A Pilot Study: Can a Short-term Complementary and Alternative Medicine Intervention Combat Stress?

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Abstract

A major public health concern is the debilitating effect of chronic stress, leading to lower performance and productivity at work and school, thus affecting quality of life. Addressing this crisis, a stress reduction pilot program was designed based on complementary and alternative medicine (CAM) strategies as an effective, quick, and relatively inexpensive health promotion strategy for chronic stress. The intervention, a four-session yoga and meditation regimen, was created to give participants the acquired skills and comprehension for performing seven breathing exercises, two meditation techniques, and 14 simple yoga postures to combat stress in their daily lives. The design was a quasi-experimental, with a pretest and posttest, and non-equivalent control group. Data were analyzed using five repeated measure ANOVAs. The intervention group experienced greater decreases in stress-related variables from pretest to posttest compared to the control group. Preliminary findings indicate promise for introducing yoga and meditation among a variety of schools, workplace settings, and preventive care clinics. as an effective, simple, and relatively inexpensive health promotion strategy to negate the debilitating effects of chronic stress, and to enhance well being and performance.

Keywords: Chronic stress, complementary and alternative medicine, psychological disorders, yoga, meditation, breathing exercises

Introduction

Chronic stress is estimated to be on a rise all over the world, posing as a major public health problem. A vital societal and public health challenge is to tackle reduced performance and productivity at work and school, resulting from occupational strain and hectic schedules, which may eventually lead to psychological disorders (Smith, et al., 2007; Steptoe et al., 2000). Complementary and alternative medicine (CAM) interventions such as yoga, rhythmic breathing exercises, meditation, relaxation, and chanting techniques have significantly reduced stress-induced psychological disorders (Gupta et. al., 2006; Michalsen et. al., 2005; Smith, et al., 2007; Woolery, Myers, Sternlieb, & Zeltzer, 2004; Brown & Gerbarg, 2005). Nevertheless, few studies have assessed the immediate impact of yoga and meditation in stress reduction (Tang, Ma, Wang, Fan, Feng, Lu, & et al., 2007). Moreover, interventions need to be cost-effective, with an aim to reduce the economic burden on any target population to improve mental health (Issakidis, Sanderson, Cony, Andrews, and Lapsley, 2004). The purpose of this intervention was, firstly, to determine the immediate effect of yoga and meditation on stress-related psychological parameters such as general stress, anxiety, depression, and cognitive disorganization in various settings. The second aim was to design a combination of cost-effective and simple techniques that could be easily performed when a stressor occurs. The third, aim was to ascertain the efficacy of a short-term CAM intervention in sustaining interest, motivation, and adherence for any target group.

Methods

Design

The pilot program was a quasi-experimental, pretest-posttest, non-equivalent control group design. It was created and conducted by two graduate students in the School of Public Health and supported by the Loma Linda University, Department of Health Promotion and Education. The intervention consisted of four 90-minute sessions, spanning over a two-week period for two days per week, with at least 15 participants attending each session. The program was conducted from August 1 through September 25, 2007. The participants were given relevant study material, pamphlets, and newsletters.

Session one covered three breathing techniques, namely, inhalation, exhalation, and breath retention (Bhastrika, Kapalbhati, and Bahiya pranayams). These breathing techniques, including Anulom Vilom, have been used to energize and cleanse the respiratory system (Sharma, 2006). During session two, four other breathing techniques were taught, where participants utilized the nostrils, tongue, and throat (Anulom Vilom, Bhramari, Sheetali, and Ujjaini pranayams). The three latter breathing techniques have been used to present calming and relaxing effects on the breath (Sharma, 2006). In session three, participants learned 14 simple physical postures (Hatha Yoga exercises) that targeted stress reduction, concentration, and balance. Before and after each breathing technique, the participants were guided through relaxation and meditation that involved staying in the present moment, observation, and witnessing or mindfulness. The fourth session revised all techniques. This program has continued since the initiation of the four sessions, as those who completed the intervention were invited to attend additional sessions. Each participant was also given a DVD containing the yoga and meditation exercises so they could continue practicing and using these skills at home.

