

Maximizing Performance while Reducing Risk

A Blood Pressure Study

The new economy has ushered in an era of unprecedented change and transformation in our organizations – and the pace continues to accelerate. For some, this rapidly changing “new world” is challenging and stimulating; for many, it is extremely difficult. Recent scientific, medical and organizational research demonstrates that the turbulence of change and transformation and subsequent feelings of being overwhelmed, under-resourced, time-pressured and stressed substantially prevent individuals, teams and entire organizations from optimum performance.

Symptoms indicating that the pressure associated with change is taking its toll on a workforce cover a broad spectrum. Some of these symptoms, e.g., indigestion, body aches, feelings of negativity and resentment may appear relatively insignificant or even unrelated to workplace efforts. Yet an accumulation of these “minor” symptoms often lead to far more dangerous conditions threatening both the health of the individual and the performance of the organization. Research has shown that a rise in the physical symptoms is a leading indicator of productivity losses.

High blood pressure, or hyper-tension, is one of the most prominent public health issues in the U.S., *affecting approximately one in four adults*. High blood pressure is a major risk factor for death and disability, and has been strongly linked with decreases in cognitive performance, memory loss and deterioration of healthy brain tissue.¹

A number of recent studies show that stress is a significant, yet manageable, contributor to hypertension.² Hypertension has been shown to contribute to absenteeism, disability, impaired performance and loss of productivity.³

For the past ten years, HeartMath has been proving the link between the physical symptoms of stress and workplace effectiveness. As part of its program offerings, HeartMath delivers tools and techniques that individuals in organizations use to improve their business performance while effectively managing work/life balance. Organizations benefit from increased productivity, reduced health care costs, lower absenteeism and improved retention.

Purpose of the Study

This study was designed to determine whether training in Inner Quality Management® (IQM) could reduce BP and simultaneously improve business performance in known hypertensive individuals. Numerous studies have demonstrated that the IQM techniques improve cardiovascular health, hormonal balance and immune function, as well as enhancing cognitive performance, communication and job satisfaction.⁴

In particular, a number of pilot studies conducted at Motorola, Shell and BP have demonstrated that executives with Stage 1 and Stage 2 hypertension who participated in an IQM training program were able to restore their blood pressure to normal values without the aid of medication after practicing the IQM techniques.⁵

In the present study, the impact of the HeartMath Inner Quality Management Program was investigated in a group of hypertensive individuals, using a randomized controlled trial design. Psycho-

logical and performance-related parameters as well as heart rate variability measures were assessed concurrently with blood pressure changes to determine the overall impact of the program on employees' health, well-being and effectiveness. This study also sought to determine the general feasibility of the implementation of such an intervention in an organizational setting as a means to improve health and performance in a hypertensive employee population.

Study Design

Thirty-eight hypertensive men and women from a Fortune 100 High Tech firm participated in the study. The participants were randomized into a target group that would first receive the training and a "waiting control" group, that would receive the training 90 days after the target group had been trained and data collected from both groups. All participants' baseline BP was measured once a week for four consecutive weeks and psychometric data were also collected prior to training. The Personal and Organizational Quality Assessment-Revised (POQA-R), a broad-based assessment of psychological states and outcomes relating to business performance, and the Brief Symptom Inventory (BSI), a clinically valid measure of key indicators of psychological distress, were used. The psychometric data, additional BP and Heart Rate Variability (HRV) data was collected again from both groups approximately 90 days after the target group's final training session. The same training was then delivered to the waiting control group.

