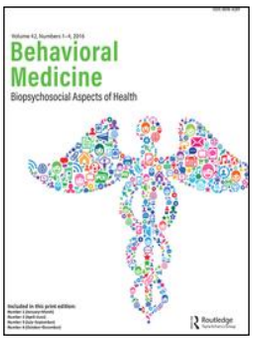

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Caring for the Caregivers: Results of an Extended, Five-component Stress-reduction Intervention for Hospital Staff

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ABSTRACT

The health-related consequences of stress in hospital workers and associated costs of absenteeism and high turnover have increased the need for programs targeting stress in this population. "Caring for the Caregivers," a multimodal approach to stress-reduction designed to address the multidimensional nature of stress in hospital staff, integrates five components: *cognitive, somatic, dynamic, emotive* and *hands-on*, in a flexible eight-month format. Significant improvements were demonstrated for 97 participants compared to 67 controls in pre–post scores for the Maslach Burnout Inventory, Job-Related Tension Index, Perceived Stress Scale, Productivity Scale, General Health Questionnaire, Positive and Negative Affect Schedule, and Visual Analogue Scales of 12 stress-associated symptoms. Together with significant reduction in upper respiratory infections and family doctor visits, these results suggest that providing hospital staff with multiple techniques addressing commonly encountered work stressors impacts positively on health and well-being and significantly reduces stress and burnout in this population.

KEYWORDS

Burnout; Caregivers; health; hospital staff; integrated stress reduction; Israel nurses; quality of life; self-care; stress; stress management; stress symptoms; relaxation; training; wellbeing; workplace stress

Introduction

Stress and burnout are implicated in a growing list of health- and job-related consequences accounting for some 50%–60% of all lost working days.[1] As biological markers of stress become more available,[2] the long term morbidity and mortality arising from prolonged or heightened stress suggests that associated physiological changes can lead to a range of physical and psychological problems and all-cause mortality.[3–5] Hospitals are increasingly demanding and stressful with staff highly susceptible to the effects of stress,[6–9] and with health care workers particularly prone to negative effects on health and well-being, including burnout, compassion fatigue, diminished quality of life, alcoholism, substance abuse, and suicide.[10–12] Nurses have one of the highest rates of injury and illness of all professions[13] with lower back pain affecting one in six annually causing 30% more days off work than the general population.[14,15] Muscular-skeletal problems have been tied to stressful and demanding work,[14,15] an association compounded in many health care workers by long periods of standing, bending, lifting and poor sitting posture.[6,7,16] Together these factors have a serious impact on healthcare, contributing to an overall fall in provision of services with costs for absenteeism and high turnover for nurses alone estimated at $91,000–$98,000.[17]

Many factors in hospital work contribute to the particular stressors to which health care workers are exposed, including high responsibility, the need to multitask and be flexible, constrained decision making, low social support, and exposure to suffering and dying.[6–12] Shift work may disrupt sleeping patterns, work performance, social and leisure time.[6,7,12] Many hospital staff, particularly women, also face a double exposure to stress—the "2nd shift" —caregiving at home with responsibility for children and elderly family members.[18]

In recent years there has been a growing interest in programs that diminish workplace stress either at the individual level and/or through change in the environmental context.[19] The former include *cognitive-behavioral* interventions, such as mind–body and/or mindfulness based approaches[20–25] aimed at changing cognition and subsequently reinforcing coping skills; *relaxation techniques*[26] focused on physical and mental relaxation as a method of coping with the consequences of stress, and *multimodal approaches* emphasizing acquisition of both passive and active coping skills through combinations of the above, as well as other techniques

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such as yoga, Tai Chi, Reiki, and the like.[27–29] Of these interventions the Mindfulness Based Stress Reduction (MBSR) program, focused principally on cognitive elements (mindfulness) together with selected exercises from Hatha Yoga, has become one of the most widely used and researched programs.[20–25] In studies on healthcare workers, MBSR has been associated with decreased measures of stress and burnout, and improved empathy and focus.[21,22] However there is less consistent evidence among hospital staff for the beneficial effects of MBSR on health status or psychological distress.[21–23] In addition, mindfulness interventions among nurses have been associated with restlessness, physical pain, and difficulty dealing with emotions, as well as difficulties in recruiting and retaining participants.[20,24]

One reason for these findings is that "*dispositional mindfulness*"— namely, an individual's inherent ability to be mindful[31]—varies individually.[30] When dispositional mindfulness is low it impacts negatively on mindfulness training and is associated with a rise in cortisol,[30] implying an extra coping effort may be necessary in these individuals.

Stress in hospital staff affects many aspects of health and well-being including physical, emotional and social. One of the principal features of MBSR and other cognitive based interventions when used as a "general purpose therapeutic technology,"[32] is that they tend to offer a standard program unrelated to the type of job stressors encountered by hospital staff or the capabilities and experience of those exposed to such stressors. To address this issue, we believe that the multidimensional nature of stress among hospital staff needs to be taken in to account, as well as the nature of those stressors and the needs and abilities of individuals participating in stress-reduction interventions.

The current study "Caring for the Caregivers" (CCG) was developed using a broadly based integrated multimodal approach in which a number of stress-reduction techniques individually associated with attenuating stress reactivity and/or improving health are applied to specific stressors common in this population. While multimodal interventions have been successfully tested in some stress-reduction programs, there is a lack of evidence of their overall effectiveness in improving physical and emotional health or of the long-term feasibility and acceptability of such an approach.[29,33] We postulated that using multiple techniques to target the physical and emotional consequences of different stressors to which health care workers are exposed, may prove more beneficial than approaches with a more uni-modal emphasis.

Health care and hospital workers generally do not routinely practice self-care measures, nor are they socialized to care for themselves or prepared to sustain their own health as they promote that of their patients.[27,28] CCG therefore focuses particularly on self-care practices combined with mindfulness, encouraging self-awareness and the recognition that such self-care "tools" are of real value in maintaining and improving health.

