

Unpacking Burnout Intervention Effects: Why Does it Work and Who  
Benefits?

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**Abstract**

The primary purpose of this study was to examine the moderating role of empathy styles and the mediating role of self-care activities, recovery experience, and Acceptance and Commitment Therapy (ACT) process behaviors in effectiveness of a successful burnout intervention trial, namely, Burnout Recovery. The current study conducted a secondary data analysis on a pooled population from the original Burnout Recovery trial and a replication study. Participants were 93 home care nursing leaders across Nova Scotia and Ontario provinces, from which 69 people were assigned to intervention group and 24 people were assigned to control group (partially at random). Data were collected via Maslach Burnout Inventory, Interpersonal Reactivity Index, Health-Promoting Lifestyle Profile II, Recovery Experience, and ACT process questionnaire. Results showed intervention effectively combated increasing burnout over time. However, empathy styles did not show significant effects on intervention effectiveness. As to the underlying process, behavioral awareness as one of the ACT process subconstructs was the only mediator that showed significant sequential explanation of the Burnout Recovery effect such that in time of increased burnout (i.e., emotional exhaustion), people in intervention group could combat reaching higher burnout over time by engaging in behavioral awareness. These results contribute to understanding the burnout alleviation process in the Burnout Recovery and lead to the program improvement in terms of reinforcing components, activities, and measurements for future implementations, which will make it more promising in improving healthcare leaders' well-being and the whole workplace's healthy engagement with the work, ultimately, benefit healthcare systems as well as patients' quality of care.

*Keywords:* Burnout, intervention, mediator, moderator

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### **Unpacking Burnout Intervention Effects: Why Does it Work and Who Benefits?**

Burnout is a global "work-related mental-health impairment" (Awa et al., 2010, p. 184) with a high prevalence rate in healthcare workers, especially among nurses (Lasebikan & Oyetunde, 2012). Burnout refers to the resulting state of long-term continuing stress (Maslach, 2003) and is associated with numerous negative outcomes for health care workers themselves (De Beer et al., 2016; Salvagioni et al., 2017), patients (Poghosyan et al., 2010; Vahey et al., 2004), and organizations (Jun et al., 2021; Swider et al., 2010). The emergence of COVID-19 in 2019 even exacerbated the pressure and work stress that healthcare workers had been experiencing and led them to a greater risk of reaching burnout. Due to this pandemic, the health care providers have experienced several physical and mental health problems such as distress, anxiety, depressive symptoms, and insomnia (Spoorthy et al., 2020; Shaukat et al., 2020) which may worsen the adverse consequences at all levels of individual, organization, and patient care.

As a result, the implementation of burnout interventions in healthcare workers has gained a great deal of attention. Meanwhile, existing studies have demonstrated inconsistency in effectiveness of intervention programs ranging from being effective to not effective and even having backfiring effects (Ahola et al., 2017; Awa et al., 2010). This inconsistency may result from different individual and situational factors that may affect the effectiveness of intervention programs (Wiederhold et al., 2018) and, more importantly, the theoretical basis and mechanism through which an intervention leads to change in the outcome behaviors (Awa et al., 2010).

Despite considerable attention to the burnout prevention interventions, there is relatively little knowledge about why an intervention works and for whom and under which conditions the effects of interventions will be increased. Meanwhile, research shows that although nursing leaders do not directly interact with daily patient care activities, the pervasive challenges and work

stressors resultant of different sources such as staff and peers, expose them to a high risk of impending burnout (Kelly et al., 2019). However, despite the critical role of leaders in team effectiveness, few research studies have targeted nursing leaders (e.g., Kelly et al., 2019).

Therefore, this study aims to examine the moderating role of empathy styles and the mediating role of self-care, recovery experience, and Acceptance and Commitment Therapy (ACT) process in a recent successful theory-based burnout intervention (Burnout Recovery program; Gilin et al., 2021) in nursing leaders' population.

## **Literature Review**

### **Burnout**

#### *Concept*

Burnout is a worldwide phenomenon that appears to be pervasive among the working population (Ahola et al., 2005; Hallsten et al., 2005; Norlund et al., 2015). It is a consequence of “a prolonged response to chronic emotional and interpersonal stressors on the job” (Maslach et al., 2001, p.397) and comprises three domains. Emotional exhaustion is the core dimension of burnout (Taris et al. 2005) and refers to feelings of depletion in emotional and physical resources and is shown as being fatigued, having no energy to complete tasks, and not being able to renew energy. Cynicism or depersonalization refers to feelings of detachment from various aspects of one's job, including people at work. Finally, a diminished sense of professional efficacy refers to having a sense of incompetency when doing tasks which results in a reduction in productivity and accomplishment at work (Maslach & Jackson, 1981). Burnout arises when people experience failure in meeting job demands for a long period (Maslach et al., 1996) and may result from one of several factors, including excessive workload, lack of control over one's job (i.e., micromanagement, lack of influence, accountability without power), not receiving enough rewards



(i.e., insufficient compensation, acknowledgment and being appreciated, or satisfaction with the job and its impact), an unsupportive social environment (i.e., poor communication, conflict, and lack of human connection and empathy among coworkers), the existence of discrimination at work, and misfit of values (e.g., ethical conflicts, meaningless tasks) between the organization and the employee (Leiter & Maslach, 2005).

### ***Consequences***

Research shows that burnout results in adverse physical and psychological outcomes (Salvagioni et al., 2017) that not only affect individuals' well-being but also cost organizations and societies through its manifestation in one's professional life (Ahola et al., 2008; Nayeri et al., 2009; Yoon & Kim, 2010; Jun et al., 2021; Stalker & Harvey, 2002). At the individual level, burnout is highly correlated with anxiety and depression symptoms (Koutsimani et al., 2019; Morse et al., 2012; Ahola et al., 2005), sleep impairment (Vela-Bueno et al., 2008; Ekstedt et al., 2006; Melamed et al., 1999; Pagnin et al., 2014; Grossi et al., 2003, 2005), and physiological responses such as high heart rate and blood pressure (Benschop et al., 1994; De Vente et al., 2003; Evans & Steptoe, 2001; Goldstein et al., 1999). It is also considered a risk factor for many physical illnesses such as type 2 diabetes (Melamed et al., 2006), coronary heart disease (Toker et al., 2012), musculoskeletal pain (Aghilinejad et al., 2014), prolonged fatigue (Leone et al., 2009), and gastrointestinal and respiratory problems (Kim & Kao, 2011). Beyond the individual suffering and distress (Freudenberger, 1975), burnout is also linked to a variety of negative job outcomes such as higher absenteeism and job turnover (Swider et al., 2010), early retirement (Dewa et al., 2014; Shanafelt et al., 2016), and lower morale as well as reduced efficiency and performance at work (Taris, 2006). Studies also stated that one's current burnout can predict getting burnout in the future (Robins et al., 2018, Dahlin et al., 2010). Based on the Conservation of Resources (COR)

theory, human resource depletion at earlier stage leads them to further loss which will result in future burnout (Westman et al., 2005). In this way, widespread burnout impedes the successful functioning and well-being of organizations and the workforce.

### ***Burnout in Healthcare Workers***

Although burnout can occur regardless of the type of profession (Maslach et al., 2001), it is known as one of the most common work-related mental issues in the health care professions, with a higher rate than reported burnout is in general work populations. National surveys conducted by Shanafelt and colleagues (2015, 2019) reflected this fact by evaluating the prevalence of burnout among physicians compared to the general population in the U.S. at three time points over six years (i.e., the years 2011, 2014, and 2017). Results showed that physician burnout is substantially higher than general population burnout (17%, 25.8%, and 15.8% higher in three years points, respectively). More importantly, there has been a significant increase in burnout symptoms among physicians from the year 2011 (45.5%) to 2014 (54.4%), while general population burnout remained unchanged (about 28.5% in both years). In addition, even though an almost similar number of physicians reported burnout symptoms in 2011 and 2017, they declared higher levels of depression and less satisfaction with their work-life balance over time. Numerous research studies have revealed an estimated burnout rate among physicians in different countries. For instance, a 22% of physicians in the USA, 27% of physicians in Great Britain (Linzer et al., 2001), 56% of physicians in Israel (Kushnir et al., 2014), 43% of physicians in pan-European (in terms of emotional exhaustion; Soler et al., 2008), and between 22% and 32% of physicians in Italy (Grassi & Magnani, 2000), are estimated to suffer from burnout<sup>1</sup>.

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<sup>1</sup> All mentioned studies used MBI to measure Burnout.

Although physicians have been a center of attention in burnout research, many research studies also show the high rate of burnout symptoms among other healthcare workers such as mental health professionals (Morse et al., 2012), nurses (Woo et al., 2020; Adwan, 2014), social workers and home care nurses (Parola et al., 2017), and also in different organizational settings such as hospitals, long term care facilities, and home care agencies. The risk factors associated with burnout may be similar among all health care workers (Patrick & Lavery, 2007).

This dramatically high prevalence of burnout in healthcare workers is not a surprise due to the nature of their work. Healthcare workers are embedded in the category of helping professions which are inherently based on social relationships between a helper and a help recipient and are considered emotionally draining jobs (Maslach et al., 2001). In addition to have a consistent exposure to emotionally draining stressors in decision making, patient treatment, and patient relationships (Gómez-Urquiza et al., 2017), excessive workload, inefficient work process, poor work-life balance, hostile work environments, and misleading organizational values and culture can lead health care workers to reach burnout (West et al., 2018; Dyrbye & Shanafelt, 2011). The adverse consequences of burnout have gained a great deal of attention in healthcare providers, as burnout can affect staff's health and organizations' productivity in these work sectors. Furthermore, there is a concern in terms of how it might affect the quality of patient care. There has been a large body of research that associated healthcare providers' burnout with negative patient care outcomes such as a higher risk of making errors in care (Shanafelt et al., 2010), reduced quality of care (Poghosyan et al., 2010), lower patient satisfaction (Vahey et al., 2004) and longer recovery times (Halbesleben & Rathert, 2008).

***Healthcare Workers' Burnout and COVID-19***

Within the context of a high rate of burnout among healthcare workers and its critical consequences on staff, patients, and organizations, the COVID-19 pandemic hit in 2019 and generated overwhelming pressure on healthcare providers and health systems. Previous research at the time of the emergence of the severe acute respiratory syndrome (SARS) and pandemic flu (H1N1) shows that there might be consistent patterns of reactions and challenges in healthcare professionals at the time of pandemics (Styra et al., 2008; Koh et al., 2005; Barelo et al., 2020). Growing mortality rates in healthcare staff, which in turn cause workforce shortages on one side and exponentially increasing infected cases on the other side, result in increasing staff workload and the possibility of work-family conflicts. Besides that, due to the workforce shortage and limitation of medical resources caused by the COVID-19 outbreak, healthcare staff frequently faced complex patient-related communication as well as difficult decision-making situations in the process of patients' treatment, some of which were not only against the morals of those making them, but also were not being understood by the public, so that resulted in more psychological pressure on frontline healthcare. An example of difficult decisions was who must receive life-support treatments and who does not. According to Etezzad and colleagues (2021) at the time of COVID-19, healthcare workers showed an elevated level of emotional exhaustion and cynicism, even though they still have a high level of professional efficacy which reflects the nature of their calls in these professions. Indeed, pandemics impose many extra chronic work stressors upon healthcare professionals (Walton et al., 2020) which may elevate their level of burnout and worsen the consequences at all levels of individuals, organizations, and patient care.

Having considered the worldwide prevalence of burnout among healthcare professionals and the vital impacts it has on staff, patient care, and the health system overall, and given the

potential outbreak situations to which they may be exposed during their professional life, it is necessary to implement evidence-based interventions to alleviate burnout symptoms in healthcare providers and help prevent them from reaching a state of escalated burnout. For this purpose, promising theories in burnout literature play a critical role in determining the components of interventions and how their change can affect burnout.

### **Burnout Theoretical Foundation**

Burnout occurs due to unsolved chronic stress that emerges when individual resources such as self-efficacy, self-esteem, and resilience (Hobfoll, 2004) and those resources provided by organizations are inadequate to meet job demands (Leiter & Maslach, 2005). There are two commonly used theories in the burnout literature including the Job Demands Resources Model (JD-R, Demerouti et al., 2001) and the Conservation of Resources Model (COR, Hobfoll, 1989; Hobfoll & Freedy, 1993; Halbesleben et al., 2014). These theories conceptually frame the rationale behind getting burnout and the necessary alleviation process (Rupert et al., 2015). Meanwhile, the Effort-Recovery Model (E-R, Meijman & Mulder, 1998) is another promising theory that elaborates on the primary mechanism of burnout prevention through resources recovery.

#### ***Job Demands Resources Model***

The Job Demands Resources Model (JD-R, Demerouti et al., 2001; Bakker & Demerouti, 2007; Bakker et al., 2003; Bakker et al., 2005) states that all occupations comprise two types of factors that are associated with job stress, named job demands and job resources. Job demands refer to physical, social, and organizational aspects of the job that employees put effort to meet, such as workload, time pressure, and difficult physical environments. This effort requires sufficient psychological and physiological energy, which drains one's energy while increasing the stress of responding to the demands. On the other hand, job resources refer to aspects of the job that are

perceived to be valuable and helpful in achieving one's work goals, leading to personal growth and development while reducing job demands and its costs. Examples of job resources are job control, opportunities for professional development, supervision (Halbesleben et al., 2014), regular positive feedback (Leiter & Maslach, 2005), participation in decision making (Bakker & Demerouti, 2007), and work social support (Schaufeli & Bakker, 2004). Based on this theory, an imbalance between employee's job demands and job resources results in getting to burnout. When in an excessively demanding work environment, the available individual and workplace resources are inadequate to meet the demands, employees face continuing and unremitting stress that gradually leads them to feel used up.

Studies show that the JD-R model is only limited to the role of organizational characteristics in the experience of stress and does not consider the role of individual characteristics such as personal tendencies (Halbesleben et al., 2014; Hobfoll, 2011; Vogt et al., 2016). Thus, the Conservation of Resources (COR) theory in the field of burnout can supplement the JD-R model as it focuses on people's tendencies toward obtaining, recovering, and fostering resources at work.

### ***Conservation of Resources Model***

The Conservation of Resources Model (COR, Hobfoll, 1989; Hobfoll & Freedy, 1993; Halbesleben et al., 2014) defined resources as any objects, states, conditions, and other things that are perceived as valuable by individuals such as health, well-being, peace, family, self-preservation, and positive sense of self (Hobfoll, 1988, 1998). Similar to the JD-R model, this theory suggests that stress happens when resources are insufficient to meet demands because they are lost, threatened, or failed to be developed. Accordingly, a continuing experience of stress results in reaching burnout (Hobfoll & Freedy, 1993). However, this theory goes beyond the

prediction of stress and put efforts to understand the resultant motivation from experiencing stress (Hobfoll, 2001).

The core idea of this theory is that regardless of being or not being in a stressful situation, people are actively motivated to protect their current resources, recover resource losses, and gain new resources. Based on this theory, the negative impact of resource loss is much more profound than the positive impact of gaining new resources. As such, when stress occurs, people are more motivated to engage in behaviors that protect against the loss of their resources and contribute to resources recovery. Meanwhile, the only thing people have in order to protect, recover, and preserve their resources are other resources (e.g., individuals use the money to protect against loss of health). Accordingly, in a high demanding job environment, people with more personal and job resources are more capable of not only preventing resource losses but also gaining new resources. This also makes them able to more easily meet job demands and combat losing resources, accordingly, stopping them from reaching burnout (Hobfoll et al., 1990).

Although COR theory states that resources recovery can buffer against burnout (Halbesleben et al., 2014), it does not elaborate on how this happens. The Effort-Recovery Model (E-R, Meijman & Mulder, 1998) in the field of burnout can fruitfully add further to explain the process of resources recovery at work.

