

## Hand Massage Reduces Perceived Stress, Anxiety and Fatigue

Megan Kirschner, DNP, RN

Robin Kirschner, EdD, DNP, RN, NEA-BC, CNE

Banner University Medical Center - Phoenix

1111 E. McDowell Rd.

Phoenix, AZ 85006

**Abstract:** *In an evidence-based practice project using a mixed-methods quasi-experimental design, on-duty nurses were provided 10-minute hand massages during break times to determine perceived reduction of stress, anxiety, and fatigue. Participants provided quantitative and qualitative survey responses evaluating the environment, personal wellness, and rating of stress, anxiety and fatigue, overall experience, impact on patients, and perception of massage. Using a paired t-test the findings were statistically significant for reduction of stress, anxiety, and fatigue. The qualitative findings surrounded the three themes of relaxation, self and others focus, and wellbeing. Results support reduced stress, anxiety, and fatigue, and promoted improved care.*

**Keywords:** *massage, nurse, stress reduction, improved care delivery*

### Hand Massage reduces perceived Stress, Anxiety and Fatigue

Professional nurses regardless of the work environment are placed in situations that generate stress (Back, Tam, Lee & Haraldsson, 2009; Bost & Wallis, 2006; Cooke, Holzhauser, Jones, Davis, & Finucane, 2007). Work-related stressors are many but include (a) workload, (b) patient and family demands, (c) an increase in hospital admissions, (d) changes in and high patient acuity, (e) decrease in nursing workforce, (f) disease, (g) injury, (h) anxiety, and (i) fatigue (Back, Tam, Lee, Haraldsson, 2009; Bost & Wallis, 2006; Cooke et al., 2007; Sundin, Hochwalder, Bilt, & Lisspers, 2007). Additionally, Payne (2001) linked work stress to burnout leading to a decrease in the quality of nursing care delivered. Acute care hospitals have been identified as areas where professional nurses experience high levels of burnout affecting patient outcomes (McHugh, Kutney-Lee, Cimiotti, Sloane, & Aiken, 2011). Other research studies support that stress related burnout negatively impacts patient care, quality and safety, and decreases nursing productivity (Borritz et al., 2006; Laschinger & Leiter, 2006; Teng, Shyu, Chiou, Fan, & Lam, 2010; You, Aiken, Sloane, Liu, & He, 2013). Improving the work environment through stress release interventions has been shown to reduce stress and burnout (Cimiotti, Aiken, Sloane, & Wu, 2012). The use of massage in various forms has demonstrated actual and perceived

reduction in stress, anxiety and fatigue among patients, families and professional nurses (Adib-Hajbaghery, Rajabi-Beheshtabad & Ardjmand, 2015; Airoso, Falkenberg, Ohlen, & Arman, 2015; Brand, Munroe, & Gavin, 2013; Garner et al., 2008; Listing et al., 2010; Moyle, Murfield, O'Dwyer, & Van Wyk, 2012; Pedrazza, Minuzzo, Berlanda, & Trifiletti, 2014; Prichard & Newcomb, 2015).

### Aim

The aim of this evidence-based practice improvement project, using a quasi-experimental design, is to apply an intervention that has ease of use, short time frame, can be applied in nearly every acute care nursing environment and reduce the perception of stress, anxiety and fatigue. The clinical question to be answered is, for acute care nurses, in a Magnet designated university medical center, does a 10-minute hand massage with essential oil in a quiet environment reduce perceived stress, anxiety and fatigue? Additionally, (a) does the receipt of a hand massage improve perceived patient-centered focus, (b) change the nurses' approach to other health professionals, staff and or students, (c) promote interacting with patients more positively, and (d) promote sharing information about hand massage with other health professions, staff, and or students.

