

Examining Cognitive-Based Stress Management Interventions in Private Sector Workplaces

Erika Ferszt

Milan, Italy

Email: erika.ferszt@gmail.com

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Abstract

Objective: Review literature regarding the efficacy of stress management interventions in the private sector workplace. As stress is deemed to have a cognitive variable, the paper focuses exclusively on interventions that had a cognitive-based program. This is the first review paper to examine the private sector workplace exclusively. **Method:** Search from 2000 to date for any studies evaluating cognitive-based stress management interventions in the private sector workplace. Studies can include either an in-person/group delivery or individual/via web delivery. Sixteen studies were identified. **Results:** There is high heterogeneity across the studies in demographics, design, population samples, and program length. Except for one study, all programs showed medium to high significance effect sizes on the primary measure of reduced perception of stress. A select number of studies showed greater increases at six months+ follow-up data collection points. There was no consistent data regarding whether online or in-person delivery was more effective. **Conclusions:** Stress management interventions can be a useful tool to provide employees with the cognitive skills required to combat and prevent stress. The choice of the correct tool for the organization's specific needs may be of significance for efficacy. Thorough consideration of implementation and evaluation of the program is advised for maximum efficacy. With consistent usage of the skills learned, employees may see not only an increase in their stress management skills over time but also an increase in their sense of self-efficacy. Increased self-efficacy may lead to positive improvements in other areas of their life beyond the professional sphere.

Keywords

Stress Management Interventions, Cognitive-Based SMI, Stress Management in the Workplace, Stress Management Interventions for the Workplace

1. Introduction

In recent years, the role of stress in human well-being has grown increasingly discussed. While there is no single agreed definition of stress, one of the most widely accepted and earliest definitions comes from Hans Selye, a noted endocrinologist frequently cited as the “father of stress”. Selye defined stress as the “response of the body to any demand, whether it is caused by, or results in, pleasant or unpleasant conditions” (Selye, 1976: p. 74). Selye suggested that stress is a physiological response process that is, first and foremost, a defense mechanism intended to protect the body (Stangor & Walinga, 2015) in response to a threatening stimulus. The stress response involves multiple systems in the body, including the nervous system, the endocrine system, and the immune system (Seaward, 2015).

Selye also noted that the body’s stress response, known as the fight or flight system, is an inherited evolutionary reaction that was intended for brief and infrequent use in the face of a threatening situation (Selye, 1946). His research stated that extended activation of the stress response could result in disease or even death (Stangor & Walinga, 2015). Indeed, due to the overlapping systemic response, stress involves almost every function in the body, causing a range of seemingly unrelated symptoms of illness. Present-day statistics suggest that up to 80% of all doctor visits are stress-related (Nerurkar, Bitton, Davis, Phillips, & Yeh, 2013). There is also neuroscientific evidence that chronic daily stress can have a damaging impact on both the structure and the connectivity of the brain (Blix, Perski, Berglund, & Savic, 2013).

In 1966, Dr. Richard Lazarus (Lazarus, 1966) offered an evolution of the definition of stress, suggesting that there is an important cognitive element to consider. His work centered around the point that the individual makes a cognitive appraisal that their abilities to respond are insufficient to match the stressor they are confronted with. Lazarus hypothesized that stress was, therefore, a dynamic response that depended on the individual and their perception of their abilities in a particular situation. His research found that if the individual believes they can deal with the stressor, the threat becomes less catastrophic (Lazarus & Folkman, 1984). This suggests that it can be important to any individual to not only understand how the stress response works but also possess pertinent skills that can be used to diffuse the perception of the threat. This is also seen in the work of Albert Bandura and his Theory of Self-Efficacy. Bandura (1978) posits that the more one is confident in their abilities to respond to the challenges in a situation, the less threatening that situation feels, and the less the individual perceives the situation as stressful. His work, like Lazarus, underlines the pivotal role that cognition plays in the management of stress.

Workplace stress is a problem that is growing increasingly costly for both the employer and employee. Employers lose money through absenteeism, presenteeism, decreased productivity, and higher turnover rates (Wick & Zanni, 2002; Rothbard & Wilk, 2011; Kigozi, Jowett, Lewis, Barton, & Coast, 2017). Present-

teeism alone currently costs the global economy over one trillion dollars in losses every year (Kigozi et al., 2017). Meanwhile, employees suffer from elevated medical costs and a potential decrease in income due to taking more time off. Beyond the financial implications, elevated workplace stress may be associated with an increased incidence of coronary heart disease and mental health issues and a decrease in subjective physical health (Faragher, Cass, & Cooper, 2013; Dragano et al., 2008; Sara et al., 2018). Given these financial and societal costs, it is important to identify interventions that can reduce workplace-related stress.

