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High Adversity Resilience Training (HART) Impact on Resilience, Motivation, Engagement, and Job Satisfaction

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2024 HART RESEARCH

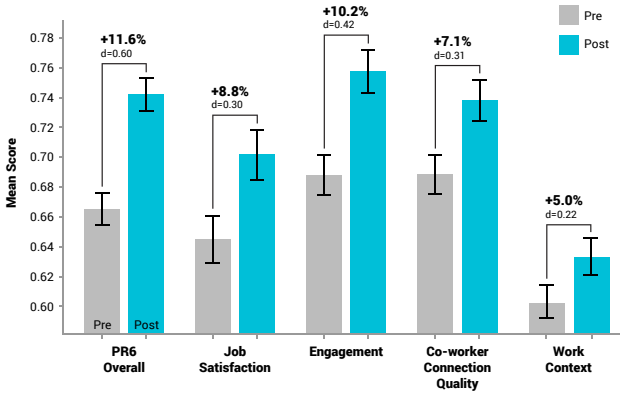
KEY TAKEAWAYS

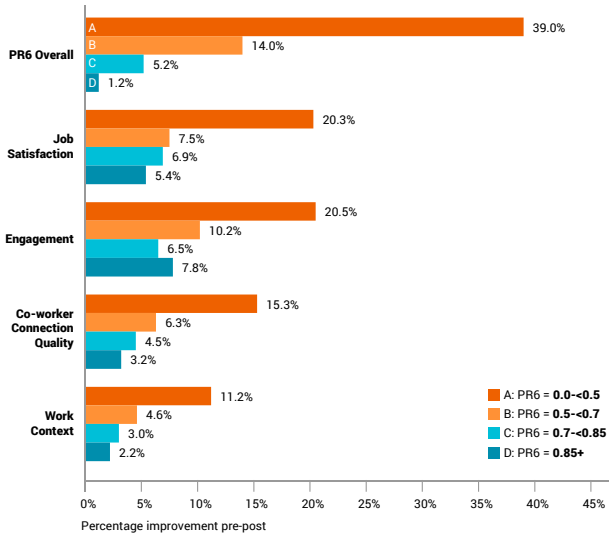
We evaluated the impact of the **High Adversity Resilience Training (HART)** Program in a large real-world sample of workers in high adversity contexts, including emergency services, healthcare, mining, government, and related settings. Across the study, HART was associated with broad improvements in resilience and workplace-related functioning, supporting the value of a preventative, strength-based approach for workforces operating under chronic stress, trauma exposure, and sustained organisational pressure. Key takeaways are as follows:

1. **Broad improvements in resilience and workplace functioning** - Participation in HART was associated with significant gains in PR6 Overall resilience (+11.6%) as well as all six PR6 domains, with the strongest increases observed in Vision (+13.4%), Reasoning (+13.1%), and Collaboration (+12.4%). Alongside these resilience gains, participants also showed significant improvement in the broad workplace factors of Job Satisfaction (+8.8%), Engagement (+10.2%), Co-worker Connection Quality (+7.1%), and Work Context (+5.0%). These findings suggest that HART may support not only personal resilience, but also broader workplace motivation, team functioning, and perceptions of the work environment.

2. **Significant gains seen among participants starting with lower resilience** - Matched analyses by baseline PR6 group showed a clear gradient in outcomes. Participants in the lowest baseline resilience band showed the largest improvement in PR6 Overall (+39.0%), while the next group improved by +14.0%, the higher group by +5.2%, and the highest baseline group by +1.2%. The same general pattern was also evident across the broad workplace factors, including Job Satisfaction, Engagement, Co-worker Connection Quality, and Work Context. This suggests that HART may be particularly valuable for participants entering training with lower initial resilience, while still offering workplace-related benefits for those already functioning at relatively high levels.

