

An Email-Based Workplace Health Intervention: Failures, Lessons Learned, and Guidance for Future Research

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A brief email-based workplace health intervention aimed at modifying employee well-being was evaluated. Data were collected from 346 faculty and staff members. A unique set of outcomes (workaholism, work stress, job satisfaction) and moderators (self-efficacy, mindfulness) were utilized. The interventions failed to produce significant behavior changes in the targeted outcomes. Future investigators should examine the amount of active participation to provide insight on inactive participants and the appropriate amount of time needed for effective interventions. To accomplish health goals in holistic Employee Assistance Programs, increased levels of tailoring to employee's needs should be implemented when using non-intrusive email-based workplace interventions.

Keywords: email-based workplace intervention, employee well-being, occupational health

INTRODUCTION

Today's workforce has become increasingly more involved with work (Brady, Vodanovich, & Rotunda, 2008). This rising trend is an important area of study due to the potentially negative influence that work can have on employees' lives. Specifically, heavy work investment is associated with increased work-family conflict and work stress (Aziz & Zickar, 2006; Snir & Harpaz, 2012). Furthermore, work stress exposes workers to a greater risk of cancer, diabetes, depression, anxiety, obesity, and virtually all other chronic conditions (Wolever et al., 2012). In turn, employees who engage in heavy work investment also have a detrimental influence on the organization in the form of financial costs via inflated healthcare expenses, decreased morale, and reduced productivity (Macik-Frey, Quick, & Nelson, 2007; Wolever et al., 2012).

Fortunately, research suggests that engaging in health-promoting behaviors can provide benefits to both the employee and the organization. Moreover, organizations are considered optimal environments for health promotion, (Karanika-Murray & Weyman, 2013) and the workplace has been recognized as an ideal setting to reach large numbers of people during generally stable conditions (Harden, Peersman, Oliver, Mauthner,

& Oakley, 1999). Consequently, in the current study, we investigate important health and well-being benefits offered by such workplace-based initiatives. To examine potential benefits, a unique composite of employee well-being indicators is used, including workaholism, work stress, and job satisfaction. Furthermore, self-efficacy and mindfulness are investigated as potential moderators to the relationship between health intervention and health outcomes. The overarching purpose of the study is to create low-cost health interventions that could be used non-intrusively to improve worker health.

INDICATORS OF PHYSICAL AND MENTAL HEALTH

The World Health Organization defines health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (Preamble to the Constitution of the World Health Organization, 1948). Consequently, employee intervention programs target a variety of health-related variables. Examples of formerly used indicators include sleep quality, mood, pain, productivity, and stress (Benavides & David, 2010; Wolever et al., 2012). The current study uses workaholism, work stress, and job satisfaction to represent employee well-being.

Workaholism

For some individuals, work can become damaging to their physical and mental well-being. Coined by Oates (1971), the workaholic is defined as “a person whose need for work has become so excessive that it creates a noticeable disturbance or interference with his bodily health, personal happiness, interpersonal relations, and with his smooth social functioning” (p.4). Furthermore, workaholism is a type of heavy work investment in which employees work excessively hard to avoid negative outcomes such as shame, guilt, or anxiety (van Beek, Taris, Schaufeli, & Brenninkmeijer, 2014). As a result of such intense fixation on work, workaholism is a significant predictor of greater work-family conflict, decreased job satisfaction, and increased stress levels (Aziz & Zickar, 2006; Brady et al., 2008). Altogether, workaholism has damaging effects on individuals, rendering it an important topic for continued investigation.

Work Stress

As defined by Long and Flood (1993), stress “occurs when a situation that is valued and significant is appraised as taxing or exceeding the individual’s coping ability” (p.110). As the majority of individuals’ occupations are both valued and taxing on personal resources, work stress often occurs. Moreover, when not successfully managed, work stress can contribute to both personal and organizational problems (Mino, Babzono, Tsuda, & Yasuda, 2006). In turn, work stress is an important inclusion as an indicator of well-being.

