

Original Paper

Mindfulness-Based Resilience Training in the Workplace: Pilot Study of the Internet-Based Resilience@Work (RAW) Mindfulness Program

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Abstract

Background: The impact of mental illness on society is far reaching and has been identified as the leading cause of sickness absence and work disability in most developed countries. By developing evidence-based solutions that are practical, affordable, and accessible, there is potential to deliver substantial economic benefits while improving the lives of individual workers. Academic and industry groups are now responding to this public health issue. A key focus is on developing practical solutions that enhance the mental health and psychological resilience of workers. A growing body of research suggests resilience training may play a pivotal role in the realm of public health and prevention, particularly with regards to protecting the long-term well-being of workers.

Objective: Our aim is to examine whether a mindfulness-based resilience-training program delivered via the internet is feasible and engaging to a group of high-risk workers. Additionally, we aim to measure the effect of the Resilience@Work Mindfulness program on measures of resilience and related skills.

Methods: The current pilot study recruited 29 full-time firefighters. Participants were enrolled in the 6-session internet-based resilience-training program and were administered questionnaires prior to training and directly after the program ended. Measurements examined program feasibility, psychological resilience, experiential avoidance, and thought entanglement.

Results: Participants reported greater levels of resilience after Resilience@Work training compared to baseline, with a mean increase in their overall resilience score of 1.5 (95% CI -0.25 to 3.18, $t_{14}=1.84$, $P=.09$). Compared to baseline, participants also reported lower levels of psychological inflexibility and experiential avoidance following training, with a mean decrease of -1.8 (95% CI -3.78 to 0.20, $t_{13}=-1.94$, $P=.07$). With regards to cognitive fusion (thought entanglement), paired-samples t tests revealed a trend towards reduction in mean scores post training ($P=.12$).

Conclusions: This pilot study of the Resilience@Work program suggests that a mindfulness-based resilience program delivered via the Internet is feasible in a high-risk workplace setting. In addition, the firefighters using the program showed a trend toward increased resilience and psychological flexibility. Despite a number of limitations, the results of this pilot study provide some valuable insights into what form of resilience training may be viable in occupational settings particularly among those considered high risk, such as emergency workers. To the best of our knowledge, this is the first time a mindfulness-based resilience-training program delivered wholly via the internet has been tested in the workplace.

KEYWORDS

resilience training; workplace mental health; occupational health; wellbeing; online intervention; employee resilience; health and safety; psychological health

Introduction

Improving workplace mental health is an opportunity of immense scale and profound importance [1-3]. By developing evidence-based solutions that are practical, affordable, and accessible, there is potential to deliver substantial economic benefits, while improving the lives of individual workers [4,5]. The impact of mental illness on society is far reaching and has been identified as the leading cause of sickness absence and work disability in most developed countries [6-11]. Poor mental health also produces large productivity losses due to absenteeism as well as presenteeism, with affected workers attending work, yet performing at a diminished capacity [12,13]. As a result, common mental health conditions such as depression and anxiety have a significant and direct impact on the overall economic welfare of a nation [14,15]. However, the impact of mental illness in the working population goes well beyond macroeconomics. Once an individual worker develops a mental health condition, they often suffer personal financial losses, career disruption, and reduced well-being.

Academic and industry groups are now responding to this public health issue. A key focus is on developing practical solutions that enhance the mental health and psychological resilience of workers [16]. There is no simple universal solution to workplace mental health. Best practice frameworks highlight the importance of a multifaceted approach that addresses individual, team, and organizational level factors. These factors include work design, organizational culture, good management, promoting and facilitating early help-seeking and early intervention, as well as supporting return-to-work programs and recovery [16,17]. These frameworks also make specific reference to the importance of employee resilience training. This type of individual training can form part of broader programs of workplace health promotion [18].

Indeed, a growing body of research suggests resilience training may play a pivotal role in the realm of public health and prevention, particularly with regards to protecting the long-term well-being of workers [17,19,20]. While definitions of resilience are diverse and plentiful, there is growing consensus that resilience is a malleable construct, wherein an individual's ability to adapt effectively during challenging circumstances can be enhanced over time. Leading researchers in the field, along with the American Psychological Society, describe resilience as a process of "bouncing back" from difficult experiences and "adapting well in the face of adversity, trauma, tragedy, threats or significant sources of stress" [21,22].

In terms of enhancing resilience, numerous studies have described positive outcomes from various types of resilience training programs among groups including medical specialists, youth workers, nurses, factory workers, and public servants [23-28]. In addition, research among emergency workers (ie,

firefighters, police, paramedics) and military personnel highlights the benefits of resilience training among individuals who frequently experience high-stress situations as an inherent aspect of their work [29-31]. Conversely, a number of larger trials with US Army Personnel and more recently with London Ambulance in the United Kingdom reported limited improvements following resilience training [32,33]. Establishing what types of resilience training programs are beneficial to high-risk groups such as emergency workers is particularly important for several reasons. First, these workers play an essential role in delivering and maintaining critical services in our communities. Second, given the nature of their work, emergency workers are at greater risk of developing common mental health conditions such as depression, anxiety, and alcohol misuse as well as posttraumatic stress disorder (PTSD) [34-37]. Finally, resilience programs that are evaluated and found to be useful among emergency service personnel may provide valuable insight on how to best support the mental health of workers in other high-stress occupations (eg, health care, journalism).

Despite the growing body of research supporting resilience training, considerable measurement variation exists in terms of how researchers evaluate the effectiveness of these programs. For example, some researchers specifically focus on changes observed on reliable and validated measures of psychological resilience following times of intense stress and adversity. Windle et al [38] offer a review of resilience measures. Other researchers have primarily examined the overall impact of resilience training on measures of general well-being and mental health symptomatology. While research continues to highlight a positive relationship between resilience and psychological well-being, the latter approach may provide limited insight into whether a resilience intervention can truly facilitate change in an individual's overall ability to bounce back from adversity. A program may improve mental health symptoms, yet not enhance a person's overall psychological resilience or vice versa [39,40]. The use of reliable and validated measures of psychological resilience is central to examining the efficacy of any intervention aimed at enhancing psychological resilience [38], particularly in groups where people identify as "mentally healthy."

Resilience training programs can differ considerably in terms of content, delivery, and length. In their systematic review of resilience interventions, Leppin et al unsurprisingly concluded "no single accepted theoretical framework or consensus statement exists to guide the development or application of these programs" [19]. This may explain why resilience researchers are now drawing on evidence-based therapies such as Acceptance and Commitment Therapy (ACT), Cognitive Behavioral Therapy, Mindfulness-Based Cognitive Therapy, and Mindfulness-Based Stress Reduction (used in the treatment of common mental health conditions) to inform program development [23,24,27,41-45]. These resilience programs tend

to include a combination of cognitive strategies, mindfulness training, psycho-educational material, and goal setting. They typically focus on enhancing a person's capacity to manage stressful situations and adverse circumstances more effectively and with greater emotional insight. These skills and strategies require time to practice and gain proficiency. As such, the majority of resilience studies to date describe interventions involving multiple face-to-face training sessions [19,20]. This is a particular challenge for many employers, where taking workers away from the workplace to attend training creates considerable disruption to business and critical services. In addition, the associated costs for replacement staff during this time can be significant. The expense inherent in face-to-face training can pose a hindrance, as can the availability of trainers and programs in remote areas. Moreover, stigma associated with mental health remains prevalent and may prevent a subset of workers from choosing to engage openly in group-training sessions that focus on psychological topics [46]. A universal approach where all employees complete the training may go some way towards reducing this stigma [47].