Sample

The intervention group included students, faculty and staff (n=18) from Loma Linda University, aspirants from the community (n=10), and staff and patients from the Beaver Medical Group (n=20), a preventive healthcare clinic located in Redlands, California. Participants were eligible to join the pilot program if they had self-indicated chronic stress. A total of 40 participants completed all four sessions. Eight participants, two men and six women, did not complete the entire program and thus were not included in the statistical analysis. Reasons stated for non-completion included being too busy with other commitments, loss of interest, and time constraints.

The control group consisted of a total of 40 students and staff from Loma Linda University who were on the waiting list for the intervention. Unlike the intervention group, no dropout occurred in the control group and after completing pre- and posttests all participants were offered the intervention. This program was a student practicum that met Loma Linda University School of Public Health's criteria for school-related projects and each participant gave consent before participating. Medical releases from Beaver Medical Group patients and staff were also acquired prior to conducting the intervention.

Measures and Analysis

The evaluations conducted during the program included process and impact evaluations. Personal satisfaction surveys were conducted before the intervention on the first day and after the last session on day-four. Also pretest and posttest questionnaires were administered at the beginning and end of each session. The variables of interest in the pre- and posttests were categorized as cognitive disorganization, anxiety, energy level, depression, and general stress. Moreover, written pre- and posttest questions were based on a ten-point scale (where 0 = not at all; 2 = nominal; 4 = marginal; 6 = moderate; 8 = considerable; 10 = very much), and were administered before and after each session for analysis and participant feedback.

The items in the pre- and posttests were abstracted from the General Well-Being Scale (GWBS) (National Center for Health Statistics, 2005). The scale, which contains 18 items, was validated by the National Center for Health Statistics. The pre- and posttest questionnaires

were initially pilot-tested among participants from the University and from Beaver Medical Group, and among a focus group comprised of 15 participants from the community. During pilot-testing, various participants felt the questionnaire was too long, so we used 10 of the 18 items, with two items per construct: general stress, depression, cognitive disorganization, anxiety, and energy level. We then pilot-tested the scale again with 20 participants and found all items to be both reliable and valid. The Cronbach's alphas were 0.780, 0.721, 0.841, 0.688, and 0.903 for generalized stress, cognitive disorganization, energy level, anxiety, and depression respectively.

For the descriptive analyses, frequencies were run to examine the percentages for categorical variables, and means and standard deviations for continuous variables. Two chi-square tests were conducted to determine whether there were group differences on race/ethnicity and gender, while six independent samples t-tests were conducted to assess group differences on age and the dependent variables at baseline. Five repeated measures ANOVAs were conducted to determine whether those in the intervention group experienced greater decreases in stress-related variables from pretest to posttest compared to the control group.

Results

There were 32 females and eight males who participated in the intervention. The ages for those in the intervention group ranged from 22 to 62 years, while the mean age was 37 years (SD = 11.20). There were 40 females and no males in the control group. The ages for those in the control group varied from 23 to 66 years, while the mean age was 32 years (SD =10.77). In the intervention group 40% of participants were White, 52.5% were Asian/Pacific Islander, 2.5% were Black, and 5% were Hispanic, while the percentages for the control group participants were 45%, 35%, 12.5%, and 7.5% respectively (Table 1). Chi-square results demonstrated that there were group differences on gender ($X^2 = 8.89$; $p < 0.003$), but not on race/ethnicity ($X^2 = 6.52$; $p < 0.089$); independent samples t-test results demonstrated there were group differences on age ($t = -2.097$; $p < 0.039$), but not on the dependent variables at baseline (Table 2). Since gender and age were significantly different at baseline, both variables were included as covariates for the multivariate analyses.

Table 1. Demographics by Intervention and Control Group

	Control		Intervention		
	N = 40	%	N = 40	%	P - value
Race/ethnicity					
White	18	45	16	40	0.089
Asian/Pacific	14	35	21	52.5	
Islander	5	12.5	1	2.5	
Black	3	7.5	2	5	
Hispanic					
Gender					
Female	40	100	32	90	0.003*
Male	0	0	8	10	

*Significant difference between intervention and control groups; ($p < 0.005$)

Thus, adjusting for gender and age, five repeated measures ANOVAs were conducted. The intervention group experienced greater decreases in stress ($p < 0.0001$), cognitive disorganization ($p < 0.0001$), anxiety ($p < 0.0001$), low energy level ($p < 0.0001$), and depression ($p < 0.0001$) from pretest to posttest, relative to the control group (Table 3). Process evaluation indicated that at each site, staff diligently provided assistance with marketing the program, coordinating the dates, and reserving space to conduct the program.