### Background

Stress, anxiety and fatigue, which are related to burnout, create physical and psychological changes (Williams, 2014). Stress can be defined as "any event that threatens homeostasis and cause the body to adapt" (Williams, 2014, p. 40). Burnout which develops from response to the stressors includes (a) physical and emotional fatigue, (b) feelings of detachment, and (c) decrease in ability to accomplish tasks (Maslach, 1982). As stress is both physical and psychological there are factors that verify a change in stress hormones, cortisol and adrenaline, and individual perception of changes in stress.

### Physical Response

An identified physiological response related to stress is the release of cortisol and adrenaline by the adrenal cortex. The release of the cortisol and adrenaline places the body in a readiness to respond with 'fight or flight'.

This 'fight or flight' response is modulated by the sympathetic nervous system preparing the individual through heightened mental awareness and physical readiness. Stress is perceived generically where the bodies physiological response mechanism does not differentiate the stress of a near car accident with active resuscitative efforts. Stress is generated within the workplace where behavioral expectations require the professional nurse to act in a specific acceptable manner. Professional expectations require the nurse to contain, conceal, and control physiological readiness to action.

Most individuals think of stress in the acute form where the individual must respond to a situation using the 'fight or flight' physiological response created through the release of cortisol and adrenaline. However, stress in nursing is chronic with episodes of acute stress requiring immediate action. It is the chronic stress that is most debilitating. In an acute situation the release of cortisol and adrenaline facilitate an actual urgency and remains active in the body for a period of time after the urgency has dissipated. Some individuals will remark that during an urgent situation where they acted swiftly, that once the urgency was no longer present that they feel 'shaky' and 'drained'. These after-urgency responses are related to the energy expenditure but also to the continued presence of the cortisol and adrenaline.

Chronic stress leads to the presence of cortisol and adrenaline at elevated levels for long periods of time. Additionally, if the stressors continue to be present, even intermittently, these cortisol and adrenaline levels remain elevated leading to common stress-related diseases. The stress-related diseases include (a) cardiovascular and hypertension, (b) digestive nausea, colitis, and ulcers, (c) endocrine related weight gain, loss of sex drive and depression, (d) integument aggravation of dermatitis, acne and other skin diseases, (e) lymphatic and immune impairment leading to increase susceptibility to disease and autoimmune disorders, (f) musculoskeletal tension that may lead to posture changes and teeth and jaw grinding, (g) nervous system anxiety, post-traumatic stress disorder, depression and mood disorders, (h) reproductive inhibition of gonadotropin-releasing hormone and inhibition of ovulation and sperm release, (i) respiratory system exacerbation of prior conditions such as asthma and chronic obstructive pulmonary disease, and (j) urinary retention and interstitial cystitis. Other common complaints from nurses include headache, heartburn and insomnia which can all be attributed to chronic stress.

### **Psychological Response**

Individual perception of stress release is the belief that the individual holds related to the interventions

designed to decrease stress. Perception is reality and how the individual perceives stress is also an individual experience (Sridevi & Maheswar, 2015). The nursing profession and work environment is a source of stress for nurses. There are many contributing factors already indicated that support stress in the environment and although some may be eliminated or reduced, there will always be stress associated with delivery of care. Therefore, individuals must manage their reaction to stress where one option is muscle relaxation (Sridevi & Maheswar, 2015). Other options include changing the environment through the use of sound, scent or temperature. The scents of essential oils have a long history of medicinal use (Halcon, 2014). The use of essential oils with massage therapy in two different studies indicates that there was an improvement in mood (Cavanagh, 2005; Snow, Hovance & Brandt, 2004). Some of the essential oils listed in these studies include lavender, lime, and a combination of ylangylang, bergamont and patchouli.

### **Stress Reduction**

Stress reduction through the use of massage and scent with essential oils supports physical and psychological improvement in actual and perceived stress. Osaka et al. (2009) found that even a brief hand massage reduced cortisol levels. In another study, Listing et al. (2010) found that cortisol levels and perception of stress was reduced after massage. Massage therapy with essential oils has been recommended for anxiety reduction (Hernandez-Rief, Field, Krasnegor & Theakston, 2001; Wilkinson et al., 1999).