Job Satisfaction

Brief (1998) defines job satisfaction as an “internal state that is expressed by affectively and/or cognitively evaluating a job experience with some degree of favor” (p.85). The changing nature of jobs, which features longer work hours, demanding deadlines, and little control over one’s workload, may contribute to decreasing levels of job satisfaction and poorer worker health (Faragher, Cass, & Cooper, 2005). Meta-analytic research demonstrates that employees who experience low job satisfaction are most likely to experience emotional burnout, lower self-esteem, anxiety, and depression (Faragher et al., 2005). Decreased job satisfaction can also negatively influence organizations via turnover (Elangovan, 2001). Together, individual and organizational outcomes of job satisfaction emphasize its value as a topic worth consideration by both researchers and employers.

MODERATORS OF HEALTH INITIATIVES

Self-Efficacy

Bandura (1977) first introduced the term self-efficacy. He described it as an individual’s expectations of personal competence and control over behavioral tasks, or positive beliefs about one’s ability to

persevere amidst challenges. The higher an individual's level of self-efficacy, the more likely that individual will be successful in completing a specific task (Schwerdtfeger, Konermann, & Schönhofen, 2008). Additionally, Bandura's framework suggests that self-efficacy may dampen the physiological arousal response instigated by stressors or threats. Subsequent research has demonstrated that self-efficacy is negatively related to negative affectivity and burnout (Schwerdtfeger et al., 2008). In turn, self-efficacy may serve as an important psychological resource that moderates the relationship between interventions and increased levels of well-being.

Mindfulness

Kabat-Zinn (1990) defines mindfulness as cultivating one's ability to pay attention to the present moment in a nonjudgmental way. This present-moment attentiveness includes an individual's current set of feelings, thoughts, and perceptions (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Mindfulness-based stress reduction programs are successful in helping individuals who suffer from a variety of psychological conditions (e.g., depression, PTSD). Furthermore, those who display high levels of mindfulness are found to better tolerate emotional arousal attributed to stressful or traumatic events, potentially reducing the use of negative coping mechanisms and increasing overall well-being (Smith et al., 2011). A study that examined the effects of meditation awareness training on those with workaholism found that individuals exposed to the mindfulness-based intervention experienced an increase in job satisfaction, work engagement, and psychological distress, compared to those in the control group (van Gordon, et al., 2017). Therefore, growing research on mindfulness has established this cognitive resource as a fairly new and important facet to investigate in relation to an employee's physical and mental health.

EMPLOYEE HEALTH INTERVENTIONS

Employers can support their employees by providing positive health and well-being programs. However, in order to successfully implement such programs, several factors must be addressed—programs must be accessible, engaging, and convenient in terms of scheduling, time requirements, and location (Wolever et al., 2012). When successfully implemented, workplace interventions offer a variety of benefits. For example, improvements are found in employees' perceived stress, sleep quality, and heart rate variability (Wolever et al., 2012). Furthermore, organizational benefits such as decreased medical costs, reduced employee absenteeism, and increased job satisfaction support the use of workplace health interventions (Harden et al., 1999).

Although multiple approaches may be taken when designing health programs, when interventions target individual employees, educational strategies are typically used (Harden et al., 1999). Additionally, when evaluating the methodological quality of health interventions, programs are considered empirically robust if they include pre- and post-intervention data and use both control and experimental groups (Harden et al., 1999). Finally, health interventions can be conducted in a variety of settings and may consist of multiple strategies such as motivational incentives and exercise programs (Marshall, 2004).

Despite the importance of health promotion, numerous barriers (e.g., lack of time and resources) have typically prevented participation by some individuals in face-to-face programs. To navigate such barriers, it is essential to develop contemporary intervention methods that improve accessibility and utilize modern mechanisms by which employees receive information. One such contemporary approach includes the use of the Internet as a platform for health interventions. The Internet is a cost-effective method that allows health initiatives to reach large numbers of individuals quickly and efficiently (Stralen, Vries, Mudde, Bolman, & Lechner, 2011) and is the leading source of information in the United States (Matusitz and McCormick, 2012).

