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The Effect of Aromatherapy Massage with Music on the Stress and Anxiety Levels of Emergency Nurses

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Abstract

Introduction: Emergency department staff are subject to significant stressors during their work. Recent studies have provided links between high levels of stress and sick leave. Nurses who work in emergency and intensive care units and new graduates suffer from high levels of stress. This research evaluated the use of aromatherapy massage and music as an intervention to decrease the occupational stress and anxiety levels of emergency nurses.

Methods: The study used a one group pretest—posttest, quasi-experimental design with random assignment. The degree of perceived occupational stress was assessed pre and post 12 weeks of aromatherapy massage and music. Anxiety levels were measured pre and post each massage session. The number of sick leave was also measured.

Results: The findings indicate that aromatherapy massage and music significantly reduced anxiety levels. Although occupational stress levels were high in relation to workload there was no significant difference following the 12-week period of the intervention.

Discussion: The use of a simple and time effective on-site stress reduction strategy significantly reduced nurses' anxiety levels. Regular on-site aromatherapy massage with music has the potential to increase the job satisfaction of the staff and decrease the number of sick leave. Further research examining the result of regular on-site massage would be useful in determining long-term effects.

Keywords : occupational stress; anxiety; emergency nurses; aromatherapy massage

Introduction

Emergency departments (EDs) are busy and stressful areas for staff and patients. The environment can be intense, cluttered, noisy and chaotic. Nursing workloads have increased with the introduction of nurse-initiated X-rays (NIXR), nurse-initiated pathology (NIP) and nurse-initiated analgesia (NIA). While there has been an increase in nurse workloads, there has been a corresponding increase in patient attendance at the ED. The access block to hospital beds causes backlogs to patient movement within the ED. These changes in health service delivery have the potential to increase nurses' workload and decrease the time spent on individual patient care raising nurses' stress levels, decreasing their job satisfaction and increasing the need for sick leave.

While occupational stress is not unique to emergency workers, nurses who work in emergency and

intensive care units and new graduates are groups that suffer from higher levels of stress.¹ A 2002 study² of 120 emergency nurses found that they were exposed to organisational stress; the most stressful situations were those dealing with patients' pain, the presence of the patient's family and a heavy workload. The literature identifies a number of factors that contribute to occupational stress and these have been categorised into seven areas:

- (1) workplace environment, structure and changes³;
- (2) non-optimal work arrangements⁴⁻⁶;
- (3) patient care demands^{4,7};
- (4) working in collaboration with others^{4,8,9,6};
- (5) workloads^{8,9,6,2};
- (6) role conflict and role ambiguity^{8,5};
- (7) personality factors such as Type A behaviour patterns and locus of control.^{10,11}

While some research shows that massage with aromatherapy is a positive stress reduction strategy, this is not specific to nursing staff in EDs. Introducing stress reduction strategies in the work-place may lower the stress levels of nursing staff in the ED, thereby increasing their job satisfaction and decreasing the number of sick leave. The aim of this study was to identify whether one stress-relieving method commonly available in many work places would be effective in the ED setting.

Literature review

A literature review was undertaken using computer databases that included nursing, medical and allied health literature for the years 1990-2004 (CINAHL; Medline, PsychInfo, PsychLit, Cochrane, Proquest).

The keywords of massage, occupational stress, anxiety, emergency nursing and nurses in various combinations were used for the searches. References from retrieved papers were also examined and relevant papers reviewed. Articles to be included in the review had to have evaluated the effect of massage with or without aromatherapy on occupational stress and/or anxiety and be written in English. Five studies that examined massage and occupational stress/anxiety were found but none that clearly examined massage with aromatherapy. Scott¹² out-lined a program of using aromatherapy massage for staff of the Wirral Hospital Trust. The study is not clearly described and indicates that 50 participants completed a modified anxiety scale before and after two massage sessions that "indicated that both new and existing clients experience a definite 'feel good' factor and symptom relief" (p. 23).¹² It is also not clear what type of aromatherapy massage these participants received because aromatherapy neck and shoulder massage and full body aromatherapy massage were available. Two studies outlining the effectiveness of massage with aromatherapy for anxiety in patients were reviewed. Both these studies^{13,14} compared aromatherapy massages with a carrier oil massages; however, no clear evidence about the additional benefit of aromatherapy for reducing anxiety was apparent.