There are a variety of areas of the body where massage can be applied. Selecting hand massage does not require removal of clothing or a particular massage station or devices. Additionally, hand massage is an easily developed skill for nurses and delivered in a 10-minute time frame leading to effective stress reduction (Brand, Munroe, & Gavin, 2013). Hand massage provides soft tissue manipulation using a series of structured movements performed in a repeating pattern. Moderate pressure tactile massage stimulates the touch receptors without the initiation of muscle contraction (Field, Diego, & Hernandez-Reif, 2010). Studies have shown that touching is a key component to relaxation and offering or receiving touch can positively impact nursing satisfaction (Arisoa et al., 2015; Pedrazza, Minuzzo, Berlanda, & Trifiletti, 2014).

Several studies with patients and nurses combined massage with the use of essential oils to provide an environment of scent also called aromatherapy (Allard & Katseres, 2016; Kianpour, Mansouri, Mehrabi & Asghari, 2016; Prichard & Newcomb, 2015; Satou et al., 2013; Smith, 2012). The outcomes of these studies included effectiveness in reduction of stress through quantitative and qualitative methods with massage and

essential oils (Dunning, 2005; Satou et al., 2013). Horowitz (2011) identified that the smell of essential oils impacts the limbic system in the brain creating a state of calm, relaxation or invigoration. Two studies found that the use of essential oils decreased anxiety (Braden, Reichow & Halm, 2009; Burns et al., 2000) and one noted a decrease in fatigue (Varney & Buckle, 2013). Additionally, a systematic review of the use of aromatherapy found that essential oils were effective in reducing anxiety without any negative effects (Lee et al., 2011). One study that targeted intensive care nurses found that inhalation of sage and lavender essential oils reduced stress (Pemberton & Turpin, 2008).

Nursing professionals are susceptible to stress-related disease that affects attendance, quality of care delivered, and productivity in the workplace. Hand massage with an essential oil in a quiet environment qualifies to meet some of these suggested psychological measures for stress reduction and is supported by research.

### **Conceptual Framework**

Watson's Theory of Human Caring (as cited in Parker & Smith, 2010) is the framework for this project. This theory at the application level promotes the language of caring which is shared through the ten carative factors or caritas (Parker & Smith, 2010). Caring science within this theory is intentional with the focus on self and others. Application of this theory in this project is related to valuing the caregiver as the object of care to facilitate ongoing delivery of high quality intentional care to patients. Caring indicators used in the project include the use of touch, scent, and quiet environment (Parker & Smith, 2010). This project aligns with this theory as the intervention demonstrates caring through massage, use of essential oils, and a quiet environment.

### **Design Methods**

This project used a quasi-experimental design with a convenience sample of registered nurses pre- and post-hand massage perceptions. Permission from the acute care university medical center and institutional review board approved this project. The sample goal was to complete hand massages until a total of 40 surveys were completed. Registered nurses (RN) were advised through the standard communication procedures of the medical center of the time and place to receive a hand massage. All hand massages were voluntary and completed during the RNs break time. The environment was quiet with dimmed lights.

When the RN staff member arrived for a hand massage, they were greeted and asked to sit with the RN that would provide the hand massage. The RN providing the hand massage requested the staff member to sit quietly without speaking during the hand massage. The staff

member is then asked to review the available essential oils and make a selection for use with the hand massage. All staff members received the same sequencing of hand massage but with self-selected essential oil.

Once the hand massage was completed the staff member was asked to complete the survey related to the hand massage that included quantitative response options for (a) evaluation of the environment, (b) perception of personal wellness improvement, (c) rating of stress, anxiety, and fatigue on a 5-point Likert scale. Qualitative responses asked about (a) identification of how the hand massage experience may improve their ability to be more patient-focused, (b) how they would interact more positively with patients, (c) how their perception of hand massage may have changed, and (d) how they may informally share information about hand massage with others.