Consequently, the current study uses contemporary intervention methods to determine their effectiveness in modifying employees' status on a variety of outcomes. Specifically, in contrast to previous electronic interventions addressing topics such as how to calculate target heart rates, setting activity goals, stretches at your desk, and taking your pulse (Leslie, Marshall, Owen, & Bauman, 2005), the current study makes a significant contribution to the existing literature by (1) investigating a unique set of outcomes (i.e.,

workaholism, work stress, and job satisfaction), (2) incorporating self-efficacy and mindfulness as potential moderators, and (3) using novel email-based educational interventions.

Given the unique characteristics of the current study, as well as previous research demonstrating the success of health interventions in improving outcomes such as work climate and stress (Elo, Ervasti, Kuosma, & Mattila, 2008; Wolever et al., 2012), it was expected that the educational email-based interventions would improve employee health.

Hypothesis 1 (H1): Educational interventions, disseminated through email, will significantly improve self-reported levels of employee health.

Furthermore, previous research has demonstrated the importance of targeted interventions. Specifically, interventions that included tailored information initiated greater behavior change (Owen, Lee, Naccarella, & Haag, 1987). In turn, it was expected that employees exposed to outcome-specific interventions would demonstrate greater levels of change.

Hypothesis 2a (H2a): Following exposure to an intervention addressing workaholism, employees in the experimental group will report greater decreases in workaholism at Time 2 than those in the control group.

Hypothesis 2b (H2b): Following exposure to an intervention addressing work stress, employees in the experimental group will report greater decreases in work stress at Time 2 than those in the control group.

Hypothesis 2c (H2c): Following exposure to an intervention addressing job satisfaction, employees in the experimental group will report greater increases in job satisfaction at Time 2, than those in the control group.

Finally, previous research has established the importance of self-efficacy and mindfulness in regard to individual health and well-being (Bandura 1977, 1997; Smith et al., 2011). Therefore, both self-efficacy and mindfulness were expected to moderate the relationship between intervention and well-being.

Hypothesis 3a (H3a): The intervention will have a greater effect for those with higher self-efficacy.

Hypothesis 3b (H3b): The intervention will have a greater effect for those with higher mindfulness.

METHOD

Participants

The study consisted of 346 full-time faculty and staff members employed at a large Southeastern university. The sample primarily consisted of females (81.8%) and the average age was 44 years with a range of 22-70 years. The majority of participants were either Caucasian American (83.0%) or African American (13.5%), and married (64.0%) with children (63.4%). Participants reported an average tenure of 8.4 years and 5.7 years in their current position. The average number of hours worked per week, including hours spent outside of work completing work-related tasks, was 46.1 hours with a range of 35-90 hours.

Procedure

The study utilized a non-random, non-probability convenience sampling method for sample recruitment. Specifically, convenience sampling was used to target a large group of employees and aimed to attract participants who represented a specific portion of a given employee population. In particular, the study was designed to capture participation from employees who self-select into non-mandatory employer-provided health and wellness programs that are advertised by similar means (i.e., email). In turn, initial recruitment efforts were directed towards all current employees within the university.

Participants were contacted using recruitment emails that were sent to all current university employees (i.e., full-time faculty and staff members) via their university email address. Recruitment emails included a description of the study and its interventions, as well as a hyperlink to an online survey. Participants were first asked a series of qualifier questions (i.e., “Are you at least 18 years of age or older?”) and were required to answer “yes” to all qualifier questions to be eligible to participate. Qualified participants were then prompted to create a unique identifier to pair pretest and posttest responses. Next, participants completed the survey and were automatically directed to an additional survey asking them to provide their preferred email address for receiving the interventions.

Participants were then randomly assigned into either an experimental or a control group. The experimental group was administered health interventions that specifically targeted the dependent variables, while the control group was administered a series of “distractor interventions” that did not specifically relate to the dependent variables. Each group received one intervention per week, in variable order, following the end of Time 1 testing. Experimental interventions included a brief explanation of the health topic, benefits of health improvement, consequences of poor health, tips for improvement, and a request to participate in behaviors that promote health. Control interventions followed a similar format to the experimental interventions, but included information on topics that were not directly related to health and well-being (i.e., prioritizing tasks and utilizing synergy in the workplace). Following the intervention period, participants were emailed a final survey, identical to the first one. After completion, participants received the interventions they did not obtain during the study.