3. **Motivation, engagement, and development-related gains were especially notable** - Beyond the headline resilience findings, some of the strongest changes were seen in specific work-related subfactors. The largest improvements were observed for Motivation (+16.2%), Development Opportunities (+14.6%), Interest (+14.6%), Work Mental Impact (+13.9%), Training Regimes (+11.7%), and Co-worker Association (+11.3%). These patterns suggest that HART may influence not only coping and emotional regulation, but also participants' enthusiasm for work, perceived growth opportunities, and quality of relational experience at work. This is especially relevant in high adversity occupations, where cumulative strain can erode motivation, morale, and long-term sustainability.





CONCLUSION

The practical implications of these findings are significant. HART appears to offer a promising and scalable resilience-building approach for high adversity occupations by strengthening not only resilience itself, but also engagement, job satisfaction, motivation, and workplace connection. The results support a broader preventative model that goes beyond trauma exposure alone and instead addresses the wider operational, organisational, and relational factors that shape mental health and sustainability in high adversity work.

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High Adversity Resilience Training (HART) Impact on Resilience, Motivation, Engagement, and Job Satisfaction

Jurie G. Rossouw (Driven Labs - ORCID 0000-0002-3793-6561)

Abstract

Background: Workers in high adversity occupations face repeated exposure to trauma, chronic stress, and demanding workplace conditions that increase risk for burnout, psychological distress, and reduced wellbeing. High Adversity Resilience Training (HART) was developed as a preventative, strength-based program to build resilience and improve broader workplace functioning in these settings.

Methods: A naturalistic pre-post program evaluation was conducted using routine implementation data. The pre-assessment sample comprised n=604 participants compared with n=471 post-assessment participants. HART was delivered in live instructor-led and self-paced online formats. Outcomes were assessed using the Predictive 6 Factor Resilience assessment (PR6) and the Job Satisfaction, Engagement, Co-worker Connection Quality, and Work Context (JSECC) Psychosocial Survey.

Results: Participation in HART was associated with significant improvement in PR6 Overall (+11.6%, d = 0.599), all six PR6 domains, and all four broad workplace factors. The strongest resilience gains were observed for Vision (+13.4%), Reasoning (+13.1%), and Collaboration (+12.4%). Among workplace factors, the largest improvement was observed for Engagement (+10.2%, d = 0.417), with particularly strong subfactor gains in Motivation (+16.2%), Development Opportunities (+14.6%), and work Interest (+14.6%). Both live and self-paced online formats were associated with favourable outcomes, with larger gains generally observed in the online cohort, including PR6 Overall (+17.6% vs. +10.2% live). Matched analyses showed the strongest gains among participants with lower baseline resilience, with PR6 Overall improving by 39.0% in the lowest baseline group. Participant feedback also indicated high satisfaction, with over 92% of respondents rating the instructor, materials, and program overall positively.

Conclusions: HART was associated with broad improvements in resilience, motivation, engagement, job satisfaction, and workplace connection in workers operating in high adversity contexts, supporting the value of a broader, strength-based, and scalable preventative approach to resilience training.

Keywords: resilience, first responders, workplace wellbeing, emergency services, preventative mental health, engagement, job satisfaction, high adversity occupations

Introduction

High adversity occupations (HAOs) expose workers to frequent, intense, and cumulative forms of stress. These occupations include emergency responders, healthcare workers, law enforcement, military personnel, crisis call staff, and other professionals who operate under conditions of trauma exposure, urgency, emotional strain, and sustained organisational pressure. Workers in such settings face elevated risk of burnout, anxiety, depression, post-traumatic stress, suicidal ideation, and broader deterioration in physical and social wellbeing (Aiken et al., 2013; Hamling, 2018; Henderson et al., 2016; Stanley et al., 2016). These risks arise not only from major traumatic incidents, but also from chronic occupational strain such as shift work, administrative burden, workplace conflict, stigma, difficult public interactions, and the cumulative impact of high adversity work on family and social life (Beaton & Murphy, 1993; Fisher & Etches, 2003; Hamling, 2018; Knutsson, 2003).

