

Massage Chair Sessions

Favorable effects on ambulatory cancer center nurses' perceived level of stress, blood pressure, and heart rate

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BACKGROUND: High stress levels over time can contribute to compassion fatigue and burnout and negatively affect individual health and well-being.

OBJECTIVES: A pre-/post-test initiative was implemented to determine the effects of massage chair sessions on ambulatory cancer center nurses (RNs and advanced practice providers) based on their perceived stress, blood pressure (BP), and heart rate (HR).

METHODS: A mechanical massage chair was available for 20-minute sessions in a secure room, and nurses self-recorded perceived stress using a visual analog scale, as well as BP and HR using a wrist cuff device. Descriptive statistics and paired t tests were used to assess nurse characteristics and differences before and after massage chair sessions.

FINDINGS: Nurses participated in 200 massage chair sessions during a six-month period. Significant reductions were noted in perceived stress, systolic and diastolic BP, and HR. These data indicate that providing a relaxing room with chair massage has favorable effects on nurses' perceived stress, BP, and HR.

KEYWORDS

mechanical massage chair; perceived stress; ambulatory oncology nursing

DIGITAL OBJECT IDENTIFIER

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AMBULATORY ONCOLOGY NURSES ARE LIKELY TO EXPERIENCE significant levels of work-related stress (Al-Majid, Carlson, Kiyohara, Faith, & Rakovski, 2018; Ko & Kiser-Larson, 2016). In addition to standard work-related factors, stress among these nurses can also be caused or exacerbated by providing oncology-specific health care, including exposure to situations involving complex treatments, patient death and dying, end-of-life and palliative care issues, workload, and challenges related to coworker support (Cañadas-De la Fuente et al., 2018; Potter et al., 2010).

High stress levels over time can contribute to burnout and compassion fatigue (Boyle, 2011; Cañadas-De la Fuente et al., 2018; Joinson, 1992; Ko & Kiser-Larson, 2016; Kutluturk, Sozeri, Uysal, & Bay, 2016; Larrabee et al., 2010; Zhang, Zhang, Han, Li, & Wang, 2018). Although burnout and compassion fatigue are often used interchangeably in the literature, they are distinct phenomena but share the underpinning component of stress exposure (Al-Majid et al., 2018; Boyle, 2011). Burnout is defined as a form of stress that is caused by conflict in the workplace, such as lack of control over decisions, unclear job expectations, and conflict with coworkers and/or supervisors. Burnout can lead to exhaustion, negative or cynical attitude, and reduced personal accomplishment (Maslach, 2017). Compassion fatigue refers to a distinct type of burnout, often among caregiving professionals who are repeatedly exposed to the traumas and stress of others (Joinson, 1992). Figley (2017) likened compassion fatigue to a type of secondary traumatic stress disorder, in which caregivers with compassion fatigue may still enjoy work but are unable to respond to or manage the emotional experience. Compassion fatigue can lead to reduced empathy, lack of self-care, and extreme self-sacrifice on the part of the caregiver (Figley, 2017).

Recognizing the presence of work-related stress and associated burnout and compassion fatigue is the first step to implementing effective coping strategies and self-care practices (Joinson, 1992). Resilience to compassion fatigue can be increased by practicing self-nurturance (Figley, 2017). The American Nurses Association (2018) launched the Healthy Nurse, Healthy Nation™ initiative, which is aimed at promoting a healthy nation by improving the health of its nurses in five main focus areas: physical activity, sleep, nutrition, quality of life, and safety. The National Academy of Medicine (2018) is leading

an interprofessional collaborative focusing on well-being among healthcare professionals (Dyrbye et al., 2017).