Lewis¹⁵ undertook a quasi-experimental study in a London labour ward to identify the level of occupational stress and to examine if massage decreased stress. Twenty-five participants including midwives ($n = 17$), doctors ($n = 3$), domestics ($n = 2$), auxiliaries ($n = 2$) and receptionists ($n = 1$) were surveyed (open and closed ended questions) using a researcher designed tool pre and post a 20-min on-site massage. Pulse rate was also measured pre and post massage. Lewis found that 80% of the participants felt stress at work and only 13% felt supported at work. All participants felt that massage had reduced the stress they were feeling and pulse rates fell by an average of 12 beats per minute.

A study undertaken in a large North American manufacturing organisation was conducted to test the effect of massage on levels of employee stress.¹⁶ The quasi-experimental study involved 34 participants (20 female and 13 male) and measured anxiety pre and post intervention using the State Trait Anxiety Inventory (STAI). Post-testing occurred 2 and 3 weeks after intervention. The massage consisted of an on-site, 15 min massage once a week for 6 weeks. There was a significant reduction in State anxiety levels for the massage group and a significant, lower, delayed posttest mean for the massage group.

Another North American study¹⁷ examined the effect of massage on physiological indicators of stress. Fifty-two government employees were involved in the study and their systolic and diastolic blood pressure was measured before and after an on-site, 15 min chair massage. The researchers found a significant reduction in systolic and diastolic blood pressure post intervention.

A quasi-experimental study was conducted with 100 hospital employees to test the effectiveness of

various stress reduction therapies (massage, music, progressive muscle relaxation with visual imagery and social support groups).⁴ The State portion of the STAI and the Profile of Mood States (POMS) was used to measure anxiety and mood states pre and post intervention. The interventions were on-site, 10 min chair massage or listening to gentle music for 10 min or 10 min of progressive muscle relations and visual imagery or 10 min in a social support group. The researchers found that massage groups reported lower anxiety, depression, fatigue and confusion, and greater vigour.

Finally, a Canadian nursing pilot study¹⁸ investigated the effectiveness of massage on pain and stress. The pilot study included 12 participants and the POMS and the researcher developed measures for pain, tension, relaxation and duration of effects which were used pre and post each massage. The intervention consisted of eight on-site, 15 min chair massages. All participants attended at least four massages with 33% completing all eight. Pain intensity and tension levels significantly reduced; self-reported levels of relaxation increased significantly; and there was a significant difference on a number of POMS subscales (mood state was significantly improved).

There are no consistencies in the studies reviewed in terms of design, intervention and measures. Although everyone used on-site massage as the intervention, a clear outline of what this entailed — other than the sitting/standing position and the time frame — was not always included. Most studies had small sample sizes and self-report approaches lacked rigour.

This study aimed to further the research in this area by increasing sample size, and clearly outlining the design, intervention and the tools used to measure stress and anxiety.

Methodology

Aim

The hypothesis tested in this study was ‘The use of aromatherapy massage and music will decrease stress and anxiety levels of emergency nursing staff’. The outcomes of this study will inform workplace management in the ED environment by identifying which emergency staff do experience high levels of occupational stress and anxiety and that aromatherapy massage and music is an appropriate support strategy to lessen anxiety and stress. It may help to improve clinical nursing practice.

Research design

The study used a one group pretest-post-test quasi-experimental design. Ethical approval was given by the Princess Alexandra Hospital Ethics Committee.

Sample and setting

The research was conducted in a large metropolitan adult ED that provides services for around 45,000 patients yearly. All permanent nursing staff working in the ED for the duration of the study were eligible to participate.