### ***Effort-Recovery Model***

The Effort-Recovery Model (E-R, Meijman & Mulder, 1998) emphasizes the important role of recovery in demanding environments and explains how recovery can stop the process of personal resource loss. Recovery refers to the process during which individual functioning returns to the pre-stressor level (Meijman & Mulder, 1998). It is inevitable to face demands at work. As such, employees drain their resources to meet job demands (Bakker and Demerouti, 2007) while

they do not always have sufficient opportunities to restore resources during worktime (Dembe, 1999). However, based on E-R theory, in an optimal circumstance during after work hours, individuals can restore their resources and return them to pre-stressor level before starting the next working day (Meijman & Mulder, 1998). If recovery does not get completed, employees need to spend extra effort to perform adequately at work which results in experiencing chronic stress at work. If this pattern continues for weeks or months, employee burnout can ultimately result (Geurts & Sonnentag, 2006; Sonnentag & Fritz, 2007). Indeed, recovery experiences play a critical role in linking demand-resource imbalance and wellbeing (Geurts & Sonnentag, 2006).

Overall, these three theories can work as a framework to explain the rationale behind getting to job burnout and, beyond the prediction of risk factors of stress, clarify the main mechanism of prevention and alleviation of burnout through resource recovery.

### **Burnout Interventions**

Over the past years, researchers have implemented a large number of interventions in order to reduce and prevent job burnout in different work sectors, with the greatest focus on healthcare providers (Awa et al., 2010; Le Blanc & Schaufeli, 2008). However, there have been several differences in the theoretical foundation, interventions type, content, design, assessment tool, and delivery approach (Zhang et al., 2020; Ahola et al., 2017).

Westermann and colleagues (2014) have distinguished burnout intervention types based on whether they are designed to educate staff with the required skills to combat work-stressors (i.e., person-directed), make changes in work-related factors (i.e., organization-directed), or considering both personal skills and work factors to improve (i.e., combined).

Person-directed approach is the most common type of intervention (Zhang et al., 2020; Ahola et al., 2017; Westermann et al., 2014; Awa et al., 2010). It usually has been delivered in



some forms of workshop or group sessions, which provide one or more components of emotion regulation, communication skills, personal coping strategies, mindfulness, relaxation techniques, self-compassion, resilience, stress management skills, activities to strengthen social support, self-care practices, and overall work-life balance (see De Simone et al., 2021; Westermann et al., 2014; Ahola et al., 2017; Patel et al., 2019; Johnson et al., 2018; Zhang et al., 2020). Professional coaching (Dyrbye et al., 2019) and individual/group counseling therapy (Rø et al., 2008) are two other delivery approaches in this type of intervention that are deemed effective in burnout reduction either as a sole component or in combination with other strategies. Results reflect that the contents of interventions varied considerably and showed inconsistent effects ranging from effective (Günüşen & Ustün, 2010; Heiden et al., 2007; Stenlund et al., 2009; Saganha et al., 2012; Gorter et al., 2001; de Vente et al., 2008; Blonk et al., 2006; Haberstroh et al., 2010; Mackenzie et al., 2006) to not effective (Meesters & Waslander, 2010; Visser et al., 2008; Jensen et al., 2006) and even having backfiring effect (Margalit et al., 2005). However, among the training contents, psychological training (CBT-based) and psychiatric interventions (e.g., yoga, mindfulness, relaxation, meditation), self-care, and communication skills training are deemed to be effective in many interventions (Aryankhesal et al., 2019; Awa et al., 2010; Busireddy et al., 2017).

Organization-directed interventions typically aim for making change in work environment, work tasks and working methods such as changing in workload or schedule (Marine et al., 2006). Although organization-directed intervention studies have shown both effectiveness and not effectiveness results in burnout reduction (DeChant et al., 2019; Van der Klink et al., 2001), when it comes to lasting effects, this type of intervention tend to have longer-term result than person-directed ones (Awa et al., 2010; Westermann et al., 2014).

Finally, combined interventions employ a combination of components from organizations and person-directed interventions. It typically includes educational interventions including job training and also some contents similar to ones that are provided in person-directed intervention workshops, workload or schedule changes, and teamwork training such as team communication, group support, and quality improvement projects (De Simone et al., 2021; Westermann et al., 2014; Patel et al., 2019; Zhang et al., 2020). Similar to two earlier types of intervention, it also has shown effective and not effective results (Ahola et al., 2017), but overall, the effects usually last longer than person-directed effects (Awa et al., 2010; Westermann et al., 2014).

Overall, research indicates the prevalence of burnout interventions and the variety of strategies and theoretical foundations that have been employed within them. Studies have reflected that all strategies seem to be effective at least to some extent (Schaufeli & Enzmann, 1998; Le Blanc & Schaufeli, 2008); However, it does not mean that intervention effectiveness is always consistent even if a similar targeting has been employed or interventions have been designed based on a same theoretical framework if any was provided at all (Ahola et al., 2017; Westermann et al., 2014). Results also showed that most interventions used the MBI instrument to measure burnout (Westermann et al., 2014; Zhang et al., 2020; Awa et al., 2010). Moreover, different kinds of delivery approaches, such as face-to-face, online programs, and internet-based interventions, have been considered effective for both physicians and nurses (Aryankhesal et al., 2019; Awa et al., 2010).

When it comes to the effectiveness, all three types of intervention may result in burnout reduction, while organization-directed tends to have longer-term results (usually lasting from up to six months to one year after intervention) compared to person-directed ones (usually lasting up to six months after intervention) (Awa et al., 2010; Westermann et al., 2014). Meanwhile, Awa and

colleagues (2010) results show that among the three types of interventions, combined interventions have more promising lasting effects. There are two main differences between person-directed interventions and the two other intervention types which may justify the longer-lasting effects of the two latter ones. The first difference is the varying duration of the intervention programs. Studies show organization-directed and combined intervention programs (2-12 months) were usually longer than person-directed interventions (2 days to 6 months) (Awa et al., 2010; Westermann et al., 2014). The second difference is the targeted burnout risk/protective factors. Person-directed interventions usually aim for reducing burnout by improving burnout psychological risk factors like stress, moods, depression, negative emotions, psychological distress, and emotional job demands. However, changes in these factors usually do not last over six months. In contrast, organizations-directed and combined interventions usually aim to improve burnout protective factors like supervisor, peer and/or co-worker support. The resultant changes in these factors which also result in positive changes in psychological outcomes and burnout, usually lasted up to one year (Awa et al., 2010). However, these two differences are just speculated to explain the lasting effects, and the mechanism of change in outcomes has not been tested in-depth. Thus, it is essential to look closer at the interventions and examine the mechanism through which burnout interventions work.

As to inconsistency in interventions' effectiveness, several explanations have been provided, such as small sample size that does not allow significant testing of results (Davison et al., 2007; Mackenzie & Peragine, 2003; Visser et al., 2008), the existence of several individual (e.g., demographic) and situational (e.g., work condition) factors that may buffer or facilitate the effectiveness (Aryankhesal et al., 2019), the intense and stressful nature of healthcare providers professions which hinder them implementing the entire tools systematically (Busireddy et al.,

2017), and different definitions and assessments of burnout as well as theoretical basis that have been employed when designing the intervention (Ahola et al., 2017).

Meanwhile, there have been relatively few controlled burnout prevention programs, and even fewer have been evaluated (Awa et al., 2010). Thus, this study aims to evaluate a successful theory-based controlled intervention, named Burnout Recovery program (Gilin et al., 2021), to examine the process of changes in outcome and the potential individual factors that may affect the program's effectiveness.

### **Burnout Recovery Program**

#### ***Principal and Procedure***

The Burnout Recovery program (Gilin et al., 2021) is one of the most recent interventions in burnout research, which examined the effects of a combined approach design on the alleviation of burnout among nursing leaders. It was first pilot-tested and evaluated using a longitudinal waitlist-control quasi-experimental design study involving 49 home care nursing leaders across Nova Scotia province who were recruited via local announcements and program flyers through a professional network organization in Canada. They were randomly assigned to two groups of intervention ( $n= 28$ ) and waitlist control ( $n= 21$ ) when operationally feasible (and when not, matching of home care agencies based on size and rural/urban context was used instead). The study was approved by the Research Ethics Board of Saint Mary's University and all individual participants of the study were provided and agreed with the informed consent form.

The study was implemented in 16 weeks with an active six-week intervention period for each intervention and control group, respectively. Active six-week contained weekly group online workshop (1.5 hours/session) and weekly individual expert coaching (20 minutes/ session). Data were collected via Qualtrics and at three comprehensive times, including at the beginning of the

study (*T1*), after the first active six-weeks (*T2*), and at the end of the study (after the second active six-weeks, *T3*) as well as seven weekly times during each of the active weeks of study.

Comprehensive surveys measured outcome variables of interest, including burnout, self-care, recovery experiences, and ACT process at all three times (i.e., *T1*, *T2*, and *T3*). In addition, demographics and dispositional traits such as empathy styles and conflict handling styles were assessed only at *T1* as they are stable and not likely to be changed during the time of intervention. A weekly survey including modified items from each comprehensive measures also was used to assess potential changes in outcome variables in intervention group participants during the past week. As another measurement tool, participants were provided with a Fitbit device to collect burnout-related physiological data (heart rate, steps, and sleep) and were asked to wear it throughout the study.

### ***Content***

As mentioned, workshop and group sessions are common forms of providing educational interventions in applied interventions. However, there have been tremendous differences in the provided contents and structure of the designs in different interventions. These differences mainly are due to the different theoretical frameworks (if any) that researchers employed to design their intervention components (McKinley et al., 2017).

Following the three core theories in the burnout literature, including the JD-R model (Demerouti et al., 2001), COR model (Hobfoll, 1989), and E-R model (Meijman & Mulder, 1998), the Burnout Recovery intervention was also designed based on the critical role of resources recovery to combat resultant work-stressors of interaction between job demands and job resources (Meijman & Mulder, 1998; Demerouti et al., 2001; Halbesleben et al., 2014). Meanwhile, the intervention also relied on COR theory's definition of resources as any things people perceived as

valuable and the human motivation to protect, recover, and promote their resources (Hobfoll, 1988, 1998). Accordingly, the content of the intervention focused on three core components.

**Values Congruence.** The first core theoretical component of the Burnout Recovery intervention was identifying individual core values and team shared values. Acknowledging one's values and the team's shared values leads people to have a larger pool of resources, and the more the one's resources, the easier they can meet job demands, which can result in reduced burnout (Hobfoll et al., 1990). This component is provided using an Acceptance and Commitment Therapy (ACT, Hayes et al., 2011) protocol named the ACT matrix (Polk & Schoendorff, 2014). ACT is a contextual cognitive behavioral therapy that emphasizes openness to experience, mindfulness, and valued action. This approach has effectively addressed a wide range of psychological and behavioral health problems (Hayes et al., 2011). The ACT matrix is an efficient tool to increase value-consistent behaviors while reducing unhelpful 'away moves,' or behaviors that draw one away from fulfilling their core personal or team values (Francis et al., 2016). In addition to the training content in workshops regarding this component, the ACT matrix was the main task to practice in six weekly coaching sessions, as evidence shows that repeatedly practicing the ACT matrix helps individuals move towards their values (Polk & Schoendorff, 2014).

**Recovery plan.** The second theoretical component of the Burnout Recovery intervention design involved sessions to map out an individual work stress recovery plan and improve self-care practices. Based on the JD-R model (Demerouti et al., 2001), employees put effort to overcome work stressors, and this effort has psychological and physiological costs and results in draining their resources which need to be recovered before starting the next workday (Sonnentag & Zijlstra, 2006). Recovery consists of four aspects of psychological detachment, relaxation, mastery

experiences, and control during leisure time (Sonnetag & Fritz 2007). This recovery plan might lead to a complete recovery with self-care training practices.

**Leadership Skills.** The third and final theoretical component of the Burnout Recovery intervention was directed toward leadership and organizational issues and aimed to equip leaders with a set of leadership communication skills, including effective validation and social support, empathy skills, and effective conflict management strategies. Based on JD-R theory (Demerouti et al., 2001), many key job resources target leaders' communication style and leadership skills, such as providing opportunities for subordinates and peers' professional development (Halbesleben et al., 2014), providing regular positive feedback (Leiter & Maslach, 2005), and work social supports (Schaufeli & Bakker, 2004). These leadership characteristics affect not only peers but also teams. Such that, employing an effective leadership style by supervisors contribute to a psychologically safe climate at the workplace, which results in the mitigation of burnout in employees (Chen & Chen, 2018). Meanwhile, in high-demand jobs, conflict is inevitable. However, the leaders' conflict management style can either play as a job resource or a job demand for employees at the time of coping with conflicts, such that the more employment of integrative approach when handling a conflict by leaders, the more their employees perceive job resources which ultimately lead to the lower level of burnout (Way et al., 2019). Therefore, equipping leaders with leadership skills in terms of effective validation and social support, empathy skills, and effective conflict management was considered the last component and the main organizational aspect of this intervention.

Despite the initial targeting of the intervention, which was a combined design and having two levels of analysis (leaders and subordinates), several barriers led the study to focus only on leaders. Some of those barriers are the staff's small sample size, high dropout rate, and insufficient

high-quality responses. Accordingly, the final analysis in the Burnout Recovery program was conducted on the leader's data, but it is still believed that leaders' well-being positively impacts staff burnout and worksite well-being. Noteworthy, the scope of the current study is focused on individual targeting of the Burnout Recovery, which is the impact and the process of the intervention among nursing leaders.

### **Results**

Results of mixed, group by time factorial ANOVA tests showed that burnout decreased significantly more for the intervention group than for the waitlist control group from pre to post test surveys ( $p=.02$ ,  $partial\ eta^2 = .23$ , medium to large effect size). Moreover, the intervention group showed more improvement in the level of self-care behaviors ( $p=.045$ ,  $partial\ eta^2 = .23$ , medium to large effect) and recovery experience ( $p=.09$  (trend),  $partial\ eta^2 = .08$ , small effect size) compared to the waitlist control group. Elevated resting heart rate as one of the indicators of chronic stress was also observed in this study via the Fitbit device. Results of Fitbit data analysis were consistent with the self-report data analysis, revealing that resting heart rates decreased significantly more for the intervention group than for the waitlist control group (coefficient= 0.68,  $SE=.21$ ,  $t(1674)= 3.17$ ,  $p=.002$ ; pseudo  $R^2=1-2\%$ , very small effects).

Overall results reflected the effectiveness of the Burnout Recovery intervention in decreasing burnout and improving nursing leaders' well-being in the intervention group, while the waitlist control group stayed unchanged or worsened (Gilin et al., 2021).

### **Current study**

Even with successful interventions, such as Burnout Recovery, there is still variability in outcomes that might result from individual and situational factors. Moreover, since Burnout Recovery is a theory-based intervention, it is important to examine whether the intervention



worked through its hypothesized mechanism. Therefore, the purpose of the current study is a secondary analysis of Burnout Recovery data to examine the moderator and mediator variables of this intervention's effectiveness. The current study explored whether the effective burnout intervention program combining online group workshops and individual coaching sessions can be created based on a recovery plan and ACT principles, and also for whom this program is more beneficial.

### ***Overall Effectiveness***

As to the starting point for further analysis on the pooled sample, it is believed that in this sample also results show the effectiveness of intervention. Therefore, the first hypothesis is:

*Hypothesis 1a.* Increased emotional exhaustion leads to higher emotional exhaustion over time, but the intervention is expected to weaken this relationship.

*Hypothesis 1b.* Increased cynicism leads to higher cynicism over time, but the intervention is expected to weaken this relationship.

*Hypothesis 1c.* Decreased professional efficacy leads to lower professional efficacy over time, but the intervention is expected to weaken this relationship.