National initiatives like these are leading the way for many organizations to examine work-related stress among nurses and to establish subsequent strategies to increase self-care. For example, the University of Virginia has implemented a healthy work environment team based on American Association of Colleges of Nursing standards, which works to promote self-care for faculty and staff in the School of Nursing (Harmon, DeGennaro, Norling, Kennedy, & Fontaine, 2018). This program includes sharing self-care ideas and resources (e.g., classes and activities, a dedicated quiet space, a “resilience room,” retreats for students to learn self-care) with employees. The current authors’ institution is an American Nurses Credentialing Center (ANCC) Magnet-designated academic medical center that promotes initiatives to support a healthy work environment, as shown by the inclusion of a work-life committee within the professional nursing staff shared governance structure. This committee’s goals are aimed specifically at providing and improving resources for nurses to benefit the working environment and nurses’ health.

Literature Review

Relaxation therapy and debriefing sessions have been identified as effective coping strategies among nurses (Lim, Bogossian, & Ahern, 2010a, 2010b). A qualitative study conducted by Lim, Hepworth, and Bogossian (2011) explored sources of stress and coping methods among nurses in Singapore. Taking breaks at work was an important coping method. Boyle (2011) distinguished between compassion fatigue and burnout among nurses and stated that compassion fatigue can be reduced by implementing workplace interventions that address emotional strain, such as counseling, support groups, debriefing sessions, art therapy, and massage sessions.

A meta-analysis by Cañadas-De la Fuente et al. (2018) examined more than 17 studies involving 9,959 oncology nurses and confirmed the presence of chronic stress and risk of burnout among these nurses. That study recommended that oncology nursing leadership focus on improving psychological wellness in the workplace, such as developing coping initiatives and other strategies for nurses to support one another and focus on self-care needs. A study by Cho and Han (2018) collected data from 432 nurses at five hospitals in South Korea and looked at nursing performance quality, nursing work environment, and health-promoting behaviors. This study showed that nurses with higher levels of personal health responsibility were more likely to perceive their nursing performance quality as higher, and the study concluded that healthcare systems should help nurses maintain healthy lifestyles as a means to improve quality of nursing practice.

Massage therapy is popular among the general population as a way to relieve stress and increase relaxation. Several studies have

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examined the physiologic and psychological effects of massage therapy. Goodfellow (2003) conducted a group experimental study that measured heart rate (HR), systolic and diastolic blood pressure (BP), perceived stress, mood, and natural killer cell activity in spouses of patients with cancer before, immediately after, and 20 minutes after a 20-minute therapeutic back massage session. Significant decreases were observed in perceived stress and positive changes in mood at the two postintervention time points. Olney (2005) conducted an experimental pre-/post-test study among hypertensive individuals receiving 10-minute massages three times per week for 10 sessions compared to the control group receiving 10-minute rest sessions three times per week for 10 sessions. Significant decreases were observed in systolic and diastolic BP for the massage group. Similarly, Givi (2013) conducted a single-blind clinical trial involving 50 pre-hypertensive women randomized to either Swedish massage or reclining relaxation for 10–15 minutes for 10 sessions over 3.5 weeks. The women receiving massage therapy experienced significant decreases in systolic and diastolic BP during the massage and 72 hours after the massage. Kaye et al. (2008) conducted a study with 263 healthy volunteers and found significant reductions among systolic and diastolic BP and HR following a 45- to 60-minute deep-tissue massage session.

Evidence supports using massage to reduce stress in the workplace and specifically in health care and nursing. Engen et al. (2012) reported that offering weekly 15-minute massages for nurses (inpatient psychiatric nurses and outpatient pain rehabilitation nurses) during work hours over a 10-week period provided a significant reduction in stress- and anxiety-related symptoms. Similarly, Brennan and DeBate (2006) found that 10-minute chair massages provided a greater reduction in nurses’ perceived stress compared to a 10-minute coffee break. Bost and Wallis (2006) conducted a randomized controlled trial among 60 Australian nurses who received weekly 15-minute massage therapy sessions for five weeks compared to no treatment. The study reported that massage therapy was beneficial for reducing stress among nurses. These studies used trained therapists to deliver the massage sessions, which requires personnel and resources.