To address these barriers, we developed an interactive e-learning program called The Resilience@Work (RAW) Mindfulness Program. This self-paced intervention aims to enhance psychological resilience among workers. It consists of 6 internet-based training sessions, each taking about 20-25 minutes to complete on a tablet or computer (see Figure 1).

The RAW program involves mindfulness training, psycho-education, and a range of skills and strategies drawn from evidence-based therapies including ACT, Mindfulness-Based Stress Reduction, and Compassion-Focused Therapy. A large body of literature highlights the positive benefits of mindfulness practice on mental health outcomes [48-53] while a growing number of studies also describe the positive impact of mindfulness training on psychological resilience [23,24,41,54].

The RAW program also teaches a number of core cognitive strategies, which may further enhance a learner's ability to manage stress and cope with adverse circumstances more effectively. These core strategies, drawn from ACT, aim to enhance psychological flexibility by applying mindfulness, acceptance-based emotion regulation strategies, and cognitive skills, while also emphasizing behavioral change that reflects personal values. Psychological flexibility is "the ability to be in the present moment with full awareness and openness to our experience, and to take action guided by our values" [55]. Psychological flexibility is associated with lower levels of depression, anxiety, and distress in clinical and nonclinical populations [56-58]. More recently, it has been found to protect against depression and PTSD among returned service personnel [59].

Figure 1. Resilience@Work Mindfulness Program homepage.

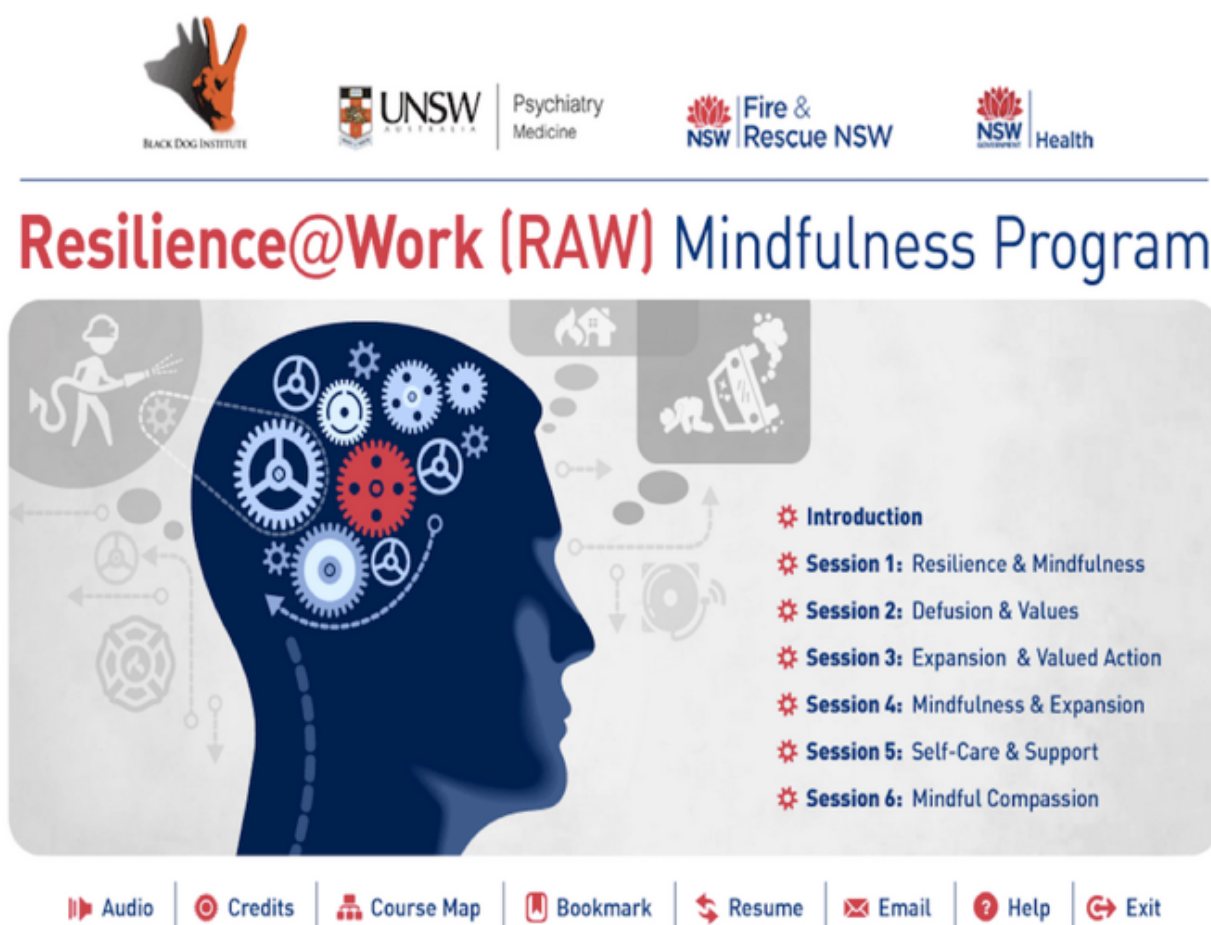


Table 1. Overview of skills and topics covered in the Resilience@Work Mindfulness Program.

Session	Resilience topic and skills focus	Mindfulness tracks
1	Introduction to mindfulness, resilience and psychological well-being	<ol style="list-style-type: none"> 1. Drop Anchor 2. Take 10 3. Leaves on a Stream
2	Mindfulness skills, Understanding your reactive mind versus wise mind, Recognizing unhelpful mind chatter and managing uncomfortable and unhelpful thoughts (cognitive defusion); Recognizing your values exercise	<ol style="list-style-type: none"> 1. Mindful Breathing 2. Defusion Technique; Notice it, Name it, Let it Go (I'm having the thought that...) 3. Defusion Technique 2: Thank you Mind
3	Revision of cognitive defusion, Introduction to mindfulness with emotions, The reactive mind and avoidance, Understanding how values are linked to emotions; Valued action check	<ol style="list-style-type: none"> 1. Creating Space (mindfulness with emotions) 2. Mindful Body Scan 3. The Golden Room
4	The problem with avoidance, Recognizing avoidance strategies versus adaptive strategies	<ol style="list-style-type: none"> 1. Creating Space 2. A Mindful Break (mindfulness with words) 3. Surfing Waves
5	Self-care and support, The compassion myth, barriers to accessing compassion, compassion fatigue, self-compassion actions & resilience; Identifying mindful support (compassionate, nonjudgmental and mindful); Valued action check	<ol style="list-style-type: none"> 1. A Kind and Gentle Hand (loving-kindness practice) 2. A Safe Place (compassion-focused mindfulness) 3. A Bird's Eye View
6	Compassion-focused mindfulness; Gratitude practice, optimism and resilience, identify and celebrate the milestones; Creating a personalized action plan to practice skills	<ol style="list-style-type: none"> 1. Breathing in the Present Moment 2. A Golden Moment exercise 3. Being Kind to your old wounds

Table 1 provides an overview of the resilience topics, core strategies, and mindfulness skills covered in each session. Several reviews and meta-analyses have found medium to large effect sizes for ACT-based interventions across a range of clinical and nonclinical settings including anxiety, depression, substance abuse, worksite stress, and burnout [60-64]. Moreover, a number of studies have found that ACT can improve mental health in the workplace [64,65], highlighting its potential as an intervention that may promote psychological resilience in occupational settings.