In an earlier conceptual paper, we argued that these realities require a broader preventative framework than has often been

adopted in high adversity settings (Rossouw et al., 2024). That paper introduced High Adversity Resilience Training (HART) as an integrated, strength-based, preventative program designed to build resilience capacity before the onset of more severe mental ill-health, while also addressing the wider cultural and relational systems surrounding workers in high adversity roles. Building on the Predictive 6 Factor Resilience (PR6) model, HART was designed around the domains of Vision, Composure, Reasoning, Health, Tenacity, and Collaboration, with the aim of strengthening protective factors linked to emotional regulation, motivation, cognitive flexibility, physical wellbeing, persistence, and supportive relationships (Rossouw & Rossouw, 2016; Rossouw et al., 2017; Rossouw et al., 2019).

This preventative focus is supported by prior research showing that resilience is associated with improved mental health, reduced distress, and better adaptation under stress, while resilience training has shown promise across occupational and clinical settings (Charney, 2003; Elisei et al., 2013; Horn & Feder, 2018; Joyce et al., 2018; Robertson et al., 2015). In high-risk occupations, factors such as cognitive emotion regulation, social support, optimism, purpose, and adaptive coping have been linked to lower distress and improved functioning (Bryant & Guthrie, 2007; Cai et al., 2017; Chamberlin & Green, 2010; Jackson et al., 2007; Mealer et al., 2012).

However, reviews have noted that many interventions for HAOs remain narrowly focused on post-traumatic stress and potentially traumatic events, with insufficient attention to broader occupational stressors, social support, family systems, and organisational contributors to distress (McCreary, 2019; Skeffington et al., 2013; Wild, Greenberg, et al., 2020). Concerns have also been raised regarding limited methodological rigour, inconsistent outcome measurement, and weak longitudinal evidence (Eidelson et al., 2011; Eidelson & Soldz, 2012; McCreary, 2019).

These gaps highlight the need for applied outcome evidence showing whether resilience-focused programs produce measurable improvements when implemented in real-world settings and across scalable delivery formats. This question is especially relevant in high adversity environments, where training often needs to be delivered flexibly through live instructor-led workshops and self-paced online learning to accommodate variable schedules, workloads, and organisational contexts. HART was developed with this implementation challenge in mind as a multimodal certification program supported through both live and self-paced formats.

In the present study, HART was evaluated not only through the PR6 resilience framework, but also through broader workplace experience indicators captured in the Job Satisfaction, Engagement, Co-worker Connection Quality, and Work Context (JSECC) Psychosocial Survey.

While resilience remains the central theoretical construct underpinning HART, the inclusion of these work-related factors allows the study to examine change across organisational and relational dimensions that are highly relevant to high adversity functioning, including leadership support, recognition, communication, trust, safety, administrative burden, and the impact of work on social and relationship functioning.

The primary aim of the present study is to assess whether participation in HART is associated with improvements in resilience and related workplace factors from pre to post assessment. A second aim is to compare patterns of change across live instructor-led and self-paced online delivery. A third aim is to examine whether starting level influences the magnitude of observed improvement, given that participants with lower initial resilience may have greater scope for measurable gain. This study contributes to the resilience intervention literature by providing outcome data on a program designed specifically for the complex realities of high adversity work and by offering real-world implementation evidence across scalable delivery formats.

Method

Study design

This study used a naturalistic pre-post program evaluation design drawing on routine implementation data collected between January 2024 and February 2026. Primary analyses compared pre-program and post-program cohort mean scores at the group level, rather than matched within-person change across the full sample. Additional subgroup analyses used matched pre-post data for participants who could be linked across time and classified according to baseline score band.

Participants

The pre-assessment sample comprised 604 participants. Of these, 277 (45.9%) were female, 321 (53.1%) were male, and 6 (1.0%) were classified as other or data not available. Participants were drawn predominantly from Australia (86.6%), with smaller representation from the United States (10.1%) and other countries (3.3%). Industry representation was broad, with the largest groups drawn from Emergency Services and Safety (27.6%), Mining (20.4%), and Healthcare (16.2%). Most participants completed HART through the live instructor-led format (74.7%), with the remainder completing the self-paced online format (25.3%) (see Table 1).