Perceived control over one's job also influences the efficacy of stress-management interventions, with higher levels of control associated with greater effectiveness.[33] Nurses and hospital workers, whose jobs are often associated with low levels of control,[6,8–10,12] may therefore benefit from interventions targeting emotional and social aspects of stress in a flexible rather than a more circumscribed format. This approach enables staff to choose techniques they personally find helpful, and in doing so contributes to a greater sense of empowerment and overall control.

Standard stress-reduction interventions can range from a few days to the eight-week MBSR program.[23–25,33] For hospital staff to more deeply understand and internalize techniques, we believe that an extended program length is also necessary, enabling participants to integrate learned practices into their daily lives in a way that may not necessarily occur in much shorter programs.

Based on this construct, CCG was developed from an earlier pilot study at Hadassah Hospital (1997–1999) in which nurses were enrolled in weekly stress-reduction classes over a three-month period. Consistent with the multidimensional nature of stress in this population, participants were offered a variety of techniques such as yoga, relaxation, breathing (pranayama), and movement, with pilot outcome data indicating improved ability to relax and cope with stress, an enhanced sense of wellbeing, and numerous requests by participants interested in joining the next program. These results suggested to us that an extended multimodal approach was a feasible and acceptable intervention in this population, and provided the incentive to develop a second phase with a wider target audience (ie, other health care and hospital staff; Sallon 1999, unpublished data).

The original pilot program was expanded for the current CCG intervention to include five components: (1) *Cognitive* (mindfulness), (2) *Somatic* (relaxation), (3) *Emotive-expressive* (drawing/journaling/listening circle), (4) *Dynamic-Interactive* (movement/interactive dance), and (5) *Hands-on* (acupressure /shiatsu). These techniques, which together have not previously been integrated into a stress-management intervention, constitute a self-care "tool-box" for hospital staff addressing both the physical and emotional causes and consequences of stress in this population.

As a long-term strategy, we believe this kind of individualized multimodal intervention provides a set of

manageable self-care tools that can be useful in combatting and preventing occupational stress in health care workers. Given that the human and financial cost of stress and burnout are so high, and that many other programs have been associated with poor attendance and high dropout rates,[20,24] the development of an acceptable and effective intervention in this population is an imperative.

In order to evaluate the effectiveness of the CCG approach, the study focused on the following outcome variables: (*a*) The quality of work life, including self-report quantitative estimates of job-related tension and work productivity, and subjective impressions of ability to cope with stress at work; (*b*) complaints, including quantitative, self-report measures of stress and burnout, somatic and mental health status, and symptoms; (*c*) indicators of health, including objective changes in frequency of upper respiratory infections, visits to health practitioners, and subjective impressions of well-being; (*d*) changes in stress-related behavior, including smoking, alcohol consumption, and the like; (*e*) acceptability of the intervention, including rates of attendance and attrition and practical use, relevance, and preference for techniques.

Our hypothesis was that hospital staff who participated in CCG relative to controls would report less job-related tension; higher work productivity; reduced stress, burnout, and somatic and mental health symptoms; and improved mood and wellbeing. We also hypothesized that participants would find the program highly acceptable for their needs.

Methods

The study was approved by the ethical committee of Hadassah University Hospital in accord with the Declaration of Helsinki of the World Medical Organization. CCG content was approved by the Nursing Division of the Ministry of Health of the State of Israel.

Ours was a quasi-experimental pre–post study evaluating the CCG intervention among hospital staff, with results compared to non-participating matched controls.

Inclusion criteria

Participants were comprised of hospital staff (full- or part-time) at Hadassah Medical Organization (HMO), including health care as well as support staff (administrative), willing to attend an eight-month program and who agreed to complete self-report questionnaires before and after the intervention, for which all data would be analyzed anonymously. Controls were staff at HMO who were willing to complete two questionnaires, who were of the same sex and approximately the same age, with a similar period of work experience and status as the participants, and who had not previously attended the CCG course nor (having seen the advertisements) expressed interest in joining it in the future.

Exclusion criteria

Excluded from the study were non-hospital workers or those who had attended the program once and wished to repeat it for 2nd or 3rd time, or had previously acted as controls.

Recruitment procedure

Recruitment to the program held at HMO, a tertiary care center in Jerusalem with over 5,000 employees, was accomplished through fliers, email, and word-of-mouth, explaining the goals of the eight-month program—namely, to help staff better cope with stress and improve their general health and well-being. The program, which was offered annually from 2000–2009, consisted of 75 hours of instruction in 30 weekly sessions (2.25 hours/week) with a final full-day workshop. The program was open to all HMO staff, was voluntary and self-selecting, with potential applicants invited to attend an introductory session where CCG aims and techniques were explained. Applicants intending to continue the program were asked to complete a pre-intervention (baseline) questionnaire that was distributed in the introductory session, and to approach other hospital staff to act as their controls (according to above mentioned criteria), however no attempt was made by the organizers to minimize or prevent contamination between participants and controls. Questionnaires were returned in the following session, together with an identical questionnaire collected from the participant's control. Post-intervention questionnaires were distributed in the final session and collected with those of controls in the final workshop and/or over the following weeks. By special arrangement, nurses (but not other staff) who completed the CCG program along with a written assignment, were eligible for Continuing Educational Credits authorized by the Nursing Division of the Ministry of Health of the State of Israel. A small sum (approximately $6/class, $180 for the entire program) was charged for participation in the program. However, any participant unable to pay was not excluded from the program.

The intervention

Course instructor Deborah Katz-Eisner (hereafter DK-E, a co-author of this article), who designed and developed

CCG from the original pilot program, has taught yoga, meditation, and shiatsu for over 20 years. DK-E has experience in dance and Qiqong, and has run integrated stress-reduction programs since 1996. Techniques taught in CCG frequently combine different components in an integrated and flexible structure, adaptable to the needs of the group. Accompanying the techniques are explanations of their history, evidence base, physiology, and relevance to daily life. Home practice was encouraged and aided by an audio CD and written instructions by DK-E distributed after each class. The five components of the CCG program are outlined below.