### ***Empathy Styles as Moderation Variables***

Burnout results from a complex interaction between environmental stressors, individual characteristics, and coping styles (Wiederhold et al., 2018). Several studies showed the association of burnout with demographic characteristics such as age (Spickard et al., 2002), gender (McMurray et al., 2000), and job experience (Maslach et al., 2001; Schaufeli & Enzmann, 1998). Also, there are some dispositional traits that have a strong relationship with burnout (Alarcon et al., 2009). Previous studies indicated that personality plays a key role in burnout. For instance, people with higher neuroticism show higher levels of emotional exhaustion, while people with higher cynicism

report lower levels of agreeableness (McManus et al., 2004). However, there has been no insight into how individual differences may affect people's response to burnout intervention. Therefore, one of the purposes of this study is to examine the role of empathy styles as a moderator of burnout intervention effectiveness.

Empathy is one of the important personality characteristics in burnout research (Davis, 1994). Empathy is a multidimensional construct consisting of four dimensions: perspective-taking, fantasy, empathic concern, and personal distress (Altmann & Roth, 2020).

Perspective-taking is the cognitive component of empathy and is negatively correlated with burnout (Paro et al., 2014). It refers to the cognitive process of understanding others' thoughts and feelings and the rationale behind them (Sessa, 1996). People with a high level of perspective taking are more likely to understand and empathize with those whose perspective is taken (Davis, 1983). Beyond that, people higher in perspective taking show more cooperative behaviors which is believed by teachers to be important to students' success in the classroom (Lane et al., 2004) and lead to long-term academic achievement (Caprara et al., 2000). Therefore, it is expected that people higher in this style are more open to learning new content and being more involved in the intervention and accordingly will have more improvement in Burnout. Therefore, it is hypothesized that:

*Hypothesis 2a.* The Burnout Recovery intervention has a stronger effect on burnout in people with a higher level of perspective-taking.

Empathic concern is the affective component of empathy and has shown a different pattern in relationship with burnout ranging from positive (Gleichgerricht & Decety, 2013) to negative (von Harscher et al., 2018). It refers to an individual's ability to have feelings of sorrow or concern for others and is known as a greater sensitivity to others (Davis, 1983). On the one hand, it is expected

that people higher in empathic concern show more openness towards the new content in intervention as they are able to consider the lecturer's feelings which may result in more engagement and accordingly more favorable result. On the other hand, individuals with empathic concern benefit others by showing prosocial helping behaviors (Eisenberg et al., 2010) even at their own expense (Batson & Oleson, 1991). This strong desire may buffer the impact of intervention for them. Therefore, we expected that the empathic concern style affects burnout intervention effectiveness, regardless of the direction of the effect.

*Hypothesis 2b.* The Burnout Recovery intervention has different effects on burnout in people with different levels of empathic concern.

Personal Distress is the other empathy style and refers to the feelings of personal discomfort and anxiety in reaction to the negative emotions of others (Davis, 1983). Personal distress has often been directly and positively correlated with burnout (Von Harscher et al., 2018; Gleichgerrcht & Decety, 2013; Thomas & Otis, 2010). Meanwhile, personal distress is considered as a self-focused response such that people high in personal distress have motivation for avoidance behaviors to reduce their unpleasant feelings (Batson et al., 1983). Therefore, it is expected that people with a high level of personal distress react to the new content as a threat and show avoidance behaviors such as not engaging fully in the intervention program, which may reduce the learning. So, it is hypothesized that:

*Hypothesis 2c.* The Burnout Recovery intervention has a weaker effect on burnout in people with a higher level of personal distress.

Finally, fantasy refers to the tendency to emotionally identify oneself with fictional situations such as books, movies, and daydreams (Davis, 1983). When it comes to the response to intervention, it seems that people high in fantasy can imagine the way that the newly provided

content in intervention would affect their worksite and humans. Meanwhile, Silva and colleagues (2019) study's result showed high fantasy style scores associated with a high level of burnout, so that, it is also likely that high levels of fantasy buffer the intervention's effectiveness. Therefore, we expected that fantasy style impacts burnout intervention effectiveness, regardless of the direction of the effect. Thus, it is hypothesized that:

*Hypothesis 2d.* The Burnout Recovery intervention has different effects on burnout in people with different levels of fantasy.

The conceptual model for the moderation Hypotheses 1 and Hypothesis 2 is presented in Figure 1.

### ***Mediation Variables***

As mentioned in previous sections, there has been an inconsistency in terms of effectiveness and the lasting effects among the burnout intervention programs which is in part due to the mechanism through which burnout changes. Indeed, intervention programs are designed to change the mediating variables that, based on existing theories, are hypothesized to cause change in the desired outcome (MacKinnon & Luecken, 2011). There are two theories drawn on to explain the mediation model in intervention programs. First, action theory which explains the change in mediator variable from intervention conditions. This theory provides researchers with information on the efficacy of manipulations that were used to change the mediators. Manipulations can include but are not limited to the intervention type, content, delivery approach, instructional design, and so on. The second theory is the conceptual theory which provides researchers with information on causal relations between hypothesized mediators and the desired outcome (Chen & Chen, 1990).

There are several benefits of conducting mediation analysis in burnout intervention studies considering action and conceptual theories. It can help to understand and evaluate the burnout

alleviation process, build and refine theory, inform about the possibility of delayed program effects, and improve the program manipulations and measurements which contribute to an overall improvement in intervention and make it more cost-effective for future implementations (MacKinnon, 2012; MacKinnon, 1994).

Despite the important role of mediation analysis in burnout intervention studies, few studies examined the effectiveness of burnout interventions through changing mediating processes as a means of changing behaviors (e.g., Puolakanaho et al., 2020). Therefore, the current study aims to examine the mechanism of burnout recovery intervention effectiveness through examining the change in potential mediators including self-care, recovery experience, and the ACT process.

**Recovery Experiences.** Recovery experience refers to four kinds of activities including relaxation, psychological detachment, control over leisure time, and mastery experiences (Sonnentag & Fritz, 2007), among which relaxation and psychological detachment are the focus of the current study as they have their roots in E-R theory (Siltaloppi et al., 2009) and relevant to resource restoration while mastery experience and control over leisure time aim at fostering new resources which is a different process (Hobfoll, 1998; Sonnentag et al., 2008; Sonnentag & Fritz, 2007). Psychological detachment is defined as a state of mentally and physically disconnecting from work (Sonnentag & Krueger, 2006). It implies not only avoiding doing work-related duties in off work hours but also not thinking about job-related problems or opportunities out of the work hours (Sonnentag & Fritz, 2007). Relaxation refers to a state of low activation and increased positive affect (Stone et al., 1995) which may include any activities with the aim of relaxing body and mind (Sonnentag & Fritz, 2007). Relaxation and psychological detachment are strongly and negatively associated with burnout (Poulsen et al., 2015). Indeed, recovery experiences help an individual's functioning return to the pre-stressors level (Sonnentag & Natter, 2004) which result

in a lower risk of reaching Burnout. However, some studies reported that people high in burnout are less likely to have enough recovery experience (Ugwu et al., 2019; Song et al., 2021), therefore it is expected that higher early burnout leads to lower recovery experiences and a decrease recovery experience cause higher burnout over time. Thus, it is hypothesized that:

*Hypothesis 3.* Lower recovery experiences will mediate the association between early and late burnout, but the intervention is expected to weaken this mediation.

**Self-Care.** Self-care is a complex of physical, psychological, mental, and spiritual activities that help people prevent negative outcomes and promote their mental and physical health (Carrol et al., 1999). Although some research reported that selfcare does not play a predictive role for burnout (e.g., Jie et al., 2021), many research studies conducted with health care professionals showed a negative correlation between self-care factors and Burnout (e.g., Alkema et al., 2008; Alexander et al., 2015) and reported self care as a protective factor against burnout (Hotchkiss & Lesher, 2018). Moreover, self-care is one of the key components of many burnout intervention studies that examined the effects of self-care strategies in burnout alleviation (Kravits et al., 2010; Krasner et al., 2009; Van Rhenen et al., 2005; Ossebaard, 2000). However, few research studies have investigated the mediating role of self-care in the context of burnout. For instance, Hricova (2020) reported a mediating role of self-care in the relationship between stress and burnout, positing that in increased stress, the risk of burnout will be decreased through engaging in self-care activities. Indeed, self-care activities help individuals recover and develop their resources, resulting in being more equipped when facing work stressors and accordingly decreasing the risk of one reaching Burnout (Hobfoll et al., 1990). Therefore, it is hypothesized that:

*Hypothesis 4.* Lower engagement in self-care activities will mediate the association between early and late burnout, but the intervention is expected to weaken this mediation.

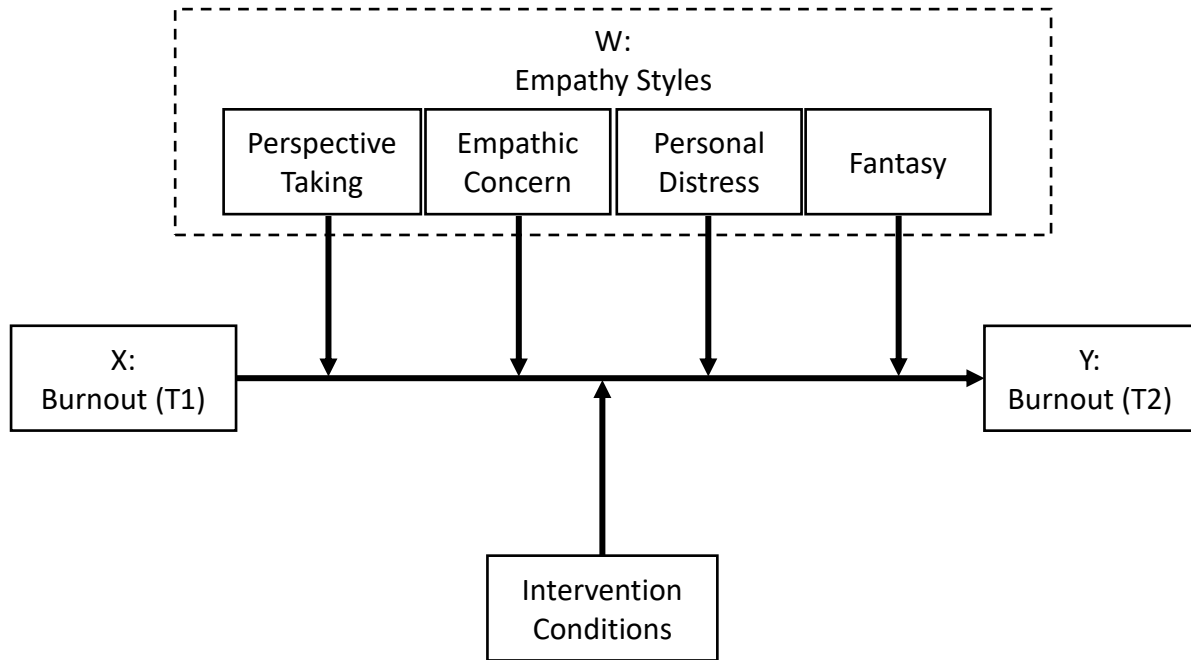
**ACT Process.** Identifying individual and team values and moving towards them is the other core component of the Burnout Recovery program. This component is provided on the basis of Acceptance and Commitment Therapy (ACT; Hayes et al., 2011) and via an ACT protocol named ACT matrix (Polk & Schoendorff, 2014). ACT aims to activate inclination to experience thoughts and feeling rather than avoiding them or trying to control or change them (Lundgren et al., 2008). This purpose is achievable through a process to promote psychological flexibility. Psychological flexibility refers to the ability to contact the present moment, open to experience and accept feelings and thoughts regardless of being pleasant or not, clarifying values and forming and fostering actions in accordance with identified values (Hayes et al., 2006, 2012). Research showed that psychological flexibility is associated with lower burnout levels (Di Benedetto & Swadling, 2014; Puolakanaho et al., 2018; Vilardaga et al., 2011). As stated in COR theory, resources are anything that perceived valuable for people and are the main factors to combat reaching to burnout. Improving in act process help people to notice themselves at the present moment and being motivated to move towards their values which results in being more equipped with resources against impending burnout. However, when people experience high emotional exhaustion, they tend to experiential avoidance (Losa et al., 2010). Indeed, when things get tough, people less tend to be aware about their feelings, thoughts, and less motivated to clarify their values and action toward them as they tend to avoid contacting with suffering. This experiential avoidance increases the risk of higher burnout in future. This is also supported by Ortiz-Fune and colleagues (2020) study which reported the predictive role of psychological flexibility for all three dimensions of burnout. Therefore, it is hypothesized that:

*Hypothesis 5.* Lower engagement in ACT behaviors will mediate the association between early and late burnout, but the intervention is expected to weaken this mediation.

The conceptual model for Hypothesis 3 to Hypothesis 5 is presented in Figure 2.

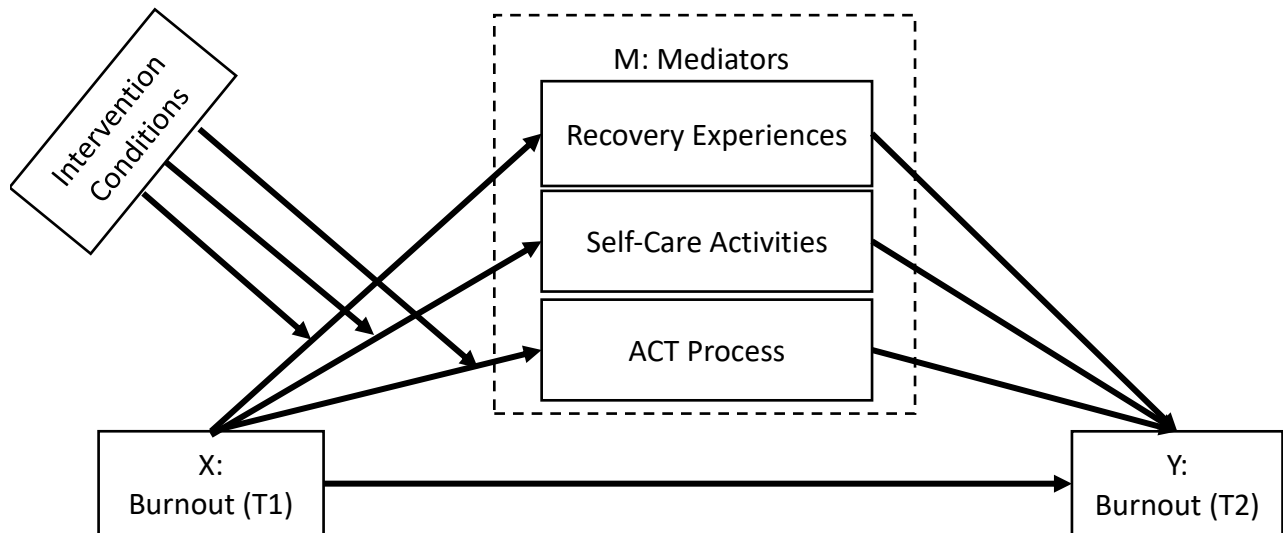
**Figure 1**

*Conceptual Model for Proposed Moderation Hypotheses (Hypotheses 1 and 2)*



**Figure 2**

*Conceptual Model for Proposed Moderated Mediation Hypotheses (Hypotheses 3 to 5)*





## Method

This research is a secondary analysis study, following up on the outcomes of the main Burnout Recovery program trial (Gilin et al., 2021) plus a replication study (Foote, 2022) to explore moderators and mediators in the Burnout Recovery program effectiveness.

### Participants

Participants are home care nursing leaders across Nova Scotia and Ontario provinces pooled from two separate Burnout Recovery studies, including the main Burnout Recovery trial (Gilin et al., 2021) and a replication study (Foote, 2022). They were recruited through a professional network organization in Canada such that, in the main trial (Gilin et al., 2021), participants were from large to small independent nursing agencies, while in the replication study (Foote, 2022), participants were from one large nursing organization, namely, Victorian Order of Nurses (VON).