Extensive research has shown the direct impact that stress has on an employee's ability to perform their job (Shansky & Lipps, 2013). When the brain is under stress, the pre-frontal cortex, frequently referred to as the "thinking" brain, is temporarily weakened, as energy is diverted to the back brain systems, including the amygdala and limbic system (Arnsten, 2009). This negatively impacts the employee's ability to down-regulate their mood, apply lateral thinking, and apply creative thinking (Golkar et al., 2014). Thinking tends to be more reactionary under stress, as the amygdala's tendency is toward hyper-vigilance rather than careful consideration (Kaiser, Andrews-Hanna, Wager, & Pizzagalli, 2015). Studies further show that employees' problem-solving skills are impaired (Creswell, Dutcher, Klein, Harris, & Levine, 2013) and can cause increased errors in their work (Wick & Zanni, 2002). This suggests that stress-induced thinking can severely impact the quality of an employee's work.

Stress can cause an employee to experience negative thoughts, which can cause employees to consequently suffer negative moods at work. Negative moods can impact their interpersonal skills (Stewart & Barling, 1996), their feelings of benevolence towards their employer, and their motivation to perform their jobs (Ilies & Judge, 2004). Additionally, there is extensive evidence that moods can spread virally through an organization through the process of emotional contagion (Barsade, 2002) and behavioral mimicry. Emotional contagion can cause a shift in group dynamics and severely impact morale (Barsade, 2002), leading to potential loss at an organization-wide scale.

On average, an individual spends approximately 50% of their waking day working. Work and workplace issues are consistently listed as one of the primary causes of stress (American Psychological Association, 2019), and recent estimates state that nearly 75% of all employees currently describe themselves as stressed (American Institute of Stress, 2021). Studies have also shown that continued exposure to daily occupational stress can lead to burnout (e.g., Ozkan & Ozdevecioglu, 2013). Recent estimates suggest that 40% of employees are currently demonstrating symptoms of burnout (Wigert & Agrawal, 2018). Data states that there may be populations of workers that are more at risk of suffering burnout. Common industries cited are healthcare workers and caregivers (Angermeyer, Bull, Bernert, Dietrich, & Kopf, 2006), individuals in the service industries (Babakus, Yavas, & Ashill, 2010), and employees classified as "know-

ledge workers” (Guan, 2021). These are individuals whose professional outcomes are intangible, such as communication, problem-solving, and strategy.

As a result of the growing awareness of the potential systematic consequences that workplace stress can have on the employee and the organization, there has been an increase in both attention and demand for stress-related interventions (Brown, 2017). In keeping with epidemiological theories, there are three forms of interventions to combat stress that can be observed today: primary, secondary, and tertiary.

Primary interventions are put into place by the organization to remove events and situations which may be inducing employee stress. This is viewed as a proactive approach and is viewed as the most efficient way to target workplace stress (Landy & Conte, 2016). Such an intervention could include adjusting workloads and increasing communication and skill development. Secondary interventions are intended to be responsive and help the employee manage their reaction to a stressor. This is the most widely used intervention type in the workplace (Lamontagne et al., 2007) and has a very broad scope of content. Some secondary interventions focus on stress-related behavior modification, including smoking cessation, physical fitness, and food-related habit changes (Landy & Conte, 2016), while others involve direct stress management such as meditation, mindfulness, relaxation training, or cognitive behavioral therapy-based (CBT) skills. Finally, tertiary interventions are reactive and symptom-directed. The aim is to treat issues that have advanced and are visible to both the employee and the organization, at which point the objective is to minimize the negative consequences of the employees’ stress (Lamontagne et al., 2007). Some examples of tertiary interventions are employee-assisted programs, rehabilitation programs that can assist in return-to-work situations, as well as access to medical and psychological care (Landy & Conte, 2016).

While all three forms of SMI have merit, secondary interventions may be the most practical. The founding principle for secondary interventions is that it is not possible to eliminate all sources of stress, and therefore, it is necessary to empower the employee to effectively manage their response at the moment (Landy & Conte, 2016). While the workplace may frequently be the center of an individual’s stress, it is often not the only source of stress. Personal, familial, and financial issues are also common sources of stress (American Psychological Association, 2019). As such, companies who have developed primary interventions and work to maintain a peaceful workplace cannot be guaranteed they will prevent a “spillover effect”, where the workplace becomes contaminated by personal stress (Grzywacz, Almeida, & McDonald, 2002).

To date, three seminal systematic reviews have been performed examining the efficacy of SMIs (Lamontagne et al. 2007; Richardson & Rothstein, 2008; Heber et al., 2017). While criteria for each review are radically different, these reviews may offer a comprehensive review, over time, of workplace SMI efficacy. All were in agreement on the highly heterogeneous nature of this category, yet all

three reported positive effects of workplace interventions. Lamontagne et al. (2007) found that 85% of studies examining secondary interventions showed improvement in individual outcome measures. Heber et al. (2017) found a Cohen $d = 0.43$, considered within the parameters of significant effect size, across all studies for the primary outcome of improvement on stress variables. Richardson and Rothstein (2008) found that across all studies, there was an average effect size of $d = 0.526$. Examination of the outcomes based on intervention type found that cognitive-behavioral interventions demonstrated the largest effect size ($d = 1.16$).