A recent review and meta-analysis found that digital mental health interventions in the workplace can improve psychological well-being and work effectiveness among employees [66]. Despite the apparent advantages of online resilience training, there has been very limited research examining the acceptability and efficacy of this approach. A few trials have examined either a blended approach (ie, programs that combine internet-based and face-to-face resilience training) [24,41] or an online approach with an emphasis on stress reduction and/or enhancing resilience-related factors [67,68]. As with the main resilience literature to date, these studies vary greatly in their approach to measuring program efficacy and thus limited conclusions can be drawn. In addition, while the research evidence for online mindfulness interventions continues to grow [48,69], to date there have been no published trials examining the efficacy of a mindfulness-based resilience training program delivered solely online.

The primary aim of our pilot study is to examine whether a mindfulness-based resilience-training program delivered via the internet is feasible and engaging to a high-risk group of

workers, that is, firefighters. A secondary aim is to capture changes in measures of resilience and psychological skills among firefighters undertaking the training program. To the best of our knowledge, this is the first pilot study of a self-paced mindfulness-based resilience training program delivered completely in an online format.

Methods

Resilience@Work Mindfulness Program

The RAW program is a mindfulness-based intervention, which also draws on ACT and has significant emphasis on self-compassion and acceptance skills. The intervention involves completing 6 internet-based training sessions. Each session takes about 20-25 minutes to complete on a tablet or computer. It was anticipated that an engaging and interactive program would help address the issue of adherence; a challenge that employers frequently encounter when offering resilience training and support to their workers. Rather than having to read through lengthy paragraphs on a website, the RAW program engages workers in the process of learning by utilizing a combination of interactive exercises, audio, and animation (see [Figure 2](#)).

Participants were able to download mindfulness tracks to their own device for continued practice. Participants also had the opportunity to sign up for text-message reminders and/or reminder emails. A podcast accompanied each RAW session with additional mindfulness tracks to encourage skills development. Podcasts were not a mandatory part of the training but were available via a website for those participants who chose to use them.

Figure 2. Screenshots of training material from the Resilience@Work Mindfulness Program

Resilience@Work (RAW) Mindfulness Program | Audio | Course Map | Bookmark | Email | Menu | Exit

Session 1: Resilience & Mindfulness

Focus on the 'here' and 'now'

Bringing our focus and attention to what is happening "here and now" is the very essence of mindfulness.

Mindfulness = Awareness of Present Moment

- Natural for the mind to wander off
- Mindfulness involves an **ebb and flow** between being caught up in a thought and then noticing where your mind has wandered to
- You can then bring your **focus back to the present moment** e.g. just noticing your breath....



Progress: | Next is a video describing how mindfulness can help you beat stress. | Back | Next

Resilience@Work (RAW) Mindfulness Program | Audio | Course Map | Bookmark | Email | Menu | Exit

Session 2: Defusion & Values

Mindfulness workout 1

Listen to the instructions on what you need to do. For information about the workout select the three buttons below then select button 2 to begin the workout.

Workout 1 : Mindful Breathing

Aim Activates Builds



Builds: Concentration Skills, Sustained Attention, Meta-awareness, learning, decision making & resilience.

Reduces: Stress, unhelpful Mind Chatter.

Progress: | Select Next to continue our discussion on the 'here and now'. | Back | Next

To ensure program engagement, workers from target industries were invited to provide detailed insight into the specific work-related challenges they encountered on a regular basis. Examples were provided by workers to the research team via email, phone, and in person during a workplace well-being

seminar. This information was collated and incorporated throughout the RAW program as “real-world” examples when introducing new resilience strategies and techniques.

Each session teaches a new strategy to cultivate psychological resilience and involves a combination of psycho-education and

mindfulness training. The program also interweaves simple quotes and messages from the eastern philosophies of Buddhism and Yogic teaching traditions from which mindfulness has its origins [70-74].

Participants

Participants for this pilot study were drawn from Fire and Rescue New South Wales (FRNSW) in Australia. FRNSW is the seventh largest urban fire service in the world and responds to firefighting, rescue, and hazardous material emergencies in Sydney, Australia, and surrounding regional areas. Given the nature of their work, employees are known to have elevated risk of depression, anxiety, and PTSD [36].

Potential participants were informed about the study during a standard well-being talk facilitated by members of the FRNSW Peer Support Team. Firefighters were provided with a participant information sheet and consent form to read and review along with the study questionnaire. Participation was voluntary. Firefighters who opted to participate in the study signed the consent form and provided a valid email address in order to register into the training program. Prepaid envelopes were provided to mail consent forms and completed questionnaires to the research team. Overall, 29 firefighters were recruited (see Table 2). Any potential participants who were currently engaged in any regular individual psychological therapy sessions with a psychologist and/or psychiatrist were excluded from this study. Ethics approval was obtained via the Human Research Ethics Committee at the University of New South Wales, Australia.

Measures

The current pilot study sought to (1) examine the initial feasibility of the RAW Mindfulness Program in a workplace setting and (2) determine whether it would lead to measurable changes in resilience and key process variables, specifically cognitive fusion and experiential avoidance.

Measure of Feasibility

Engagement and feasibility of the RAW Mindfulness Program were recorded by storing the total number of sessions completed by each participant and the number of training hours completed.

Measure of Resilience

Psychological resilience was measured using the validated short form 10-item version of the Connor-Davidson Resilience Scale (CD-RISC 10) [75]. Participants respond to each item on a 5-point scale, ranging from 0 (not true at all) to 4 (true nearly all of the time). The total score ranges from 0-40 with a higher score indicative of higher psychological resilience. Previous studies have found the CD-RISC 10 to be a reliable and valid measure with Cronbach alpha ranging from .81-.88 [76,77] and test-retest reliability of 0.9 at 6 weeks [77,78].

Measure of Process

The RAW Mindfulness Program was designed to utilize a variety of mindfulness and ACT techniques, the most prominent of which were cognitive defusion and psychological flexibility. In order to measure the impact of the intervention program on these processes, the Cognitive Fusion Questionnaire (CFQ) and the Acceptance and Action Questionnaire version 2 (AAQ-II) were administered to participants.

Cognitive Fusion Questionnaire

The CFQ is a measure of cognitive fusion and defusion, a core component of the ACT model [79]. The CFQ contains 7 items rated on a 7-point scale from 1 (never true) to 7 (always true) with a total score range of 7-49. A higher score reflects greater cognitive fusion and thought entanglement. A sample item is "I get so caught up in my thoughts that I am unable to do the things that I most want to do." Previous studies have found the CFQ to be a reliable and valid measure with Cronbach alpha ranging from .89-.93 [79,80].

Table 2. Demographics of participants in Resilience@Work pilot study (N=29).

Characteristics	Value
Age, mean (SD); range	43.7 (8.7) 24-59
Sex, n (%)	
Male	28 (97)
Female	1 (3)
Highest education, n (%)	
High school	8 (27.6)
Technical and Further Education (TAFE)	15 (51.7)
Graduate degree	5 (17.2)
Postgraduate degree	1 (3.4)
Years with Fire and Rescue New South Wales, n (%)	
1-5	3 (10.7)
6-10	4 (14.3)
11-15	5 (17.9)
16-20	3 (10.7)
20+	13 (46.4)

Acceptance and Action Questionnaire-II

The AAQ-II is a 7-item self-reported measure of experiential avoidance and psychological inflexibility. Participants rate each question on a 7-point Likert scale from 1 (never true) to 7 (always true) with a total score range of 7-49. A higher score reflects greater avoidance behavior and less psychological flexibility. Previous research has found the AAQ-II to be a reliable and valid measure with a Cronbach alpha of .84 and test-retest reliability of 0.81 at 3-month follow-up [56].