Intervention

Massage was administered by a massage therapist with a certificate in relaxation therapy. The massage consisted of a 15 min seated chair massage of the shoulders, mid back, neck, scalp, forehead and temples. It was performed in a quiet room while sitting in a normal chair listening to new age music through earphones. Listening to music via earphones was considered important as a means of lessening environmental noise, such as the internal paging system that is audible in all rooms within the ED. Aromatherapy spray mist containing distilled water, essential plant oils and colouring was sprayed lightly above the participant’s head prior to the commencement of the massage. Participants could chose from four mists: Rose, Lavender, Lime and Ocean Breeze that consisted of Lavender, Ylang Ylang, Bergamot and Patchouli. Sixteen massages were administered each week for a 12-week period, totalling 192 massages over this time. The massage sessions were originally set down for Tuesday and Thursdays but were rescheduled to Monday and Wednesday 3 weeks into the massage sessions because of appointment conflicts for the massage therapist. The time of day remained the same, between 13.30 and 15.30 h. Eight names of staff were randomly drawn from an opaque envelope. These staff were then approached, given an information sheet to read, consent obtained and a time schedule for their massage established. If a staff member did not want to participate, another name would be drawn from the envelope.

Data collection

The data collection instrument, a survey, comprised two sections: demographic data and the Perceived Occupational Stress Scale (POSS)¹⁹ and stressors specific to the ED was administered before and after

the 12-month period of massages. Anxiety was measured pre and post each individual massage using the Faces Anxiety Scale.²⁰ Registered nurses' sick leave figures for the 3 months prior, 3 months during and the corresponding 3 months of the year before the massage were also collected.

Instruments

The POSS¹⁹ had been used to measure perceived stress among factory workers. The tool consists of 46 items and the language used was adapted to suit the ED. Questions in the POSS are grouped to measure

- responsibility pressure;
- quality concern;
- role conflict;
- job versus non-job conflict;
- workload;
- type A personality;
- job satisfaction;
- occupational self-esteem;
- intrinsic rewards;
- extrinsic rewards;
- importance rewards;
- control rewards.

Although an old tool, it was chosen as the measure of occupational stress because its measures are consistent with the factors identified in the literature as influencing this type of stress.

While the POSS looks at the overall occupational stress measures, it was felt that there were sources of stress specific to an ED, so 21 items were included; 19 were identified in the literature 2 and two were specific to the department where the study was to be conducted. Face and content validity were improved through the use of a reference group that included nurse educators, registered nurses and academics who reviewed the questions.

Demographic information was collected, including sex, age, marital status, dependent family at home, exercise use and number of years worked in the ED.

All groups within the POSS have been developed and tested for reliability, face validity, convergent validity and discriminant validity. Reliability varied between measures from adequate to very good, with Chronbach's α varying between 0.54 for control rewards to 0.87 for intrinsic rewards. For the current study Chronbach's α vary between 0.623 for type A personality to 0.92 for job satisfaction. The extrinsic rewards had a Chronbach's α of 0.425, however the questions in this section may not relate as well to nurses and medical staff, working for a government organisation with strict guidelines on extrinsic rewards, as to factory workers. The Chronbach's α for stress items specific to an emergency department for this study was 0.863, previously 0.87.²

The Faces Anxiety Scale (FAS) has been developed and tested as a measure of anxiety in critically ill patients.²⁰ Although intended for use with the critically ill it was chosen because it is easy to administer and has minimal subject burden. The FAS enables subjects to choose which of the five faces shows how much anxiety they are feeling at the time.²⁰ Providing a measure that was time efficient was important given that nurses were taken off-line for their massages and adding more time to this would have been problematic for the subjects and the department. McKinley et al.²¹ assessed the validity of the FAS and found that the "correlation between the objective clinical judgement of the interviewer and the patients' self-reports of anxiety on the Faces scale is well within the recommended range of 0.4—0.8 for criterion validity" (p. 150).

Data analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 12.0. Descriptive statistics for mean and standard deviation and range were used. Comparisons between pre and post massage anxiety scores were undertaken by generalised estimating equations²² and occupational stress scores were compared pre and post the 12-week period of massages using a two-sample *t*-test. For the 3

months before and three months during the massage intervention, an average pro-portion of sick leave taken per person per time period was calculated then transformed with logs to get symmetric data then compared over the two time periods with a paired *t*-test.

Results

Sixty-nine surveys were distributed before the 12-week period of massage and 73 after this time; response rates pretest 48% (*n* = 33) and posttest 48% (*n* = 35) were achieved. See Table 1 for the characteristics of the sample for both periods of time.