Cognitive

Cognitive practices taught were based on mindfulness training derived from *Vipassana* (insight) meditation, whose premise is that enhancing the ability to attend to present-moment experience in a receptive, non-judgmental manner can lessen self-focused, repetitive thought patterns that lead to poorer mental health.[21–22] Sitting meditation was practiced using the breath as a focus, with exercises incorporating mindfulness into everyday activities (eg, eating and walking). Participants were encouraged to apply mindfulness techniques at home (eg, while doing domestic chores) and at work, to lessen automatic, reactive patterns of thinking and behavior and bring fresh awareness and greater connection to themselves and others. Body scans[34] were used to develop deep concentration and relaxation by progressively focusing attention throughout the body and observing feelings and sensations that arise.

Somatic: body awareness

Two principal somatic methods were used: (*a*) *Relaxation*:several simple techniques combining cognitive (focused attention), somatic (awareness of bodily sensations), and exercises enhancing parasympathetic tone included: guided imagery,[35] progressive muscle relaxation (PMR),[26] the relaxation response,[36] and relaxation with breathing;[37] and (*b*) *Mindful movement and postural alignment*: Practices combined mindfulness and somatic awareness with alignment, balance and posture, focusing attention particularly on the lower back and muscular skeletal system. Exercises showing how subtle shifts in weight and movement can relieve pain associated with long periods of standing and poor sitting posture were drawn from Hatha yoga[38] (eg, stretches, restorative and supported poses); Qigong[39] (reinforcing postural alignment and balance while relaxing mind and body); and the Alexander technique[40] (correcting muscle tension from habitual and harmful misuse of the spine in everyday activities; eg, standing, sitting, walking, lifting).

Dynamic-interactive

Practices accompanied by music, sound, and voice to energize the body, release muscle tension, provide an outlet for expressing emotions, and establish a sense of interconnectedness and joy within the group included; medium impact cardiovascular exercises (eg, interactive dance[41] from Rio Abierto[42]), laughter,[43] and Qigong[39] (eg, gentle body tapping and shaking).

Emotive-expressive

To encourage openness, empathy, and self-expression participants practiced drawing and writing[44] alone and/or in small groups. A weekly "listening circle" provided a supportive atmosphere for participants to reflect on the personal and emotional relevance of practices, come to a deeper understanding of them, and address verbally and creatively issues of importance. The listening circle did not, however, function as a "support group" (ie, focused on personal difficulties in participants' lives).

Hands-on

Self-administered activation of trigger points using acupressure (finger pressure)[45] and palm massage (shiatsu)[46] were practiced alone, with a partner, and in small groups to relieve common stress-related conditions (eg, pain, fatigue, insomnia).

Measures

Pre-intervention—baseline

Demographics. Demographic categories assessed at baseline were age, sex, marital status, child care, birth place, years in Israel, work nature/position/full- or part-time, amd years of experience.

Medical history. Participants' were asked to provide relevant past and current medical history.

Stress history. We also assessed participants' most common self-reported stressors, and their ways of reducing their stress within six months prior to CCG in two categories: (*a*) *stress-reducing activities* such as sports/exercise, long walks, counseling, positive thinking, prayer, support group participation, medication; and (*b*) *specific stress-reduction techniques* such as yoga, meditation, relaxation, touch therapy, and energy healing/Reiki.

Pre and post-intervention

Medical and health-related behaviors assessed included medication, smoking, and alcohol and coffee consumption. Also assessed were the number of upper respiratory tract infections (URTIs), and the number of visits to a

health practitioner (eg, family doctor, medical specialist, alternative therapist, psychologist) in the previous three months.

Additionally, the following quantitative self-report questionnaires were administered.

Mashlach burnout inventory. The Mashlach Burnout Inventory (MBI)[47] is a widely used 22-item inventory measuring three dimensions of occupational stress and providing a clinical-level cumulative score: (*a*) *Emotional Exhaustion* refers to an individual's experience of stress and, in turn, a decline in emotional and physical resources; (*b*) *Depersonalization* refers to cynicism or detachment from work in reaction to an overload of exhaustion; and (*c*) reduced *Personal Accomplishmen*t refers to perceived inefficiency or loss of confidence in one's work. These three dimensions relate to the participant's present state, with responses measured on a 7-point Likert scale of frequency ranging from 0 (never) to 6 (every day). Results for each of the three subscales are conceptualized as continuous variables ranging from low to moderate to high degrees of experienced feeling, with mean values available for a range of professions. In health care workers, a high degree of burnout is indicated by high scores for *Emotional Exhaustion* (>26) and *Depersonalization* (>12) and low scores for *Personal Accomplishment* (<32), employing reverse scoring.

Perceived stress scale. The Perceived Stress Scale (PSS)[48] is a 10-item measure of the degree to which situations commonly encountered in life are appraised as stressful. Responses to these situations relating to the last month are measured on a 5 point Likert scale, with answers ranging from 0 (never) to 4 (very often). Higher scores are indicative of greater perceived stress, with mean values available across a range of populations, including women (13.6), those with a college education (13.1), skilled workers (12.3), and those with separated marital status (16.6).[48]

General health questionnaire. The General Health Questionnaire (GHQ)[49] is a widely implemented measure of self-perceived general health. The US 30-item version of the GHQ was used for this study. Responses relating to participants' perception of their health in the previous month are measured on a 4 point Likert scale, with answers ranging from 0 (better than usual or not at all or more than usual) to 3 (much less or much more than usual). Higher values indicate poorer health, with a normalized mean value of 27.

Job related tension index. The Job Related Tension Index (JRTI)[50] is an established 15-item questionnaire that measures how frequently "bothered" participants are by various aspects of their work. Responses referring to the present time are rated on a 5-point Likert scale, with answers ranging from 1 (never) to 5 (nearly all the time). Higher scores indicate greater job tension, with a normalized mean value of 20 (US population).