All of the reviews above show an overall benefit of performing SMIs in the workplace. However, the definition of the workplace may be too broad for ideal interpretation. Healthcare workers, teachers, nurses, or manufacturing employees are exposed to physical stressors and emotional stressors, along with cognitive stressors. Whereas those in the private corporate sector, working “office jobs”, will typically only encounter cognitive stressors. As such, this review will only include jobs in private sector workplaces. As these may be considered more solely cognitive driven professions. Given the evidence that cognitive interventions show the highest effect size (Richardson & Rothstein, 2008), it is the choice of this author to concentrate on these particular inventions, making this paper the first to examine these forms of stress interventions exclusively in the private sector.

The study proposes to examine if cognitive-based SMIs can have a positive impact on private sector workplaces. Specific questions to be posed and examined are as follows:

- 1) What is the current product offering of SMIs in the private sector? Is there a standard approach?
- 2) Do the programs work and if so, how is that measured?
- 3) Are there specific methodologies or approaches that perform better than others?
- 4) What considerations might an organization want to make when implementing these programs?

Using standard research practice (Paré & Kitsiou, 2017) of search, screening, assessment, extraction, and analysis, we aim to investigate if the current literature supports the use of secondary SMIs in the private sector workplace.

2. Methods

Initially, only systematic reviews and meta-analyses were selected using searches in PubMed and Medline. This manual search was conducted on Google Scholar using the following search terms; “stress management” AND “intervention” OR “program” AND “work*” as well as “emotional regulation” OR “emotional intelligence” OR “emotional resilience” OR “stress resilience” OR “resilience” OR “stress regulation” OR “psychological resilience” AND “workplace” AND intervention or coping or skill or training. The term resilience can be defined as the

ability to successfully adjust one's emotional reactions and responses when faced with challenges (Chmitorz et al., 2018). This is considered synonymous with stress management and is why it was included in the search criteria. Determining whether the paper focused on the private sector was performed manually on the studies identified.

Inclusion and Exclusion Criteria

For inclusion, articles were required to be experimental in nature and investigating the efficacy of a stress-management intervention. The intervention must have been cognitive in its approach. Studies that examine cognitive approaches, whether specifically entitled Cognitive Behavioral Therapy or similar, were included. Given the focused range of the topic, all studies were included regardless of participation size. Participants, however, were required to be employed in the private sector and free of pre-existing pathologies. The inclusion criteria limited studies to 2000-2020. Articles that were mindfulness, meditation, relaxation-based, or using other non-cognitive approaches were excluded.

Systematic reviews and meta-analyses in the area were cross-referenced with the selected papers to establish any potentially missing studies of note. However, due to the highly heterogeneous nature of this category and the language used to describe and define it, it was ultimately necessary to perform extensive manual checks in each paper for other cited papers. This led to a total of 16 relevant papers.

3. Results

3.1. Study and Participant Demographics

Of the 16 papers included in this review, five came from Australia, four from the USA, three from Germany, and two each from Japan and the United Kingdom. Participant numbers ranged from 18 (Burton, Pakenham, & Brown, 2010) to 431 (Hodges, 2010), with the average number of participants being 178. Only 12 studies reported information regarding participant ages.

Participant demographics varied widely from one study to another. In some cases, the studies were explicitly designed to be only for men (e.g., Li et al., 2017), whereas in other cases, due to convenience sampling, groups had unbalanced compositions, including up to 85% dominance of one gender over the other (e.g., Ebert, Lehr, Heber, Riper, Cuijpers, & Berking, 2016). However, in studies where sampling was recruited entirely within the selected organization, it was suggested that the percentages of male/female participation followed similar patterns of gender division in the workplace itself (e.g., Abbott, Klein, Hamilton, & Rosenthal, 2009). While this may be the case, evidence of single-gender dominance was also apparent in studies with general population sampling (Asplund et al., 2018). It is therefore impossible to exclude gender as a potential mitigating variable in the study outcomes, yet without performing matched demographic studies, no reliable conclusions regarding gender and study outcomes

can be made.

Across those studies, the average participant age was 40, S.D. 4.22. Waite and Richardson (2004) did not provide detailed age information; however, their demographic breakdown showed that 68% of their participants were between the ages of 18 and 30, which is significantly lower than the average of other studies.