### *Main Trial Sample (Gilin et al., 2021)*

The dataset created by Gilin and colleagues (2021) contained 49 nursing leaders who mainly participated within the intact leadership teams. Indeed, each involved organization, participated with a team of leaders who were running the home care agency at that time. Then, participants randomly assigned to the control and intervention group. However, two participants did not complete both pre (*T1*) and post (*T2*) comprehensive surveys and were removed from the current thesis analysis. The final sample, consisting of 47 nursing leaders included in the current study analysis, was predominately female (95.7%) and Caucasian (97.9%) with an average age of 46.53 ( $SD = 9.21$ ). They were from large to small independent nursing agencies across Nova Scotia with an average job experience of 13.3 years ( $SD = 10.72$ ). The majority of participants were married (66%) and reported having no dependents (44.7%). Participants were randomly assigned to

two groups of intervention ( $n = 29$ ) and waitlist control ( $n = 18$ ) when operationally feasible (and when not, matching of home care agencies based on size and rural/urban context was used instead). Specifically, intervention participants in intervention group received an average of  $M = 5.62$  ( $SD = .56$ ) workshop sessions and attended an average of  $M = 2.62$  ( $SD = 2.41$ ) coaching sessions.

### ***Replication Study Sample (Foote, 2022)***

The dataset created by Foote (2022) contained 49 nursing leaders. However, three participants did not complete both pre ( $T1$ ) and post ( $T2$ ) comprehensive surveys and were removed for the current analysis. The final analyzed sample consists of 46 nursing leaders, who were predominately female (95.7%) and Caucasian (95.7%) with an average age of 44.91 ( $SD = 7.96$ ). They were from a large nursing organization located in Ontario (i.e., VON), with an average job experience of 10.32 years ( $SD = 10.19$ ). The majority of participants were married (58.7%) and reported two dependents (43.5%). As to grouping process, leaders with roles of significant responsibility who had not previously received the course through the main study were offered it ( $n = 40$ ) and those who were not able to participate actively in the program or have a more minor leadership role were offered to be part of the control group ( $n = 6$ ). Noteworthy, in contrast to the main trial sample, the leadership roles of participants in the intervention group of the replication study were not limited to responsibilities to run the home cares, but involved any leadership roles. Intervention participants in intervention group received an average of  $M = 4.83$  ( $SD = 1.20$ ) workshop sessions and attended an average of  $M = 1.53$  ( $SD = .96$ ) coaching sessions.

### ***The Pooled Sample***

The pooled sample of the main burnout recovery trial and the replication study consists of  $N = 93$  nursing leaders of which  $n = 69$  were in the intervention group and  $n = 24$  were in the control group. Participants were predominately female (95.7%) and Caucasian (96.8%) with an

average age of 45.73 ( $SD = 8.61$ ). The majority of participants were married (62.4%) and reported either no dependent (41.9%) or two dependents (33.3%). They also had an average job experience of 11.82 years ( $SD = 10.51$ ).

### **Procedure**

As noted previously, participants from two studies, the main study and the replication, were pooled for the current study. In both studies, participants were recruited through a professional network organization in Canada via local announcement and a program flyer, then either randomly when feasible (main trial) or not randomly (replication study) assigned to treatment and control groups.) Both main trial and replication study (as a modification of the main study) were approved by the Research Ethics Board of Saint Mary's University (REB #21-033) and all individual participants were provided and agreed with the informed consent form. Data were collected via Qualtrics in a comprehensive version (all original item content of all measures) at the beginning of the study ( $T1$ ) and after the end of six-weeks of intervention ( $T2$ ). In addition, a short version of the survey (one representative item per construct) was used during each of the weeks of interventions to assess potential changes in the outcomes of interest during the past week. Noteworthy, in the current study, only the comprehensive data was pooled and used for the analysis. Comprehensive surveys measured outcome variables of interest, including burnout, self-care activities, recovery experiences, and ACT process, in addition to the demographics and dispositional traits such as empathic styles (only at the beginning of the studies,  $T1$ ).

When it comes to the study design and intervention implementation, there are some similarities and dissimilarities between the main trial and the replication study. Both studies are quasi-experimental; however, the main trial employed a longitudinal waitlist-control quasi-experimental design with limited (due to operational requirements) random assignment and

matching, while the replication study employed a quasi-experimental design with a pre-test and post-test with a very limited size control group. Also, both studies' interventions included online group workshops with mostly similar content such that five sessions were identical, but one session was not (i.e., a safety leadership session in the main trial but a trauma-informed leadership session in the replication study). Moreover, both studies provided their participants with individual coaching sessions and Fitbit.

As to dissimilarities, in the main trial study, the workshops were provided by the experts who created the content, while the replication study was offered on a train-the-trainer model such that the video lectures (recorded by the experts who created the original content) were provided in workshops via two trained masters and Ph.D. level facilitators. As to coaching sessions, while the main trial offered six coaching sessions coached by two Ph.D. candidates in clinical psychology, the replication study offered three coaching sessions across the study, which were coached by trained masters and Ph.D. candidates in the organizational psychology field.

## **Measures**

### ***Empathy Styles***

Empathy styles were assessed using the Interpersonal Reactivity Index (*IRI*; Davis, 1980). It consists of four 7-items subscales, including empathic concern (e.g., Before criticizing somebody, I try to imagine how I would feel if I were in their place), perspective-taking (e.g., I believe that there are two sides to every question and try to look at them both), personal distress (e.g., In emergency situations, I feel apprehensive and ill-at-ease), and fantasy (e.g., I daydream and fantasize, with some regularity, about things that might happen to me). *IRI* is a 5-point Likert scale ranging from 0 (*does not describe me well*) to 4 (*describes me very well*) and asks individuals to rate the extent to which each item describes them. Nine of the items are reversed coded

including three items in empathic concern and two items in each of the other three subscales. Total score for each subscale is the composition of all its items. The range of scores for each of the subscales is 0 to 28. Wang and colleagues (2020) reported the reliability of the subscales including perspective-taking ( $\alpha = .73$ ), empathic concern ( $\alpha = .68$ ), personal distress ( $\alpha = .73$ ), and fantasy ( $\alpha = .68$ ). In the current study, three of the four subscales showed acceptable level of internal consistency: Empathic concern ( $\alpha = .63$ ), perspective taking ( $\alpha = .70$ ), personal distress ( $\alpha = .72$ ), and fantasy ( $\alpha = .76$ ). These values are fairly consistent with past research. For the sake of parsimony, the subscales are called IRI-EC, IRI-PT, IRI-PD, and IRI-FAN onward.

### *Self-Care*

Self-care activities were assessed using four subscales of Health-Promoting Lifestyle Profile (*HPLP II*; Walker & Hill-Polerecky, 1996), including interpersonal relations (e.g., Discuss my problems and concerns with people close to me), health responsibilities (e.g., Discuss my health concerns with health professionals), physical activities (e.g., Get exercise during usual daily activities), and nutrition (e.g., Eat breakfast). Each subscale has 3 items and measures the frequency of engaging in specific health-promoting behaviors over the past month. It is a 4-point Likert scale ranging from 1 (*never*) to 4 (*routinely*). Total score for each subscale is the composition of all its items. The range of scores for each of the subscales is 3 to 12. Tajik and colleagues (2010) reported the reliability of the subscales, including health responsibility ( $\alpha = .89$ ), physical activity ( $\alpha = .88$ ), nutrition ( $\alpha = .76$ ), and interpersonal relations ( $\alpha = .76$ ). In the current study, the subscales yielded good internal consistency; Cronbach's  $\alpha$  were .83 for interpersonal relations, .81 for health responsibilities, .92 for physical activities, and .75 for nutrition. For the sake of parsimony, the subscales are called SC-Inter, SC-Health, SC-Activity, and SC-Nut onward.

### ***Recovery Experience***

Recovery experience was assessed using two subscales of relaxation (e.g., I did relaxing things) and psychological detachment (e.g., I do not think about work at all) within the Recovery Experience Questionnaire (*REQ*; Sonnentag & Fritz, 2007). Each subscale has 3 items and measures recovery in the past month. It is a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Total score for each subscale is the composition of all its items. The range of scores for each of the subscales is 3 to 15. Sonnentag & Fritz (2007) reported the reliability of subscales, including relaxation ( $\alpha = .80$ ) and psychological detachment ( $\alpha = .82$ ). In the current study, the subscales yielded good internal consistency; Cronbach's  $\alpha$  were .87 for relaxation and .85 for psychological detachment. For sake of parsimony, the subscales are called REQ-Rel and REQ-PsyDet, onward.

### ***Burnout***

Burnout was assessed using the Maslach Burnout Inventory - General Survey (*MBI-GS*; Schaufeli et al., 1996). It is a 16-item scale consisting of three subscales, including emotional exhaustion (e.g., I feel emotionally drained from my work; 5 items), cynicism (e.g., I doubt the significance of my work; 5 items), and professional efficacy (e.g., in my opinion, I am good at my job; 6 items). It is a 7-point Likert scale ranging from 0 (*never*) to 6 (*every day*) and respondents rate the extent to which they experience each item. Total score for each subscale is the composition of all its items. The range of scores for each of the emotional exhaustion and cynicism subscales is 0 to 30 and for professional efficacy subscale is 0 to 36. Rothe and colleagues (2020) reported the reliability of subscales, including emotional exhaustion ( $\alpha = .90$ ), cynicism ( $\alpha = .84$ ), and professional efficacy ( $\alpha = .90$ ). In the current study, the subscales showed excellent internal consistency, emotional exhaustion ( $\alpha = .95$ ), cynicism ( $\alpha = .91$ ), and professional efficacy ( $\alpha =$

.90). For the sake of parsimony, the subscales are called MBI-Exh, MBI-Cyn, and MBI-PE onward.

### ***ACT process***

ACT process was assessed using an abbreviated version of the Comprehensive assessment of Acceptance and Commitment Therapy processes (*CompACT*, Francis et al., 2016). The original *CompACT* has 23 items consisting of three subscales, including openness to experience (e.g., I work hard to keep out upsetting feelings), behavioral awareness (e.g., Even when doing the things that matter to me, I find myself doing them without paying attention), and valued action (e.g., My values are really reflected in my behavior) to measure psychological flexibility as the ACT process. It is a 7-point Likert scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*) and respondents rate the extent to which they agree with each item. All the items for openness to experience and behavioral awareness subscales are reverse coded. Francis and colleagues (2016) reported the reliability of the subscales, including openness to experience ( $\alpha = .90$ ), behavioral awareness ( $\alpha = .87$ ), and valued action ( $\alpha = .90$ ). This measure was shortened by subject matter experts (the main Burnout Recovery trial authors) for the Burnout Recovery program. The abbreviated version is a 9-item scales (3 items per subscale). Total score for each subscale is the composition of all its items. The range of scores for each of the subscales is 0 to 18. In the current study, the subscales showed good internal consistency for behavioral awareness ( $\alpha = .72$ ) and openness to experience ( $\alpha = .80$ ), but low for valued action ( $\alpha = .59$ ). For the sake of parsimony, the subscales are called ACT-Aware, ACT-Open, and ACT-Value onward.

## Data Analysis

For this study, data from the main trial and the replication study's pre-post intervention surveys were merged into a composite dataset. Data analysis followed the following steps, using SPSS 28.

Prior to any statistical analysis, data screening was performed to identify any data inaccuracy, missing values, and univariate/multivariate outliers in the main, replication, and potential pooled sample. No systematic missing data has been found in the dataset. Due to the small sample size ( $N = 93$ ), all random missing data were treated analysis by analysis for the t-test and linear regression analyses. However, missing data were excluded listwise for correlation analysis since this approach in comparison to pairwise deletion is more conservative way to treat missing data in order to have closer results to the complete data (Buck, 1960). Although a few univariate outliers ( $Z < -3.3$  or  $Z > 3.3$ ) have been found, the multivariate outliers did not reveal any influential multivariate outlier for the pooled and replication samples (Cook's  $D < 1$  for all outcome variables). One influential outlier was found in the main sample (Cook's  $D = 1.09$ ), however, the Mahalanobis Distance for this case was not significant (*Mahal D* probability = .66). Therefore, due to the small sample size of this study, all data was kept for further analysis. Next, multivariate assumptions of normality and linearity were checked for the pooled sample and each sample separately, split by intervention conditions. There was no concern regarding linearity, however, in each of the three examined samples, there were some of the outcome variables with significant Shapiro-Wilk values ( $p < .05$ ) in either control or treatment groups, revealing the violation of normality. However, the distribution shape of outcome variables including kurtosis, skewness, histogram and Q-Q plots did not show substantial violation in normality. Accordingly, robust tests were conducted for further analysis where applicable.



Next, to establish whether analyses of pooled data are acceptable, studies should address similar research questions and have similar outcome variables, be conducted in similar populations and settings, and use similar intervention components and implementation approaches (Bangdiwala et al., 2016). As noted, most of these similarities have been proven to some extent for the main trial study and the replication one. However, it does not mean that there is no heterogeneity in the two samples as they are from different sizes of organizations, and data were collected at different points in time. Therefore, testing the two studies' baseline difference in demographics and outcome variables of interest were implemented through bootstrapped independent samples t-tests. In case many differences between the studies group were significant, study membership was considered as a potential covariate to control the between-study differences in the sample (Brincks et al., 2018).

Then, descriptive statistics, intercorrelations, and Cronbach's alpha values for all study variables were implemented using SPSS software. As to test the proposed moderation hypotheses, the PROCESS Macro for SPSS (model 1, Hayes, 2017) was used to test the moderating effects of group in pre-post burnout (to test overall intervention effectiveness) and also the effects of empathy styles on the relationship between pre and post burnout in the intervention group. Noteworthy, there are two different analytical approaches to test the effectiveness of the burnout recovery intervention. The first way, which also was used to analyze data in the burnout recovery main trial (Gilin et al., 2021) is based on comparing mean differences between the intervention conditions (i.e., control and treatment groups). Indeed, an effective intervention would make a reduction in burnout in the intervention group while the control group burnout remains unchanged or even get worse, which is the pattern reported by Gilin and colleagues (2021). The second way, which was used to analyze data in the current study, is based on a continuous linear regression model allowing mediators and moderators to be tested. That is, this method allows examination of

how the association (correlation or regression) between early (*T1*) and late (*T2*) burnout scores is moderated and mediated by other continuous variables (rather than focusing on changes in mean burnout). My analyses examine how intervention conditions make a difference in the correspondence between early burnout (*T1*) and late burnout (*T2*) for each individual. Indeed, an effective burnout intervention would make early burnout less determinative of the late burnout.

Finally, PROCESS Macro model 7 for SPSS (Hayes, 2017) was utilized to test the moderated mediation models (Hypothesis 3 to 5). In all moderated mediation analysis, the mediator was the post assessment (*T2*) of the variable. Also, for these analyses, the baseline (*T1*) of that variable was used as a covariate to adjust for a baseline group difference in order to have an unbiased difference estimate (Van Breukelen, 2006)

In all analyses, robust tests were conducted and bootstrap confidence intervals (CIs) were used to figure out whether an effect is significant, such that if 95% confidence intervals did not include zero, the effect was considered significant (Hayes, 2017). Age and job experience were considered as covariate in all the analyses using the PROCESS Macro for SPSS as it is reported that there are small negative correlation between these two demographics and emotional exhaustion as one of the core dimensions of burnout (Brewer & Shapard, 2004).