Data Analysis Plan

Analyses were conducted using SPSS statistical analysis program. Prior to analysis, frequency distributions and plots for each of the outcome and process variables were examined for unusual data points and to ensure the assumption of normality was not violated, using the Shapiro-Wilk's test. Paired-samples *t* tests were used to determine any differences between each measure at baseline and immediately after the intervention. The main measure of the efficacy of the intervention was the level of psychological resilience as measured by the CD-RISC 10. We proposed that an effect size of 0.5 would be considered a meaningful and clinically important effect. Based on such figures, we aimed to recruit at least 26 participants to this pilot study, which would achieve 0.8 power of detecting an effect size of 0.5 in terms of the CD-RISC 10 with an alpha of 0.1 (two-sided). This approach is similar to other pilot studies of this kind [81]. The total number of modules completed by each participant was also recorded to examine program engagement. In addition, univariate analysis using chi-square tests and Student *t* tests were used to examine which baseline measures predicted completion of at least 50% of the RAW program. Baseline factors considered were age, gender, level of education, years working as a firefighter, and baseline resilience.

Results

Overview

A total of 29 firefighters were recruited for the pilot study. Of the participants, 72% (21/29) had completed some form of post-high school education and the majority (16/29, 55%) had been employed by FRNSW for more than 15 years. In line with most first responder agencies, the vast majority of participants were male. Baseline resilience scores on the CD-RISC 10 were similar to normative data from first responders [69].

Program Engagement

Table 3 outlines the number of RAW program sessions completed by participants. The majority of participants (16/29, 55%) completed more than half the program (mean number of sessions completed was 3.6 out of a possible 6, SD 2.2) equating to 60-75 minutes of training. Eleven participants (11/29, 38%) completed all 6 sessions (a total of at least 2 hours training).

Analysis examining for baseline predictors of completion found no evidence that age, gender, level of education, years working as a firefighter, or baseline resilience were able to predict which participants were more likely to complete at least half of the RAW program ($P>.05$ for all).

Resilience, Cognitive Fusion, and Psychological Inflexibility/Experiential Avoidance

Participants reported greater levels of resilience after RAW training compared to baseline, with a mean increase in their CD-RISC 10 score of 1.5 (95% CI -0.25 to 3.18, $t_{14}=1.84$, $P=.09$), equating to a moderate effect size of 0.5. Table 4 displays the baseline and post-training measurements of resilience and measures of process.

Table 3. The number of Resilience@Work sessions completed by pilot study participants.

Minimum number of sessions completed	n (%)
1	29 (100)
2+	21 (72)
3+	16 (55)
4+	14 (48)
5+	14 (48)
6	11 (38)

Table 4. Baseline and post-training scores for measures of resilience and process variables.

Measure	Baseline, mean (SD)	Post Resilience@Work training, mean (SD)	<i>P</i> value
Resilience, CD-RISC 10 ^a (n=15)	26.0 (5.5)	27.5 (4.9)	.09
Cognitive fusion, CFQ ^b (n=13)	20.7 (8.9)	18.4 (7.5)	.12
Psychological inflexibility, AAQ-II ^c (n=14)	18.5 (6.7)	16.7 (5.7)	.07

^aCD-RISC 10: 10-item version of the Connor-Davidson Resilience Scale.

^bCFQ: Cognitive Fusion Questionnaire.

^cAAQ-II: Acceptance and Action Questionnaire version 2.

Compared to baseline, participants reported lower levels of psychological inflexibility and experiential avoidance following training, with a mean decrease of -1.8 (95% CI -3.78 to 0.20, $t_{13}=-1.94$, $P=.07$). With regards to cognitive fusion (thought entanglement), paired-samples t test revealed a trend towards reduction in mean scores post training ($P=.12$).

Discussion

Principal Findings

This pilot study of the RAW Mindfulness Program suggests that an internet-based resilience-training program is feasible in a workplace setting. In addition, those using the RAW program showed a trend toward increased resilience and psychological flexibility. To the best of our knowledge, this is the first time a wholly online mindfulness-based resilience-training program and its feasibility have been tested in the workplace.

While it is difficult to directly compare effect sizes from pre-post studies compared to control trials, it is worth noting that the moderate effect sizes demonstrated in this pilot study are similar to those described in a recent meta-analysis examining the effectiveness of online mindfulness interventions aimed at reducing stress [48]. In addition, the observed trends in both of the predicted process factors, cognitive fusion (thought entanglement), and psychological inflexibility/experiential avoidance, suggest the desired skills and techniques can be taught via an internet-based format.

Limitations

There were some important limitations to this pilot study, most notably the lack of a control group, the small sample size, and the absence of longer-term follow-up. The use of self-reported measures of resilience and process measures is also a limitation, although all scales used were well validated and the resilience measure chosen is known to be associated with a range of mental health outcomes among working populations [82]. Recruitment was facilitated by peer supporters and occurred while a proportion of firefighters were either responding to emergency calls or off duty. It is therefore unknown what proportion of

firefighters were informed of the program and subsequently signed up for resilience training. Thus, limited insight was gained into overall acceptability of the program. It is important to note that our sample of emergency workers was a uniformed, male-dominated, high-risk group. Therefore, it remains unclear as to whether this form of resilience training is feasible among gender-balanced, low-risk workforces.

While most participants completed half of the program, there was a notable drop in completion after the second session. This may be due to a new cognitive skill being taught in this session that focused on how to manage difficult and uncomfortable thoughts. This may have been particularly confronting or challenging for some learners. Dropout analysis found that level of baseline resilience, age, gender, education level, and years on the job did not predict who would go on to complete more than 50% of the program. It is worth noting that this analysis is hindered by an overall lack of power and that other factors such as intrinsic motivation may have influenced completion rates. That said, most participants completed at least half of the RAW program and of these most went on to complete the entire program (ie, all 6 sessions).

Conclusion

Despite these limitations, the results of this pilot study provide some valuable insights into what form of resilience training may be viable in occupational settings. More specifically, it suggests that internet-based resilience training is a feasible approach in workplaces, particularly among those considered high risk, such as first responders, and those with specific inherent challenges for training, such as shift work, frequent travel on the road, and limited access to face-to-face training.

In spite of these promising results, the effectiveness of the RAW Mindfulness Program needs to be tested via a larger randomized controlled trial, ideally with both short-term and longer-term follow up. Additional secondary outcome measures, such as levels of psychological symptoms, perceived stress, and well-being are also needed to establish whether programs such as the RAW program can create meaningful changes beyond short-term gains in self-reported resilience.

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Authors' Contributions

SJ and SBH devised the study. SJ developed the RAW Mindfulness Program, the internet-based format, and collected, scored, and entered the data. TJL assisted with data collection. SJ and SBH analyzed and interpreted the data, and SJ wrote the first draft of the manuscript. All authors read and contributed to subsequent versions and approved the final manuscript.

Conflicts of Interest

SJ and SBH are associated with a company that offers resilience training (RAW Mind Coach). SBH and FS work for the Black Dog Institute, a not-for-profit organization that provides mental health and resilience training to various other organizations.