Finally, only studies conducted in the USA attempted to provide ethnicity data, separating Caucasians from other races. In these studies, the majority of participants (e.g., Waite & Richardson, 2004) identified as Caucasians. One study noted a high level of participants identifying as Asian (Billings et al., 2008) but also specified that the percentage over-indexed when compared to general population statistics.

3.2. Study Design

In 13 out of 16 studies, the primary objective was to evaluate the efficacy of a specific SMI program in its ability to reduce levels of perceived stress or increase stress-related coping behaviors. Exceptions to this include Hasson, Brown, and Hasson (2010), who examined an additional data point of what demographic characteristics were correlated with more frequent usage of an SMI. Domes, Stachele, von Dawans, and Heinrichs (2019) compared the effect that completing two different types of SMI, one cognitive and the other muscle relaxation-based, could have on cortisol levels. Participants who completed the SMI program were then subjected to a Trier Social Stress Test for Groups (TSST-G) and cortisol levels were measured after. Finally, one study (Li et al., 2017) used mixed modeling to examine the long-term efficacy of SMI by comparing current data with that of a prior experimental study as the control. Milllear, Liossis, Shochet, Biggs, and Donald (2008) and Liossis, Shochet, Milllear, and Biggs (2009), validated the same SMI program in two different lengths. All other studies tested distinct and differing SMIs, further confirmation of the heterogeneous nature of the category. It is also frequently observed (e.g., Hasson et al., 2010) that the SMI program under evaluation in the study was written by one of the authors of the study itself. In one instance (Rogerson, Meir, Crowley-Mchattan, McEwen, & Pastoors, 2016), the survey used to measure the efficacy of the SMI was developed by the study author.

There was a broad range of SMI program durations. In papers where program length was reported ($k = 12$), durations ranged from 110 minutes total intervention time to 2100 minutes total intervention time. The average intervention time was 720 minutes, with programs ranging from two days to 13 weeks.

All studies used an experimental design. Many studies applied a randomized control design using a waitlist as a control (e.g., Eisen et al., 2008), whereas others compared an SMI against another typology of intervention (e.g., Domes et al., 2019). All studies used opportunity sampling, some drawing on single work institutions (e.g., Billings, Cook, Hendrickson, & Dove, 2008) and others recruiting through advertisements aimed at a specific working population from

the general public (e.g., Domes et al., 2019). Except for Bond and Bunce (2000) and Rogerson et al. (2016), who both used block-randomization, all studies applied a simple randomization technique.

The majority of studies ($k = 12$) used a pre-post-follow-up study design, with the follow-up timing mode of six months. The range of follow-up periods was from one month (Eisen et al., 2008) to nine years (Li et al., 2017). All studies used self-reporting measures, although there was little to no consistency in measures used across studies. In the 16 papers reviewed, a total of 53 different survey measures were used. There was repeated usage of only ten surveys (Perceived Stress Scale (PSS), Center for Epidemiological Studies Depression Scale (CES-D), Hospital Anxiety and Depression Scale (HADS-A), Insomnia Severity Index (ISI), Utrecht Work Engagement Scale (UWES), Trimbos and Institute of Medical Technology Assessment Cost Questionnaire for Psychiatry (TiC-P), Positive and Negative Affect Schedule (PANAS), Depression Anxiety Stress Scales (DASS), Ryff's Psychological Well-being Scales (RSPWB), Coping Self Efficacy Scale (CSE). Outcome measures included a broad range of items such as depression, job satisfaction, locus of personal control, work-life stress spillover, absenteeism, and quality of life. In several studies, outcome items were chosen to directly match the learning contents of the respective SMI program (e.g., Liossis et al., 2009). In addition to self-reported measures, Domes et al. (2019) also collected physiological data to track cortisol responses after an induced stress test, performed after the SMI.

3.3. Study Outcomes

Except for one (Abbott et al., 2009), all studies reported statistically relevant improvements on the respectively stated primary outcome measures. In the case of Abbott et al. (2009), a high level of attrition was observed, which may have affected the program outcomes. It was observed in the literature (e.g., Eisen et al., 2008), and active participation in the program, combined with repeated practice of the techniques learned, impacted the effect size. In Hodges (2010), programs were administered to managers, with data being collected from both the manager and the associates within the manager's team. Interestingly, improvement in stress-related coping skills and performance was greater for the associates who had not taken the program than the data reported by the managers. This suggests that there may be an element of positive contagion within workgroups.

In the remainder of the studies, where effect sizes are provided (e.g., Ebert et al., 2016), previously declared effect levels for cognitive-based stress management interventions are confirmed (Lamontagne et al., 2007; Richardson & Rothstein, 2008).

Varying effect sizes between one type of program and another is echoed in the findings of Bond and Bunce (2000). It was observed that the Acceptance Commitment Therapy (ACT) group performed better on measures of general health, depression, and propensity to innovate, whereas the group receiving Innovation

Promotion Program (IPP) training only performed better on measures of propensity to innovate. It is also noted in [Bond and Bunce \(2000\)](#) that programs which are less like traditional therapy and more focused on applicable skill learning are more suitable for the workplace.