Participants were drawn from a range of workplace settings in which HART was implemented. This included a mix of voluntary participation and workplace-based delivery in which training was provided to whole departments and participation was effectively mandatory. The proportion of voluntary versus mandatory participation was not available. Duplicate enrolments were identified and removed prior to analysis.

Table 1: Participant demographics and occupation

Characteristic	Category	n	%
Gender	Female	277	45.9
	Male	321	53.1
	Other or n/a	6	1
Country	Australia	523	86.6
	USA	61	10.1
	Other	20	3.3
Industry	Education & Training	58	9.6
	Healthcare	98	16.2
	Emergency Services & Safety	167	27.6
	Mining	123	20.4
	Government	38	6.3
	Other	120	19.9
Delivery mode	Live	451	74.7
	Online (self-paced)	153	25.3
Total		**604**	**100%**

Intervention

HART is a preventative, strength-based resilience training program developed for workers operating in high adversity contexts. It is grounded in the Predictive 6 Factor Resilience (PR6) model and is designed to strengthen resilience-related capacities relevant to functioning under sustained occupational stress. In the live format, HART was delivered by a certified HART Instructor.

In the self-paced format, participants completed an online version of the course consisting of a sequence of instructional videos and digital self-reflection activities. All participants, regardless of delivery mode, received a hard copy HART Manual that included written activity spaces to support reflection and application during the program.

Measures

PR6 - Predictive 6 Factor Resilience assessment

Resilience was assessed using the Predictive 6 Factor Resilience assessment (PR6), a multidimensional measure designed to assess key protective factors associated with resilient functioning (Rossouw & Rossouw, 2016; Rossouw et al., 2017; Rossouw et al., 2019). The PR6 used in the present study consisted of 16 items measuring an overall resilience score as well as six domain scores: Vision, Composure, Reasoning, Health, Tenacity, and Collaboration. Momentum was excluded from the present analyses, as it is treated separately as a forward-looking indicator rather than one of the six core PR6 domains.

All PR6 items were rated on a 5-point Likert scale. The instrument includes both positively and negatively keyed items, with reverse-scored items recoded prior to analysis. Scores were averaged and normalised to a 0 to 1 scale, with higher scores indicating stronger resilience-related functioning. Previous research has reported good internal consistency for the PR6, including an alpha coefficient of 0.8398 reported in earlier validation work (Rossouw et al., 2017). In the present sample, the PR6 demonstrated good internal consistency, with a Cronbach's alpha of 0.8315.

JSECC - Job Satisfaction, Engagement, Co-worker Connection Quality, and Work Context Psychosocial Survey

Psychosocial work-related factors were assessed using the Job Satisfaction, Engagement, Co-worker Connection Quality, and