## Results

### Sample Heterogeneity

Bootstrapped independent samples t-tests (1000 resamples) were conducted to determine if baseline mean in demographics (i.e., age, and job experience) and outcome variables (i.e., all the subscales for burnout, recovery experience, act process, and self-care activities) are significantly different in the main and replication samples (missing data were excluded per analysis). Results showed there are significant mean differences in MBI-Exh at baseline between the main ( $M =$

16.21,  $SD = 8.25$ ) and replication sample ( $M = 20.67$ ,  $SD = 6.77$ ),  $t(88.32) = -2.85$ , 95%  $CI [-7.50, -1.54]$ , medium effect size, such that participants in the replication study showed significantly higher level of MBI-exhaustion than people in the main trial. Otherwise, there were no significant mean differences between the main and replication samples in demographics and outcomes of interest. As to the comparison of control and treatment groups between the two studies, results of independent samples t-tests showed that only the REQ-Rel mean difference is significant between the main control group ( $M = 9.94$ ,  $SD = 2.69$ ) and the replication control group ( $M = 11.83$ ,  $SD = .41$ ),  $t(19.12) = -2.88$ , 95%  $CI [-3.30, -.64]$ , large effect size, such that REQ-relaxation is significantly higher in the replication control group than the main trial control group. Meanwhile, for treatment groups, there was a significant mean difference between SC-Health in the main study ( $M = 6.66$ ,  $SD = 2.00$ ) and the replication study ( $M = 5.70$ ,  $SD = 2.03$ ),  $t(60.89) = 1.94$ , 95%  $CI [.02, 1.92]$ , medium effect size, such that people in the treatment group from the main trial showed significantly higher scores in SC-health responsibility than people in the replication study treatment group. All other variables in addition to the demographics were not significantly different between condition groups in main and replication study ( $p > .00$ ). Noteworthy, all the values were reported from non-equal variances values and estimates, due to the substantial sample size difference in control groups between two studies.

Overall, the results indicated that there was not too much significant difference between the two samples at baseline in outcome variables of interest and demographics, reflecting that pooling two samples are acceptable. Therefore, further analyses were done on the pooled sample of the main and replication study.

The pooled sample of the main burnout recovery trial and the replication study consist of  $N = 93$  nursing leaders, of which  $n = 69$  (74.8%) were in the intervention group and  $n = 24$  (25.8%)

were in the control group. Participants were predominately female ( $n = 89, 95.7\%$ ) and Caucasian ( $n = 90, 96.8\%$ ) with an average age of 45.73 years ( $SD = 8.61$ ). The majority of participants were married ( $n = 58, 62.4\%$ ) and reported either no dependent ( $n = 39, 41.9\%$ ) or two dependents ( $n = 31, 33.3\%$ ). They also had an average job experience of 11.82 years ( $SD = 10.51$ ).

As the last step to explore baselines differences, bootstrapped independent samples t-tests (1000 resamples) were conducted to determine if baseline mean in demographics and outcome variables are significantly different in the control and treatment groups within the pooled sample. Results showed there are significant mean differences in MBI-Exh at baseline between the control ( $M = 14.13, SD = 7.40$ ) and treatment group ( $M = 19.91, SD = 7.47$ ),  $t(40.50) = -3.29, 95\% CI [-9.13, -2.22]$ , medium to large effect size, such that participants in the treatment group showed significantly higher level of MBI-exhaustion than people in the control group. Results also indicated there are significant mean differences in SC-activity at baseline between the control ( $M = 5.63, SD = 2.60$ ) and treatment group ( $M = 7.32, SD = 3.03$ ),  $t(46.37) = -2.63, 95\% CI [-2.89, -.42]$ , small to medium effect size, such that participants in the treatment group showed significantly higher level of SC-physical activity than people in the control group. Otherwise, there were no significant mean differences between control and treatment group in demographics and outcomes of interest.

### **Descriptive and Correlation Analysis**

Descriptive statistics, intercorrelations, and Cronbach's alpha values for all study variables (baselines) are presented in Table 1. Due to the concerns of normality, bootstrapped confidence intervals were assessed (1000 resamples).

**Table 1***Descriptive Statistics, Correlations, and Cronbach's Alpha for Study Variables (N = 89)*

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	-											
2. Age	-.05	-										
3. Ethnicity	<b>.04</b>	<b>-.08</b>	-									
4. Marital status	-.12	.18	<b>-.13</b>	-								
5. Dependents	<b>.12</b>	<b>-.22</b>	.01	.07	-							
6. Job Experience	-.01	<b>.55</b>	<b>-.13</b>	.12	-.14	-						
7. IRI-PT	.06	.20	.07	.10	.08	.02	(.70)					
8. IRI-EC	.01	.06	-.07	.14	.16	.10	<b>.34</b>	(.63)				
9. IRI-PD	.02	<b>-.23</b>	-.05	-.07	.13	-.06	<b>-.25</b>	-.09	(.72)			
10. IRI-FAN	-.04	<b>-.24</b>	<b>.17</b>	-.14	.16	<b>-.25</b>	.07	<b>.26</b>	<b>.24</b>	(.76)		
11. MBI-Exh	<b>.24</b>	-.03	.08	.04	.15	-.06	.04	.07	.03	.18	(.95)	
12. MBI-Cyn	.14	.07	-.01	-.02	.01	.01	.06	.10	.03	.08	<b>.61</b>	(.91)
13. MBI-PE	<b>-.17</b>	.17	-.11	-.08	-.02	.05	.03	.01	<b>-.27</b>	-.19	<b>-.27</b>	<b>-.31</b>
14. REQ-PsyDet	-.18	.05	.03	.08	<b>-.21</b>	.04	-.05	-.18	.06	.07	<b>-.36</b>	<b>-.31</b>
15. REQ-Rel	<b>-.15</b>	-.04	<b>.09</b>	.03	-.10	.07	.14	.10	-.15	.15	-.18	<b>-.26</b>
16. ACT-Open	<b>-.18</b>	-.02	<b>.10</b>	-.07	-.06	-.001	.03	-.15	-.18	-.17	<b>-.40</b>	-.17
17. ACT-Aware	<b>-.18</b>	.13	<b>-.23</b>	-.08	<b>-.24</b>	.22	.10	.04	-.13	-.05	<b>-.42</b>	<b>-.35</b>
18. ACT-Value	-.04	.17	.04	.05	-.16	.03	.14	.04	<b>-.25</b>	.05	<b>-.21</b>	<b>-.29</b>
19. SC-Inter	-.04	-.03	.02	-.03	.12	.05	-.07	.10	-.09	-.04	<b>-.22</b>	<b>-.19</b>
20. SC-Health	-.16	<b>.24</b>	.12	.07	-.01	<b>.23</b>	<b>.22</b>	.17	.01	.13	<b>-.38</b>	<b>-.22</b>
21. SC-Activity	-.01	.06	-.12	.05	.10	-.01	.16	.09	-.06	-.02	-.001	-.08
22. SC-Nut	-.02	<b>.26</b>	.04	.07	.01	.15	.08	.17	-.04	-.03	-.11	-.08
<i>M</i>	-	45.39	-	-	1.12	11.68	21.22	22.74	8.15	14.80	18.70	12.21
<i>SD</i>	-	8.50	-	-	1.15	10.58	3.83	3.83	4.74	5.91	7.57	7.27

*Note.* Listwise exclusion was applied. 95% bias-corrected bootstrapping with 1,000 resamples. Significant correlations are bolded. Gender was coded as 0 = male, 1 = female. Age and job experience variables were measured in year. Ethnicity was coded as 0 = Caucasian, 1 = Indigenous, 2 = Asian. Marital status was coded as 1 = single, 2 = married, 3 = common-law., 4 = Separated, 5 = Divorced. Coefficient alpha is presented in parentheses on the diagonal. All the abbreviations were introduced in the measure section.

**Table 1***Descriptive Statistics, Correlations, and Cronbach's Alpha for Study Variables (N = 89) (CONTINUED)*

Variables	13	14	15	16	17	18	19	20	21	22
1. Gender										
2. Age										
3. Ethnicity										
4. Marital status										
5. Dependents										
6. Job Experience										
7. IRI-PT										
8. IRI-EC										
9. IRI-PD										
10. IRI-FAN										
11. MBI-Exh										
12. MBI-Cyn										
13. MBI-PE	(.90)									
14. REQ-PsyDet	.22	(.85)								
15. REQ-Rel	<b>.30</b>	<b>.55</b>	(.87)							
16. ACT-Open	.19	.06	.16	(.80)						
17. ACT-Aware	<b>.25</b>	.15	.08	<b>.28</b>	(.72)					
18. ACT-Value	<b>.40</b>	<b>.31</b>	<b>.29</b>	<b>.21</b>	<b>.29</b>	(.59)				
19. SC-Inter	<b>.35</b>	<b>.29</b>	<b>.30</b>	<b>.21</b>	.18	<b>.54</b>	(.83)			
20. SC-Health	<b>.29</b>	.20	<b>.27</b>	.10	<b>.34</b>	<b>.29</b>	<b>.38</b>	(.81)		
21. SC-Activity	<b>.23</b>	.002	.12	.02	.12	<b>.29</b>	<b>.41</b>	.20	(.92)	
22. SC-Nut	<b>.23</b>	-.05	.04	<b>.22</b>	<b>.23</b>	.20	<b>.38</b>	<b>.28</b>	<b>.47</b>	(.75)
<i>M</i>	29.09	8.20	10.69	7.52	8.30	13.04	8.60	6.16	6.92	7.57
<i>SD</i>	5.72	2.54	2.29	4.15	3.50	2.36	2.13	2.16	3.01	2.08

*Note.* Listwise exclusion was applied. 95% bias-corrected bootstrapping with 1,000 resamples. Significant correlations are bolded. Gender was coded as 0 = male, 1 = female. Age and job experience variables were measured in year. Ethnicity was coded as 0 = Caucasian, 1 = Indigenous, 2 = Asian. Marital status was coded as 1 = single, 2 = married, 3 = common-law., 4 = Separated, 5 = Divorced. Coefficient alpha is presented in parentheses on the diagonal. All the abbreviations were introduced in the measure section.

### **Overall Effectiveness**

Hypothesis 1 posits the moderation effect of intervention conditions on burnout over time (see Figure 1). PROCESS Macro model 1 for SPSS (Hayes, 2017) was conducted to test Hypothesis 1, after controlling for age and job experience (95% bias-corrected bootstrapping with 5,000 resamples). The results from the analyses are presented in Table 2.

### ***Emotional Exhaustion***

As presented in Table 2, MBI-Exh (*T1*) has positive impact on MBI-Exh (*T2*) ( $b = .96$ ,  $95\%CI [.77,1.15]$ ) and group significantly moderates this relationship ( $b = -.35$ ,  $95\%CI [-.60,-.08]$ ). The interaction showed a significant overall incremental effect on MBI-Exh (*T2*),  $F(1,87) = 4.41$ ,  $p < .05$ , small effect size, and accounted for 2% of the variance in post exhaustion. Results presented in Figure 3 portrays the nature of the interaction, using the PROCESS Macro model 1 output data for visualizing the conditional effect. As shown, the simple slope for MBI-Exh (*T1*) on MBI-Exh (*T2*) is significantly and positively steeper in the control group (simple slope =  $.96$ ,  $t = 6.72$ ,  $p < .001$ ) than intervention group (simple slope =  $.62$ ,  $t = 7.37$ ,  $p < .001$ ), meaning that in the intervention group, people's emotional exhaustion was less consistent over time compared to the control group. In other words, the intervention disturbed the association between early exhaustion and late exhaustion. Thus, Hypothesis 1a was supported.

### ***Cynicism***

As presented in Table 2, MBI-Cyn (*T1*) has positive impact on MBI-Cyn (*T2*) ( $b = .93$ ,  $95\%CI [.70,1.15]$ ) and group significantly moderates this relationship ( $b = -.43$ ,  $95\%CI [-.72,-.15]$ ). The interaction showed a significant overall incremental effect on MBI-Cyn (*T2*),  $F(1,87) = 6.06$ ,  $p < .05$ , small to medium effect size, and accounted for 4% of the variance in MBI-Cyn (*T2*). Results presented in Figure 4 portrays the nature of the interaction, using the PROCESS Macro

model 1 output data for visualizing the conditional effect. As shown, the simple slope for MBI-Cyn ( $T1$ ) on MBI-Cyn ( $T2$ ) is significantly and positively steeper in the control group (simple slope = .93,  $t = 6.38$ ,  $p < .001$ ) than intervention group (simple slope = .50,  $t = 5.01$ ,  $p < .001$ ), meaning that in the intervention group, people's cynicism was less consistent over time compared to the control group. In other words, the intervention disturbed the association between early cynicism and late cynicism. Thus, Hypothesis 1b was supported.

### ***Professional efficacy***

As presented in Table 2, MBI-PE ( $T1$ ) has positive impact on MBI-PE ( $T2$ ) ( $b = .75$ , 95%CI [.37,.93]). However, group does not moderate this relationship ( $b = .03$ , 95%CI [-.25,.47]). Results presented in Figure 5 portrays the nature of the interaction, using the PROCESS Macro model 1 output data for visualizing the conditional effect. As shown, two slopes are not obviously different from each other which echoed that two groups did not show a difference in this subscale over time. Thus, Hypothesis 1c was not supported.

Overall, the findings reflect the effectiveness of the intervention for pooled sample. Specifically, the intervention combats increasing emotional exhaustion and cynicism over time in the intervention group while made no impact on professional efficacy. Therefore, Hypothesis 1 was partially supported.

### **Role of Empathy Styles**

Hypothesis 2 posits the moderation effects of empathy styles on the Burnout Recovery intervention effectiveness in the intervention group (see Figure 1). PROCESS Macro model 1 for SPSS (Hayes, 2017) was conducted only among intervention group to test Hypothesis 2, after controlling for age, job experience, and all empathy styles subscales except the predictor subscale in each model (95% bias-corrected bootstrapping with 5,000 resamples). The results from the



analyses are presented in Table 3. As can be seen, none of the interactions showed significant incremental effects on outcomes of interest. Therefore, there was no moderation effect for any of the empathy styles on pre intervention burnout-post intervention burnout relationship in intervention group. Thus, Hypothesis 2 was not supported.

**Table 2**

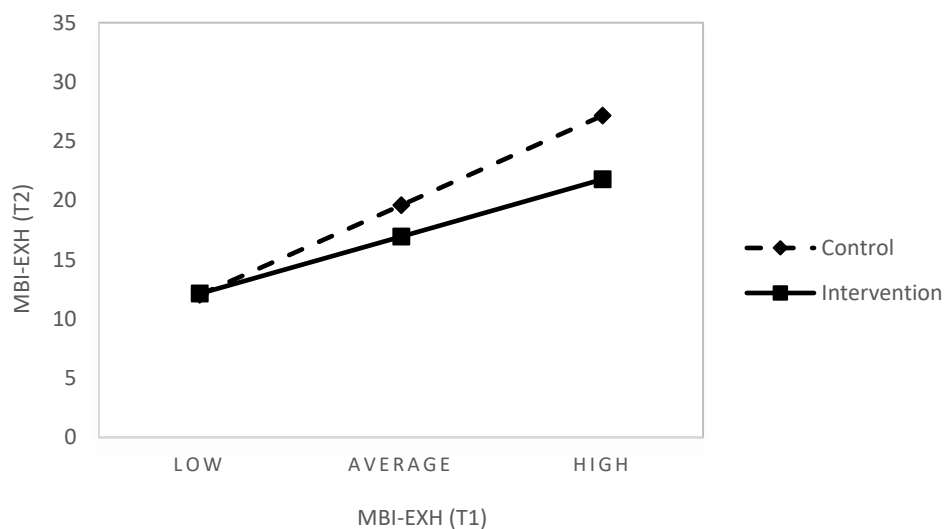
*Moderation Regression Coefficients and Confidence Intervals (CIs) for Moderating Effect of Intervention Conditions on Pre Intervention Burnout and Post Intervention Burnout.*

Path	X: MBI-Exh (T1) Y: MBI-Exh (T2)		X: MBI-Cyn (T1) Y: MBI-Cyn (T2)		X: MBI-PE (T1) Y: MBI-PE (T2)	
	Coeff.	95% CI	Coeff.	95% CI	Coeff.	95% CI
X->Y	<b>.99</b>	<b> [.77,1.15]</b>	<b>.93</b>	<b> [.70,1.15]</b>	<b>.75</b>	<b> [.37,.93]</b>
Group -> Y	<b>-2.64</b>	<b> [-4.81,-.57]</b>	-1.38	[-3.81,1.01]	-.67	[-2.52,1.05]
INT -> Y	<b>-.35</b>	<b> [-.60,-.08]</b>	<b>-.43</b>	<b> [-.72,-.15]</b>	.03	[-.25,.47]
	F (5,87)=21.00, p=.00,r=.74,r2=.55		F (5,87)=14.10, p=.00,r=.67,r2=.45		F (5,86)=22.76, p=.00,r=.75,r2=.57	

*Note.* 95% bias-corrected bootstrapping with 5,000 resamples. Significant results are bolded. X: Independent variable. Y: Dependent variable. INT: X\*Group. T1 is pre intervention assessment. T2 is post intervention assessment.