Measures

Workaholism

The Work Addiction Risk Test (WART; Robinson, 1999) was used to measure workaholism. Greater scores indicate higher levels of work addiction. Coefficient α was .89.

Work Stress

The Stress in General Scale-Revised (SIG-R; Yankelevich, Broadfoot, Gillespie, Gillespie, & Guidroz, 2011) was used to measure work stress. Greater scores indicate higher levels of work stress. Coefficient α was .83.

Job Satisfaction

The Abridged Job in General Scale (A-JIG; Russell, Spitzmüller, Lin, Stanton, Smith, & Ironson, 2004) was used to measure job satisfaction. Greater scores indicate higher levels of job satisfaction. Coefficient α was .86.

Mindfulness

The Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) was used to measure mindfulness. The FFMQ consists of five factors: observing, describing, acting with awareness, nonreactivity of inner experience, and nonjudging of inner experience. Greater scores indicate higher levels of mindfulness. Coefficient α was .91.

Self-Efficacy

The General Self-Efficacy Scale (GSES; Schwarzer, Bäßler, Kwiatek, & Schröder, 1997) was used to measure self-efficacy. Greater scores indicate higher levels of global self-efficacy. Coefficient α was .87.

RESULTS

A power analysis was initially conducted using parameters that specified a medium effect size and a .05 criterion for statistical significance when detecting mean differences between two independent groups using a two-tailed t-test—the target number of participants was approximately 300. Participants were recruited through a network of key university members and electronic mailing lists. These non-random

sampling methods linked the study researchers to a large participant pool ($N = 6,288$). A total of 1021 survey responses were originally received from the Time 1 survey. However, 366 respondents were subsequently removed from the sample for failing to pass the qualifier questions, provide a unique identifier, or complete one or more study measures. Thus, initial data screening at Time 1 resulted in 655 usable surveys. Following the intervention period and Time 2 data collection, data screening followed a similar procedure for the Time 2 survey. In sum, a total of 346 participants were included in the current study by receiving the intervention and producing valid Time 1 and Time 2 data which could be paired accurately.

Descriptive statistics and correlations are shown in Table 1. The WART was negatively correlated with the A-JIG, the FFMQ, and the GSES, and positively correlated with the SIG-R. Next, the SIG-R was negatively correlated with the A-JIG, the FFMQ, and the GSES. Positive correlations were found between the A-JIG and the FFMQ and the GSES. Finally, the FFMQ was positively correlated with the GSES.

TABLE 1
CORRELATIONS AND DESCRIPTIVE STATISTICS

Variable	1	2	3	4	5	6	7	8	9	10
1. WART (T1)	(.89)									
2. WART (T2)	.76**	(.89)								
3. SIG-R (T1)	.35**	.36**	(.83)							
4. SIG-R (T2)	.39**	.47**	.75**	(.83)						
5. A-JIG (T1)	-.23**	-.22**	-.32**	-.38**	(.83)					
6. A-JIG (T2)	-.19**	-.22**	-.32**	-.39**	.79**	(.86)				
7. FFMQ (T1)	-.44**	-.39**	-.16*	-.23**	.31**	.24**	(.91)			
8. FFMQ (T2)	-.38**	-.38**	-.10	-.25**	.24**	.21**	.83**	(.91)		
9. GSES (T1)	-.15*	-.16*	-.10	-.17**	.23**	.19**	.53**	.50**	(.86)	
10. GSES (T2)	-.12**	-.16*	-.13*	-.23**	.21**	.22**	.47**	.53**	.71**	(.87)
Range of Current Data	31-97	26-96	0-8	0-8	0-8	0-8	79-182	70-183	17-40	14-40
Range of Possible Scores	25-100	25-100	0-8	0-8	0-8	0-8	39-195	39-195	10-40	10-40
Mean	60.86	61.32	3.42	3.51	6.38	6.22	136.71	137.14	31.66	31.85
SD	11.56	11.63	2.53	2.55	2.00	2.23	18.60	18.19	4.23	4.26

Note. *N* = 346. Entries on the main diagonal are Cronbach's alpha. WART = Work Addiction Risk Test; SIG-R = Stress in General-Revised; A-JIG = Abridged Job in General Scale; FFMQ = Five Facet Mindfulness Questionnaire; GSES = General Self-Efficacy Scale; **p* < .05, ***p* < .001.