Table 2: Participant pre-assessment descriptive statistics

Factor / Sub-factor	N	Mean	StDev	Q1	Median	Q3
PR6 Overall	**604**	**0.665**	**0.135**	**0.576**	**0.671**	**0.756**
Tenacity	604	0.665	0.196	0.553	0.663	0.830
Vision	604	0.656	0.197	0.495	0.618	0.750
Collaboration	604	0.647	0.224	0.502	0.652	0.781
Composure	604	0.685	0.192	0.601	0.728	0.864
Reasoning	604	0.679	0.186	0.540	0.676	0.798
Health	604	0.665	0.197	0.545	0.688	0.806
Job Satisfaction	**604**	**0.645**	**0.198**	**0.520**	**0.670**	**0.790**
Job Enjoyment	604	0.663	0.220	0.500	0.630	0.750
Leadership Views	604	0.583	0.276	0.500	0.500	0.750
Development Opportunities	604	0.642	0.252	0.500	0.750	0.750
Recognition	604	0.599	0.263	0.500	0.580	0.750
Management Views	604	0.709	0.272	0.500	0.750	1.000
Commitment	604	0.674	0.297	0.500	0.750	1.000
Co-worker Connection Quality	**604**	**0.689**	**0.167**	**0.590**	**0.720**	**0.810**
Co-worker Association	604	0.656	0.225	0.500	0.750	0.750
Co-worker Harmony	604	0.725	0.186	0.630	0.750	0.880
Co-worker Communication	604	0.674	0.206	0.500	0.750	0.880
Co-worker Trust	604	0.705	0.208	0.630	0.750	0.880
Engagement	**604**	**0.688**	**0.172**	**0.600**	**0.700**	**0.800**
Motivation	604	0.580	0.251	0.500	0.500	0.750
Interest	604	0.618	0.243	0.500	0.750	0.750
Productivity	604	0.736	0.214	0.750	0.750	1.000
Involvement	604	0.699	0.237	0.500	0.750	0.750
Accomplishment	604	0.808	0.208	0.750	0.750	1.000
Work Context	**604**	**0.603**	**0.139**	**0.508**	**0.610**	**0.690**
Ergonomics	604	0.784	0.216	0.750	0.750	1.000
Work Safety	604	0.617	0.316	0.250	0.750	1.000
Policies and Procedures	604	0.663	0.236	0.500	0.750	0.750
Administrative Work	604	0.481	0.289	0.250	0.500	0.750
Public Interactions	604	0.709	0.251	0.500	0.750	1.000
Training Regimes	604	0.681	0.225	0.500	0.750	0.750
Work Mental Impact	604	0.469	0.284	0.250	0.500	0.750
Work Social Impact	604	0.538	0.229	0.500	0.500	0.750
Work Relationship Impact	604	0.487	0.223	0.500	0.500	0.500

Note. PR6 = Predictive 6 Factor Resilience Scale

Work Context (JSECC) Psychosocial Survey. The JSECC comprises 29 items and assesses four broad dimensions of workplace experience relevant to high adversity occupations: Job Satisfaction, Engagement, Co-worker Connection Quality, and Work Context.

- The Job Satisfaction factor assesses perceptions of job enjoyment, leadership views, management views, development opportunities, recognition, and commitment.
- Engagement assesses motivation, interest, productivity, involvement, and accomplishment.
- Co-worker Connection Quality assesses association, harmony, communication, and trust among co-workers.
- Work Context assesses ergonomics, work safety, policies and procedures, administrative work, public interactions, training regimes, and the mental, social, and relationship impact of work.

All JSECC items were rated on a 5-point Likert scale. As with the PR6, the JSECC includes both positively and negatively keyed items, with reverse-scored items recoded before analysis. Scores were averaged and normalised to a 0 to 1 scale, with higher scores indicating more favourable workplace perceptions. In the present sample, the JSECC demonstrated excellent internal consistency overall, with a Cronbach's alpha of 0.912. Subscale internal consistency was good for Job Satisfaction (alpha = 0.850), Engagement (alpha = 0.801), and Co-worker Connection Quality (alpha = 0.829), and acceptable for Work Context (alpha = 0.704). The relatively lower alpha for Work Context likely reflects the broader and more heterogeneous nature of this factor, which captures a range of distinct workplace conditions rather than a narrowly defined single construct.

Post-program feedback survey

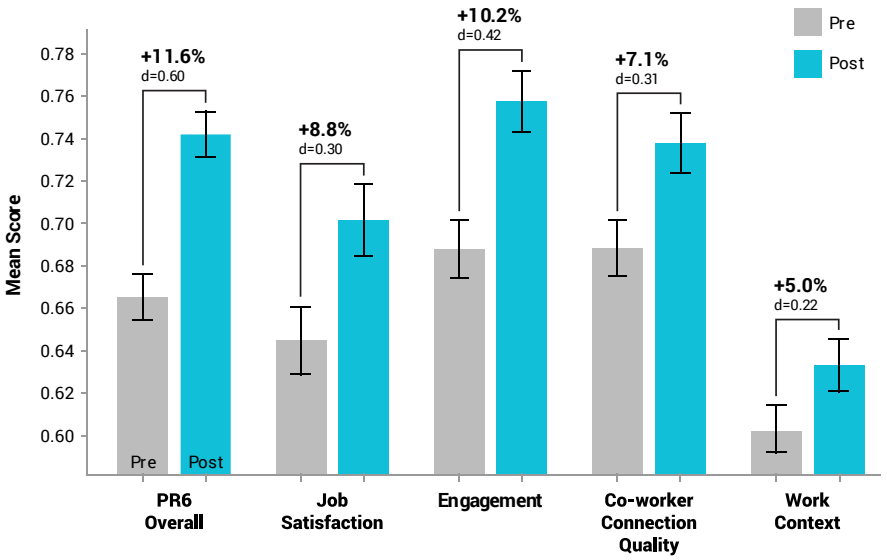
The post-assessment also included a program feedback survey comprising quantitative rating items and qualitative free-response questions. The quantitative items assessed participant perceptions of the training, while the qualitative items invited responses regarding what participants liked, disliked, and any