**Figure 3**

*Interaction Effect of MBI-Exh (T1) and Intervention conditions on MBI-Exh (T2)*

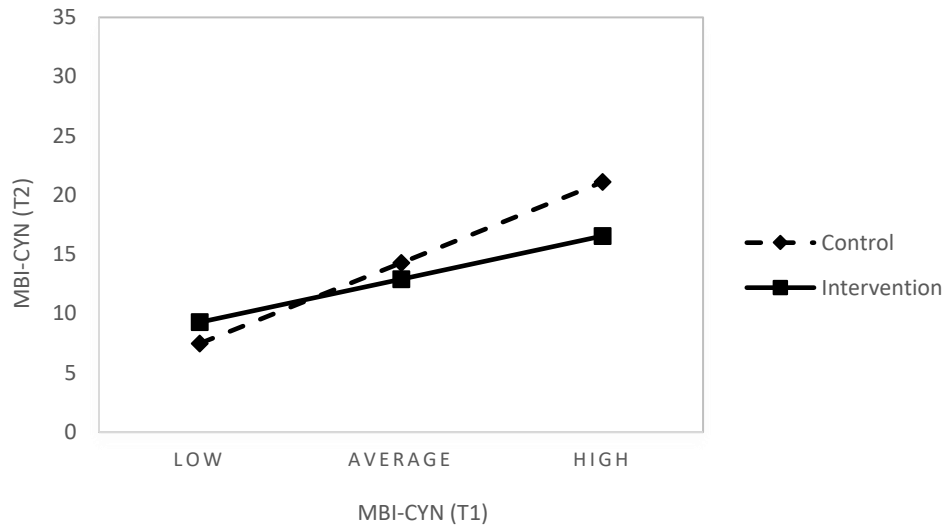


*Note.* Data was obtained from the PROCESS Macro model 1 output for visualizing the conditional effect. Two-tailed. The graph is based on the linear regression approach to examine the effectiveness

of the intervention, that is the lines depict the strength of association between early (T1) and late (T2) emotional exhaustion for the intervention versus control group.

**Figure 4**

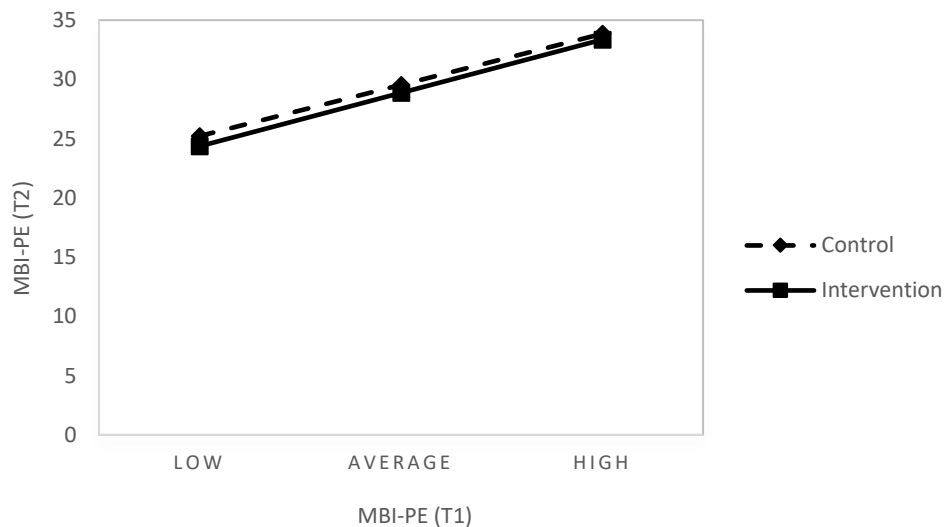
*Interaction Effect of MBI-Cyn (T1) and Intervention conditions on MBI-Cyn (T2)*



*Note.* Data was obtained from the PROCESS Macro model 1 output for visualizing the conditional effect. Two-tailed. The graph is based on the linear regression approach to examine the effectiveness of the intervention, that is, the lines depict the strength of association between early (T1) and late (T2) cynicism for the intervention versus control group.

**Figure 5**

*Interaction Effect of MBI-PE (T1) and Intervention conditions on MBI-PE (T2)*



*Note.* Data was obtained from the PROCESS Macro model 1 output for visualizing the conditional

effect. Two-tailed. The graph is based on the linear regression approach to examine the effectiveness of the intervention, that is, the lines depict the strength of association between early (T1) and late (T2) professional efficacy for the intervention versus control group.

**Table 3**

*Moderation Regression Coefficients and Confidence Intervals (CIs) for Moderating Effect of Empathy Style's Subscales on Pre Intervention Burnout and Post Intervention Burnout in Intervention Group.*

Path	X: MBI-Exh (T1) Y: MBI-Exh (T2) N = 69		X: MBI-Cyn (T1) Y: MBI-Cyn (T2) N = 69		X: MBI-PE (T1) Y: MBI-PE (T2) N = 68	
	Coeff.	95% CI	Coeff.	95% CI	Coeff.	95% CI
W: IRI-PT						
X->Y	<b>.65</b>	<b> [.48,.89]</b>	<b>.47</b>	<b> [.25,.68]</b>	<b>.79</b>	<b> [.55,1.04]</b>
IRI-PT -> Y	-.21	[-.53,.18]	.07	[-.31,.44]	-.25	[-.53,.03]
INT -> Y	-.01	[-.10,.03]	.01	[-.06,.05]	-.05	[-.10,.01]
	F (8,60)=6.56, p=.00,r=.68,r2=.47		F (8,60)=3.08, p=.005,r=.54,r2=.29		F (8,59)=10.31, p=.00,r=.76,r2=.58	
W: IRI-EC						
X->Y	<b>.65</b>	<b> [.47,.87]</b>	<b>.47</b>	<b> [.25,.68]</b>	<b>.75</b>	<b> [.46,.99]</b>
IRI-EC -> Y	.23	[-.15,.68]	-.15	[-.64,.29]	.01	[-.30,.40]
INT -> Y	.01	[-.05,.05]	-.01	[-.08,.05]	.01	[-.05,.08]
	F (8,60)=6.60, p=.00,r=.68,r2=.47		F (8,60)=3.09, p=.005,r=.54,r2=.29		F (8,59)=9.45, p=.00,r=.75,r2=.56	
W: IRI-PD						
X->Y	<b>.65</b>	<b> [.46,.85]</b>	<b>.48</b>	<b> [.23,.67]</b>	<b>.73</b>	<b> [.51,1.00]</b>
IRI-PD -> Y	.11	[-.17,.42]	-.04	[-.41,.36]	-.23	[-.45,.05]
INT -> Y	-.01	[-.04,.03]	.00	[-.04,.04]	.04	[-.04,.08]
	F (8,60)=6.60, p=.00,r=.68,r2=.47		F (8,60)=3.08, p=.005,r=.54,r2=.29		F (8,59)=10.36, p=.00,r=.76,r2=.58	
W: IRI-FAN						
X->Y	<b>.64</b>	<b> [.45,.83]</b>	<b>.47</b>	<b> [.22,.66]</b>	<b>.75</b>	<b> [.52,1.03]</b>
IRI-FAN -> Y	-.09	[-.38,.18]	.12	[-.20,.44]	-.04	[-.32,.24]
INT -> Y	.00	[-.04,.03]	-.01	[-.05,.04]	.01	[-.04,.05]
	F (8,60)=6.52, p=.00,r=.68,r2=.47		F (8,60)=3.10, p=.005,r=.54,r2=.29		F (8,59)=9.48, p=.00,r=.75,r2=.56	

Note. 95% bias-corrected bootstrapping with 5,000 resamples. Significant results are bolded. X: Independent variable. Y: Dependent variable. W: Moderator. INT: X\*W. T1 is pre intervention assessment. T2 is post intervention assessment.

### Underlying Process

Hypotheses 3 to 5 posit the moderated mediation (conditional indirect) effects of recovery experience, self-care activities, and act processes on burnout over time (see Figure 2), respectively,

in the pooled sample ( $N = 93$ ), including 69 people in the intervention group and 24 people in the control group. The pooled sample from main trial and the replication study was used as the study's samples were only significantly different in very few baseline measures and were acceptable to be pooled (Bangdiwala et al., 2016). PROCESS Macro model 7 for SPSS (Hayes, 2017) was conducted to test Hypotheses 3 to 5, after controlling for age, job experience, and pre-assessment ( $T1$ ) of the mediator (post-assessment,  $T2$ ) which is involved in each model (95% bias-corrected bootstrapping with 5,000 resamples). The results from the moderated mediation analyses are presented in Table 4.

### ***Recovery Experience***

As shown in Table 4, there is a non-significant moderated mediation effect for each of the recovery experience subscales in all three burnout subscales ( $CI$  in all indexes of moderated mediation include zero). Results also showed the two-way interaction effect between group and any of burnout subscales on recovery subscales were not significant (all  $CI$ s included zero), meaning that the intervention did not make a substantial difference in the intervention group compared to control group regarding either REQ-PsyDet or REQ-Rel behaviors. In general, the findings implied that there was no indirect effect between pre intervention burnout and post intervention burnout through recovery experience behaviors and that the intervention did not make a difference regarding this relationship between groups. Therefore, Hypothesis 3 was not supported.

### ***Self-Care Activities***

As shown in Table 4, there is a non-significant moderated mediation effect for each of the self-care activities subscales in all three burnout subscales ( $CI$  in all indexes of moderated mediation include zero). Results also showed the two-way interaction effects between group and

any of burnout subscales on self-care activities subscales were not significant (all *CI*s included zero), meaning that the intervention did not make a substantial difference in the intervention group compared to control group regarding self-care activities subscales. In general, the findings implied that there was no indirect effect between pre intervention burnout and post intervention burnout through self-care activities and that the intervention did not make a difference regarding this relationship between groups. Therefore, Hypothesis 4 was not supported.

### *ACT processes*

As shown in Table 4, findings revealed that only there is one subscale, ACT-Aware, that showed a significant moderated mediation effect and two other subscales (i.e., ACT-Open and ACT-value) indicated nonsignificant effects neither in moderation effects nor in moderated mediation effects, meaning that there was no indirect effect between pre intervention burnout and post intervention burnout through either ACT-Open or ACT-value behaviors and that the intervention did not make a difference regarding these relationship between groups.

When it comes to ACT-Aware, as presented in Table 4, there is only one significant moderated mediation effect, and it is related to MBI-Exh. Results demonstrated a significant moderated mediation effect (index of moderated mediation =  $-.21$ , 95% *CI* [ $-.41, -.04$ ]), reflecting that there was an indirect effect between MBI-Exh ( $T1$ ) and MBI-Exh ( $T2$ ) through ACT-Aware and the intervention made a difference regarding this relationship between groups. To be more elaborated, findings (see Table 4) showed the two-way interaction effect between group and MBI-Exh ( $T1$ ) on ACT-Aware was significant ( $b = .23$ , 95%*CI* [ $.04, .43$ ]) such that in the control group, MBI-Exh ( $T1$ ) was significantly and negatively associated with ACT-Aware ( $b = -.25$ , 95%*CI* [ $-.43, -.06$ ]) whereas in the intervention group this association is not significant ( $b = -.02$ , 95%*CI* [ $-.14, .11$ ]). The interaction showed a significant overall incremental effect on ACT-Aware,  $F(1, 81)$

= 4.45,  $p < .05$ , small to medium effect size, and accounted for 4% of the variance in ACT-Aware. Figure 6 portrays the nature of the interaction, using the PROCESS Macro model 7 output data for visualizing the conditional effect. As shown, the simple slope for MBI-Exh ( $T1$ ) on ACT-Aware in the control group is significantly negative (simple slope =  $-.25$ ,  $t = -2.69$ ,  $p < .05$ ) while there is a smooth non-significant negative slope in intervention group (simple slope =  $-.02$ ,  $t = -.25$ ,  $p > .05$ ). It can be inferred in high emotional exhaustion people in the control group show significantly lower level of behavioral awareness, but this destructive relationship was neutralized in the intervention group. Given these findings, the next step is to compare the conditional indirect effects. As shown in the Table 4, the conditional indirect effect was significant and positive in control group ( $b = .22$ , 95%CI [.02,.40]) whereas in the intervention group, the conditional indirect effect was not significant ( $b = .07$ , 95%CI [.01,.17]) and the difference of two conditional indirect effects was significant ( $diff = -.21$ , 95%CI [-.41,-.04]). The result for moderation mediation model regarding ACT-Aware also is presented in Figure 7. In general, the findings imply that in the control group, increased emotional exhaustion led to higher emotional exhaustion over time through decreasing behavioral awareness but this destructive indirect relationship was neutralized in the intervention group by engaging in the behavioral awareness.

Noteworthy, while the effect of MBI-Cyn ( $T1$ ) on MBI-Cyn ( $T2$ ) through ACT-Aware in control group was significant ( $b = .14$ , 95%CI [.02,.33]), the difference between the conditional indirect effects was not significant ( $diff = -.10$ , 95%CI [-.29,.05]). Therefore, in general, the findings imply that even though there are one significant indirect effect between MBI-Cyn ( $T1$ ) and MBI-Cyn ( $T2$ ) through ACT-Aware, the intervention did not make a significant difference regarding this relationship between intervention and control groups.

Overall, results indicated that among ACT processes subscales, the only sequential explanation of the burnout effect, specifically emotional exhaustion, involves indirect change in behavioral awareness, such that there was significant indirect effect between pre intervention exhaustion and post intervention exhaustion through behavioral awareness and that the intervention did make a difference regarding this relationship between groups. Therefore, Hypothesis 5 was partially supported.