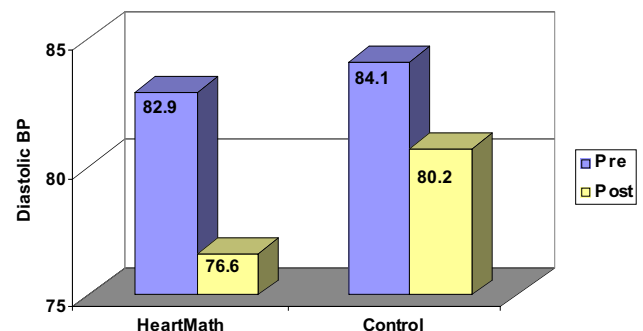
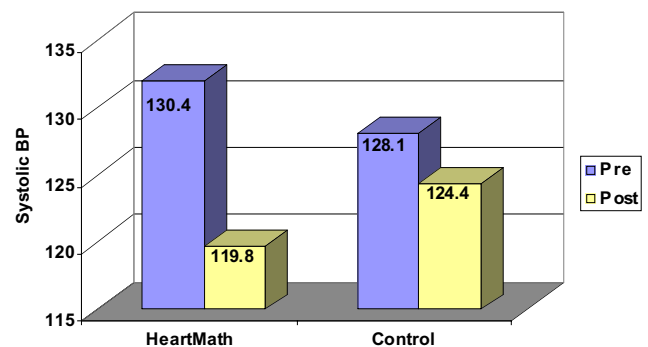
The Program & Training Delivery

The IQM training was delivered in one full-day (8-hour) and two half-day (4-hour) sessions over three successive weeks. In addition to the class room material, participants were trained in the use of the Freeze-Framer®, a software/hardware package which assists in the management of emotional and physiological responses and monitors Heart Rate Variability patterns (heart rhythms) at a personal computer.

Blood Pressure Outcomes

The reduction in systolic BP in the HeartMath (HM) treatment group was significantly larger than that in the waiting control (WC) group ($p < .05$). The HM group demonstrated a mean adjusted reduction of 10.6 mm Hg in systolic BP, as compared with the WC groups' mean adjusted reduction of 3.7 mm Hg. For diastolic BP, the HM group showed a mean adjusted reduction of 6.3 mm Hg, while the WC group demonstrated a mean adjusted reduction of 3.9 mm Hg. The figure below displays the systolic and diastolic BP changes in both groups adjusted for baseline BP, age, gender, Body Mass Index and medication status.

Because of the BP reductions they were able to achieve using the techniques, three participants in the treatment group who were regularly taking antihypertensive medications were able to reduce their medication usage, with their physicians' approval, during the study period. Of these, one participant was permitted to discontinue medication usage entirely following completion of the study.



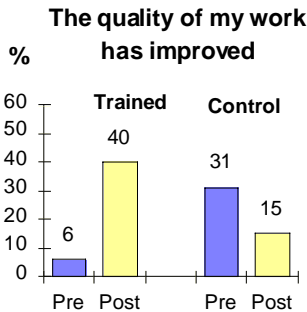
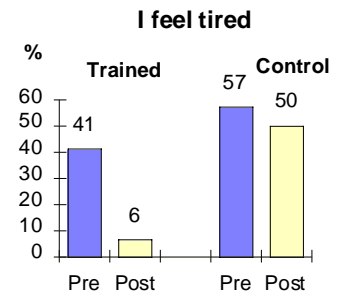
Psychological and Performance Outcomes—POQA-R Results

The results of the POQA-R survey revealed numerous significant improvements in key indicators of both personal and organizational effectiveness in the HM group as compared to the waiting control group.

Notably, for nearly all the items listed in the table, the HM group's results improved while those of the control group declined over the same period of time. This suggests that the intervention not only stimulated positive changes but, potentially, may have also helped to reverse a trend toward decreased effectiveness in these measures.

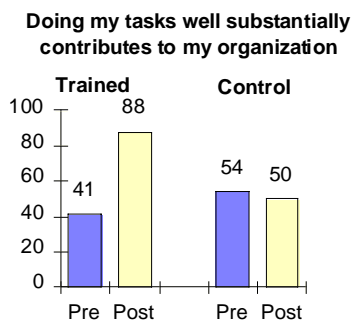
Improvement in a number of areas was substantial, with clear implications for organizational productivity and quality.

At the start of the study, 41% of employees in the HM group stated that they often or always felt tired. After the IQM training, this number had decreased to 6%.