References

- Harvey S, Henderson M. Occupational Psychiatry. *Psychiatry*. May 2009;8(5):174-178. [doi: [10.1016/j.mppsy.2009.03.011](https://doi.org/10.1016/j.mppsy.2009.03.011)] [Medline: [2009212502](https://pubmed.ncbi.nlm.nih.gov/2009212502/)]
- Harvey SB, Henderson M, Lelliott P, Hotopf M. Mental health and employment: much work still to be done. *Br J Psychiatry*. Mar 2009;194(3):201-203. [doi: [10.1192/bjp.bp.108.055111](https://doi.org/10.1192/bjp.bp.108.055111)] [Medline: [19252144](https://pubmed.ncbi.nlm.nih.gov/19252144/)]
- Henderson M, Harvey SB, Overland S, Mykletun A, Hotopf M. Work and common psychiatric disorders. *J R Soc Med*. May 2011;104(5):198-207. [FREE Full text] [doi: [10.1258/jrsm.2011.100231](https://doi.org/10.1258/jrsm.2011.100231)] [Medline: [21558098](https://pubmed.ncbi.nlm.nih.gov/21558098/)]
- Joyce S, Modini M, Christensen H, Mykletun A, Bryant R, Mitchell P, et al. Workplace interventions for common mental disorders: a systematic meta-review. *Psychol Med*. Mar 2016;46(4):683-697. [doi: [10.1017/S0033291715002408](https://doi.org/10.1017/S0033291715002408)] [Medline: [26620157](https://pubmed.ncbi.nlm.nih.gov/26620157/)]
- Mykletun A, Harvey SB. Prevention of mental disorders: a new era for workplace mental health. *Occup Environ Med*. Dec 2012;69(12):868-869. [doi: [10.1136/oemed-2012-100846](https://doi.org/10.1136/oemed-2012-100846)] [Medline: [23152590](https://pubmed.ncbi.nlm.nih.gov/23152590/)]
- Black DC. Working for a Healthier Tomorrow: Dame Carol Black's Review of the Health of Britain's Working Age Population. London, UK. Health, Work, and Well-being Programme; 2008:1-125.
- Moncrieff J, Pomerleau J. Trends in sickness benefits in Great Britain and the contribution of mental disorders. *J Public Health Med*. Mar 2000;22(1):59-67. [Medline: [10774906](https://pubmed.ncbi.nlm.nih.gov/10774906/)]
- Murray C, Vos T, Lozano R, Naghavi M, Flaxman AD, Michaud C, et al. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. Dec 15, 2012;380(9859):2197-2223. [doi: [10.1016/S0140-6736\(12\)61689-4](https://doi.org/10.1016/S0140-6736(12)61689-4)] [Medline: [23245608](https://pubmed.ncbi.nlm.nih.gov/23245608/)]
- Cattrell A, Harris EC, Palmer KT, Kim M, Aylward M, Coggon D. Regional trends in awards of incapacity benefit by cause. *Occup Med (Lond)*. May 2011;61(3):148-151. [FREE Full text] [doi: [10.1093/occmed/kqr008](https://doi.org/10.1093/occmed/kqr008)] [Medline: [21482620](https://pubmed.ncbi.nlm.nih.gov/21482620/)]
- Knudsen AK, Øverland S, Aakvaag HF, Harvey SB, Hotopf M, Mykletun A. Common mental disorders and disability pension award: seven year follow-up of the HUSK study. *J Psychosom Res*. Jul 2010;69(1):59-67. [doi: [10.1016/j.jpsychores.2010.03.007](https://doi.org/10.1016/j.jpsychores.2010.03.007)] [Medline: [20630264](https://pubmed.ncbi.nlm.nih.gov/20630264/)]
- Knudsen AK, Harvey SB, Mykletun A, Øverland S. Common mental disorders and long-term sickness absence in a general working population. The Hordaland Health Study. *Acta Psychiatr Scand*. Apr 2013;127(4):287-297. [doi: [10.1111/j.1600-0447.2012.01902.x](https://doi.org/10.1111/j.1600-0447.2012.01902.x)] [Medline: [22775341](https://pubmed.ncbi.nlm.nih.gov/22775341/)]
- Harvey S, Glozier N, Henderson M, Allaway S, Litchfield P, Holland-Elliott K, et al. Depression and work performance: an ecological study using web-based screening. *Occup Med (Lond)*. May 2011;61(3):209-211. [doi: [10.1093/occmed/kqr020](https://doi.org/10.1093/occmed/kqr020)] [Medline: [21525074](https://pubmed.ncbi.nlm.nih.gov/21525074/)]
- Wang PS, Beck AL, Berglund P, McKenas DK, Pronk NP, Simon GE, et al. Effects of major depression on moment-in-time work performance. *Am J Psychiatry*. Oct 2004;161(10):1885-1891. [doi: [10.1176/ajp.161.10.1885](https://doi.org/10.1176/ajp.161.10.1885)] [Medline: [15465987](https://pubmed.ncbi.nlm.nih.gov/15465987/)]
- National Occupational Health and Safety Commission. National Occupational Health and Safety Commission Annual Report 2002-03. Canberra, Australia.; 2003. URL: https://www.safeworkaustralia.gov.au/system/files/documents/1702/nohsannualreport2002_2003_archivepdf.pdf [WebCite Cache ID 722pfqfy]
- LaMontagne A, Sanderson K, Cocker F. Estimating the Economic Benefits of Eliminating Job Strain as a Risk Factor for Depression. *J Occup Environ Med*. Jan 2017;59(1):12-17. [FREE Full text] [doi: [10.1097/JOM.0000000000000908](https://doi.org/10.1097/JOM.0000000000000908)] [Medline: [28045792](https://pubmed.ncbi.nlm.nih.gov/28045792/)]
- Petrie K, Joyce S, Tan L, Henderson M, Johnson A, Nguyen H, et al. A framework to create more mentally healthy workplaces: A viewpoint. *Aust N Z J Psychiatry*. Jan 2018;52(1):15-23. [doi: [10.1177/0004867417726174](https://doi.org/10.1177/0004867417726174)] [Medline: [28835112](https://pubmed.ncbi.nlm.nih.gov/28835112/)]
- Harvey S, Joyce S, Tan L, Johnson A, Nguyen H, Modini M, et al. Australia National Mental Health Commission and The Mentally Healthy Workplace Alliance. Australian Mental Health Commission; 2014. URL: <http://apo.org.au/node/57690> [accessed 2018-08-30] [WebCite Cache ID 722oRDRwK]
- Leka S, Jain A. Consensus Paper. EU Compass for Action on Mental Health and Well-being. EU Health Programme; 2017. URL: https://ec.europa.eu/health/sites/health/files/mental_health/docs/2017_workplace_en.pdf [WebCite Cache ID 722p51SR9]
- Leppin AL, Gionfriddo MR, Sood A, Montori VM, Erwin PJ, Zeballos-Palacios C, et al. The efficacy of resilience training programs: a systematic review protocol. *Syst Rev*. Mar 06, 2014;3:20. [FREE Full text] [doi: [10.1186/2046-4053-3-20](https://doi.org/10.1186/2046-4053-3-20)] [Medline: [24602236](https://pubmed.ncbi.nlm.nih.gov/24602236/)]
- Robertson I, Cooper C, Sarkar M, Curran T. Resilience training in the workplace from 2003 to 2014: A systematic review. *J Occup Organ Psychol*. Apr 25, 2015;88(3):533-562. [FREE Full text] [doi: [10.1111/joop.12120](https://doi.org/10.1111/joop.12120)]
- Comas-Diaz L, Luthar SS, Maddi SR, O'Neill HK, Saakvitte KW, Tedeshchi RG. The Road to Resilience. American Psychological Association; 2016. URL: <http://www.apa.org/helpcenter/road-resilience.aspx2016> [accessed 2018-08-30] [WebCite Cache ID 722qkZS1u]
- Bonanno GA, Romero SA, Klein SI. The Temporal Elements of Psychological Resilience: An Integrative Framework for the Study of Individuals, Families, and Communities. *Psychological Inquiry*. Jun 11, 2015;26(2):139-169. [FREE Full text] [doi: [10.1080/1047840X.2015.992677](https://doi.org/10.1080/1047840X.2015.992677)]

