



Original Article

Reducing nurses' stress: A randomized controlled trial of a web-based stress management program for nurses[☆]



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ABSTRACT

Background: Nursing is a notoriously high-stress occupation – emotionally taxing and physically draining, with a high incidence of burnout. In addition to the damaging effects of stress on nurses' health and well being, stress is also a major contributor to attrition and widespread shortages in the nursing profession. Although there exist promising in-person interventions for addressing the problem of stress among nurses, the experience of our group across multiple projects in hospitals has indicated that the schedules and workloads of nurses can pose problems for implementing in-person interventions, and that web-based interventions might be ideally suited to addressing the high levels of stress among nurses.

Purpose: The purpose of this study was to evaluate the effectiveness of the web-based *BREATHE: Stress Management for Nurses* program.

Methods: The randomized controlled trial was conducted with 104 nurses in five hospitals in Virginia and one hospital in New York. The primary outcome measure was perceived nursing-related stress. Secondary measures included symptoms of distress, coping, work limitations, job satisfaction, use of substances to relieve stress, alcohol consumption, and understanding depression and anxiety.

Results: Program group participants experienced significantly greater reductions than the control group on the full Nursing Stress Scale, and six of the seven subscales. No other significant results were found. Moderator analysis found that nurses with greater experience benefitted more.

Conclusion: Using a web-based program holds tremendous promise for providing nurses with the tools they need to address nursing related stress.

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1. Background

With nearly 4 million nurses in the U.S., nursing represents the largest sector of the health care professions and an indispensable component of the health care system (IOM, 2010). Although nurses are responsible for the health of millions of Americans on a daily basis, they suffer from high rates of stress that not only threaten their health and well-being, but which also have a significant impact on productivity and retention – and ultimately on the quality of patient care (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Kimball & O'Neill, 2002; Laschinger, Finegan, Shamian, & Wilk, 2001; Milliken, Clements, & Tillman, 2007).

[☆] Conflict of Interest: The first two authors are owners in the research organization that owns the *BREATHE: Stress Management for Nurses* program which was tested in this study.

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Several studies conducted over the past 25 years have found that nursing is a high-stress occupation and that higher stress among nurses is associated with poorer health and absenteeism (Erickson & Grove, 2007; Kimball & O'Neill, 2002; McCrane, Lambert, & Lambert, 1987; Schaefer & Peterson, 1992). The amount of stress and burnout experienced by nurses appears to be both a function of the work environment and nurses' coping resources. The way a stressful event is perceived is dependent on the individual's characteristics, resiliency, and coping skills (Wakim, 2014). Many sources of nurses' stress have been identified, including shift work, death of patients, heavy work load, feelings of powerlessness, management styles, and ill-designed jobs and work environments (Burke & Greenglass, 2001; Cohen-Katz, Wiley, Capuano, Baker, Deitrick et al., 2005; Cohen-Katz, Wiley, Capuano, Baker, Kimmel et al., 2005; Laschinger et al., 2001; Ruggiero, 2003; Upenieks, 2003).

A considerable body of research strongly suggests that workplace stress management interventions are effective at reducing stress (Milliken et al., 2007; Richardson & Rothstein, 2008). A meta-analysis by Richardson and Rothstein (2008) found that stress interventions

($N = 36$) had a medium to large effect on psychological, physiological, and organizational outcomes (overall effect size was .52), with cognitive-behavioral interventions producing the largest effects, followed by relaxation interventions. Studies of stress management programs conducted specifically for nurses indicate that cognitive-behavioral and relaxation techniques can be effective in helping nurses cope with and reduce personal stress (Cohen-Katz et al., 2005; Cohen-Katz et al., 2005; Milliken et al., 2007; Pipe et al., 2009). The findings of other studies have also underscored the roles of hospital environment and management style in determining nurses' stress levels, suggesting that stress management interventions should address issues at the organizational/management level as well as the personal level (Laschinger et al., 2001; Ruggiero, 2003).

However, virtually all of these interventions require multiple in-person trainer-led sessions, typically conducted in groups. Convening groups at scheduled times can be an impediment to implementing interventions with any occupational group (Billings, Cook, Hendrickson, & Dove, 2008; Cook & Schlenger, 2002; Snow, Swan, & Wilton, 2003), but it is especially problematic for nurses whose duties require an unusual amount of mobility and immediate responsiveness to patient needs (Chesak et al., 2015; Hersch et al., 2009). To address this issue, there is now accumulating evidence that web-based programs can be effective (and cost-effective) approaches to workforce health promotion and disease prevention (Rothert et al., 2006; Wantland, Portillo, Holzemer, Slaughter, & Mcghee, 2004; Webb, Joseph, Yardley, & Michie, 2010). Importantly, web-based programs do not require the convening of groups at mutually convenient times and places, but can be delivered to users at the time and place of their choosing, requiring only access to the Internet.