### **Procedure**

One RN completed the hand massage training in the two and one-half day wellness event. The training included education, observation and demonstration of massage technique and sequencing. This RN completed all of the hand massages. The hand massage was completed in alignment with the techniques outlined for nurses that included (a) hypertensive technique, (b) jiggle technique, (c) petrissage technique, (d) rubbing technique, and (e) squeezing technique (Brand, Munroe, & Gavin, 2013). An overview of the hand massage began with the staff member extending the hand of their choice to the hand massage provider. The provider started the procedure with rubbing the back of the hand followed by use of the jiggle technique. Next the provider used a circular motion on the palmar surface of the hand following in sequence with the hypertensive technique, petrissage technique, squeezing technique and jiggle technique. Each hand received a massage for 5 minutes. At the completion of the second hand, both hands were gently grasped for one final gentle rub over both sides of each hand.

### **Data Analysis**

All quantitative data was entered into GraphPad ([www.graphpad.com](http://www.graphpad.com)). Paired *t*-tests were utilized to determine the P value and statistical significance at an alpha of 0.5. The comparison was of the RNs perception pre- and post-hand massage related to stress, anxiety and fatigue.

### **Results**

#### **Quantitative Survey**

The goal was to achieve 40 completed surveys however only 38 were found to be complete without missing responses. Question one and two had response options ranging from excellent, good, fair or poor. The next

three quantitative questions (question three, four and five) asked the staff member to rate their perception of stress, anxiety and fatigue before and after completion of the hand massage. The 5-point Likert scale aligned as follows: 1 – none; 2 – very little; 3- moderate amount; 4 – great deal; and 5 – extensive.

**Question 1.** The first question asked if the environment was quiet and tranquil. Twenty-five participants (65.7 %) rated the environment as excellent and thirteen of the respondents indicated 'good' (34.2%). There were no responses indicating fair or poor. All participants indicated that the environment was quiet and tranquil at the good level, with nearly two-thirds of the participants rating the environment as excellent.

**Question 2.** The second question asked the staff member to evaluate the degree to which hand massage had improved their personal wellness. Thirty-five participants (92.1%) rated an excellent improvement and three of the respondents indicated 'good' (7.9%). There were no responses indicating fair or poor. Nearly all participants found the hand massage experience to have improved their personal wellness at a level of excellent.

**Question 3.** The paired *t*-test for perception of stress had a P value of less than 0.0001 ( $t = 16.34$ ) which indicates extremely statistically significant. The confidence interval was 2.08 with a range of 1.82 to 2.34 indicating that this change from pre- to post-hand massage is statistically significant at an alpha of 0.5 or 95% confidence interval. Hand massage with essential oil decreased the perception of stress.

**Question 4.** The paired *t*-test for perception of anxiety had a P value of less than 0.0001 ( $t = 13.43$ ) which indicates extremely statistically significant. The confidence interval was 1.90 with a range of 1.61 to 2.18 indicating that this change from pre- to post-hand massage is statistically significant at an alpha of 0.5 or 95% confidence interval. Hand massage with essential oil decreased the perception of anxiety.

**Question 5.** The paired *t*-test for perception of fatigue had a P value of 0.0001 ( $t = 11.63$ ) which indicates extremely statistically significant. The confidence interval was 1.66 with a range of 1.37 to 1.95 indicating that this change from pre- to post-hand massage is statistically significant at an alpha of 0.5 or 95% confidence interval. Hand massage with essential oil decreased the perception of fatigue.

### Qualitative Survey

The nurse's reflection on the qualitative question analysis led to identification of three themes; (a) relaxation, (b) self and other focus, and (c) wellbeing. Under the relaxation theme the nurses were asked "As a result of today's hand massage, I will appreciate how

hand massage can improve patient-centered focus on resumption of care". There were 31 responses to this item. Within these 31 responses there were three selected responses reflect the effect and impact on the RN receiving the hand massage. Each of these responses represents the theme of relaxation as an aspect for reduction of anxiety, stress relief, and decreasing fatigue. Examples of the responses include: "the hand massage actually allowed me to forget I was at work and I feel very relaxed", "10 minutes of someone focusing on me, allows me the chance to re-charge and focus on others", and "after the massage I feel refreshed and ready to work".