Productivity scale. The Productivity Scale (PS)[51] measures an individual's self-perceived performance at work on a simple scale ranging from 0–100. The lowest score is 0 (not productive at all) and the highest is 100 (best worker), with a normalized mean value of 54.

Positive and negative affect schedule. The Positive and Negative Affect Schedule (PANAS)[52] measures two broad mood dimensions: (*a*) *Positive affect* (PA) represents the extent to which an individual experiences pleasurable engagement with the environment and zest for life, characterized by enthusiasm and alertness (high score) and lethargy and sadness (low score); and (*b*) *Negative affect* (NA) reflects aversive emotional states in which the individual conveys feeling upset or unpleasantly aroused, characterized by subjective distress and un-pleasurable engagement (high score) and absence of such feelings (low score). Responses to various "mood" adjectives describing PA (eg, sociable, alert, attentive) and NA (eg, frightened, angry, contemptuous) experienced in the previous week are rated on a 5-point Likert scale, ranging from 0 (very slightly or not at all) to 4 (extremely). Scores for PA and NA are computed as two separate variables, with low scores for PA and high scores for NA likely indicators of distress. The reliabilities of PANAS scales are considered high, with a consistent relationship to measures of anxiety and depression.[53] In the current study, the Hebrew version of PANAS was used, containing 22 items shown to be cross-culturally consistent and highly correlated with PANAS models of mood described in the 20-item English version of the assessment,[54] however since normative values are available only for the English version,[53] we are using these values in order to comprehend the significance of scores obtained using the Israeli version.

Visual analogue scales. The Visual Analogue Scales (VAS) are symptom-focused outcome measures in which the participant is asked to evaluate, on a scale from 0 (did not suffer at all) to 100 (suffered all the time), the frequency in the previous one month of the following 12 stress-associated symptoms: headache, anxiety, muscle tension, insomnia, overeating, tiredness, heartburn, low back pain, neck problems, stomach problems, depression, and irritability.

Post intervention

Global assessments. Global assessments were only administered to participants, and included structured questions with a choice of responses (ie, not at all, a little, quite a lot, a great deal) assessing (*a*) overall experience and benefits of the CCG intervention on health and well-being; (*b*) coping with stress at work and home; (*c*) the practice, use, preference, and relevance of techniques taught in CCG to stressors encountered; and (*d*) expectations and comparison of CCG with other programs. Participants were also asked to write three words that best described their feelings after a class, and to indicate the length of time these feelings lasted.

End points. Success of the intervention was based on significant improvements and/or positive findings in the study end points. Primary endpoints included (*a*) changes in quantitative measures of perceived stress, (*b*) burnout, job-related tension, work productivity, general health and mood. Secondary endpoints included (*a*) changes in prevalence of URTI's, (*b*) visits to health practitioners, (*c*) health-related behavior, (*d*) attendance and attrition rates, and (*e*) global assessments.

Data analysis. To analyze the data, we used the Statistical Package for the Social Sciences (SPSS) version 20. Baseline (pre-intervention) data was described for all enrolled participants and controls using frequency and descriptive statistics. Pre- and post-intervention scores were compared per protocol analysis for intra- and inter-group analysis using a 2 × 2 design, based only on those who completed both questionnaires. Continuous variables between two independent groups were compared with the two sample *t* test and the non-parametric Mann-Whitney test applied for variables with non-normal distribution. Association between two categorical variables was assessed using Chi-square or the Fisher's exact tests. Descriptive statistics presented as percentages for each category of variable described were used for evaluative count data from global assessments. All statistical tests applied were two-tailed, and a p value of 5% or less was considered statistically significant.

Results

From 2000–2009, a total of 121 HMO staff enrolled as participants in CCG of whom 118 filled in a pre-intervention questionnaire. A total of 99 (81.8%) participants completed the program, including 14 who failed to hand in a post-intervention questionnaire or it was lost, and 3 who completed only a post-intervention questionnaire. Of 22 participants (18.2%) who enrolled in the program but did not complete it, 7 (5.8%) were described as drop-outs, citing work scheduling problems, personal issues (unrelated to the course), and health problems requiring surgery, as reasons for discontinuing. The remaining 15 (12.3%) filled in pre-intervention questionnaires but attended only the introductory session. Pre- and post-intervention questionnaires were obtained from 82 participants (69.5%) of whom 68 (83%) attended at least 24 (80%) sessions. A total of 97 controls recruited at the beginning of the program completed a first questionnaire, with 68 (70%) completing a second questionnaire 8 months later.

Demographic and baseline descriptive data

A total of 118 participants and 97 controls completed the pre-intervention questionnaire, the majority of which were health care workers and primarily nurses (75%), and the remainder (9.3%) administrative staff (see Table 1). Participants were slightly older than controls (45 vs 42 y, respectively; $p = .02$) and more frequently single parents (37% vs 12%, respectively; $p = .001$). Alcohol use was similar in both groups but controls drank significantly more glasses/week than did participants (2.9 vs 1.3, respectively; $p = .03$). In the three months before the program, more participants than controls had visited a psychologist (14.8% vs 4%, respectively; $p < .01$) or alternative health practitioner (21% vs 8%, respectively; $p < .01$), and reported more stressors in their lives (1.7 ± 0.87 vs 1.2 ± 1.02, respectively; $p = .001$). The most common self-reported stressor in both groups was family (64% vs 54.5%, respectively; NS). Participants, compared to controls, used significantly more counseling (20.5% vs 9.3%, respectively; $p = .03$), support groups (16% vs 6.2%, respectively; $p = .03$), meditation (23% vs 12%, respectively; $p = .05$), and energy healing/Reiki (15% vs 6%, respectively; $p = .04$).