**Table 4**

*Moderated-Mediation Regression Coefficients and Confidence Intervals (CIs) for Predicting Post-Burnout*

Path	X: MBI-Exh (T1) Y: MBI-Exh (T2)		X: MBI-Cyn (T1) Y: MBI-Cyn (T2)		X: MBI-PE (T1) Y: MBI-PE (T2)	
	Coeff.	95% CI	Coeff.	95% CI	Coeff.	95% CI
<b>M: REQ-PsyDet</b>						
X->Y	<b>.65</b>	<b> [.51,.79]</b>	<b>.63</b>	<b> [.47,.80]</b>	<b>.79</b>	<b> [.60,.93]</b>
X -> M	-.05	[-.17,.09]	-.06	[-.13,.05]	.04	[-.14,.17]
INT -> M	-.02	[-.17,.11]	.05	[-.07,.15]	-.07	[-.24,.15]
COV->M	<b>.58</b>	<b> [.37,.77]</b>	<b>.61</b>	<b> [.40,.79]</b>	.61	[-41,.80]
M->Y	<b>-.68</b>	<b> [-1.21,-.08]</b>	-.50	[-1.06,.06]	.11	[-.32,.52]
COV->Y	.46	[-.02,.90]	<b>.60</b>	<b> [.08,1.14]</b>	-.14	[-.62,.32]
X->M->Y	.03	[-.06,.15]	.03	[-.02,.10]	.00	[-.05,.04]
	<i>.04</i>	<i> [-.004,.11]</i>	.00	[-.05,.05]	.00	[-.03,.02]
IMM	.01	[-.09,.11]	-.02	[-.12,.03]	-.01	[-.06,.05]
		<i>N = 91</i>		<i>N = 91</i>		<i>N = 90</i>
<b>M: REQ-Rel</b>						
X->Y	<b>.67</b>	<b> [.52,.81]</b>	<b>.66</b>	<b> [.49,.81]</b>	<b>.80</b>	<b> [.62,.95]</b>
X -> M	<b>-.10</b>	<b> [-.21,-.001]</b>	-.07	[-.17,.05]	.05	[-.11,.15]
INT -> M	.06	[-.05,.18]	.10	[-.03,.20]	-.03	[-.17,.17]
COV->M	<b>.49</b>	<b> [.29,.68]</b>	<b>.51</b>	<b> [.30,.70]</b>	<b>.51</b>	<b> [.30,.71]</b>
M->Y	-.29	[-.99,.46]	-.35	[-1.08,.41]	.05	[-.44,.49]
COV->Y	.18	[-.41,.75]	.70	[-.02,1.46]	-.26	[-.75,.22]
X->M->Y	.03	[-.03,.15]	.03	[-.03,.12]	.00	[-.04,.04]
	.01	[-.02,.05]	-.01	[-.06,.02]	.00	[-.03,.03]
IMM	-.02	[-.11,.03]	-.03	[-.15,.03]	-.01	[-.05,.04]
		<i>N = 91</i>		<i>N = 91</i>		<i>N = 90</i>
<b>M: ACT-Open</b>						
X->Y	<b>.67</b>	<b> [.55,.79]</b>	<b>.55</b>	<b> [.40,.69]</b>	<b>.76</b>	<b> [.57,.90]</b>
X -> M	-.07	[-.24,.13]	-.06	[-.20,.10]	.01	[-.26,.20]
INT -> M	.04	[-.17,.23]	-.01	[-.20,.16]	.10	[-.13,.42]
COV->M	<b>.70</b>	<b> [.46,.88]</b>	<b>.70</b>	<b> [.50,.88]</b>	<b>.70</b>	<b> [.48,.86]</b>
M->Y	<b>-.88</b>	<b> [-1.17,-.57]</b>	<b>-.86</b>	<b> [-1.21,-.46]</b>	.22	[-.05,.46]
COV->Y	<b>.60</b>	<b> [.27,.92]</b>	<b>.54</b>	<b> [.15,.87]</b>	-.07	[-.30,.21]
X->M->Y	.06	[-.09,.24]	.05	[-.07,.21]	.00	[-.06,.05]
	.02	[-.08,.13]	.06	[-.03,.18]	.03	[-.01,.10]
IMM	-.04	[-.23,.14]	.01	[-.16,.17]	.02	[-.03,.12]
		<i>N = 87</i>		<i>N = 87</i>		<i>N = 87</i>

*Note.* 95% bias-corrected bootstrapping with 5,000 resamples. Significant results are bolded. X: Independent variable. Y: Dependent variable. M: Mediator. INT: X\*Group. COV: Mediator assessment (T1). All mediators are assessment (T2). IMM: Index of moderated mediation. In two-row cells, the above row is for control group and below row is for intervention group. Borderline estimates are italicized.



**Table 4**

*Moderated-Mediation Regression Coefficients and Confidence Intervals (CIs) for Predicting Post-Burnout (CONTINUED)*

Path	X: MBI-Exh (T1) Y: MBI-Exh (T2)		X: MBI-Cyn (T1) Y: MBI-Cyn (T2)		X: MBI-PE (T1) Y: MBI-PE (T2)	
	Coeff.	95% CI	Coeff.	95% CI	Coeff.	95% CI
<b>M: ACT-Aware</b>						
X->Y	<b>.63</b>	<b>[.50,.76]</b>	<b>.55</b>	<b>[.39,.69]</b>	<b>.72</b>	<b>[.50,.87]</b>
X -> M	<b>-.25</b>	<b>[-.40,-.09]</b>	<b>-.17</b>	<b>[-.35,-.02]</b>	<b>.17</b>	<b>[.01,.41]</b>
INT -> M	<b>.23</b>	<b>[.04,.43]</b>	.12	[-.06,.32]	-.01	[-.28,.21]
	<b>-.25</b>	<b>[-.43,-.06]</b>				
	-.02	[-.14,.11]				
COV->M	<b>.45</b>	<b>[.23,.70]</b>	<b>.44</b>	<b>[.23,.64]</b>	<b>.44</b>	<b>[.23,.64]</b>
M->Y	<b>-.89</b>	<b>[-1.21,-.57]</b>	<b>-.85</b>	<b>[-1.17,-.55]</b>	<b>.23</b>	<b>[.001,.46]</b>
COV->Y	<b>.42</b>	<b>[.10,.71]</b>	<b>.42</b>	<i>[-.004,.78]</i>	.05	[-.21,.31]
X->M->Y	<b>.22</b>	<b>[.07,.40]</b>	<b>.14</b>	<b>[.02,.33]</b>	<b>.04</b>	<i>[-.005,.12]</i>
	.01	[-.10,.12]	.05	[-.05,.15]	<b>.04</b>	<i>[-.002,.11]</i>
IMM	<b>-.21</b>	<b>[-.41,-.04]</b>	-.10	[-.30,.05]	.00	[-.07,.07]
		<i>N = 88</i>		<i>N = 88</i>		<i>N = 88</i>
<b>M: ACT-Value</b>						
X->Y	<b>.70</b>	<b>[.56,.84]</b>	<b>.67</b>	<b>[.50,.84]</b>	<b>.74</b>	<b>[.53,.89]</b>
X -> M	<b>-.11</b>	<b>[-.19,-.02]</b>	-.05	[-.14,.07]	.07	[-.06,.16]
INT -> M	<b>.10</b>	<i>[-.005,.21]</i>	-.02	[-.12,.15]	.02	[-.12,.21]
COV->M	<b>.45</b>	<b>[.19,.69]</b>	<b>.45</b>	<b>[.18,.71]</b>	<b>.42</b>	<b>[.15,.66]</b>
M->Y	.12	[-.54,.66]	-.09	[-.68,.47]	<b>.55</b>	<b>[.07,1.00]</b>
COV->Y	-.01	[-.52,.53]	.51	[-.11,1.18]	-.22	[-.73,.23]
X->M->Y	-.01	[-.08,.06]	.00	[-.04,.06]	.04	[-.04,.11]
	.00	[-.03,.02]	.00	[-.03,.03]	.05	[-.01,.17]
IMM	.01	[-.06,.08]	.00	[-.06,.04]	.01	[-.06,.15]
		<i>N = 88</i>		<i>N = 88</i>		<i>N = 88</i>
<b>M: SC-Inter</b>						
X->Y	<b>.66</b>	<b>[.51,.79]</b>	<b>.64</b>	<b>[.47,.79]</b>	<b>.80</b>	<b>[.59,.95]</b>
X -> M	-.03	[-.11,.07]	-.04	[-.12,.03]	.02	[-.11,.09]
INT -> M	-.03	[-.14,.07]	.04	[-.05,.14]	-.02	[-.14,.15]
COV->M	<b>.63</b>	<b>[.46,.78]</b>	<b>.65</b>	<b>[.48,.81]</b>	<b>.66</b>	<b>[.50,.82]</b>
M->Y	<b>-.80</b>	<b>[-1.50,-.15]</b>	<b>-1.37</b>	<b>[-2.17,-.62]</b>	.17	[-.43,.78]
COV->Y	.65	[-.05,1.35]	<b>1.37</b>	<b>[.61,2.11]</b>	-.31	[-.82,.22]
X->M->Y	.02	[-.04,.13]	.06	[-.04,.20]	.00	[-.04,.04]
	<b>.05</b>	<i>[-.001,.14]</i>	.00	[-.09,.08]	.00	[-.04,.04]
IMM	.02	[-.07,.12]	-.06	[-.23,.06]	.00	[-.06,.05]
		<i>N = 85</i>		<i>N = 85</i>		<i>N = 85</i>

*Note.* 95% bias-corrected bootstrapping with 5,000 resamples. Significant results are bolded. X: Independent variable. Y: Dependent variable. M: Mediator. INT: X\*Group. COV: Mediator assessment (T1). All mediators are assessment (T2). IMM: Index of moderated mediation. In two-row cells, the above row is for control group and below row is for intervention group. Borderline estimates are italicized.

**Table 4**

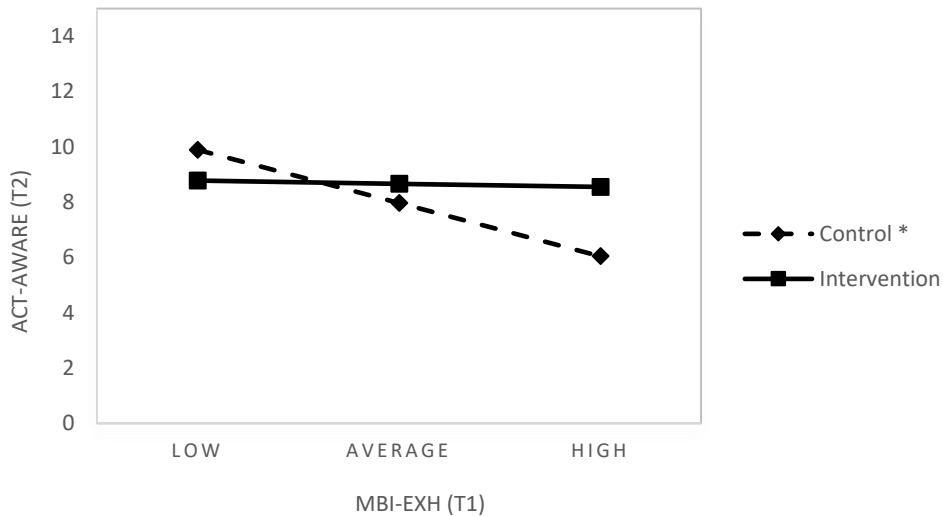
*Moderated-Mediation Regression Coefficients and Confidence Intervals (CIs) for Predicting Post-Burnout (CONTINUED)*

Path	X: MBI-Exh (T1) Y: MBI-Exh (T2)		X: MBI-Cyn (T1) Y: MBI-Cyn (T2)		X: MBI-PE (T1) Y: MBI-PE (T2)	
	Coeff.	95% CI	Coeff.	95% CI	Coeff.	95% CI
<b>M: SC-Health</b>						
X->Y	<b>.68</b>	<b> [.54,.86]</b>	<b>.61</b>	<b> [.45,.77]</b>	<b>.80</b>	<b> [.60,.94]</b>
X -> M	.00	[-.14,.11]	.02	[-.13,.11]	-.06	[-.14,.11]
INT -> M	-.01	[-.13,.15]	-.01	[-.12,.15]	.07	[-.11,.20]
COV->M	<b>.52</b>	<b> [.32,.72]</b>	<b>.54</b>	<b> [.34,.73]</b>	<b>.55</b>	<b> [.34,.74]</b>
M->Y	-.13	[-.83,.64]	-.51	[-1.29,.33]	.05	[-.46,.54]
COV->Y	.15	[-.60,.97]	.19	[-.59,.97]	-.24	[-.72,.24]
X->M->Y	.00	[-.04,.08]	-.01	[-.07,.10]	.00	[-.04,.04]
	.00	[-.03,.03]	.00	[-.06,.03]	.00	[-.02,.04]
IMM	.00	[-.08,.05]	.01	[-.13,.07]	.00	[-.05,.06]
	N = 90		N = 90		N = 89	
<b>M: SC-Activity</b>						
X->Y	<b>.67</b>	<b> [.53,.80]</b>	<b>.62</b>	<b> [.45,.76]</b>	<b>.78</b>	<b> [.59,.91]</b>
X -> M	-.05	[-.12,.03]	-.01	[-.07,.08]	.03	[-.06,.09]
INT -> M	.02	[-.07,.11]	.01	[-.10,.08]	-.03	[-.18,.13]
COV->M	<b>.74</b>	<b> [.61,.86]</b>	<b>.74</b>	<b> [.61,.86]</b>	<b>.74</b>	<b> [.60,.88]</b>
M->Y	.10	[-.38,.71]	-.27	[-.98,.65]	<b>.51</b>	<b> [.09,.96]</b>
COV->Y	.15	[-.43,.64]	.64	[-.32,1.31]	<b>-.41</b>	<b> [-.83,-.004]</b>
X->M->Y	-.01	[-.04,.03]	.00	[-.03,.04]	.02	[-.03,.06]
	.00	[-.03,.02]	.00	[-.03,.03]	.00	[-.07,.08]
IMM	.00	[-.03,.04]	.00	[-.06,.04]	-.02	[-.10,.08]
	N = 90		N = 90		N = 89	
<b>M: SC-Nut</b>						
X->Y	<b>.66</b>	<b> [.52,.80]</b>	<b>.62</b>	<b> [.46,.76]</b>	<b>.78</b>	<b> [.59,.92]</b>
X -> M	-.02	[-.07,.03]	-.02	[-.07,.04]	.02	[-.05,.08]
INT -> M	-.01	[-.08,.05]	.03	[-.04,.11]	-.03	[-.13,.07]
COV->M	<b>.79</b>	<b> [.67,.90]</b>	<b>.79</b>	<b> [.67,.91]</b>	<b>.79</b>	<b> [.67,.92]</b>
M->Y	-.82	[-1.64,.07]	<b>-1.46</b>	<b> [-2.36,-.44]</b>	.03	[-.71,.76]
COV->Y	.81	[-.05,1.73]	<b>1.48</b>	<b> [.51,2.48]</b>	-.01	[-.93,.85]
X->M->Y	.01	[-.02,.08]	.03	[-.05,.13]	.00	[-.03,.02]
	.03	[-.01,.08]	-.02	[-.11,.04]	.00	[-.04,.04]
IMM	.01	[-.06,.07]	-.05	[-.19,.05]	.00	[-.05,.06]
	N = 89		N = 89		N = 88	

*Note.* 95% bias-corrected bootstrapping with 5,000 resamples. Significant results are bolded. X: Independent variable. Y: Dependent variable. M: Mediator. INT: X\*Group. COV: Mediator assessment (T1). All mediators are assessment (T2). IMM: Index of moderated mediation. In two-row cells, the above row is for control group and below row is for intervention group. Borderline estimates are italicized.