2. Purpose

The current study was undertaken to test the effectiveness of a web-based stress management intervention created specifically for nurses and the situations that they experience. The *BREATHE: Stress Management for Nurses* program was designed to provide nurses with the information and tools they need to manage the myriad of stressors that can impact their work life. The web-based program provides a mechanism for nurses to access the intervention at times and places convenient to their busy and often stressful schedules. Influenced by feedback from nurses in focus groups and feasibility tests, the program includes sections on how stress impacts the body; assessing stress and identifying stressors; practical stress management tools addressing changing one's views of stressors, changing one's response to stressors, or changing the stressful situation; promoting effective communication skills; taking time to grieve; and depression and anxiety. A randomized controlled trial was conducted to test this web-based program with a sample of hospital-based nurses to determine if the program could help reduce the perceived stress associated with nursing and improve other coping and work practices. It was hypothesized that participants receiving the web-based program (experimental group) would experience greater reductions in nursing related stress when compared to participants in the wait-list control condition. It was further hypothesized that there would be greater reductions in symptoms of distress, using substances to relieve stress, alcohol consumption, and work limitations and greater increases in coping strategies, understanding depression and anxiety, and job satisfaction for participants in the experimental group when compared to control group participants.

3. Methods

3.1. Design

The web-based *BREATHE: Stress Management for Nurses* program was tested with nurses in six hospitals (five hospitals from a suburban Virginia hospital system and one located in New York City). The study

was a pretest–posttest randomized controlled trial in which participants were randomly assigned to a group condition. Participation was voluntary and all protocols and procedures were approved by the study team's Institutional Review Board (IRB) and the Institutional Review Boards of the participating hospitals. Those expressing interest in participating were asked to complete a pretest survey and, upon completion, were randomly assigned to either the experimental group (receiving access to the *BREATHE* web-based program) or to a wait-list control group. All participants were given access to the *BREATHE* program following completion of the posttest questionnaire.

3.2. Procedures

Recruitment information was provided to nurses through a number of communication strategies depending on the hospital. Communication methods included posting the information on the hospital Intranet, announcing the study at new nursing orientations, sending emails to nurses, and posting the study flyer on the units. Nurses interested in participating were instructed to contact the study team directly and were provided additional information about the nature of the study. To be eligible for the study, nurses had to be 21 years of age or older and work at one of the participating hospitals. Interested participants were told that they would receive \$25 for completing each of the two study questionnaires and be entered into a drawing in which one participant would receive either \$200 or \$500 (depending on the hospital; the respective hospital IRBs set the drawing amount) during each questionnaire round. Nurses who expressed continued interest provided the study team with an email address which was used to send a personalized link to the online pretest questionnaire, which included the consent document.

After reading the consent document, nurses were given the option of consenting or declining participation. Nurses were not able to continue with the questionnaire until they acknowledged and indicated that they consented to participate. Two nurses declined to participate at the point of the consent document and ten additional nurses who initially expressed interest in the study and received the pretest link did not complete the questionnaire. A hard copy of the consent document was emailed to participants after they completed the pretest questionnaire.

One hundred and seventeen nurses contacted the study team in response to the initial recruitment announcement and were sent a link to the online survey, 105 of whom completed the baseline survey. One participant subsequently withdrew from the study leaving a total sample size of 104 participants (See Fig. 1).

Randomization was conducted using a block randomized design with blocks of 4 and 6. The 0 and 1 within each block were random and the order of the group of 4 and the group of 6 was random. Randomization occurred after each participant completed the pretest questionnaire. The online questionnaire site was checked every day to determine who completed the pretest each day and individuals were assigned to the next condition on the randomization table as they completed the questionnaire. Once randomization was complete, participants were notified of the condition to which they were assigned (no blinding procedures were employed) and were informed of next steps; experimental group participants were sent a link to the *BREATHE* program along with a randomly generated username and password and instructions for using the program. Control group participants were told that their access to the program would be delayed until the end of the test period. Participants could complete the online questionnaires and, for those in the program condition, access the online program on work time or at home. The program incorporated a responsive web design that allowed the program to be viewed on a desktop or laptop computer, tablet, or smartphone.

Participants in the experimental group could access the web-based program at any time during the three-month test period, both at work or outside work (e.g., at home). A "project update" email was sent to all participants at one-month post randomization. For the experimental

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