Table 3: Pre-post outcomes across PR6 and JSECC measures

Measure	Pre Mean (SD)	Post Mean (SD)	Change	Cohen's d	p value
PR6 Overall	**0.665 (0.135)**	**0.742 (0.120)**	**11.6%**	**0.599**	**<.001**
Vision	0.656 (0.197)	0.744 (0.174)	13.4%	0.472	<.001
Composure	0.685 (0.192)	0.755 (0.179)	10.2%	0.374	<.001
Reasoning	0.679 (0.186)	0.768 (0.157)	13.1%	0.508	<.001
Health	0.665 (0.197)	0.728 (0.174)	9.5%	0.338	<.001
Tenacity	0.665 (0.196)	0.729 (0.188)	9.6%	0.330	<.001
Collaboration	0.647 (0.224)	0.727 (0.204)	12.4%	0.374	<.001
Job Satisfaction	**0.645 (0.198)**	**0.702 (0.186)**	**8.8%**	**0.295**	**<.001**
Job Enjoyment	0.663 (0.220)	0.729 (0.208)	10.0%	0.307	<.001
Leadership Views	0.583 (0.276)	0.632 (0.269)	8.4%	0.179	0.004
Development Opportunities	0.642 (0.252)	0.736 (0.215)	14.6%	0.396	<.001
Recognition	0.599 (0.262)	0.665 (0.243)	11.0%	0.261	<.001
Management Views	0.709 (0.272)	0.747 (0.255)	5.4%	0.145	0.018
Commitment	0.674 (0.297)	0.699 (0.279)	3.7%	0.085	*0.163*
Engagement	**0.688 (0.172)**	**0.758 (0.161)**	**10.2%**	**0.417**	**<.001**
Motivation	0.580 (0.250)	0.674 (0.227)	16.2%	0.392	<.001
Interest	0.618 (0.243)	0.708 (0.224)	14.6%	0.380	<.001
Productivity	0.736 (0.214)	0.791 (0.181)	7.5%	0.279	<.001
Involvement	0.699 (0.237)	0.775 (0.200)	10.9%	0.347	<.001
Accomplishment	0.808 (0.208)	0.840 (0.188)	4.0%	0.162	0.008
Co-worker Connection Quality	**0.689 (0.167)**	**0.738 (0.157)**	**7.1%**	**0.305**	**<.001**
Co-worker Association	0.656 (0.225)	0.730 (0.212)	11.3%	0.333	<.001
Co-worker Harmony	0.725 (0.186)	0.745 (0.182)	2.8%	0.110	*0.074*
Co-worker Communication	0.674 (0.206)	0.718 (0.191)	6.5%	0.220	<.001
Co-worker Trust	0.705 (0.208)	0.767 (0.189)	8.8%	0.308	<.001
Work Context	**0.603 (0.139)**	**0.633 (0.138)**	**5.0%**	**0.216**	**<.001**
Ergonomics	0.784 (0.216)	0.817 (0.190)	4.2%	0.165	0.006
Work Safety	0.617 (0.316)	0.595 (0.326)	-3.6%	-0.069	*0.263*
Policies and Procedures	0.663 (0.236)	0.703 (0.233)	6.0%	0.173	0.005
Administrative Work	0.481 (0.289)	0.504 (0.272)	4.8%	0.084	*0.168*
Public Interactions	0.709 (0.251)	0.685 (0.276)	-3.4%	-0.091	*0.143*
Training Regimes	0.681 (0.225)	0.761 (0.207)	11.7%	0.365	<.001
Work Mental Impact	0.469 (0.284)	0.534 (0.283)	13.9%	0.229	<.001
Work Social Impact	0.538 (0.229)	0.560 (0.235)	4.1%	0.095	*0.126*
Work Relationship Impact	0.487 (0.223)	0.538 (0.235)	10.5%	0.223	<.001