Before the training only 6% of employees in the HM group felt that the quality of their work had recently improved, while 40% noted improvements in work quality 3 months after the program.

Nearly a quarter of employees in the HM group acknowledged feeling frustrated often or always at pre-test, and 18% stated they felt like leaving the organization. At post-test, this ratio dropped to only 6% for both these items. In contrast, the percentage of employees in the WC group who stated they felt like leaving the organization increased from 21% to 43% over the study period.



Heightened awareness of the relationship between individual performance and organizational success increased dramatically in the target group.

Further improvements in the HM group were measured in survey items dealing with areas that include communication, recognition, attitude toward the organization, positive outlook and value of work contribution, among others. The group also demonstrated substantial reductions in items reflecting burnout and physical stress symptoms.

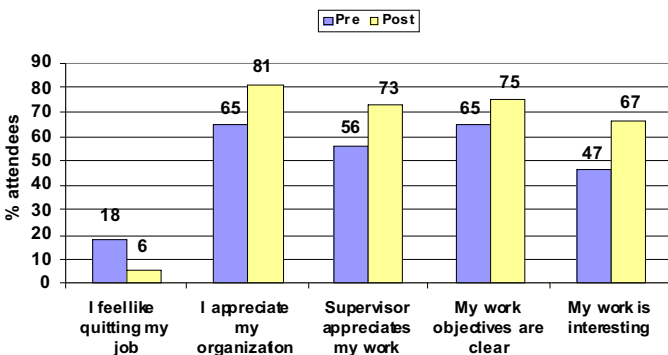
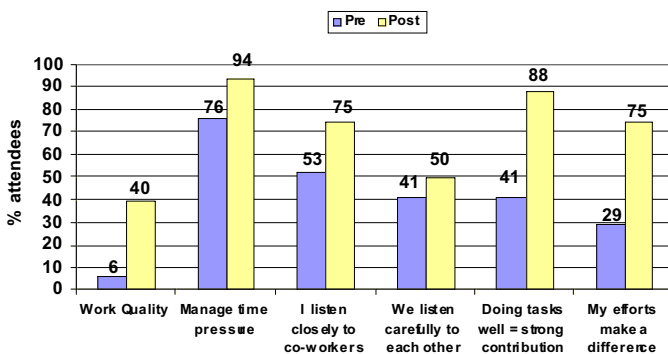
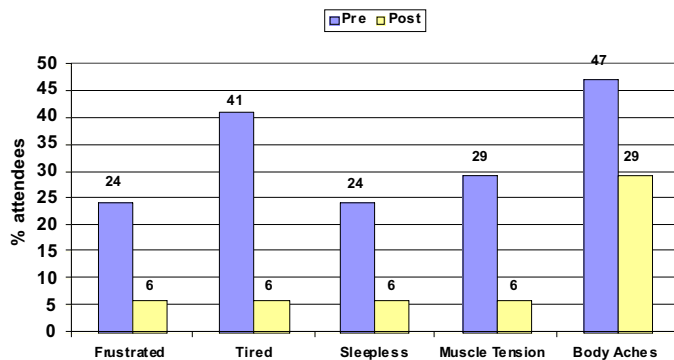
Conclusions & Recommendations

This study demonstrates that the HeartMath Inner Quality Management program was effective in reducing blood pressure in a group of hypertensive employees over a 3-month period. Simultaneously, dramatic improvements were shown in employee attitudes and business performance. Not only are these employees healthier and less likely to be away from work for reasons relating to high blood pressure and its consequences, but they also feel less like quitting, find themselves better recognized

for their efforts by the company, are communicating better with each other while coping effectively with the pressures of their jobs and their lives.

This study indicates that the IQM program can help to promote effective blood pressure management and improve well-being in hypertensive employees. This results in a healthier and more productive workforce while reducing losses to the organization due to cognitive decline, performance impairment, morbidity and premature mortality. The approach utilized in this study helps to establish a practical model that can be easily duplicated and expanded to make the benefits of this program available to larger populations.