TABLE 2
MEANS AT TIME 1 AND TIME 2

Variable	WART	SIG-R	A-JIG	FFMQ	GSES
Time 1	60.86	3.42	6.38	136.71	31.66
Time 2	61.32	3.51	6.22	137.14	31.85

Note. *N* = 346. WART = Work Addiction Risk Test; SIG-R = Stress in General-Revised; A-JIG = Abridged Job in General Scale; FFMQ = Five Facet Mindfulness Questionnaire; GSES = General Self-Efficacy Scale

Hypothesis 1 proposed that the study interventions would significantly improve self-reported levels of employee health. Difference scores between pre and post assessment scores were calculated and, ignoring groups, a paired-samples t-test was conducted for each dependent variable—analyses revealed there was no effect of the study interventions on difference scores. Thus, Hypothesis 1 is not supported. Additional analyses were conducted to detect any significant differences between pre- and post-assessment scores within either the experimental or control group—analyses revealed no significant mean differences for any of the dependent variables in either group.

Hypotheses 2a to 2c proposed that following exposure to interventions that specifically target the dependent variables, employees in the experimental group will report greater improvements in health than employees in the control group. A one-way ANOVA was conducted for each dependent variable—analyses revealed no significant effect of treatment on pre-post difference scores. Thus, Hypotheses 2a to 2c are not supported. Means for the current study variables at Time 1 and Time 2 are shown in Table 2.

Hypotheses 3a and 3b proposed that the effect of the intervention would be greater for those with higher self-efficacy and mindfulness, respectively. First, a least squares ANCOVA was conducted to determine if there was a significant interaction between self-efficacy and group membership. Analyses revealed no significant interaction between self-efficacy and group membership. Thus, Hypothesis 3a is not supported. An identical process was conducted to determine if there was a significant interaction between mindfulness and group membership. Similarly, analyses did not reveal a significant interaction. Thus, Hypothesis 3b is not supported.

DISCUSSION

The fact that the current workforce commits increasingly more time to work (Brady et al., 2008) holds several important implications regarding personal well-being and organizational outcomes. On an individual level, employees may become overly committed to work, struggle with workaholism, and experience high levels of work stress. Such findings were revealed in the current study, as number of hours spent toward work was positively correlated with both workaholism and work stress. On an organizational level, employees who are overly stressed may experience mental and physical illness that results in increased healthcare costs, reduced productivity, and absenteeism (Quick, Quick, Nelson, & Hurrell, 1997; Macik-Frey et al., 2007).

We aimed to enhance the research surrounding modern health interventions and examined the effectiveness of educational interventions disseminated through email. Furthermore, we targeted a unique composition of outcomes that were novel to the study of health interventions. Overall, results suggest that these interventions are not effective at initiating behavior change for workaholism, work stress, and job satisfaction. However, a critical review of key methodological characteristics of the current study and its interventions reveals important information regarding the successful implementation of non-intrusive workplace health interventions. Furthermore, such information is presently absent from the literature and, in the context of the current study, may have only been detected by examining a comparatively radical approach at non-intrusively modifying employees' behavior.

Specifically, the intervention period timeline and the level of intervention tailoring may have hindered the success of the experimental interventions. First, the intervention period was brief, as interventions were delivered over the course of three weeks. Studies have demonstrated success in modifying such outcomes as blood pressure in employees (Fanous, Kier, Rush, & Terrell, 2014) when using a 12-week intervention—this time frame appears to be ideal for behavior change within health education and physical activity promotion. Furthermore, outcome variables were only targeted on a single occasion, thus, most participants likely reviewed the intervention once, thereby hindering a significant amount of behavioral change within the brief time frame.