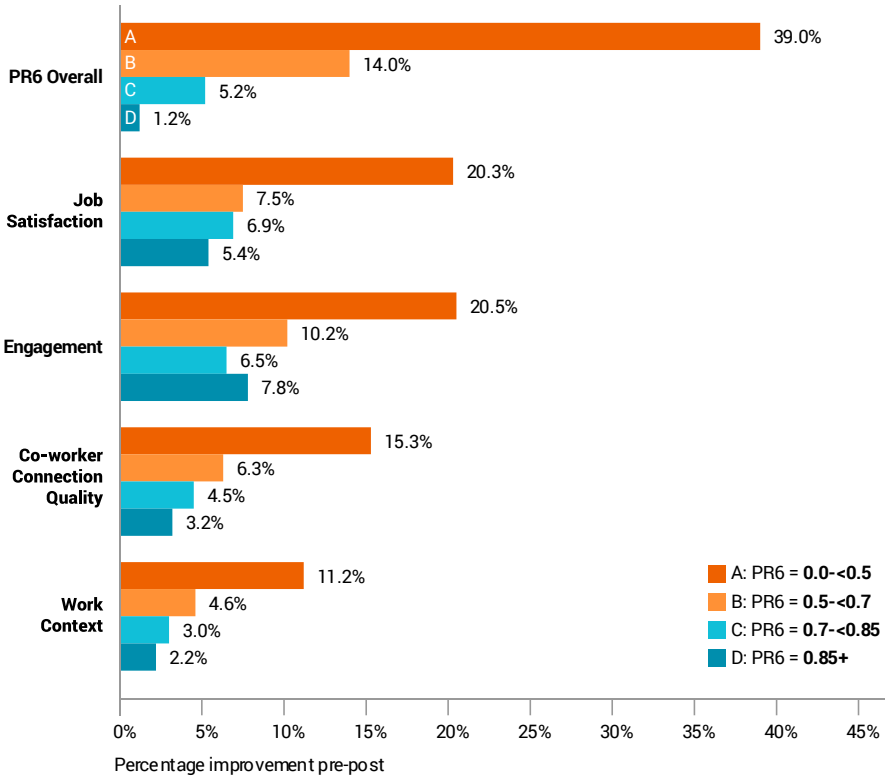
Note. Values are reported as mean (SD). Change values represent percentage change from pre- to post-assessment. Parent rows indicate broad factors; indented rows indicate component domains or subfactors. Pre-assessment n = 604 and post-assessment n = 471 for all outcomes shown.

Figure 1: Overall pre-post changes following HART certification



Note. Mean pre- and post-program scores for PR6 Overall and the four broad JSECC factors. Values are shown on a normalised 0 - 1 scale. Error bars represent 95% confidence intervals. Percentage labels indicate relative pre-post change and d values indicate effect size.

Figure 2: Pre-post percentage improvement by baseline PR6 group



Note. Bars show percentage change from pre- to post-assessment for matched participants within each baseline PR6 group. Baseline groups were defined using pre-assessment PR6 Overall scores: A = 0-<0.50, B = 0.50-<0.70, C = 0.70-<0.85, and D = 0.85+. PR6 = Predictive 6 Factor Resilience assessment.

overall comments or recommendations. These data were collected to provide additional descriptive insight into participant experience and perceived value of the program.

Procedure

Participants completed the pre-assessment prior to commencing 14 hours of HART training, either over two days of instructor-led training, or over a self-paced period if completed via digital training, followed by the post-assessment at program completion as part of the standard program process. Assessment administration was embedded within routine program delivery for both live and self-paced participants. Only fully completed assessments were included in analysis. The assessment platform requires completion of all items before submission, and as such no missing item-level data were present within submitted assessments.