Comparison of pre–post intervention scores

Of the 82 participants and 67 controls who completed both questionnaires, no significant differences were found in baseline scores between groups for the MBI, GHQ, JRTI, PSS, PS and PANAS (see Table 2). To assess if these 82 participants differed from 36 participants with only pre-intervention data, baseline scores were compared for the above variables. No significant differences were found except in PANAS where slightly higher scores of Negative Affect (NA) were recorded in those with only pre-intervention data (13.6 ± 5.9 vs 11.2 ± 6.1, respectively; $p = .05$). Evaluation of pre–post intervention scores in 82 participants and 67 controls showed the following inter and intra-group findings (Table 2).

Table 1. Demographic and baseline characteristics.

	SRT n = 118	Controls n = 97	*p*-value
Age (yr) ± (SD) Range	45.6 (10.59) 21–63	42.01 (11.49)18–67	.02
Gender (% Female)	114 (97%)	89 (92%)	.14
Occupation			
Nurse	88 (74.6%)	73 (75.3%)	1.0
Technicians	9 (7.6%)	7 (7.2%)	1.0
Dietician	7 (5.9%)	6 (6.2%)	1.0
Administration	11 (9.3%)	9 (9.3%)	1.0
Medical staff	3 (2.5%)	2 (2.1%)	1.0
Position			
Full time	53 (57.6%)	52 (58.4%)	1.0
Part time	39 (42.4)	37 (41.6%)	1.0
Years of work experience	19.99 ±(10.37)	17.55 (±11.44)	.11
Place of birth			
Israel	52 (46%)	52 (55.9)	
Eastern Europe	39 (34.5%)	22 (23.7%)	.51
USA/Europe/ S. Africa	12 (10.6)	14 (15.1)	
Middle East /N. Africa	9 (7.9%)	5 (5.4%)	
Years in Israel (SD)	23.14 (±13.04)	27.24 (±16.23)	.15
No. of children (SD)	2.3 (±1.5)	2.3 (±1.6)	1.0
Marital status			
Married or living with partner	79 (67%)	77 (79%)	.05
Divorced	19 (16.1)	5 (5.2%)	.02
Single	17 (14.4%)	14 (14.4%)	1.0
Widowed	3 (2.5%)	1 (1%)	.63
Child care			
Single parent	27 (37.5%)	7 (12%)	.001
Spouse/partner	45 (62.5%)	52 (88%)	
Smoking (%)	26 (22.2%)	17 (17.7%)	.49
Number of cigarettes/week /week	36.48 (±40.65)	66.82 (±67.56)	.07
Alcohol consumption (%)	16 (14%)	15 (15.5%)	.85
Number of glasses/week	1.50 (±1.55)	2.93 (±1.83)	.03
Coffee drinking (cups /week) (SD)	14.62 (±13.09)	16.98 (±13.78)	.21
Visit to Health professional in previous 3 months			
Family doctor	44 (38.9%)	25 (26.9%)	.08
Medical Specialist	50 (43.9)	36 (38.7)	.48
Psychologist	17 (14.8%)	4 (4.1%)	.01
Alternative Medicine practitioner	24 (20.9)	8 (8.2%)	.01
Medication			
pain	22 (18.8%)	20 (20.8%)	.73
sleeping pills,	9 (7.8%)	5 (5.2%)	.58
tranquillizers,	3 (2.6%)	1 (1%)	.63
antacids,	11 (9.5%)	8 (8.3%)	.81
muscle relaxants,	2 (1.7%)	4 (4.2%)	.41
anti-depressants	3 (2.6%)	0 (0%)	.26
Most commonly reported stressors:	**(n = 111)**	**(n = 88)**	
Family	71 (64%)	48 (54.5%)	.19
Work	55 (49.5%)	36 (41%)	.02
Financial	25 (22.5%)	20 (22.7%)	1.00
Health	25 (22.5%)	11 (12.5%)	.09
Political/security	19 (17%)	14 (16%)	.09
Studies	2 (2%)	8 (9%)	.02
Living environment	3 (3%)	4 (4%)	.70
Overall mean no of stressors reported (SD)	1.65 (±0.87)	1.18 (±1.02)	<.001
Specific activities to reduce stress in 6 mth prior to course:			
Positive thinking	95 (81.9%)	78 (81.3%)	1.0
Sports	75 (65.2%)	52 (53.6%)	1.0
Walking	59 (51.3%)	47 (48.5%)	.09
Prayer	47 (40.5%)	36 (37.5)	.78
Counselling	23 (20.5%)	9 (9.3%)	.03
Support group	18 (15.9%)	6 (6.2%)	.03
Medication	10 (8.8%)	3 (3.2%)	.15
Specific techniques in 6 mth prior to course:			
Yoga	19 (17%)	10 (10.3%)	.23
Meditation	26 (22.8%)	12 (12.4%)	.05
Relaxation	21 (19.4%)	12 (12.9%)	.25
Touch therapy	27 (24.1%)	19 (19.6%)	.50
Energy healing (Reiki)	17 (15.2%)	6 (6.3%)	.04

Table 2. Comparison of pre-post scores for *MBI, GHQ, PSS, JRTI, PS and PANAS* questionnaires.