The second theme was self and other focus. The nurses were asked, "As of today's hand massage, I will appreciate how hand massage may change my approach". There were 33 responses to this item. Within these 33 responses there were three selected responses that identify that the nurses were able to focus on their internal feelings and identify the theme as well as strategies to become more "centered". This led to perceived improved assessment of feelings of others and identifying strategies for effective communication so that they could move toward supporting patient goals and needs. Examples of the responses include: "communication between nurses, staff and physicians can be improved due to stress reduction", "will help me with patients in high stress, de-escalate their feelings", and "I will be more mellow and kind".

The third theme was wellbeing. The nurses were asked, "As a result of today's hand massage, I will informally share information about hand massage with health professionals, staff and / or students and interact with patients more positively". There were 16 responses to this item. Examples of the responses include: "giving hand massages to patients with high levels of pain", "relaxed caregivers improve the patient's well-being by remaining calm in stressful situations", and "I will talk about how relaxing; calms your inner soul; advocate this for all—patients, staff, family". Nurses were also asked to determine how many people they would impact about this information over the coming year. The responses to 'how many' ranged from statements "all people" to "everybody" to a specific number of people such as 145.

### Conclusion

Nurses are in a position to care for the patient and family with a person-centered focus. Ensuring that that nurse is fully effective in completing a high level of quality care requires that the nurse has the physical and psychological ability to do so. Simply providing the opportunity for the on-duty nurse to receive a 10-minute hand massage improved the nurse's perception of physical and psychological wellbeing. Additionally,

nurses felt renewed ability to focus on the needs of others upon return to work and to recommend hand massage for others within their environment.