Table 1 Characteristics of the sample

	Pre massage (<i>n</i> = 33)	Post massage (<i>n</i> = 35)	National ²⁸
Age (mean, years)	35.7	37.1	37.8
Gender			
F (%)	80.6	82.9	86.5
M (%)	19.4	17.1	13.5
Type of employment			
F/T (%)	61.3	65.7	49.5
P/T (%)	38.7	34.3	50.5
Years of employment in ED (mean, years)	7.0	6.6	

Table 2 Frequency of anxiety scores pre and post massage with aromatherapy and music

	1 (no anxiety)	2	3	4	5 (extreme anxiety)
Pre massage score (<i>n</i>)	23	41	61	34	24
Post massage score (<i>n</i>)	146	23	11	3	0

Over a 12-week period, 192 massages were scheduled: one massage was missed because the participant declined participation and a replacement was not able to be found; two were missed because of time constraints within the ED; and five were not analysed because the data were missing. There were 183 comparisons of anxiety scores, that is, 183 massages and 68 staff received massages over the 12-week period. The number of massages per person ranged from 1 to 10, an average of 2.7 massages per person. Table 2 illustrates the frequency of anxiety scores pre and post massage. It is clear that massage was effective in reducing anxiety in most cases. There were no occasions when anxiety was worse after massage but, in contrast, there were 157 (86%) occasions where anxiety was improved after massage. The mean improvement was 1.7 units with a range from 1 to 4 units. A statistical analysis of the data using generalised estimating equations²² to account for the repeated measures confirms that massage was effective in reducing anxiety levels (*p* = 0.0002).

The 46 questions from the POSS survey were recoded based on the guidelines set out by House et al.¹⁹ into 12 subscales. Scores for each subscale were summed and then analysed by two-sample *t*-test (see Table 3). The scores from questions 48-69 were added and also analysed by two-sample *t*-test (means, see Table 3). These results suggest there has been no change in stress levels from the pre massage time period to the post massage time period with responsibility pressure experiencing the greatest change (*p* = 0.12). Although there was no significant difference between the two time periods, it can be seen that the staff experienced high levels of occupational stress in the workload sub-scale. The possible range for this subscale is 0-12 and the means for both time were high (10.4, 10.0). The scores from questions 48 to 69 were added and also analysed by two-sample *t*-test indicating no significant difference between pre and post intervention period. Table 4 lists the means for the items in descending order of stress (0 = 'causes me no stress', 5 = 'causes me extreme stress').

Table 3 Occupation stress levels pre and post a 12-week period of massage with aromatherapy and music

Variable	Range of possible scores	Time 1 [mean (S.D.)]	Time 2 [mean (S.D.)]	P-value	Chronbach's α
Responsibility pressure	0-12	8.3 (2.0)	7.5 (1.8)	0.12	0.697
Quality concern	0-12	7.4 (1.7)	7.3 (2.2)	0.92	0.699
Role conflict	0-12	6.6 (2.3)	6.0 (1.9)	0.28	0.716
Job vs. non-job conflict	0-12	4.8 (2.1)	5.0 (2.3)	0.65	0.569
Workload	0-12	10.4 (1.8)	10.0 (1.8)	0.41	0.916
Type A personality	0-30	17.0 (3.6)	16.2 (4.2)	0.41	0.623
Job satisfaction	0-24	13.2 (5.4)	13.5 (5.5)	0.83	0.932
Occupational self-esteem	0-18	6.8 (2.8)	6.6 (3.5)	0.82	0.738
Intrinsic rewards	0-24	14.6 (3.9)	14.3 (3.2)	0.75	0.821
Extrinsic rewards	0-12	4.2 (2.0)	4.4 (1.9)	0.77	0.425
Importance rewards	0-15	7.0 (2.5)	7.1 (2.3)	0.76	0.627
Control rewards	0-9	4.0 (2.3)	3.9 (1.7)	0.86	0.661
ED stressors Qs 48-69	0-48	49.7 (9.1)	48.8 (10.3)	0.72	0.863

Sick leave was analysed using a paired *t*-test. Table 5 outlines sick leave figures for the 3 months prior to massage and 3 months during massage. There was no statistically significant difference ($p = 0.13$) in sick leave between the two periods during massage with aromatherapy and music.