Second, due to the non-intrusive nature of the study interventions, there was no individual-level tailoring of information. This method aimed to investigate the effectiveness of interventions that required minimal contact with participants and maximum ease for dissemination by individuals untrained in health interventions (i.e., management). Despite the fact that other Internet-based sources of health information (e.g., health websites, blogs) use similar non-tailored approaches, it appears that to facilitate behavior change, individualized information must be used. Therefore, it is recommended that extended intervention periods, including multiple administrations for each health outcome, be incorporated into any health intervention effort and personal interaction take place with employees to establish health and well-being goals and ensure that the delivery of information is both interesting and effective.

Furthermore, this is not the first study to find undesirable results after the implementation of a mindfulness-based intervention. Van Dongen et al. (2016) found no significant difference in job satisfaction, general vitality, or work ability after a 12-month worksite mindfulness-based intervention. Another study found no significant differences after 6 or 12 months between the experimental group and control group after administering a mindfulness-based intervention at work (van Berkel, Boot, Proper, Bongers, & van der Beek, 2014). These results, along with those of the current study, speak to the complexity of worksite interventions.

LIMITATIONS AND CONCLUSIONS

It is possible that demand characteristics could have threatened the study's internal validity. Specifically, participants were made aware of their participation in an employee wellness program, which could have engendered responses that they believed were desired by the study's researchers (i.e., social desirability). Additionally, whether or not the participants viewed the interventions and the amount of time spent viewing them were not controlled for in the study. In future research, investigators are encouraged to examine the amount of active participation. Such information would provide insight on inactive participants as well as the appropriate amount of time needed for the interventions to be effective.

A further consideration that potentially limits the study and the interpretation of its results is a low response rate. Low response rates restrict the interpretability of results and may prevent the current study findings from being generalized to a larger population of employees. However, it must be noted that although the final response rate of 5.5% is very low, the initial participant pool by which the response rate is calculated represents the entire employee population and not any specific group of employees. Conversely, recruitment methods aimed to receive participation from employees who, in general, display a tendency to self-select into employer-provided programs that are not directly related to the employee's work duties. In turn, for the purpose of the current study, the final sample of 346 participants and the subsequent results reasonably represent the typical university employee who is interested in engaging in non-mandatory health programs. It is recommended that, in future research, an initial assessment that gauges interest prior to including employees in the study be incorporated in order to provide a more accurate assessment of response rates and interest in similar employee programs.

A final limitation of the study involves the content of the control interventions. To increase the methodological strength of the study, a control group was used. As a control, participants were sent interventions identical to those in the experimental group, with the exception of the content. Specifically, control group interventions addressed topics unrelated to the study variables, whereas experimental group interventions expressly addressed the study outcomes. For example, whereas experimental interventions

provided participants with information on how to improve job satisfaction and reduce workaholism and work stress, control interventions instructed participants on the benefits of prioritizing tasks and utilizing synergy in the workplace. Results suggest that such information may have failed to act as a control, but rather, the use of content that was not specific to health but work-related, could have influenced participants' work experience and affected the health-related study outcomes. Given that the current study results suggest the control interventions had a similar, if not equal, effect on self-reported levels of the study variables, control interventions that have a lower probability of influencing the study outcomes should be used in future research, such as interventions that are different in format and include content that is in no way related to health or work experiences. However, researchers should also be cognizant of the possibility for communication between participants and the ease of transmission of email interventions between individuals.

With further investigation of the most effective methods for creating and disseminating email interventions, future researchers and employers may experience the benefits traditionally derived from costlier and burdensome interventions. It is suggested that continued research be conducted in the area of holistic Employee Assistance Programs which can provide employees with tailored information to accomplish health goals, while also focusing on the use of email—a widespread and useful tool in nearly all organizations. Furthermore, managers can promote healthy practices and educate employees about the importance of well-being and the development of physical and psychological resources. Finally, increased acceptance that employee well-being is important and intimately related to an organization's financial success will also help support the need for future research in this area.

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