4. Discussion

This review aims to examine cognitively-based stress management interventions in the private sector workplace. Sixteen studies were identified that matched the inclusion criteria stated above. Four research questions were posed for investigation, as follows:

- 1) What is the current product offering of SMIs in the private sector? Is there a standard approach?
- 2) Do the programs work, and if so, how is that measured?
- 3) Are there specific methodologies or approaches that perform better than others?
- 4) What considerations might an organization want to make when implementing these programs?

Each question is discussed individually here below.

Research Question 1

The SMI category is marked by high heterogeneity. The issue of heterogeneity is at the root of the construct as there is no single agreed definition in the academic community on what defines stress, how it should be managed, and what a stress-management intervention should do. Indeed, this divergence of thought is visible in the wide range of SMI offerings. Even with the exclusion of programs that were not cognitively based, there is a broad range of products available to the workplace, each one designed incorporating techniques from multiple, and differing, psychological constructs. Some programs are designed to increase problem-solving ([Ebert et al., 2016](#)) and cognitive skills, while others suggest that stress management is an increase in specific qualities that together compose a trait, for example, resilience or Psychological Capital ([Hodges, 2010](#)).

Unfortunately, as these programs are frequently commercial for-profit products, and the studies are performed to validate the tools for efficacy, the details of the contents of the program remain confidential. This does not permit external researchers to examine and compare the contents and components of the programs. According to the literature, each program may be a combination of validated cognitive therapies, emotional self-regulation techniques, practical soft skills (e.g., conflict management, communication, and time management), and/or cognitive techniques that have been designed ad hoc, in some cases directly by the study's author.

The SMI programs examined also differ in terms of delivery and length. Organizations have the choice of implementing programs in-person, via the web, or web-based with the option of human interaction. Programs can be available for two-day training or may last for months.

As a potentially positive point, the wide heterogeneity of program offerings means there is a greater opportunity for matching a program that suits the immediate needs of the organization. Organizations differ in culture, people, and life stages. Each organization has a unique set of needs and challenges. It is perhaps then even advisable that there be a broad selection of SMI offerings. Finding a program that reflects the organization's specific needs is included as a "best practice" by Rogerson et al. (2016).

As stress is universal and contagious within an organization (Gump & Kulik, 1997), there is an elevated interest to include as many employees as possible in the programs. In the absence of a "one-size-fits-all" solution, organizations can select programs that are tailored to the differing needs of their people. However, this requires that the organization be aware of its needs first and foremost. It is therefore advisable for any organization to thoroughly research the needed areas of intervention in their organization to select the most appropriate program. It may even be suggested that an organization consider offering multiple SMI programs to broaden the potential impact on their workforce.

A workplace that is interested in incorporating an SMI program in its organization has a wide selection of possibilities to choose from. However, organizations need to be aware that the validation data of the tool in question may not meet the highest levels of research quality. This is not to suggest that the data is not correct and that the programs don't work as evidenced. Without scientific rigor in the execution of the study, replication of the data is impossible. Without the possibility to replicate the findings, the results cannot be considered scientifically reliable. Therefore, an organization should consider performing proprietary research on program efficacy.

Research Question 2

According to the body of literature examined in this paper, there is confirmation in 15 out of 16 studies that the SMI evaluated in the study caused improvement in the primary outcome and selected secondary outcomes. Effect sizes, where specifically noted, were equal to, or above noted effect sizes in previously published systematic reviews (Lamontagne et al., 2007; Richardson & Rothstein, 2008).

It is important to note that, in keeping with the heterogeneity of the category, there was little to no commonality in the choice of measured outcomes, either primary or secondary. Primary outcomes ranged from a reduction in perceived stress to depression levels to "living authentically" (Rogerson et al., 2016: p. 332). Secondary outcomes evaluated included items such as negative work-family spillover (Lioxis et al., 2009), alcohol use (Asplund et al., 2018), and psychological detachment from work (Li et al., 2017). Over the 16 studies, more than 50 surveys were used to measure the differing outcomes. In some cases (Rogerson et al., 2016), surveys were created by the study authors; however, in the majority of studies, previously validated instruments were used.

What is evident across the data presented is that the path to stress reduction,

and improvement of correlated behaviors, is neither immediate nor direct. For example, [Billings et al. \(2008\)](#) were able to demonstrate that an increase in stress reduction skills led to reduced alcohol consumption. [Waite and Richardson \(2004\)](#) found that after the SMI program, some employees had begun smoking cessation and fitness programs of their own accord. [Liopsis et al. \(2009\)](#) found that after the intervention, perception of stress levels had reduced, but at the five-month follow-up, there were improvements in other areas of life, such as job satisfaction, work-life spillover, and communication at home. Qualitative feedback from participants suggested that the skills learned in the program were applicable in multiple areas of life. The increased confidence in their abilities led to a positive increase in their opinions of their workplace ([Millear et al., 2008](#)). This suggests that the skills learned through SMI programs can have an indirect positive effect on other areas of life.