Little has been reported on the effects of mechanical massage chair sessions on nurses' perceived stress. A study by Muller, Ekström, Harlén, Lindmark, and Handlin (2016) conducted in Sweden examined the effect of massage chairs on workers, but it was not specific to healthcare providers. The eight-week randomized study implemented 15-minute massage chair sessions in the workplace three times per week, which resulted in significant decreases in employees' HR and systolic and diastolic BP, compared with employees receiving either mental training (e.g., mindfulness, stress reduction, life enjoyment) alone with no massage or a combination of massage chair and mental training sessions.

The purpose of the current study was to determine the effect of mechanical massage chair sessions on perceived stress, BP, and HR among ambulatory cancer center RNs and advanced practice providers (APPs). A dedicated room at the cancer center was created for this unit-based project.

Theoretical Framework

Felgen's (2007) approach for creating lasting change was used as the guiding framework for this project. This framework consists of four elements: inspiration, infrastructure, education, and evaluation (I_2E_2). The inspiration began with one nurse suggesting massages to ease the daily stressors at work. She garnered support from peers and identified a team of nurses who were interested in developing the project proposal. Infrastructure involved key stakeholders supporting the development of the project and creation of a designated room. Buy-in from nursing leadership, environmental services, engineering, and peers was instrumental in creating the room. Education involved emails, daily huddles, and word-of-mouth. Staff supported and encouraged one another to use the room. Evaluation was a continuous process of the change to assess the project's impact.

Methods

This project used a pre-/post-test design involving a convenience sample of RNs and APPs from an ambulatory cancer center at Rush University Cancer Center in Chicago, Illinois. This project, referred to as the Chair Project (TCP), was reviewed by the institutional review board and did not meet the definition of human subjects research.

Creating the Room

A clean utility room was repurposed specifically for TCP by painting it blue and adding a comfortable rug and stencils on the wall with an inspirational message. The room requires badge access and contains a massage chair, a sound machine to reduce ambient noise, filtered ceiling lighting, a table and lamp located next to the chair, and a small refrigerator stocked with refreshments. In addition, a privacy sign was made available to put on the outside of the door when in use. The massage chair offered

two preset invigorating auto-massage programs, as well as the option for a customized massage experience. Each massage chair session is a 15-minute cycle and offers a complete head-to-toe massage.

Procedures

Information about TCP was disseminated through six informal in-services, flyers, and emails for the 100 RNs and APPs working in the cancer center. This information included the purpose of the project, how to schedule a chair massage using the Microsoft® Outlook calendar, and what to expect before and after the massage session. Weekly emails were sent during the first month of TCP and monthly thereafter. In addition, reminders about TCP were presented at daily unit huddles. Members of the project team were identified as super-users and helped educate the RNs and APPs about scheduling the room, using the massage chair, and completing data collection forms.

The room was available for 20-minute appointments and could be prescheduled using the shared calendar or used spontaneously for self-care needs. RNs and APPs self-recorded their pre- and postsession information and inserted the data form in a locked box. RN and APP characteristics were collected for age, number of years worked in outpatient oncology, and whether the encounter was scheduled or spontaneous. The form also requested that the nurse provide the last four digits of his or her employee number, so frequency of encounters could be tracked.

Perceived level of stress was assessed using a visual analog scale (VAS), which has been widely used in clinical settings to assess perceived stress in healthcare workers (Dutheil et al., 2012, 2013, 2017; Lesage, Berjot, & Deschamps, 2012). The VAS has been validated in the clinical setting (Lesage & Berjot, 2011; Lesage et al., 2012), is easy to understand and implement, and is time-efficient, which are important considerations with respect to participant burden and adherence to completing the tool. The VAS was a single question asking the respondent to rate perceived stress using a 10-point scale and was constructed based on recommendations from the literature (Miller & Ferris, 1993; Wewers & Lowe, 1990). The VAS consisted of a 10 mm horizontal line (visual ruler) anchored on the left with 0 (no stress) and on the right with 10 (unbearable stress) (Mitchell, 2010; Mitchell, Crane, & Kim, 2008). RNs and APPs were given written instructions to mark a line indicating their level of stress, such that a mark on the right would indicate a higher level of stress compared to a mark on the left.