23. Victoria CM, Ortiz-Tallo M, Cardenal V, De la Torre-Luque A. Positive psychology group intervention for breast cancer patients: a randomised trial. *Psychol Rep.* Aug 2014;115(1):44-64. [doi: [10.2466/15.20.PR0.115c17z7](https://doi.org/10.2466/15.20.PR0.115c17z7)] [Medline: [25153949](https://pubmed.ncbi.nlm.nih.gov/25153949/)]
24. Kahn J, Collinge W, Soltysik R. Post-9/11 Veterans and Their Partners Improve Mental Health Outcomes with a Self-directed Mobile and Web-based Wellness Training Program: A Randomized Controlled Trial. *J Med Internet Res.* Sep 27, 2016;18(9):e255. [FREE Full text] [doi: [10.2196/jmir.5800](https://doi.org/10.2196/jmir.5800)] [Medline: [27678169](https://pubmed.ncbi.nlm.nih.gov/27678169/)]
25. Loprinzi CE, Prasad K, Schroeder DR, Sood A. Stress Management and Resilience Training (SMART) program to decrease stress and enhance resilience among breast cancer survivors: a pilot randomized clinical trial. *Clin Breast Cancer.* Dec 2011;11(6):364-368. [doi: [10.1016/j.clbc.2011.06.008](https://doi.org/10.1016/j.clbc.2011.06.008)] [Medline: [21831722](https://pubmed.ncbi.nlm.nih.gov/21831722/)]
26. Sood A, Prasad K, Schroeder D, Varkey P. Stress management and resilience training among Department of Medicine faculty: a pilot randomized clinical trial. *J Gen Intern Med.* Aug 2011;26(8):858-861. [FREE Full text] [doi: [10.1007/s11606-011-1640-x](https://doi.org/10.1007/s11606-011-1640-x)] [Medline: [21279454](https://pubmed.ncbi.nlm.nih.gov/21279454/)]
27. Sood A, Sharma V, Schroeder D, Gorman B. Stress Management and Resiliency Training (SMART) program among Department of Radiology faculty: a pilot randomized clinical trial. *Explore (NY).* 2014;10(6):358-363. [doi: [10.1016/j.explore.2014.08.002](https://doi.org/10.1016/j.explore.2014.08.002)] [Medline: [25443423](https://pubmed.ncbi.nlm.nih.gov/25443423/)]
28. Mealer M, Conrad D, Evans J, Jooste K, Solyntjes J, Rothbaum B, et al. Feasibility and acceptability of a resilience training program for intensive care unit nurses. *Am J Crit Care.* Nov 2014;23(6):e97-105. [FREE Full text] [doi: [10.4037/ajcc2014747](https://doi.org/10.4037/ajcc2014747)] [Medline: [25362680](https://pubmed.ncbi.nlm.nih.gov/25362680/)]
29. Arnetz B, Nevedal D, Lumley M, Backman L, Lublin A. Trauma Resilience Training for Police: Psychophysiological and Performance Effects. *J Police Crim Psych.* Dec 2, 2008;24(1):1-9. [FREE Full text] [doi: [10.1007/s11896-008-9030-y](https://doi.org/10.1007/s11896-008-9030-y)]
30. McCraty R, Atkinson M. Resilience Training Program Reduces Physiological and Psychological Stress in Police Officers. *Glob Adv Health Med.* Nov 2012;1(5):44-66. [FREE Full text] [doi: [10.7453/gahmj.2012.1.5.013](https://doi.org/10.7453/gahmj.2012.1.5.013)] [Medline: [27257532](https://pubmed.ncbi.nlm.nih.gov/27257532/)]
31. Adler A, Bliese P, McGurk D, Hoge C, Castro C. Battlemind debriefing and battlemind training as early interventions with soldiers returning from Iraq: Randomization by platoon. *J Consult Clin Psychol.* Oct 2009;77(5):928-940. [doi: [10.1037/a0016877](https://doi.org/10.1037/a0016877)] [Medline: [19803572](https://pubmed.ncbi.nlm.nih.gov/19803572/)]
32. Adler A, Williams J, McGurk D, Moss A, Bliese P. Resilience training with soldiers during basic combat training: randomisation by platoon. *Appl Psychol Health Well Being.* Mar 2015;7(1):85-107. [doi: [10.1111/aphw.12040](https://doi.org/10.1111/aphw.12040)] [Medline: [25641899](https://pubmed.ncbi.nlm.nih.gov/25641899/)]
33. Wild J. An evaluation of Mind's resilience intervention for emergency workers. Oxford, UK. University of Oxford URL: <https://www.mind.org.uk/media/4627959/strand-3.pdf> [accessed 2018-08-30] [WebCite Cache ID 722w9Ziu0]
34. McFarlane AC, Bryant RA. Post-traumatic stress disorder in occupational settings: anticipating and managing the risk. *Occup Med (Lond).* Sep 2007;57(6):404-410. [doi: [10.1093/occmed/kqm070](https://doi.org/10.1093/occmed/kqm070)] [Medline: [17728313](https://pubmed.ncbi.nlm.nih.gov/17728313/)]
35. Kaufmann CN, Rutkow L, Spira AP, Mojtabai R. Mental health of protective services workers: results from the national epidemiologic survey on alcohol and related conditions. *Disaster Med Public Health Prep.* Feb 2013;7(1):36-45. [doi: [10.1001/dmp.2012.55](https://doi.org/10.1001/dmp.2012.55)] [Medline: [23193220](https://pubmed.ncbi.nlm.nih.gov/23193220/)]
36. Harvey SB, Milligan-Saville JS, Paterson HM, Harkness EL, Marsh AM, Dobson M, et al. The mental health of fire-fighters: An examination of the impact of repeated trauma exposure. *Aust N Z J Psychiatry.* Jul 2016;50(7):649-658. [doi: [10.1177/0004867415615217](https://doi.org/10.1177/0004867415615217)] [Medline: [26607303](https://pubmed.ncbi.nlm.nih.gov/26607303/)]
37. Wild J, Smith KV, Thompson E, Béar F, Lommen MJJ, Ehlers A. A prospective study of pre-trauma risk factors for post-traumatic stress disorder and depression. *Psychol Med.* Sep 2016;46(12):2571-2582. [FREE Full text] [doi: [10.1017/S0033291716000532](https://doi.org/10.1017/S0033291716000532)] [Medline: [27348599](https://pubmed.ncbi.nlm.nih.gov/27348599/)]
38. Windle G, Bennett K, Noyes J. A methodological review of resilience measurement scales. *Health Qual Life Outcomes.* Feb 04, 2011;9:8. [FREE Full text] [doi: [10.1186/1477-7525-9-8](https://doi.org/10.1186/1477-7525-9-8)] [Medline: [21294858](https://pubmed.ncbi.nlm.nih.gov/21294858/)]
39. Erogul M, Singer G, McIntyre T, Stefanov DG. Abridged mindfulness intervention to support wellness in first-year medical students. *Teach Learn Med.* 2014;26(4):350-356. [doi: [10.1080/10401334.2014.945025](https://doi.org/10.1080/10401334.2014.945025)] [Medline: [25318029](https://pubmed.ncbi.nlm.nih.gov/25318029/)]
40. Nichols LO, Martindale-Adams J, Zuber J, Graney J, Burns R, Clark C. Support for Spouses of Postdeployment Service Members. *Military Behavioral Health.* Jan 30, 2015;3(2):125-137. [FREE Full text] [doi: [10.1080/21635781.2015.1009210](https://doi.org/10.1080/21635781.2015.1009210)]
41. Aikens KA, Astin J, Pelletier KR, Levanovich K, Baase CM, Park YY, et al. Mindfulness goes to work: impact of an online workplace intervention. *J Occup Environ Med.* Jul 2014;56(7):721-731. [doi: [10.1097/JOM.0000000000000209](https://doi.org/10.1097/JOM.0000000000000209)] [Medline: [24988100](https://pubmed.ncbi.nlm.nih.gov/24988100/)]
42. Johnson D, Thom N, Stanley E, Haase L, Simmons A, Shih P, et al. Modifying resilience mechanisms in at-risk individuals: a controlled study of mindfulness training in Marines preparing for deployment. *Am J Psychiatry.* Aug 2014;171(8):844-853. [FREE Full text] [doi: [10.1176/appi.ajp.2014.13040502](https://doi.org/10.1176/appi.ajp.2014.13040502)] [Medline: [24832476](https://pubmed.ncbi.nlm.nih.gov/24832476/)]
43. McGonagle AK, Beatty JE, Joffe R. Coaching for workers with chronic illness: evaluating an intervention. *J Occup Health Psychol.* Jul 2014;19(3):385-398. [doi: [10.1037/a0036601](https://doi.org/10.1037/a0036601)] [Medline: [24796227](https://pubmed.ncbi.nlm.nih.gov/24796227/)]
44. Yu X, Stewart SM, Chui JPL, Ho JLY, Li ACH, Lam TH. A pilot randomized controlled trial to decrease adaptation difficulties in Chinese new immigrants to Hong Kong. *Behav Ther.* Jan 2014;45(1):137-152. [doi: [10.1016/j.beth.2013.10.003](https://doi.org/10.1016/j.beth.2013.10.003)] [Medline: [24411121](https://pubmed.ncbi.nlm.nih.gov/24411121/)]