Indeed, it was [Bandura \(1978\)](#) who suggested that it is one's self-estimation of their ability to respond to life that determines behavioral responses. As [Lazarus & Folkman \(1984\)](#) posited that there is a cognitive component to stress, it is possible that through the increase of necessary skills to effectively manage daily stressors the individual's sense of confidence in their self-efficacy increases. This then reduces the perceived level of threat that the individual feels. Stress training then would be useful in increasing cognitive skills to increase self-efficacy, which may then have an indirect effect on a series of secondary behaviors, such as drinking, or life skills, such as communication at home. This point is also confirmed in [Millear et al. \(2008\)](#), who noted that "...addressing cognitions jointly affect both efforts and outcomes. Increasing feelings and experiences of competence are concurrent with reduced depression and stress without changes in workload or family responsibilities" (p. 18).

The possibility that stress management training functions as a catalyst to improve well-being in other seemingly unrelated areas of life is important for the organization to consider when an organization seeks to determine the return on investment (ROI) of the program. As evidenced by multiple studies (e.g., [Richardson & Rothstein, 2008](#)), direct improvements on job performance or productivity are rarely seen and difficult to quantify, particularly when data is gathered only pre and immediately post-intervention. The data suggests that the process of improvement on work-related items is achieved through self-efficacy ([Liopsis et al., 2009](#)), yet only a handful of studies measured self-efficacy ([Billings et al., 2008](#); [Ebert et al., 2016](#); [Liopsis et al., 2009](#); [Millear et al., 2008](#)). In all four studies, self-efficacy scores greatly improved post-intervention. This item may be worthwhile to track over time. For some outcomes there was improvement seen when follow-up was performed after several months had passed ([Ebert et al., 2016](#)). It would be advisable for anyone wanting to evaluate the efficacy of an SMI program to gather data after at least six months to allow the skills to be integrated.

In line with this, SMIs major effect on productivity and job satisfaction may

not be solely a result of the program itself; instead, it results as part of a “domino effect” which occurs through the increased self-efficacy of the workers (Milliar et al., 2008). This supports the notion of delaying the assessment of an intervention’s effectiveness until months after the program. While Rogerson et al. (2016) suggest that organizations measure the specific skills being taught, just doing so may hide the true benefits of the program. The higher-order benefits of “life satisfaction”, “quality of life”, and “overall well-being” may be outcomes that take extended periods to see improvement. However, once these improvements take effect productivity often increases and one can see a cyclical relationship between effort, outcome, and consolidation. Employees start to put their newly acquired skills to work, and then see visible improvements in their output, and as such are motivated to apply increased effort (Lioassis et al., 2009). This suggests that the skills learned through SMI programs can have an indirect positive effect on other areas of life. A model of how this process may work is seen in Figure 1.

Hodges (2010) discovered that there may be benefits of SMI programs for employees who did not take the course but instead showed improvements in outcome measures as a result of emotional contagion. SMIs may have a much greater positive impact than has been accurately measured to date. Evaluating secondary coping behaviors, levels of self-efficacy, and improvements throughout the organization, and not only on the directly interested individuals, may provide a better picture. This also suggests to thoroughly and accurately measure the impact an SMI can have, it is important to consider multiple psychological constructs that may not be immediately obvious to persons within the organization, who are not versed in the subject.

Another point worth consideration is the fact that the most common method of gathering data is through self-reported surveys, which can create the potential for response bias. The fact that self-reported data may not be reliable emerges in

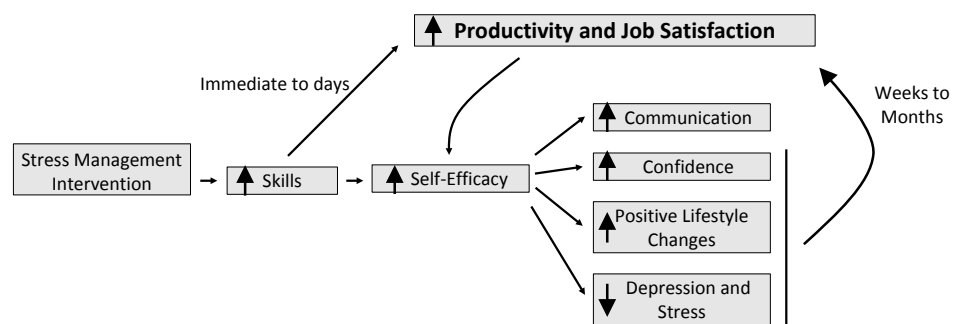


Figure 1. Indirect effect of stress management interventions on productivity and job satisfaction. The studies evidence that through the acquisition of critical emotion regulation skills and practical soft skills for the workplace, employees may demonstrate an immediate increase in productivity. It is further observed that there is an increase in self-efficacy which leads to a reduction in depression & stress as well as additional participation in secondary wellness behaviors. This subsequently leads to an increase in productivity and job satisfaction, suggesting that SMI’s can raise workplace productivity through self-efficacy generated from skill expansion.