BP and HR were measured using a wrist cuff device, which is an electronic oscillometric device. It analyzes pulse waves detected during inflation to measure BP at the wrist. This model has been tested according to developing standards of the Association of Medical Instruments and the European Society of Hypertension and has been validated with the standard mercury sphygmomanometer (Takahashi, Yoshika, & Yokoi, 2013).

Written instructions for using the device with an accompanying picture were provided and located on the table next to the massage chair. The participant was seated in the chair with feet firmly placed on the ground, the device was turned on, the cuff was placed on the right wrist, the start button was activated, and the unit was positioned at heart level throughout the measurement. This device contains a sensor that serves as a guide for the user when not properly positioned. After the measurement was completed, the RN or APP would record the BP as mmHg and HR as beats per minute (bpm) on the data form before and after each massage chair session.

Data Management and Analyses

Data from the paper forms were collected and entered into a spreadsheet weekly by a member of the project team. No identifiers were included in the spreadsheet. Descriptive statistics reporting means, standard deviations, and medians were used to assess RN and APP characteristics for age and years worked in outpatient oncology (continuous variables). Differences in pre- and postsession data for perceived level of stress, BP, and HR were compared using a paired *t* test. A secondary analysis was performed to examine whether the massage encounter was scheduled or spontaneous (categorical variables). All analyses were performed using IBM SPSS Statistics, version 22, and differences deemed significant at the 0.05 level.

TABLE 1.
SAMPLE CHARACTERISTICS FOR MASSAGE CHAIR SESSIONS (N = 200)

CHARACTERISTIC	\bar{X}	SD
Age (years)	37.4	12.2
Years worked in outpatient oncology	8.7	9.8
CHARACTERISTIC	n	%
Job type		
RN	169	85
Advanced practice provider	10	5
Missing data	21	11
Type of session		
Spontaneous session	114	57
Scheduled session	78	39
Missing data	8	4

Note. N indicates the total number of massage chair sessions. The total number of nurses who participated is 51.
Note. Because of rounding, percentages may not total 100.

TABLE 2.
PRE- AND POSTSESSION PHYSIOLOGIC OUTCOMES AND PERCEIVED STRESS

VARIABLE	PRESESSION (N = 200)		POSTSESSION (N = 199)		%Δ
	\bar{X}	SD	\bar{X}	SD	
Systolic BP (mmHg)	121	14.2	113*	12.2	-6.6
Diastolic BP (mmHg)	72	9.9	68.2*	9.6	-5.3
Heart rate (bpm)	70.3	12	67.3*	11	-4.3
Perceived stress ^a	4.6	1.5	2.6*	1.2	-43.5

^a Perceived stress was measured using a visual analog scale from 1 (no stress) to 10 (unbearable stress).
* $p \leq 0.001$
%Δ—percent change; BP—blood pressure; bpm—beats per minute
Note. N indicates the total number of massage chair sessions. The total number of nurses who participated is 51. One nurse fell asleep during the chair massage and did not complete postsession measures.

Results

Nurses participated in 200 massage chair sessions from January 1 through June 31, 2018. Of the 100 RNs and APPs working in the cancer center, 51% reported using the massage chair, with an average of 4 sessions (SD = 6.4, range = 1–31) (see Table 1). A significant difference in nurses' perceived stress was found from pre- to postsession, corresponding with a 43.5% reduction (see Table 2). With respect to physiologic outcomes, significant differences were observed for BP and HR ($p < 0.001$), with corresponding favorable changes for systolic BP, diastolic BP, and HR. Fifty-seven percent of the chair encounters were spontaneous. A greater improvement was found in perceived stress among nurses who prescheduled appointments (delta = 2.3) compared to a spontaneous session (delta = 1.7).