### References

- Adib-Hajbageri, M., Rajabai-Beheshtabad, R., & Ardjmand, A. (2015). Comparing the effect of whole body massage by a specialist nurse and patients' relatives on blood cortisol level in coronary patients. *ARYA Atheroscler*, 11(2), 126-132.
- Allard, M. E., & Katseres, J. (2016). Using essential oils to enhance nursing practice and for self-care. *American Journal of Nursing*, 116(2), 42-49.
- Airosa, F., Falkenberg, T., Ohlen, G., & Arman, M. (2015). Tactile massage as a part of the caring act: A qualitative study in short-term emergency wards. *Journal of Holistic Nursing*. [Online: Epub ahead of print]. Pii: 0898010115579769
- Back, C., Tam, H., Lee, E., & Haraldsson, B. (2009). The effects of employer-provided massage therapy on job satisfaction, workplace stress, and pain and discomfort. *Holistic Nursing Practice*, 23(1), 19-31.
- Borritz, M., Rugulies, R., Bjorner, J. B., Villadsen, E., Mikkelsen, O. A., & Kristensen, T. S. (2006). Burnout among employees in human service work: Design and baseline findings of the PUMA study. *Scandinavian Journal of Public Health*, 34, 49-58.
- Bost, N. & Wallis, M. (2006). The effectiveness of a 15 minute weekly massage in reducing physical and psychological stress in nurses. *Australian Journal of Advanced Nursing*, 23(4), 28-33.
- Braden, R., Reichow, S., & Halm, M. A. (2009). The use of the essential oil lavender to reduce preoperative anxiety in surgical patients. *Journal of Perianesthesia Nursing*, 24(6), 348-355.
- Brand, L. R., Munroe, D. J., & Gavin, J. (2013). The effect of hand massage on preoperative anxiety in ambulatory surgery patients. *AORN*, 97(6), 708-717.
- Burns, E., Blamey, C., Ersser, S. J., Lloyd, A. J., & Barnettson, L. (2000). The use of aromatherapy in intrapartum midwifery practice an observational study. *Complementary Therapies in Nursing and Midwifery*, 6(1), 33-34.
- Cavanagh, H. (2005). Lavender essential oil: A review. *Australian Infection Control*, 10, 35-37.
- Cimiotti, J., Aiken, L. H., Sloane, D. M., & Wu, E. S. (2012). Nurse staffing, burnout, and health care-associated infection. *American Journal of Infection Control*, 40, 486-490.
- Dunning, T. (2005). Applying a quality use of medicines framework to using essential oils in nursing practice. *Complementary Therapies in Clinical Practice*, 11, 172-181.
- Earnst, E. (1999). Massage therapy for low back pain: A systematic review. *Journal of Pain Symptom Management*, 17(1), 65-69.
- Field, T., Diego, M., & Hernandez-Reif, M. (2010). Moderate pressure is essential for massage therapy effects. *International Journal of Neuroscience*, 120, 381-385.
- Garner, B., Phillips, L. J., Schmidt, H., Markulev, C., O'Connor, J., Wood, S. J. . . . McGorry, P. D. (2008). Pilot study evaluating the effect of massage therapy on stress, anxiety and aggression in a young adult psychiatric inpatient unit. *Australian and New Zealand Journal of Psychiatry*, 42, 414-422.
- Halcon, L. (2014). Aromatherapy. In R. Lindquest, M. Snyder & M. F. Tracy (Eds.), *Complementary and alternative therapies in nursing* (7<sup>th</sup> ed.) (pp. 323-342). New York, NY: Springer Publishing.
- Hernandez-Reif, M., Field, T., Krasnegor, J. & Theakston, H. (2001). Lower back pain is reduced and range of motion increased after massage therapy. *The International Journal of Neuroscience*, 106(3-4), 131-145.
- Horowitz, S. (2011). Aromatherapy: Current and emerging applications. *Alternative & Complementary Therapies*, 17(1), 26-31. doi: 10.1089.2011.17103
- Kianpour, M., Mansouri, A., Mehrabi, T., & Asghari, G. (2016). Effect of lavender scent inhalation on prevention of stress, anxiety and depression in the postpartum period. *Iranian Journal of Nursing and Midwifery Research*, 21(2), 197-201.
- Laschinger, H. K. & Leiter, M. P. (2006). The impact of nursing work environments on patient safety outcomes: The mediating role of burnout/engagement. *Journal of Nursing Administration*, 36(5), 259-267.
- Lee, Y. L., Wu, Y., Tsang, H. W., Leung, A. Y., & Cheung, W. M. (2011). A systematic review on the anxiolytic effects of aromatherapy in people with anxiety symptoms. *Journal of Alternative and Complementary Medicine*, 17(2), 101-108.
- Listing, M., Krohn, M., Liezmann, C., Kim, I., Reissauer, A., Peters, E. . . . Rauchfuss, M. (2010). The efficacy of classical massage on stress perception and cortisol following primary treatment of breast