Table 4 Stressors specific to emergency department

Items	Pre		Post	
	Mean	S.D.	Mean	S.D.
Lack of staff	3.30	0.81	3.31	0.83
Busy work load	3.18	0.77	3.14	0.85
Use of casual staff unfamiliar with ED	3.13	0.71	2.83	0.86
Relatives reactions/behaviour	2.82	1.01	2.77	0.88
Poor cooperation and communication in other departments	3.03	0.95	2.77	1.03
Physician not available	2.70	0.77	2.69	0.93
Pressure to work very fast	2.94	0.90	2.69	0.80
Communicating bad news	2.58	1.15	2.31	0.93
Performing non-nursing tasks	2.50	1.10	2.29	1.18
Physicians' demands on my workload	2.42	0.83	2.29	0.71
Family presence in the department	2.30	1.07	2.20	1.13
Poor cooperation in ED	2.58	0.97	2.17	1.07
Shift work	2.41	1.07	2.14	1.06
Dealing with death and dying	2.30	1.26	2.06	1.00
Triage	1.64	1.27	2.03	1.42
Patients reactions ^a	—	—	1.97	0.86
Multi-trauma management	1.85	1.09	1.86	0.97
Dealing with patient's pain and suffering	2.00	0.97	1.83	0.66
The decisions I have to make	1.67	0.85	1.79	0.84
Tasks I don't like	1.97	0.88	1.77	0.91
Working overtime	1.39	1.00	1.60	0.91

^a This item was not collected in pre survey because of tool error.

Table 5 Sick leave figures

Time period	Geometric mean proportion of hours sick (range) (%)	Paired <i>t</i> -test
May-July 2004	3.7 (0.5-20.5)	$p = 0.13$
August-October 2004	4.1 (0.5-24.3)	

Limitations

This study sought to identify if aromatherapy massage with music would decrease occupational stress and anxiety scores in ED nursing staff. There were a number of limitations associated with this study. A more rigorous randomisation would be the most suitable sampling method; however, with the logistics required to use this system, work practices may have been affected and rostering of staff to participate in these sessions would have been more difficult. The use of a control group or other treatment groups (for example, massage, massage with aromatherapy, massage with music) would have also enhanced

the analyses of difference; however, practical issues and resource limitations made it unrealistic. The study was conducted in one organisation and this might make the findings con-text specific and difficult to generalise to other settings.

Discussion

The results clearly show the immediate positive effect of aromatherapy massage with music on the anxiety levels on the nursing staff in the ED. Although occupational stress and sick day levels were not decreased, this is not unexpected because some participants had only had one massage over the 12-week period. The number of massages participants received over the 12-week period ranged from 1 to 10. Although occupational stress was not decreased after the 12-week period of massages, the high levels of occupational stress in relation to workload was evident. The ED-specific stressful situations were found to differ from that of Adeb-Saeedi² who found the three most stressful situation were 'Dealing with patients' pain and suffering', 'Family presence' and 'Heavy work load'. In this study they were 'Lack of staff', 'Busy work load' and 'Poor cooperation and communication with other departments'. The increasing international shortage of nurses^{23,24} may have contributed to this difference. In addition, the increase in nursing workloads²⁵⁻²⁷ affect the ability to provide quality patient care and in this way increase the levels of stress. In light of these challenges, the effectiveness of aromatherapy massage with music as a practical, easy, intensive anxiety-reducing strategy needs to be considered.

Conclusion

Nurses working in EDs are faced with many stressful situations, a number of which are highlighted in this research. This research has demonstrated that aromatherapy massage with music significantly reduces the anxiety levels of emergency nurses thereby enhancing their comfort and over-all well-being. Although occupational stress levels were not significantly reduced over the 12-week period of intervention, many of the participants received only one massage session. Aromatherapy massage with music is a convenient, easily accomplished anxiety-reducing strategy. Given the significant reduction in anxiety it would be useful to look at providing a massage therapist for access on-site for massages at a cost. Staff found the massages extremely beneficial and indicated that they would be interested in paying for them if they were available and regular massages may improve stress levels. Supporting staff needs for stress reduction strategies with other methods would also be beneficial. Further research might examine the long-term effectiveness of aromatherapy massage with music using a randomised control trial where participants in the intervention group would receive a series of aromatherapy massages over a time period.

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