Discussion

The objective of this project was to determine the effects of massage chair sessions on perceived stress, BP, and HR among ambulatory cancer center RNs and APPs. The authors discerned several important findings resulting from this project.

A significant decrease was observed in nurses' perceived stress after the chair massages. This finding is particularly meaningful given the prevalence of work-related stress among nurses (Roberts, Grubb, & Grosch, 2012).

Significant and notable changes were observed with respect to systolic and diastolic BP and HR. Prior to the chair massage, the average BP was in the prehypertensive range (defined as 120–139 mmHg or 80–89 mmHg) and then dropped to the normal range postsession (Benjamin et al., 2018). This finding is clinically important given the continuous and progressive rise in cardiovascular disease risk throughout the BP range, even at BP levels

previously considered normal (Benjamin et al., 2018; Huang et al., 2013). Individuals with BP in the prehypertensive range are at risk of developing definite hypertension (Carson et al., 2013; Huang et al., 2013). Because the majority of RNs and APPs were relatively young, this favorable change in BP is important for overall health, well-being, and disease prevention.

Stress is pervasive among nurses, and TCP served as a unit-based approach to address concerns among nurses in an ambulatory cancer center. The project was driven by and for nurses and aligned with the four elements of the I₂E₂ approach for change. There was a strong desire among nurses to promote a healthy work environment and support each other by fostering an opportunity for self-care. Incorporating employee input and involvement in all phases of the program have been reported as factors to enhance project implementation (Roberts et al., 2012). The finding that 50% of the cancer center nurses used the massage chair demonstrates that there was a high level of investment and participation in this project.

In addition, there was support from the nursing leadership to create a designated room and implement a project focusing on nurses' health and well-being. This aligns with the authors' organizational priorities and with ANCC's (2018) Magnet Recognition Program® guidelines. TCP is an example of using quality improvement and innovation to improve the nursing profession and patient care.

Limitations

Although TCP resulted in favorable outcomes, there are a few limitations to note. TCP was designed as a project rather than a research study and, as such, a comparison group was not included. Future investigation is warranted using a rigorous research design to determine the effectiveness of massage chair sessions on nurse outcomes. In addition, the findings are specific to RNs and APPs in one ambulatory cancer center, so the results may not be generalizable. However, the concept of promoting an avenue for self-care within the work environment is universal among all nurses, regardless of specialty or clinical focus.

Implications for Nursing

Promoting a healthy work environment is promulgated by several national organizations and is a priority for many healthcare institutions (Graystone, 2018; Harmon et al., 2018). Although TCP required some initial funding to purchase equipment and resources for redesigning the room, it was affordable with the allocated funds, and there are no additional costs for sustaining this initiative. TCP can easily be replicated to any setting within the organization or other inpatient or ambulatory facilities. Following TCP, the professional nursing staff structure and nursing leadership have used this project as a template to redesign respite rooms across the organization.

IMPLICATIONS FOR PRACTICE

- Use self-care strategies to improve quality of life while at work.
- Reduce perceived stress, blood pressure, and heart rate using a mechanical massage chair.
- Promote a healthy work environment to align with organizational and national initiatives that promote health and wellness.

Conclusion

TCP provides evidence that creating a designated room with a massage chair is one strategy for promoting a healthy work environment. Of note, TCP had a significant effect on nurses' perceived stress. Given the current landscape and complexity of the healthcare environment, the financial investment to establish TCP is small in comparison to the return on investment with respect to nurses' well-being. Creating a quiet room for nurses to have a massage chair session provides a welcoming, supportive place for nurses to emotionally and physically engage in self-care needs.

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