	CCG		Controls			Pre-Post intra-group differences		
	Pre-score	Post- score	Pre-score	Post- score		*p-value*		
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Baseline inter-group differences*p-value*	CCG	Controls	Pre-Post inter-group differences*p-value*
Maslach Burnout Index (MBI)								
Emotional [a] *Exhaustion*	20.0 (11.62)	15.47 (9.08)	17.21 (10.36)	18.35 (10.86)	.13	< .001	.30	.001
	(n = 82)		*(n = 67)*					
Depersonalization[b]	3.62 (4.62)	3.51 (4.05)	2.49 (3.36)	3.95 (6.02)	.11	.83	.03	.06
	(n = 77)		*(n = 61)*					
Personal Accomplishment[c]	38.08 (8.0)	38.80 (8.30)	36.43 (7.73)	35.14 (8.51)	.21	.42	.06	.07
	(n = 79)		*(n = 64)*					
Perceived Stress Scale (PSS)	22.15 (2.91)	21.11 (2.97)	22.06 (3.20)	21.73 (3.34)	.86	.004	.44	.86
	(n = 81)		*(n = 67)*					
General Health (GHQ) [d]	27.35 (9.78)	22.11 (11.21)	24.69 (9.35)	29.08 (12.07)	.10	< .001	.001	< .001
	(n = 81)		*(n = 66)*					
Job Related [e] Tension Index (JRTI)	33.41 (8.22)	27.24 (9.29)	32.72 (8.58)	31.70 (8.32)	.62	< .001	.49	< .001
	(n = 81)		*(n = 65)*					
Productivity Scale [f] (PS)	76.38 (15.3)	79.61 (17.38)	77.57 (14.64)	75.95 (14.97)	.65	.06	.34	.004
	(n = 71)		*(n = 58)*					
PANAS								
Positive Affect (PA)	34.42 (6.59)	36.67 (6.75)	35.57 (7.20)	35.0 (7.79)	.32	.004	.47	.011
	(n = 81)		*(n = 66)*					
Negative Affect (NA)	11.22 (6.09)	7.99 (5.51)	10.78 (6.75)	10.61 (6.15)	.68	< .001	.80	.001
	(n = 80)		*(n = 66)*					

Maslach Burnout Inventory (MBI): Burnout scores according to standardized values in medicine (nurses, physicians).
[a]*Emotional exhaustion* low <18 Average = 19-26 High ≥27.
[b]*Depersonalization* low <5 Average = 6-9 High ≥10.
[c]*Personal Accomplishment* low >40 Average = 39-34 High ≤33 (scores reversed low value indicates burnout).
[d]General Health Questionnaire (GHQ) mean = 27 [e] Job Related Tension Index, (JRTI) mean = 20 (US versions).
[f]Productivity scale, (PS) mean = 54 [g] PANAS (20 item English version) means PA = 31.7, NA = 17.04.

MBI

Emotional exhaustion. Baseline scores for participants and controls were below the high range associated with burnout in health professionals (≥27). Participants scores (20) were in the average (19–26) and controls (17.2) in the low range (<18). Post-intervention participant scores fell to the low range (20 to 15.5, $p < .001$), indicating a significant decrease in this indicator of burnout, with no significant change in controls and highly significant inter-group differences ($p = .001$).

Depersonalization. Both groups at baseline were in the low range for burnout in health professionals (<5), with participants' post-intervention scores showing a non-significant fall (3.6 to 3.5) and controls a significant increase (2.5 to 4.0, $p = .032$), indicating greater depersonalization and borderline intergroup significance ($p = .056$).

Personal accomplishment. Baseline scores for both groups were in the average range for health professionals (34–39), with lower values indicating more burnout. Post-intervention participants showed a slight non-significant rise (38.1–38.8) and controls a fall (36.4–35.1, $p = .06$), indicating reduced Personal Accomplishment and borderline intergroup significance ($p = .069$).

GHQ

At baseline both groups scored around the normative mean value (27). Post-intervention participants scores fell significantly (27.4–22.1, $p \leq .001$), indicating improved health, while controls increased significantly (29.1–29.8, $p < .001$) indicating health deterioration with significance pre–post inter-group differences ($p < .001$).

JRTI

Both groups at baseline were well above the normative value (20) indicating greater work tension however only participants scores fell significantly following the intervention (33.4 to 27.2, $p \leq .0001$), with no significant change in controls (32.7 to 31.7) and significance inter-group differences ($p < .001$).

PSS

Both groups at baseline scored higher than means for women (13.6), those with college education (13.1), skilled workers (12.3), or those having been separated (16.6). Post-intervention-only participant scores significantly declined (22.2 to 21.2, $p = .004$), indicating decreased perceived stress with no significant change in controls.

PS

Both groups scored well above the normative value (54) where higher scores indicate greater work productivity however only participants demonstrated a borderline significant rise in values post intervention (76.4 to 79.61, $p = .06$) with controls showing a non-significant decline (77.6 to 75.95) and significant intergroup differences ($p = .004$).

PANAS

Positive affect. Both groups at baseline scored higher than a normative value[37] (31.72). Post-intervention only participants scores significantly increased (34.4 to 36.7, $p = .004$), controls showing a non- significant fall (35.6 to 35.0, NS), and with significant inter-group differences ($p = .011$).

Negative affect. Both groups scored lower than a normative value[37] (17.04), but only participants showed a significant decline in scores post intervention (11.2 to 7.9, $p < .001$), indicating improvement in negative aspects of mood compared to controls, who showed no significant change (10.7 to 10.6, NS), with significant inter-group differences ($p = .001$).

VAS

Pre-intervention, the most common symptom in both groups was tiredness (VAS > 50). Participants reported significantly more neck problems (43 vs 26, respectively; $p = .006$) and irritability (40.7 vs 25.9, respectively; $p = .013$) than controls. Post-intervention participants showed improvement in all symptoms with significant decreases in scores compared to base line values while controls remained the same or in the case of heart burn significantly worsened (see Table 3).

Medical and health-related behaviors

In the 3 months before the end of the CCG intervention (April -June), participants showed a significant negative shift in frequency of upper respiratory tract infections (URTIs) and family doctor visits compared to the 3 months prior to the beginning of the program (August–October). URTIs fell from 44% (36/82) to 12% (10/82) ($p = .001$), while family doctor visits decreased from 39% (31/79) to 14% (11/79) ($p = .02$). Significant changes were not seen in controls during the same time period for URTIs (32% to 14%, NS) and family doctor visits (32% to 15%, NS). No significant changes were found for either group in visits to other practitioners or in coffee or alcohol consumption. A significant negative shift in smoking occurred in both groups. Of participants, 22% (17/78) smoked at baseline and 13% (10/78) smoked

Table 3. Comparison of pre-post VAS Scores in participants and controls.