Domes et al. (2019). Their data showed that in the group that took the Muscle Relaxation course, the self-declared stress reduction was significantly lower than the control group. However, when cortisol levels were measured in response to a TSST-G, this group showed higher levels of stress response compared to both the SMI group and the control. This suggests that self-reported data may not be entirely reliable.

Research Question 3

Within the larger category of stress management inventions, there is significant data that suggests that cognitively-based interventions perform better than others. In the body of literature examined in this paper, this point is confirmed in Domes et al. (2019) and Bond and Bunce (2000); however, these were the only two studies to compare cognitive-based SMIs to another form of intervention. Unfortunately, the specific components of the programs were not included in the study information, so it was impossible to compare what aspect of one program worked in comparison with another. What is repeated throughout the literature, however, is the confirmation of the fact that programs which teach applicable skills show significant improvement in both perceptions of stress items and more general quality of life items. Qualitative data from employee participants in one program (Milllear et al., 2008) stated that witnessing their abilities increase provided them the necessary encouragement to use their newly acquired skills more frequently.

There are some important points to consider, however, including usability, participation, integration, and practice. If the SMI programs aren't designed to maximize engagement—from the length of intervention to content to long-term follow-up—then the program may witness high levels of attrition. In short, a stress-management intervention can only help people perform better if they use it. In-person groups demonstrate larger effect sizes and are frequently considered the gold standard in SMIs, but groups must maintain small participant numbers to be effective on an individual level. This can also make the program expensive for an organization, particularly as it impacts a handful of people. Web-based programs may be at an early stage in their evolution, and with many areas of investigation and improvement still to come, however, they are easy to implement and can reach a wider audience.

In addition to the reach of the program, the data is also inconclusive as to which of the two formats is more efficient. There is data suggesting that in-person interventions perform better than those delivered via the web. Other data suggests that web delivery can arrive at the same effect levels as in person. Accountability may be a determining variable in participation. It is widely documented in science that productivity increases when an individual is observed (Hansson & Wigblad, 2006). The study that demonstrated the highest attrition rates was a web-delivery group (Eisen et al., 2008). The conclusion was that the lack of deadlines and no accountability to an outside observer led to participants' procrastination in starting the program. After a time, participants seemed to simply

forget that the program was available and did not participate. This would not be possible in an in-person setting where absence is noted and reported. As a possible compromise, one web-based study (Ebert et al., 2016), gave users the option to enable reminders and notifications to bring them back to the program using the model of supportive accountability (Mohr, Cuijpers, & Lehman, 2011). The majority of users enabled this service, and this study reported below-average attrition rates. Therefore some form of accountability is suggested to keep participation motivation.

One of the variables that impact usage is the length of the program. Shorter programs may be attractive to an organization and the employee, but it is important to remember Ebbinghaus' Forgetting Curve (Seel, 2012), which states that without reinforcement, 76% of information can be lost within seven days. On the other hand, very long programs, such as the PAR program examined in Milliar et al. (2008), which can take months, are less appreciated by participants. Based on the qualitative feedback provided in the studies, participants enjoyed programs that were shorter in length yet provided the opportunity for weekly interaction. From the studies that provided attrition data, the programs that had the lowest attrition rates both lasted between six and seven weeks (Domes et al., 2019; Umanodan et al., 2014).

Commitment and repetition are two other important variables. Where participants demonstrated increased practice of the learned skills, there was both greater appreciation for the program and increased improvements in relative outcome items (Eisen et al., 2008; Hasson et al., 2010). It was further seen in Liossis et al. (2009) that when employees were consistent about practicing their skills and were able to see improvement in their abilities, this created the motivation to continue to use the techniques. To ensure that this happens, it is advised that the programs include booster sessions or reminder material after the SMI program has ended (Waite & Richardson, 2004).

Research Question 4

Based on the information presented in the reviewed studies, the choice of the program is a primary consideration. Rogerson et al. (2016) suggest that the contents of the SMI program should be as closely related to the situations and challenges facing the organization at that moment. Bond and Bunce (2000) also noted that when the content of the program is too general and not immediately applicable in the employee's life there is no internalization of the information and therefore no integration into the employee's daily routine. Eisen et al. (2008) also suggest that employees may have different learning styles making them more comfortable with one delivery method over the other. Some employees may perform better with in-person groups, while others feel more suited to web-based programs. This suggests that for the program to be as beneficial as possible to as many employees as possible, the program requires a methodological and holistic selection process. There should be clear knowledge of the needs of the organization and the needs of the employees. The more attractive and

useful the program is deemed by the employees, the greater the chances of widespread participation.