**Figure 6**

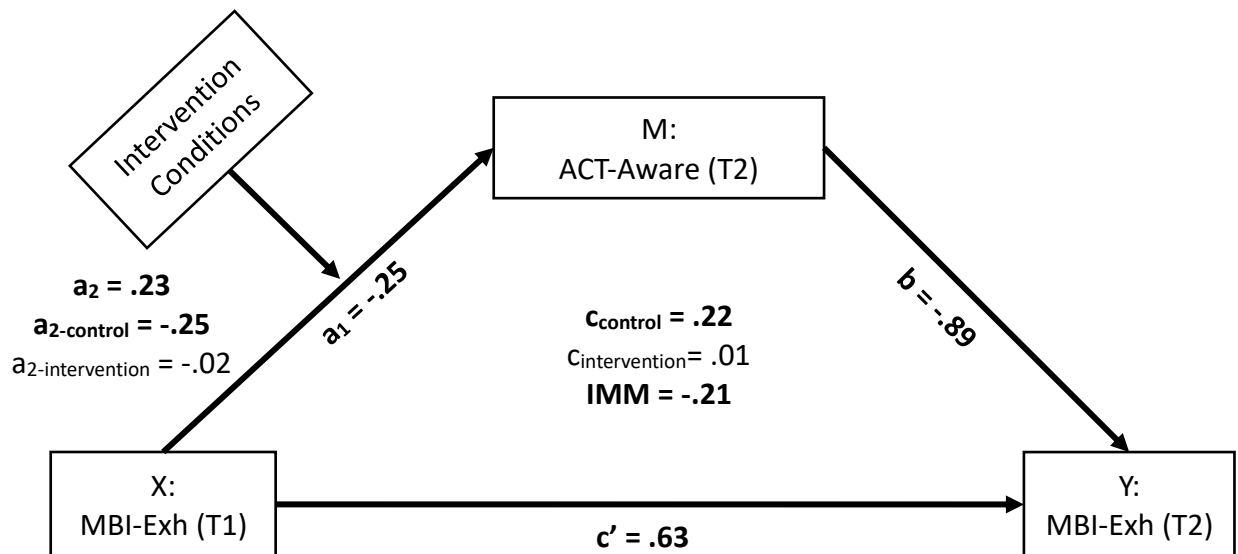
*Interaction Effect of MBI-Exh (T1) and Intervention conditions on ACT-Aware (T2)*



*Note.* Data was obtained from the PROCESS Macro model 7 output for visualizing the conditional effect. Two-tailed. Star shows significant effect.

**Figure 7**

*Results of PROCESS Model 7 for Underlying Process of Change in Emotional Exhaustion Through Behavioral Awareness*



*Note.* Significant coefficients are bolded.  $a_1$ : X->M.  $a_2$ : X\*group->M.  $a_{2-control}$ : X->M in control group.  $a_{2-intervention}$ : X->M in intervention group.  $b$ : M->Y.  $c'$ : X->Y.  $c$ : X->M->Y.  $c_{control}$ : X->M->Y in control group.  $c_{intervention}$ : X->M->Y in intervention group. IMM: Index of moderated mediation.

## Discussion

The growing increase of burnout among health care workers and its adverse impact on staff, patients, and health system on one side and the existence of potential outbreak situations that may hit during their professional life such as COVID-19 on the other side, have highlighted the importance of implementing burnout prevention interventions to alleviate this critical population burnout. Meanwhile, given the intense and stressful nature of healthcare providers and the fact that resources are not endless, it is vital to attempt implementing the most promising and cost-effective interventions so that it will benefit both intervention recipients and providers. For this purpose, it is important to examine why an intervention works and for whom this intervention can be more effective and leveraged. Despite the implementation of many burnout interventions in healthcare population, there are relatively few studies that evaluate the underlying process and explore the influential individual and situational factors in the effectiveness of an intervention. Thus, the purpose of this study is to evaluate a successful theory-based controlled intervention, namely the Burnout Recovery program, and provide insight into the process through which it worked and examine potential individual factors that might affect the effectiveness of this intervention. This study, in particular, examined the mediating role of recovery experience, self-care activities, and ACT processes in the Burnout Recovery effectiveness. Finally, it looked deeper at the empathy styles of the participants involved in the intervention and examined its impacts on the Burnout Recovery effectiveness.

The findings of this study supported the positive effectiveness of the Burnout Recovery program in the pooled sample from the main trial Burnout Recovery program (Gilin et al., 2021) and the replication study (Foote, 2022). Precisely, findings indicated that intervention group showed less consistency in emotional exhaustion and cynicism compared to the control group

(see Table 2). Results showed a small to medium effect sizes suggesting that there are small but meaningful changes. However, there were no differences in professional efficacy level over time between the two groups. These results echoed the finding from Gilin and colleagues' (2021) study which showed an overall effectiveness of Burnout Recovery program.

Meanwhile, both groups showed an elevated level of professional efficacy over time. This result is consistent with Etezad and colleagues' (2021) study which reported a unique burnout profile of not only a high level of emotional exhaustion and cynicism, but also a high sense of worthiness in job (i.e., professional efficacy) for health care workers at the time of COVID-19. Further findings in the current study tried to answer two questions: Why does burnout recovery work? and who benefits more from this intervention?

### **Why Does Burnout Recovery Work?**

According to MacKinnon & Luecken (2011), there are several explanations regarding the possible outcomes in the intervention mediation analysis which can be also applied to the moderated mediation analyses. First, a significant moderated mediation model supports the conceptual theory and reflects success in the action theory which means the outcome changed over the intervention through changing in the examined program. Moreover, the components and activities of the program were effective enough to make changes in the mediator variable(s). Second, if the results do not show a significant interaction effect between the independent variable and intervention conditions, they imply the failure of the action theory; this means either intervention activities and components were not sufficient to change the theorized mediator, or the tools to assess the mediator were not enough reliable or valid to detect the change in the mediator.

Third, if the results do not show a significant interaction effect but a significant overall

effect of intervention (e.g., Hypothesis 1 in the current study), it could be inferred that intervention did work, and the conceptual theory based on which the intervention is designed is supported. However, the change in the outcomes was not through the change in the examined mediator. There might be other potential mediator(s) that could explain the underlying process of the intervention. Likewise, if there is an insignificant interaction between the independent variable and the group conditions – however, there is a significant relationship between mediator and dependent variable, it reflects the success in the conceptual theory but a failure in the action theory. Fourth, if the interaction shows a significant effect but the mediator does not significantly lead to the dependent variable, it implies that the action theory was successful to change the mediator. However, there is no evidence for the conceptual theory because the mediator did not cause a change in the dependent variable. It is also possible that there is a delay in effects, meaning that the effects of the mediator(s) will be revealed at future measurements but not immediately after the change.

Finally, if there are neither significant overall effects, nor significant interaction and indirect relations, this suggests that the theory basis of the intervention needs to be refined, or a new conceptual theory should be developed in the field of outcome of interests. Therefore, the findings of the current study are discussed based on the provided interpretations. Noteworthy, the findings from the first Hypothesis reflected that the intervention did work, and the theories based on which the intervention has been designed (i.e., the conceptual theory in the current study) was supported. There were three potential mediators which were expected to explain the process of changing burnout in the Burnout Recovery program.

### ***Recovery Experience***

Based on the findings (see Table 4), there were neither significant interaction effects nor

significant indirect relationships between pre intervention burnout and post intervention burnout subconstructs through any of the recovery experience subscales, including psychological detachment and relaxation. Based on MacKinnon & Luecken (2011) interpretations of the intervention mediation analysis, the findings imply that although the intervention successfully combated increasing burnout over time, this buffering was not through engaging in the recovery experiences behaviors, and other potential mediators might involve in the underlying process of the intervention. Moreover, looking at the Recovery Experience Questionnaire (REQ; Sonnentag & Fritz, 2007), suggests that this tool shows a good internal consistency in the current study (range from .80 to .82). Thus, it is possible that the intervention activities and components relevant to the recovery experience need to be improved and powerful enough to make changes in the recovery experience behaviors.

### *Self-care Activities*

In accordance with the findings (see Table 4), there were neither significant interaction effects nor significant indirect relationships between pre intervention burnout and post intervention burnout subconstructs through any of the self-care activities subscales, including interpersonal relations, health responsibilities, physical activities, and nutrition. Based on the interpretations of MacKinnon and Luecken (2011), these findings imply that although the intervention successfully combated increasing burnout over time, this buffering was not through engaging in selfcare activities, and other potential mediators might be involved in the underlying process of the intervention. Moreover, looking at the tool to measure self-care activities (HPLP II; Walker & Hill-Polerecky, 1996) suggests that this tool showed reliability ranged from acceptable to excellent in the current study. Thus, it is possible that the intervention activities and components relevant to selfcare activities need to be improved and powerful enough to

change selfcare activities.

### ***ACT Process***

According to the findings (see Table 4), among the three ACT process subscales, including behavioral awareness, openness to experience, and valued action behaviors, there was only one significant moderated mediation effect on emotional exhaustion over time through behavioral awareness. Based on the interpretation listed already (MacKinnon & Luecken, 2011), this finding was the indicator for a success in the action theory for behavioral awareness subscale, meaning that intervention activities and components effectively made difference in behavioral awareness between the control and intervention groups such that in the control group, the higher emotional exhaustion led to lower behavioral awareness, but the intervention buffered this negative association for the intervention group. However, for the two other subscales, the findings reflected that either intervention activities were not sufficient to make changes, or the measurement tools did not work properly to assess the changes. Looking at the short version of the ACT process questionnaire revealed that even though openness to experience showed a good internal consistency ( $\alpha=.80$ ), the valued action showed a low reliability ( $\alpha=.59$ ) which limits the ability to accurately assess the potential changes in the valued action behaviors in the intervention.

Overall, the findings revealed that Burnout Recovery intervention did work in terms of combating reaching higher burnout over time. More specifically, it did work through engaging in behavioral awareness. When looking at intervention components and activities in detail, it can be seen that ACT relevant components and activities are the most frequently provided materials in the six-week intervention. ACT matrix is the main tool in this program which was practiced each workshop session as well as each coaching session. Therefore, being exposed to the ACT



materials frequently and actively practicing it could explain why this mediator is the one that did change the most and showed meaningful in the underlying process of the Burnout Recovery program. Findings also reflected the need for improvement in assessment tools and the possibility of existence of other potential mediators that could explain the mechanism of change in burnout in the Burnout Recovery program.

### **Who Benefits More From the Intervention?**

Findings showed that none of the empathy styles impacted the effectiveness of Burnout Recovery program in the intervention group. These findings are not consistent with the literature as the past research have reported that at least perspective taking (Paro et al., 2014) and personal distress (von Harscher et al., 2018) have been associated with burnout and can affect learning new contents. The findings might suggest the strong influence of the situational factors such as the emergence of the pandemic. Indeed, at the time of COVID-19, there might be a substantial internal need in the participants to learn helpful activities in order to avoid getting worse in burnout. Based on the COR theory (Hobfoll et al., 1990), at the time of stress, people are more motivated to recover their lost resources and even gain new resources, since the more the resources they have, the easier it would be to combat against the burnout. This motivation might be strong enough to neutralize the effects of other individual factors such as empathy styles in responding to the Burnout Recovery intervention. Also, there might be other individual or situational factors that neutralize the effects of empathy styles on the effectiveness of the Burnout Recovery program.

Overall, there are some other explanations regarding the findings of the current study that should be considered. Both interventions ran at the time of COVID-19. Emergence of the COVID-19 and given many waves of increased infection reports, exacerbated the pressure and

work stressors for healthcare providers; in an intense and stressful situation, it is likely that people do not be able to put enough effort to apply all the learned intervention components in their life (Busireddy et al., 2017). Moreover, it is possible that during the pandemic, some situational factors were powerful enough to buffer the effectiveness of intervention in changing mediator or neutralized the effects of potential moderators on the intervention effectiveness. Finally, the small sample size might decrease the statistical power of the current analysis which results in insignificant results even when there might be some effects to be detected. As shown in the results, there are some borderline effects that could have been significant with a larger sample size.

### **Implications**

The high prevalence of burnout in healthcare workers and its negative impacts on not only staff, but also patients and overall health system shed light on the importance of implementing burnout alleviation interventions among this critical population. Even with successful interventions, it is still beneficial to explore the process of change in burnout and examine the influential factors that could increase the effectiveness of the intervention. The results of this study provide valuable insight into the mechanism through which the Burnout Recovery intervention mitigated burnout. According to the results, the most supported underlying process of change happened through changing behavioral awareness, which is one of the subscales of the ACT process construct. This implies that the activities, components, and measurement tools related to the behavioral awareness did an effective performance in the intervention program.

The ACT process components were the most frequent provided materials over the course, provided and practiced during each of the workshop sessions and during the coaching

sessions via working on the ACT matrix. The main purpose of the ACT matrix is noticing and awareness about values, thoughts and feelings, and actions towards or away from values. It can be inferred that the individual practicing, reflections through the coaching sessions, and being exposed to the concept and several group discussions and reflection questions and activities during the workshop led leaders to engage more, learn better, and become motivated to apply the learned knowledge in their life.

Thus, it is recommended to enhance the Burnout Recovery program by improving the components and activities related to the other hypothesized mediators such as self-care and recovery experiences in a way similar to what provided for the ACT process. To be more elaborated, more exposure to the self-care activities and recovery experience by conducting several group discussions and activities, providing workbooks and handouts, and asking reflection questions may lead to more engagement in such activities which may result in a meaningful sequential role of these mediators in the Burnout Recovery program.

Coaching sessions are the other component of the program which were mainly focused on the ACT process. Thus, providing more individual opportunities to the participants may help them to set goals for developing or improving their self-care activities and recovery plan and share their concerns regarding applying the learned techniques in their life, so that it is more likely that they apply the learned content in their personal and professional life. Meanwhile, it is recommended to utilize more reliable measurement tools in the future Burnout Recovery implementations which contribute to have a more precise assessment of outcomes of interests. For instance, utilizing more reliable measure to assess valued-action behaviors might lead to have a more accurate assessment of this subconstruct which might detect possible changes over time.

Overall, examining moderating-mediating variables in a successful interventions trial can help understand the burnout alleviation process, improve the program components and measurements, and guide better intervention targeting for future implementations which results in optimal effects on healthcare leaders' wellbeing and ultimately improves the whole workplace's healthy engagement behaviors and mental health.

### **Limitations and future research**

The main limitation of this study is regarding the sample. Even though the current sample is a pooled sample of two studies, it still was small and might affect the significance of the results. As shown in results, there are several models with borderline significant estimates which might result from the small sample size for the conducted analysis. Moreover, the majority of sample is Caucasian-female and from one big health care organization (VON) or from Nova Scotia province. This sampling bias might limit the generalizability of the results to only female and Caucasian people, and maybe only to specific organization. It is recommended for future studies to attempt to have a larger sample with more variability in terms of gender, organizations, and other characteristics so that increase the power of statistics and also the generalizability of the results.

The other limitation is using a pooled sample. Even though pooling samples are acceptable with the aim of increasing the statistic power, there are still some sample heterogeneities that cannot be avoided even if the samples are not significantly different in baselines and demographics. For the studied sample, each sample was affected by a different time of Covid-19. Although both samples experience waves of Covid-19, it might be different in terms of intensity and other environmental factors. All visible or not visible factors related to time might affect the response of the participants to the intervention. Future research should

apply research questions on one sample in order to avoid the effects of time period or other variabilities on participants.

Furthermore, results of this study suggested the effectiveness of Burnout Recovery program while only the mediating role of ACT processes (i.e., behavioral awareness) is supported. It is likely that there are other mediators that can explain the process of change in burnout in this specific burnout intervention. Meanwhile, in this study only one individual factor examined as the moderator in the program effectiveness. It is recommended for the future research in Burnout Recovery and also other intervention evaluation studies to examine more mediators and moderators to gain a better insight into the program underlying process and influential factors that can affect the effectiveness.

Finally, the pooled sample was from two longitudinal study. Thus, the significant directions stated in the results of this study deserved more attention. However, exploring all the relationships was beyond the scope of the current study. Future research should consider the significant results in this study and examine them in depth in separate studies.

### **Conclusion**

Healthcare workers play a critical role in the society and their lack of wellbeing in terms of experiencing burnout has destructive impacts on all other part of society life. Saying that, they must be provided with promising burnout alleviation programs and intervention program evaluation is a gate to improve programs and make them more cost effective and beneficial. This research study specifically evaluated a theory-based burnout intervention program, named Burnout Recovery. Results suggest that Burnout Recovery program is an effective program to combat increasing burnout while need some improvement in program activities and measurements relevant to recovery experience, self-care activities, and overall ACT processes

to have optimal effects. Findings highlighted the promising role of behavioral awareness in burnout alleviation process which may benefit other intervention programs when designing the intervention.

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