	CCG		Controls		Pre- post intra-group differences			
	Pre-score	Post score	Pre-score	Post -score	Baseline inter-group differences*p-value*	*p-value*		Pre- post inter-group differences*p-value*
Symptom VAS score*	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		CCG	Controls	
Headache	29.90 (23.82)	18.40 (14.77)	28.51 (21.41)	32.02 (25.73)	.71	< .001	.20	< .001
Anxiety	28.03 (22.45)	18.94 (15.15)	22.48 (20.64)	25.22 (19.18)	.12	< .001	.32	.001
Muscle Tension	39.93 (27.15)	25.19 (20.62)	38.16 (28.49)	35.87 (27.86)	.67	< .001	.51	.01
Insomnia	33.11 (29.28)	22.75 (22.91)	33.93 (30.70)	33.93 (26.81)	.91	< .001	.91	.03
Overeating	29.51 (26.82)	21.52 (23.15)	30.57 (29.20)	34.24 (26.60)	.82	.001	.32	.007
Tiredness	52.61 (22.74)	37.20 (18.58)	51.79 (25.59)	52.42 (24.24)	.75	< .001	.84	< .001
Heartburn	14.62 (17.99)	9.75 (17.01)	14.98 (21.32)	21.45 (23.89)	.97	.031	.05	.003
Low back pain	40.64 (27.90)	25.41 (24.48)	34.79 (29.11)	35.67 (28.59)	.15	< .001	.79	.001
Neck problems	43.15 (28.24)	26.30 (24.50)	29.18 (29.39)	32.84 (31.50)	.006	< .001	0.28	< .001
Stomach problems	22.98 (26.17)	9.50 (13.14)	25.11 (27.16)	22.53 (22.51)	.57	< .001	.43	.01
Depression	18.95 (22.57)	10.47 (16.05)	16.05 (20.31)	16.05 (17.91)	.51	.02	.96	.03
Irritability	40.73 (20.35)	25.88 (16.83)	32.45 (20.41)	35.82 (19.53)	.01	< .001	.17	< .001

*Where 0 = never and 100 = all the time

post-intervention ($p = .02$); of controls, 12% (8/66) smoked at baseline and 3% (2/66) smoked post course ($p = .03$).

In 85 participants who completed a post-intervention questionnaire, evaluative count data showed improvements in (*a*) physical state (65%); (*b*) energy (74%); (*c*) mental state (82%); (*d*) ability to relax (97%; 65% very much, 32% moderately); (*e*) cope with stress at work (94%; 55% very much, 32% moderately), and (*f*) cope with stress outside work (99%; 67% very much, 32% moderately). Techniques were practiced at home by 99% of participants (66% regularly or quite often, 33% occasionally), with 87% using techniques on others including (*a*) patients (53%); (*b*) colleagues (51%); (*c*) family (47%); and (*d*) friends (41%). The most enjoyable and helpful techniques practiced were relaxation (41%) followed by breathing (24%). Less enjoyable and regarded as less helpful were sitting meditation (11.7%) and visualization (7.3%). CCG was relevant to the type of stressors encountered at work in 95% of participants (63% very relevant, 33% moderately), 98% said CCG fulfilled their expectations (74% very much, 24% moderately), 94% reported they would recommend it to colleagues and 91% were interested in joining another program. The most common words describing feelings after a class were "relaxed"(85%), "inner peace" (35%), "happiness" (32%), and "energized" (32%), lasting on average 33 hr (median 24 hr), ranging from 15 min to 168 hr.

Discussion

Caring for the Caregivers (CCG), a multimodal stress-reduction intervention, was associated with very significant improvements compared to controls in quality of work as measured by a decrease in job related tension and increased work productivity, decrease in symptoms of perceived stress and emotional exhaustion associated with burnout, and improvements in mood and somatic and mental health symptoms. Objective improvements in health included decrease in upper respiratory tract infections and visits to health practitioners. Rates of attrition (5.8%) were low and attendance high over the 8-month intervention, with a high proportion of participants reporting regular use of techniques, home practice, and high levels of satisfaction and well-being lasting on average some 33 hours after the class. These results suggest CCG is very effective in helping hospital staff cope with the multidimensional nature of stress and is an acceptable and feasible intervention in this population.

A complex relationship exists between job stressors, response to these stressors and their impact on health and well-being.[55] Combinations of mental and physical stressors have been shown to exacerbate the sympatho-adrenal (SA) and hypothalamic pituitary adrenal (HPA) responses[56,57] and it has been postulated that if pathological events are related independently to psychological and physical stress, then multiple stressors are likely to be responsible for even greater pathophysiological alterations than single stressors alone.[56]

In the current intervention, multiple stressors inherent to health care work were targeted using various techniques that while individually have significant evidence for their effectiveness, used together can enhance and complement each other. Sitting meditation, a part of the cognitive component, was reported as the least enjoyable and least helpful technique, a finding that suggests a potentially low dispositional mindfulness[30] among CCG participants. Since hospital staff are exposed to multiple stressors, individuals with low dispositional mindfulness may therefore benefit by combining mindfulness training with other stress-reduction techniques. In CCG, the heightened sense of attention and awareness cultivated

by mindfulness was used to support, complement, and enhance other aspects of the program particularly the somatic (body awareness) component. Exercises drawn from yoga,[38] Qigong,[39] and the Alexander technique[40]—encouraging mindful movement, postural alignment, and relaxation—address musculoskeletal problems exacerbated by chronic stress[16] and long hours of standing, bending, lifting.[7,14] The dynamic-interactive component of CCG was mediated through sound, voice, and dance, the specific health benefits of the latter having been well documented.[41] Overall, the positive role of aerobic exercise in attenuating stress reactivity has been well established with improvements to physiological and psychological health, including decreased sympathetic nervous system reactivity, enhanced cardiovascular efficiency, improved recovery from stressors, lower stress-induced cortisol response, and relative to other therapeutic modalities, immediate psychological benefits.[56] Additional repetitive shaking and tapping exercises derived from Qigong have also been associated with reducing the stress response in the HPA-axis indexed by cortisol reactivity, and in the parasympathetic nervous system through vagal brake.[58]

Well-being is affected by many factors including social support, strong interpersonal relationships, and creative outlets for stress and emotion.[44,59] In the emotive-expressive component of CCG, activities promoting these factors were integrated regularly throughout the program including weekly listening circles, drawing, journaling, and writing. All of these components contributed to an important emotional release from stress and tension while helping participants come to a deeper understanding of the exercises and their contributions to self-care.