45. Songprakun W, McCann TV. Effectiveness of a self-help manual on the promotion of resilience in individuals with depression in Thailand: a randomised controlled trial. *BMC Psychiatry*. 2012;12:12. [[FREE Full text](#)] [doi: [10.1186/1471-244X-12-12](https://doi.org/10.1186/1471-244X-12-12)] [Medline: [22339984](#)]
46. Amaranto ES, Steinberg J, Castellano C, Mitchell R. Police stress interventions. *Brief Treatment and Crisis Intervention*. 2003;3(1):47-53. [[FREE Full text](#)] [doi: [10.1093/brief-treatment/mhg001](https://doi.org/10.1093/brief-treatment/mhg001)]
47. Young KS. An empirical examination of client attitudes towards online counseling. *Cyberpsychol Behav*. Apr 2005;8(2):172-177. [doi: [10.1089/cpb.2005.8.172](https://doi.org/10.1089/cpb.2005.8.172)] [Medline: [15938657](#)]
48. Spijkerman M, Pots W, Bohlmeijer E. Effectiveness of online mindfulness-based interventions in improving mental health: A review and meta-analysis of randomised controlled trials. *Clin Psychol Rev*. Apr 2016;45:102-114. [[FREE Full text](#)] [doi: [10.1016/j.cpr.2016.03.009](https://doi.org/10.1016/j.cpr.2016.03.009)] [Medline: [27111302](#)]
49. Keng S, Smoski M, Robins C. Effects of mindfulness on psychological health: a review of empirical studies. *Clin Psychol Rev*. Aug 2011;31(6):1041-1056. [[FREE Full text](#)] [doi: [10.1016/j.cpr.2011.04.006](https://doi.org/10.1016/j.cpr.2011.04.006)] [Medline: [21802619](#)]
50. Hofmann S, Sawyer A, Witt A, Oh D. The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *J Consult Clin Psychol*. Apr 2010;78(2):169-183. [[FREE Full text](#)] [doi: [10.1037/a0018555](https://doi.org/10.1037/a0018555)] [Medline: [20350028](#)]
51. Kuyken W, Hayes R, Barrett B, Byng R, Dalgleish T, Kessler D, et al. Effectiveness and cost-effectiveness of mindfulness-based cognitive therapy compared with maintenance antidepressant treatment in the prevention of depressive relapse or recurrence (PREVENT): a randomised controlled trial. *Lancet*. Jul 04, 2015;386(9988):63-73. [[FREE Full text](#)] [doi: [10.1016/S0140-6736\(14\)62222-4](https://doi.org/10.1016/S0140-6736(14)62222-4)] [Medline: [25907157](#)]
52. Kuyken W, Weare K, Ukoumunne OC, Vicary R, Motton N, Burnett R, et al. Effectiveness of the Mindfulness in Schools Programme: non-randomised controlled feasibility study. *Br J Psychiatry*. Aug 2013;203(2):126-131. [doi: [10.1192/bjp.bp.113.126649](https://doi.org/10.1192/bjp.bp.113.126649)] [Medline: [23787061](#)]
53. Khoury B, Lecomte T, Fortin G, Masse M, Therien P, Bouchard V, et al. Mindfulness-based therapy: a comprehensive meta-analysis. *Clin Psychol Rev*. Aug 2013;33(6):763-771. [doi: [10.1016/j.cpr.2013.05.005](https://doi.org/10.1016/j.cpr.2013.05.005)] [Medline: [23796855](#)]
54. Sood A, Prasad K, Schroeder D, Varkey P. Stress management and resilience training among Department of Medicine faculty: a pilot randomized clinical trial. *J Gen Intern Med*. Aug 2011;26(8):858-861. [[FREE Full text](#)] [doi: [10.1007/s11606-011-1640-x](https://doi.org/10.1007/s11606-011-1640-x)] [Medline: [21279454](#)]
55. Harris R. *ACT Made Simple: An Easy-to-Read Primer on Acceptance and Commitment Therapy*. Oakland, CA. New Harbinger Publications; 2009.
56. Bond F, Hayes S, Baer R, Carpenter K, Guenole N, Orcutt H, et al. Preliminary psychometric properties of the Acceptance and Action Questionnaire-II: a revised measure of psychological inflexibility and experiential avoidance. *Behav Ther*. Dec 2011;42(4):676-688. [doi: [10.1016/j.beth.2011.03.007](https://doi.org/10.1016/j.beth.2011.03.007)] [Medline: [22035996](#)]
57. Flaxman P, Bond F. Worksite stress management training: moderated effects and clinical significance. *J Occup Health Psychol*. Oct 2010;15(4):347-358. [doi: [10.1037/a0020522](https://doi.org/10.1037/a0020522)] [Medline: [21058850](#)]
58. Kashdan TB, Rottenberg J. Psychological flexibility as a fundamental aspect of health. *Clin Psychol Rev*. Nov 2010;30(7):865-878. [[FREE Full text](#)] [doi: [10.1016/j.cpr.2010.03.001](https://doi.org/10.1016/j.cpr.2010.03.001)] [Medline: [21151705](#)]
59. Bryan C, Ray-Sannerud B, Heron E. Psychological flexibility as a dimension of resilience for posttraumatic stress, depression, and risk for suicidal ideation among Air Force personnel. *J Contextual Behav Sci*. Oct 2015;4(4):263-268. [doi: [10.1016/j.jcbs.2015.10.002](https://doi.org/10.1016/j.jcbs.2015.10.002)]
60. Ost L. Efficacy of the third wave of behavioral therapies: a systematic review and meta-analysis. *Behav Res Ther*. Mar 2008;46(3):296-321. [doi: [10.1016/j.brat.2007.12.005](https://doi.org/10.1016/j.brat.2007.12.005)] [Medline: [18258216](#)]
61. Powers M, Zum Vorde Sive Vording MB, Emmelkamp PMG. Acceptance and commitment therapy: a meta-analytic review. *Psychother Psychosom*. 2009;78(2):73-80. [doi: [10.1159/000190790](https://doi.org/10.1159/000190790)] [Medline: [19142046](#)]
62. Ruiz FJ. A review of Acceptance and Commitment Therapy (ACT) empirical evidence: Correlational, experimental psychopathology, component and outcomes studies. *International Journal of Psychology and Psychological Therapy*. 2010;10:125-162. [[FREE Full text](#)]
63. Bohlmeijer E, Fledderus M, Rokx TAJJ, Pieterse M. Efficacy of an early intervention based on acceptance and commitment therapy for adults with depressive symptomatology: Evaluation in a randomized controlled trial. *Behav Res Ther*. Jan 2011;49(1):62-67. [doi: [10.1016/j.brat.2010.10.003](https://doi.org/10.1016/j.brat.2010.10.003)] [Medline: [21074752](#)]
64. Fledderus M, Bohlmeijer M, Pieterse M, Schreurs K. Acceptance and commitment therapy as guided self-help for psychological distress and positive mental health: a randomized controlled trial. *Psychol Med*. Mar 2012;42(3):485-495. [doi: [10.1017/S0033291711001206](https://doi.org/10.1017/S0033291711001206)] [Medline: [21740624](#)]
65. Bond FW, Bunce D. Mediators of change in emotion-focused and problem-focused worksite stress management interventions. *J Occup Health Psychol*. Jan 2000;5(1):156-163. [Medline: [10658893](#)]
66. Carolan S, Harris PR, Cavanagh K. Improving Employee Well-Being and Effectiveness: Systematic Review and Meta-Analysis of Web-Based Psychological Interventions Delivered in the Workplace. *J Med Internet Res*. Jul 26, 2017;19(7):e271. [[FREE Full text](#)] [doi: [10.2196/jmir.7583](https://doi.org/10.2196/jmir.7583)] [Medline: [28747293](#)]
67. Rose R, Buckley J, Zbozinek T, Motivala S, Glenn D, Cartreine J, et al. A randomized controlled trial of a self-guided, multimedia, stress management and resilience training program. *Behav Res Ther*. Feb 2013;51(2):106-112. [doi: [10.1016/j.brat.2012.11.003](https://doi.org/10.1016/j.brat.2012.11.003)] [Medline: [23262118](#)]