Summary of Improvements Seen in Target Group



1. Neurology, 1998. Journal of American Medical Association, 1995.
2. Journal of Hypertension, 1998. American Heart Journal, 1998.
3. Journal of Occupational and Environmental Medicine, 1999.
4. American Journal of Cardiology, 1995. Stress Medicine, 1997.
5. Watkins, A. The personal and business benefits of the Inner Quality Management Programme: Case Study 9, Oil Company 1. Hunter Kane Resource Management, Southampton, UK, 1999.



A Change of Heart Changes Everything

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Results: Comparison Target to Control Group

Scale	Question		Pre-IQM	3 Months Later	
Organizational Climate					
Value of Contribution	My efforts make a difference in my organization	Treatment	29%	75%	<i>Agree-Strongly Agree</i>
		Control	57%	43%	
Value of Contribution	Doing my tasks well substantially contributes to my organization	Treatment	41%	88%	<i>Agree-Strongly Agree</i>
		Control	54%	50%	
Value of Contribution	My efforts do not go unacknowledged	Treatment	53%	63%	<i>Agree-Strongly Agree</i>
		Control	50%	21%	
Perceptions of Management	There is tension between management and staff	Treatment	31%	27%	<i>Agree-Strongly Agree</i>
		Control	14%	31%	
Role Clarity	My work objectives are very clear	Treatment	65%	75%	<i>Agree-Strongly Agree</i>
		Control	50%	36%	
Recognition	My supervisor appreciates the way I do my work	Treatment	56%	73%	<i>Agree-Strongly Agree</i>
		Control	64%	31%	
Communication	I listen closely to my co-workers	Treatment	53%	75%	<i>Agree-Strongly Agree</i>
		Control	79%	64%	
Communication	We listen carefully to each other at work	Treatment	41%	50%	<i>Agree-Strongly Agree</i>
		Control	50%	38%	
Organizational Quality					
Attitude toward Organization	The success of my organization is important to me	Treatment	76%	88%	<i>Agree-Strongly Agree</i>
		Control	69%	64%	
Attitude toward Organization	I am committed to my organization's mission	Treatment	76%	81%	<i>Agree-Strongly Agree</i>
		Control	57%	46%	
Quality of Work	Recently, the quality of my work has improved	Treatment	6%	40%	<i>Agree-Strongly Agree</i>
		Control	31%	15%	
Quality of Work	I strive for excellence in all I do at work	Treatment	71%	75%	<i>Agree-Strongly Agree</i>
		Control	71%	62%	
Job Satisfaction	I feel like leaving this organization	Treatment	18%	6%	<i>Agree-Strongly Agree</i>
		Control	21%	43%	
Personal Quality					
Positive Outlook	I feel relaxed	Treatment	41%	76%	<i>Often-Always</i>
		Control	36%	29%	
Positive Outlook	I wake up and look forward to each day	Treatment	59%	81%	<i>Often-Always</i>
		Control	64%	46%	
Negative Outlook	The actions of others get on my nerves	Treatment	13%	6%	<i>Often-Always</i>
		Control	7%	15%	
Anger	I feel frustrated	Treatment	24%	6%	<i>Often-Always</i>
		Control	29%	38%	
Burnout	I feel tired	Treatment	41%	6%	<i>Often-Always</i>
		Control	57%	50%	
Burnout	I feel fatigued	Treatment	35%	12%	<i>Often-Always</i>
		Control	50%	43%	
Physical Symptoms	I experience sleeplessness	Treatment	24%	6%	<i>Often-Always</i>
		Control	14%	15%	
Physical Symptoms	I have muscle tension	Treatment	29%	6%	<i>Often-Always</i>
		Control	21%	36%	
Self-Management Competencies					
Emotional Management	I manage time pressures well	Treatment	76%	94%	<i>Often-Always</i>
		Control	64%	69%	
Emotional Management	It's difficult for me to calm down after I've been upset	Treatment	29%	0%	<i>Often-Always</i>
		Control	29%	15%	
Self Esteem	I like who I am	Treatment	71%	94%	<i>Often-Always</i>
		Control	79%	77%	