- cancer. *Arch Womens Mental Health*, 13, 165-173. doi: 10.1007/s00737-009-0143-9
- Maslach, C. (1982). *Burnout: The cost of caring*. Englewood Cliffs, NJ: Prentice Hall.
- McHugh, M. D., Kutney-Lee, A., Cimiotti, J. P., Sloane, D. M., & Aiken, L. H. (2011). Nurses' widespread job dissatisfaction, burnout, and frustration with health benefits signal problems for patient care. *Health Affairs*, 30, 202-210.
- Moyer, C., Rounds, J. & Hannum, J. (2004). A meta-analysis of massage therapy research. *Psychological Bulletin*, 130(1), 3-18.
- Moyle, W., Cooke, M., O'Dwyer, S. T., Murfield, J., Johnston, A., & Sung, B. (2013). The effect of foot massage on long-term care staff working with older people with dementia: A pilot, parallel group, randomized controlled trial. *BMC Nursing*, 12(5). Retrieved from <http://www.biomedcentral.com/1472-6955/12/5>
- Moyle, W., Murfield, J. E., O'Dwyer, S., & Van Wyk, S. (2012). The effect of massage on agitated behaviors in older people with dementia: A literature review. *Journal of Clinical Nursing*, 22, 601-610. doi: 10.1111/j.1365-2702.2012.04234.x
- Nantsupawat, A., Nantsupawat, R., Kunaviktikul, W., & Poghosyan, L. (2016). Nurse burnout, nurse-reported quality of care, and patient outcomes in Thai hospitals. *Journal of Nursing Scholarship*, 48(1), 83-90.
- Osaka, I., Kurihara, Y., Tanaka, K., Nishizaki, H., Aoki, S., & Adachi, I. (2009). Endocrinological evaluations of brief hand massages in palliative care. *The Journal of Alternative and Complementary Medicine*, 15(9), 981-985. doi: 10.1089/acm.2008.0241
- Parker, M. E., & Smith, M. C. (2010). *Nursing theories and nursing practice* (3<sup>rd</sup> ed.). Philadelphia, PA: F. A. Davis Company.
- Payne, N. (2001). Occupational stressors and coping as determinants of burnout in female hospice nurses. *Journal of Advanced Nursing*, 33, 396-405.
- Pedrazza, M., Minuzzo, S., Berlanda, S., & Trifileti, E. (2015). Nurses' comfort with touch and workplace wellbeing. *Western Journal of Nursing Research*, 37(6), 781-98.
- Pemberton, E., & Turpin, P. G. (2008). The effect of essential oils on work-related stress in intensive care unit nurses. *Holistic Nursing Practice*, 22, 97-102.
- Prichard, C. & Newcomb, P. (2015). Benefit to family members of delivering hand massage with essential oils to critically ill patients. *American Journal of Critical Care*, 24(5), 446-449.
- Satou, T., Chikama, M., Chikama, Y., Hachigo, M., Urayama, H., . . . Koikem, K. (2013). Effect of aromatherapy massage on elderly patients under long-term hospitalization in Japan. *The Journal of Alternative and Complementary Medicine*, 19(3), 235-237.
- Snow, L., Hovanec, L. & Brandt, J. (2004). A controlled trial of aromatherapy for agitation in nursing home patients with dementia. *The Journal of Alternative and Complementary Medicine*, 10, 431-437.
- Sridevi, B. & Maheswar, V. (2015). Management of stress and coping strategies. *International Journal of Multidisciplinary Approach and Studies*, 2(6), 60-67.
- Sundin, L., Hochwalder, J., Bilt, C., & Lisspers, J. (2007). The relationship between different work-related sources of social support and burnout among registered and assistant nurses in Sweden: A questionnaire survey. *International Journal of Nursing*, 44, 758-769.
- Teng, C. I., Shyu, Y. L., Chiou, W. K., Fan, H. C., & Lam, S. M. (2010). Interactive effects of nurse-experienced time pressure and burnout on patient safety: A cross-sectional survey. *International Journal of Nursing Studies*, 47, 1442-1450.
- You, L. M., Aiken, L. H., Sloane, D. M., Liu, K., & He, G. P. (2013). Hospital nursing, care quality, and patient satisfaction: Cross-sectional surveys of nurses and patients in hospitals in China and Europe. *International Journal of Nursing Studies*, 50, 154-161.
- Varney, E. & Buckle, J. (2013). Effect of inhaled essential oils on mental exhaustion and moderate burnout: A small pilot study. *Journal of Alternative and Complementary Medicine*, 19(1), 69-71.
- Wilkinson, S., Aldridge, J., Salmon, I., Cain, E., & Wilson, B. (1999). An evaluation of aromatherapy massage in palliative care. *Palliative Medicine*, 13(5), 409-417.
- Williams, A. (2014). Understanding stress. *Massage & bodywork*, 40-43.