It is also suggested in the literature that the psycho-social environment of the organization may be an important factor in employee participation. Resistance, or disdain towards the program, from supervisors or superiors, can hinder an employees' willingness to participate (Liossis et al., 2009). Conversely, when managers themselves participate in SMI programs improvement is seen throughout the team (Hodges, 2010). Therefore, an organization must be aware of how the program is being presented to employees and take the necessary steps to create an environment encouraging participation.

How the program is communicated to the employees may also be an opportunity to increase participation. When the programs are touted as being support for mental health, employees were less willing to participate (Millier et al., 2008). Peters, Deady, Glozier, Harvey, and Calvo (2018) further discovered that within male-dominated industries, the use of the words "mental health" in stress management apps was highly stigmatizing and an obstacle to use. The stigma around the term "mental health" is widely recognized throughout academic literature (Brohan & Thornicroft, 2010) and should be taken into consideration. It has been suggested that more generic language, underlining the practical nature of the skills being taught, may be a better focus of communication to ensure increased usage (Peters et al., 2018).

While it is naturally in the best interest that as many employees engage in SMI programs as is feasibly possible, the organization should be mindful of ethical considerations. Some companies adopt methods of incentivizing use and punishing employee's lack of use in an attempt to ensure that the investment of resources is not wasted (Mattke et al., 2013). Incentives can be participation-based, progress-based, or result-based and may lead to recognitions or even rewards within the company. Punishments can even include loss of pay for non-participation (Mitchell et al., 2016). While these may be efficient in motivating employees to participate, these actions come very close to coercion and may make situations of stress in the organization even worse (Cavico & Mujtaba, 2013). Additionally, the use of incentives has implications on the employee's privacy regarding the program usage. The majority of employees do not enjoy discussing or disclosing their mental health status to the employer and this can develop into an additional source of stress.

5. Conclusion and Recommendations

Implementing a cognitive-based stress management program can be considered a positive and potentially ethically responsible choice on behalf of the organization. However, the field of stress management interventions is still in its early stages, particularly considering the new addition of programs available through the web. Research done to date demonstrates weak internal validity, with many programs being tested only once and by the authors of the programs. For the

category to demonstrate robust and reliable data, there is an important need for standardization of evaluation methods and practices on behalf of the academic community.

The current body of research, however, does offer promising evidence that an organization can gain value by implementing a stress-management intervention. The data collected demonstrates that SMI programs show positive improvements in employees through the acquisition of key cognitive-related skills. Regular use of these skills, in turn, increases the employee's sense of self-efficacy which may have a positive halo effect on other areas of the employee's life. Improvement in all spheres of the employees' lives contributes to increased well-being which inevitably affects the employees' motivation and satisfaction at work. Considering the current body of literature, the following recommendations are suggested:

- 1) Programs should focus on practicable skills that help employees combat stress through relevant cognitive techniques. Generalized programs without specific skills that can be put into use in daily life may have limited impact. Organizations should be aware of the needs of both employees and the organization itself. Programs should be chosen based on their ability to best respond to these needs. The more employees have the opportunity to successfully apply their skills in real-life situations, the more they are encouraged and inclined to further develop these skills. It may be worth considering more than one form of stress management intervention to encourage as broad a participation as possible.

- 2) The organization should further consider macro-level factors, such as product design, skills taught, length of the program, and follow-up material, as they may affect performance and participation. The organization should also carefully consider how the program is communicated to employees. An implementation strategy should be thought through to create an environment that encourages employees to participate. The role of the manager may be decisive in the success of the program. Where managers are reticent, employees are less willing to participate. Conversely, in organizations where managers learn stress management skills, significant improvements are seen throughout the entire team.

- 3) The organization should carefully consider how it chooses to evaluate the program's effectiveness. The desired positive results may not be evident in the measures chosen but may be more apparent in secondary behaviors as a byproduct of increased self-efficacy. Surveys used to evaluate efficiency should reflect the skills being taught. General questionnaires on quality of life and overall well-being may be too macro of concepts to witness significant improvements. Measurements should be taken periodically after six months of the program's conclusion, as evidence suggests skills take time to build. Finally, measures should be tracked longitudinally to observe when effects begin to fade. It is further advised that each program have some form of booster or reinforcement data to help keep the learning top of mind for employees.

In conclusion, the data suggest that stress management interventions offer

encouraging potential to help improve employee well-being and organizational performance.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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