Acupressure and Shiatsu, not usually features of stress-reduction interventions, were used in the hands-on component to relieve pain and decrease other stress-related symptoms.[45,46] Widespread increased pain sensitivity is associated with stress[60] and thought to be mitigated via DNIC (diffuse noxious inhibitory control system).[61] Acupressure is credited with relieving pain, particularly chronic low back and neck pain,[45] by restoring DNIC.[62] Studies also show that patients who self-administer acupressure have improved well-being and quality of life, effects attributed to a heightened sense of self-empowerment and control.[62]

Low control, lack of empowerment, negative interpersonal relationships, and low self-esteem are all commonly seen in health care workers, particularly nurses.[6,8–10,12] Targeting them through self-care practices and the close inter-personal activities fostered by combining various components of CCG helps combat these very significant stressors in this population.

With its 8-month curriculum, CCG is significantly longer than other stress-reduction programs. This extended period, we believe, has a significant accumulative and deepening effect, allowing participants to more fully internalize and integrate techniques into their daily routine. Under these circumstances, missing or arriving late to sessions, an often unavoidable consequence of hospital work, rather than creating another source of tension is far less of an issue and is counteracted by the overriding sense of continuity inherent in a longer program. The program length also allows it to be flexible. It can adapt to the group's needs, taking into account prevailing moods and situations arising in the hospital and allowing participants freedom to practice and familiarize themselves with techniques they personally find most helpful.

This approach differs from other more circumscribed programs in which dependence on the group is discouraged by a relatively shorter format.[29] In contrast, we believe that the benefits of a supportive and nurturing framework developed over an extended period enables busy and stressed staff to look forward to weekly sessions on a long-term basis, which in itself plays a significant role in combatting the corrosive effects of stress in a hospital environment.

In the current study, participants' alcohol and coffee consumption, as lifestyle behaviors associated with stress, did not show significant changes, perhaps due to the relatively low consumption of both beverages in this population. Although a negative shift in smoking occurred in both groups, this finding may be partially due to the successful anti-smoking campaign launched by the hospital in 1999, shortly before the first CCG course.[63]

Stress has been shown to exert a negative effect on cellular and humoral immunity[64] and to increase susceptibility to the common cold.[65] While immune markers were not performed in the current study, the significant health benefits observed in participants, including reduced frequency of respiratory infections and family doctor visits (not present significantly in controls), suggests that CCG may be associated with a positive effect on the immune system, a finding in keeping with other previously published studies showing the beneficial role of stress reduction practice on immune status.[66]

Strengths and limitations

The effects of CCG on measures of stress, burnout, and health in hospital staff were explored in a prospective quasi-experimental study using a non-participating control group for comparison. Participants, of whom a majority were nurses, included other healthcare workers such as dieticians, medical staff, radiology and laboratory

technicians, and administrative workers not usually the subject of stress-reduction programs. Nevertheless, there were limitations in the study design. Enrollment in CCG was not randomized but based on self-selection by participants and voluntary agreement by other staff to act as controls. Nor was an attempt made to prevent contamination between groups, which in the circumstances would have been difficult since participants and controls tended to work closely together in the same departments. Controls were not wait-listed or entered into a parallel stress-reduction program but instead continued with their own personal approach to reducing stress. This process is reflected in the composition of the groups; as might be expected of those expressing an interest in a long stress-reduction program, participants reported more stressors, greater concern over health, higher rates of divorce, and more frequent visits to psychologists. They also expressed greater "openness" to self-help measures, with more experience of counseling, support groups, non-conventional therapies, and use of alternative practitioners than controls. Despite these differences, however, both groups were similar at baseline in evaluations of stress, burnout, and measures of general and emotional health, although participants reported higher frequencies of several stress-related symptoms. While a randomized controlled study would have been preferable, it would have been difficult to implement; participation was dependent on a strong motivation and commitment to join an 8-month program; to practice techniques; and, in the case of nurses, to complete a written assignment for Continuing Education Credits. A control group would have also needed to wait 8 months before joining the course or to be provided with an alternative intervention to compare with CCG, an option unavailable due to lack of funding, but a possibility for future studies. Participants and controls, however, were exposed to a similar hospital environment and the exceptional stresses associated with the second Intifada that occurred from 2000–2006, when the majority of staff were enrolled in the study.[67] In addition to routine work, both groups experienced ongoing casualties from suicide bombings, military operations, and constant anxiety for personal safety and that of family and friends. Despite these additional stressors,[68] only participants showed significant improvements in stress and health-related indices, while controls demonstrated either no change in these variables or a significant decline.

Conclusions

CCG a five-component multimodal intervention for combating occupational stress and burnout and improving health and wellbeing in hospital staff demonstrated significant benefits on work quality as indexed by improvements in job related tension and work productivity. Symptoms of stress, burnout, somatic and mental health complaints, and mood were all significantly improved with a positive effect on general health and well-being. While many of the techniques have been documented in other interventions, the number of components, long length, and integrated, flexible approach may have significant advantages for hospital and health care staff over shorter, more circumscribed, and and/or more homogenous programs. Further studies are needed to compare CCG with other popular stress-reduction interventions to assess its effect on specific groups of hospital workers less frequently targeted in stress-reduction programs, and to physiologically evaluate specific indicators of stress including immune function and cortisol levels. CCG should also be examined in other highly stressful professions, such as police, armed forces, teachers, fire fighters, with appropriate modifications to the program to address the specific nature of stress in these populations.

Note

Further details of the program are available by request. Descriptions of techniques and exercises used in the CCG intervention can be found as supplemental content on the publisher's website

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