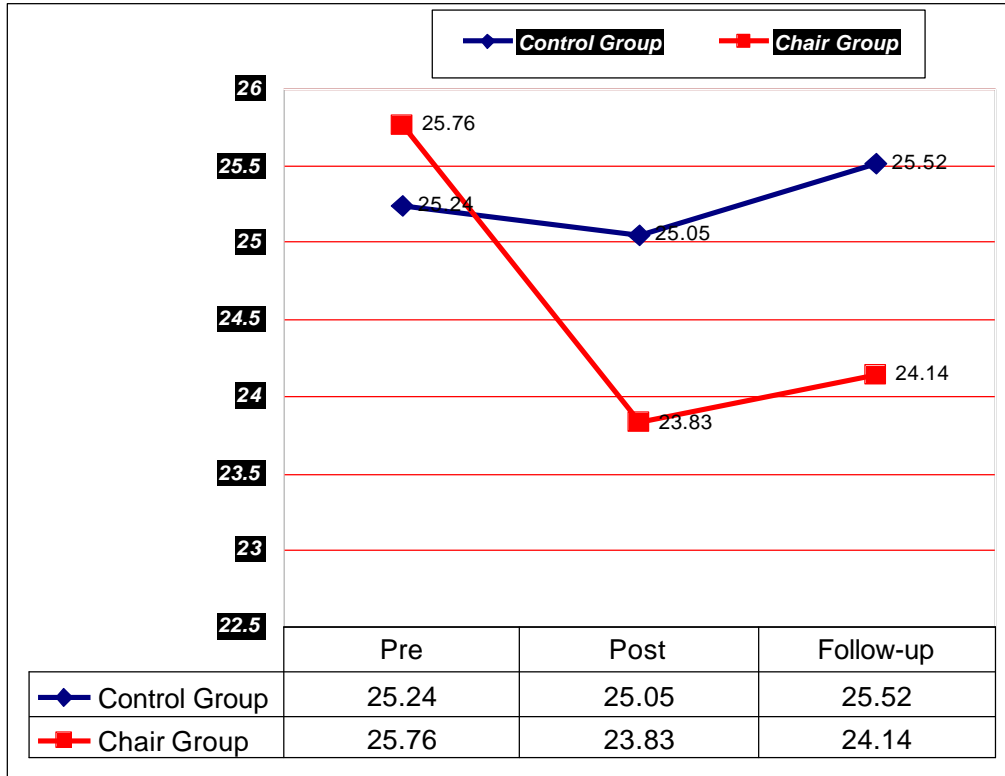


Figure 1. Comparison of Stress Scores between Control and Massage Groups

REFERENCES

Breakwell, G. (1990). Are you stressed out? American Journal of Nurses, 31-33.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health & Social Behavior, 24, 385-396.

Field, T., Quintino, O., Henteloff, T., Wells-Keife, L., & Delvecchio-Feinberg, G. (1997). Job stress reduction therapies. Alternative Therapies in Health and Medicine, 3, (4), 54-56.

Field, T., Ironson, G., Scafidi, F., Nawrocki, T., Goncalves, A., Burman, I., Pickens, J., Fox, N., Schanberg, S., and Kuhn, C. (1996). Massage therapy reduces anxiety and enhances EEG pattern of alertness and math computations. International journal of neuroscience, 86 (3-4), 197-205.

Katz, J., Wowk, A., Culp, D., & Wakeling, H. (1999). Pain and tension are reduced among hospital nurses after on-site massage treatments: a pilot study. Journal of Perianesthesia Nursing, 14, 128-133.

Keane, A., Ducette, J., & Adler, D.C. (1985). Stress in ICU and non-ICU nurses. Nursing Research, 34, 231-236.

Lawler, S.P. & Cameron, L.D. (2002). Massage therapy as a technique for coping with stress. University of Auckland, New Zealand in collaboration with The New Zealand College of Massage. Poster presentation at the American Massage Therapy Association National Convention, Portland, OR, October 2002.

MacNeil, J.M., & Weisz, G.M. (1987). Critical care nursing stress: another look. Heart & Lung: Journal of Critical Care, 16, 274-277.

McLeroy, K.R., Green, L.W., Mullen, K.D., & Foshee, V. (1984). Assessing the effects of health promotion in worksites: A review of stress

program evaluations. Health Education Quarterly, 11, 379-401.

Peddicord, K. (1991). Strategies for promoting stress reduction and relaxation. Nursing Clinics of North America, 26, 867-874.

Pollock, S. (1984). The stress response. Critical Care Quarterly, 3, 1-13.

Sawatzky, J.V. (1996). Stress in critical care nurses: Actual and perceived. Heart and Lung, 25, 409-417.

Sharpe, P., Williams, H., Granner, M., & Hobart, M. (2002). Methods for Improving the Range of Motion of Older Adults. Massage Therapy Journal, 41, 86-97.

Seamonds, B.C. (1983). Extension of research into stress factors and their effect on illness absenteeism. Journal of Occupational Medicin. 25, 821-822.

Tennant, J.K., Farmer, C.F., Larose, P.E., Lindsay, J., Marchesseault, L.C., & Narayan, M.C. (1997). Wellness for nurses, by nurses. American Journal of Nurses, 97, 67-68.