68. Abbott J, Klein B, Hamilton C, Rosenthal A. The impact of online resilience training for sales managers on wellbeing and performance. *E-JAP*. Jun 15, 2009;5(1):89-95. [FREE Full text] [doi: [10.7790/ejap.v5i1.145](https://doi.org/10.7790/ejap.v5i1.145)]
69. Stratton E, Lampit A, Choi I, Calvo R, Harvey S, Glozier N. Effectiveness of eHealth interventions for reducing mental health conditions in employees: A systematic review and meta-analysis. *PLoS One*. 2017;12(12):e0189904. [FREE Full text] [doi: [10.1371/journal.pone.0189904](https://doi.org/10.1371/journal.pone.0189904)] [Medline: [29267334](https://pubmed.ncbi.nlm.nih.gov/29267334/)]
70. Hanh TN. Transformation And Healing: Sutra on the Four Establishments of Mindfulness. Berkeley, CA. Parallax Press; 2006.
71. Hanh T. No Mud, No Lotus: The Art of Transforming Suffering. Berkeley, CA. Parallax Press; 2014.
72. Paul G, Choden. Mindful Compassion: How the Science of Compassion Can Help You Understand Your Emotions, Live in the Present, and Connect Deeply with Others. Oakland, CA. New Harbinger Publications; 2014.
73. Miller R. The iRest Program for Healing PTSD: A Proven-Effective Approach to Using Yoga Nidra Meditation and Deep Relaxation Techniques to Overcome Trauma. Oakland, CA. New Harbinger Publications; 2015.
74. Brach T. True Refuge: Finding Peace and Freedom in Your Own Awakened Heart. New York, NY. Bantam Books; 2016.
75. Campbell-Sills L, Cohan SL, Stein MB. Relationship of resilience to personality, coping, and psychiatric symptoms in young adults. *Behav Res Ther*. Apr 2006;44(4):585-599. [doi: [10.1016/j.brat.2005.05.001](https://doi.org/10.1016/j.brat.2005.05.001)] [Medline: [15998508](https://pubmed.ncbi.nlm.nih.gov/15998508/)]
76. Alobo O, Olabisi O, Alobo T. The 10-Item Connor-Davidson Resilience Scale: Factorial Structure, Reliability, Validity, and Correlates Among Student Nurses in Southwestern Nigeria. *J Am Psychiatr Nurses Assoc*. Feb 2016;22(1):43-51. [doi: [10.1177/1078390316629971](https://doi.org/10.1177/1078390316629971)] [Medline: [26929231](https://pubmed.ncbi.nlm.nih.gov/26929231/)]
77. Notario-Pacheco B, Martínez-Vizcaíno V, Trillo-Calvo E, Pérez-Yus MC, Serrano-Parra D, García-Campayo J. Validity and reliability of the Spanish version of the 10-item CD-RISC in patients with fibromyalgia. *Health Qual Life Outcomes*. Feb 01, 2014;12:14. [FREE Full text] [doi: [10.1186/1477-7525-12-14](https://doi.org/10.1186/1477-7525-12-14)] [Medline: [24484847](https://pubmed.ncbi.nlm.nih.gov/24484847/)]
78. Wang LSZ, Shi Z, Zhang Z, Zhang Z. Psychometric properties of the 10-item Connor-Davidson Resilience Scale in Chinese earthquake victims. *Psychiatry Clin Neurosci*. Oct 2010;64(5):499-504. [FREE Full text] [doi: [10.1111/j.1440-1819.2010.02130.x](https://doi.org/10.1111/j.1440-1819.2010.02130.x)] [Medline: [20923429](https://pubmed.ncbi.nlm.nih.gov/20923429/)]
79. Gillanders DT, Bolderston H, Bond FW, Dempster M, Flaxman PE, Campbell L, et al. The development and initial validation of the cognitive fusion questionnaire. *Behav Ther*. Jan 2014;45(1):83-101. [doi: [10.1016/j.beth.2013.09.001](https://doi.org/10.1016/j.beth.2013.09.001)] [Medline: [24411117](https://pubmed.ncbi.nlm.nih.gov/24411117/)]
80. Ruiz FSJ, Suárez-Falcón J, Riaño-Hernández D, Gillanders D. Psychometric properties of the Cognitive Fusion Questionnaire in Colombia. *Revista Latinoamericana de Psicología*. Jan 2017;49(1):80-87. [FREE Full text] [doi: [10.1016/j.rlp.2016.09.006](https://doi.org/10.1016/j.rlp.2016.09.006)]
81. Levin MEPI, Pistorello J, Seeley JR, Hayes SC. Feasibility of a prototype web-based acceptance and commitment therapy prevention program for college students. *J Am Coll Health*. 2014;62(1):20-30. [FREE Full text] [doi: [10.1080/07448481.2013.843533](https://doi.org/10.1080/07448481.2013.843533)] [Medline: [24313693](https://pubmed.ncbi.nlm.nih.gov/24313693/)]
82. Wild J, Smith KV, Thompson E, Béar F, Lommen MJJ, Ehlers A. A prospective study of pre-trauma risk factors for post-traumatic stress disorder and depression. *Psychol Med*. Sep 2016;46(12):2571-2582. [FREE Full text] [doi: [10.1017/S0033291716000532](https://doi.org/10.1017/S0033291716000532)] [Medline: [27348599](https://pubmed.ncbi.nlm.nih.gov/27348599/)]

Abbreviations

AAQ-II: Acceptance and Action Questionnaire version 2
ACT: acceptance and commitment therapy
CD-RISC 10: 10-item version of the Connor-Davidson Resilience Scale
CFQ: Cognitive Fusion Questionnaire
FRNSW: Fire and Rescue New South Wales
NSW: New South Wales
PTSD: posttraumatic stress disorder
RAW: Resilience@Work

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