Discussion

Public health researchers have implied a need for adequate treatment for mental health disabilities in school and work (Mechanic, 2007). Steptoe et al. (2000) cited job strain as a major determinant of increased chronic stress and anger. Our preliminary findings indicate that yoga and meditation may reduce chronic stress, confusion, negative thoughts, and anxiety, thus increasing vitality. Likewise, various studies

Table 2. Means and Standard Deviations for Age and Stress-related Variables at Baseline

	Control			Intervention				
Pre-test Variables	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	***t***	***95% CI***
General Stress	40	11.05	3.62	39	10.97	4.68	0.08	-1.80, 1.95
Cognitive Disorganization	40	8.68	4.52	37	9.22	4.87	-0.51	-2.67, 1.59
Anxiety	38	9.00	4.62	37	10.89	3.76	-1.94	-3.83, 0.05
Low Energy Level	40	9.65	2.95	39	10.38	3.57	-1.00	-2.20, 0.73
Depression	40	8.93	3.50	40	9.43	4.38	-0.56	-2.27, 1.27

Note: The variables were not significantly different at baseline in both groups.

Table 3. Repeated Measures ANOVAs for Stress-related Variables

	Control			Intervention				
Post-test Variables	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**F**	**P - value**
General Stress	40	10.95	4.33	37	6.43	3.91	28.18	0.000*
Cognitive Disorganization	40	9.42	4.80	36	5.11	3.35	29.52	0.000*
Anxiety	38	9.58	5.36	37	4.86	2.36	46.85	0.000*
Low Energy Level	40	8.98	3.42	38	5.16	2.83	40.49	0.000*
Depression	40	8.95	3.37	37	4.57	3.10	34.43	0.000*

*Significant difference between change in stress-related variables (pretest to posttest) for intervention and control groups; ($p < 0.0001$).

have pointed out the importance of yoga and breathing exercises to curb mental health problems. Brown and Gerbarg (2005) indicated that breathing techniques could enhance the autonomic central nervous system functions, and balance neuro-endocrine secretions. Similarly, Smith et al. (2007) and Michalsen et al. (2005) observed a significant reduction in anxiety levels, depression, and stress. Moreover, Tang, et al. (2007) reported that only 20 minutes of meditation for a period of five days demonstrated significant improvements in attention and anxiety in undergraduate students. Nevertheless, most studies conducted included several sessions and studied a relatively long-term effect of yoga on stress parameters.

Our preliminary findings suggest that a short, comprehensive program may reduce stress and increase productivity in just four sessions. In addition, it equipped a diverse age group of participants with the necessary skills to practice yoga techniques, in a feasible and affordable way. Furthermore, Issakidis et al. (2004)

demonstrated that evidenced-based care for anxiety disorders considerably increased health gains, decreasing the cost per years lived with disability (YLD) to less than $20,000. The current intervention thus proposes cost-beneficial results by negating a myriad of ensuing stress related diseases.

Limitations

One of the limitations of this pilot study was that there might have been a treatment bias. It is possible that rather than respond to the actual effect of the intervention, participants may have responded to their expectations about receiving a treatment. In addition, the results may not be generalizable to men and individuals from other medical clinics, workplace, and university settings in California, as the majority of patients, university students and staff, and community members who attended the program were females from San Bernardino County. Also, since follow-up was not conducted, it is uncertain whether the participants continued to practice the techniques, and whether the program effects remained over a longer period of time.

Preliminary study findings indicate promise for introducing complementary and alternative medicine techniques such as yoga and meditation amid a variety of colleges and preventive care clinics to negate the pressing issue of chronic stress and related mental health disorders. A comprehensive short-term yoga program can be simple, cost effective, and motivating for the participants to incorporate in their daily living to deal with everyday stressors and promote their health and well-being. However, more in-depth studies need to be conducted to examine the sustaining effects of yoga and meditation on stress reduction for short-term interventions.

Acknowledgements:

We would like to express our gratitude to Loma Linda University students, faculty, and staff, and Beaver Medical Group patients and staff for their participation and dedication to stress reduction.

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