Participants provided consent during the initial sign-up process for de-identified program data to be used for research and reporting purposes. The present study therefore reflects routine pre and post program assessment data collected under standard implementation conditions, using de-identified results for evaluation and research reporting.

Data preparation

Prior to analysis, duplicate enrolments were removed. For both the PR6 and JSECC measures, item responses were scored, reverse-coded where required, and averaged to produce normalised scores on a 0 to 1 scale. Pre-assessment descriptive statistics for the full set of measures are presented in Table 2, which provides baseline participant characteristics across resilience and psychosocial work-related domains.

Statistical analysis

Descriptive statistics were calculated for all study variables, including mean scores, standard deviations, standard errors, and score distributions at pre-assessment. For the total sample, and separately for live and self-paced formats, aggregate pre-assessment and post-assessment cohort mean scores were compared using independent samples t-tests, with effect sizes reported using Cohen's d.

Additional subgroup analyses examined change by gender and by baseline score group. Gender subgroup analyses were conducted at the aggregate cohort level. Baseline score group analyses were conducted using matched pre-post data, with participants classified according to their baseline score band and analysed using paired samples t-tests. Effect sizes for matched analyses were also reported using Cohen's d.

Post-program feedback data was analysed descriptively for quantitative items. Qualitative free-text responses were examined using thematic analysis to identify recurring patterns in participant experiences, perceived benefits, and suggested improvements.

Results

Sample and analytic overview

A total of 604 participants completed the pre-assessment and 471 completed the post-assessment. Within delivery formats, 451 live participants completed pre-assessment and 382 completed post-assessment, while 153 online participants completed pre-assessment and 89 completed post-assessment. Adjusted for participants still in progress (Live = 19, Online = 50), completion rates are 88.4% for Live training, and 86.4% for Online training. As outlined in the Method section, the primary analyses compared aggregate pre-assessment and post-assessment cohort means, while matched pre-post analyses were used for baseline PR6 starting group comparisons.

Table 4: Pre-post outcomes by delivery format for PR6 and broad JSECC factors

Measure	Live Pre	Live Post	Live %	Online Pre	Online Post	Online %
PR6 Overall	0.665	0.733	10.20%	0.664	0.781	17.60%
Vision	0.654	0.733	12.10%	0.663	0.795	19.90%
Composure	0.687	0.751	9.30%	0.679	0.771	13.50%
Reasoning	0.680	0.757	11.30%	0.676	0.811	20.00%
Health	0.668	0.719	7.60%	0.655	0.765	16.80%
Tenacity	0.657	0.716	9.00%	0.688	0.782	13.70%
Collaboration	0.655	0.720	9.90%	0.623	0.759	21.80%
Job Satisfaction	0.641	0.698	8.90%	0.657	0.719	9.40%
Engagement	0.676	0.745	10.20%	0.722	0.813	12.60%
Co-worker Connection Quality	0.682	0.728	6.70%	0.709	0.784	10.60%
Work Context	0.596	0.617	3.50%	0.624	0.704	12.80%

Note. Percentage values show increase from Pre to Post assessment. Corresponding effect sizes ranged from *d* = 0.15 to 0.54 for the live cohort and *d* = 0.29 to 0.87 for the online cohort.

Table 5: Matched outcomes by baseline PR6 group for PR6 Overall and broad JSECC factors

Baseline group	Measure	Pre Mean	Post Mean	Change	Cohen's d	p value
A: 0.0-<0.5	PR6 Overall	0.428	0.595	39.0%	1.461	<.001
	Job Satisfaction	0.492	0.592	20.3%	0.696	<.001
	Engagement	0.523	0.630	20.5%	0.641	<.001
	Co-worker Connection Quality	0.576	0.664	15.3%	0.723	<.001
	Work Context	0.517	0.575	11.2%	0.496	0.001
B: 0.5-<0.7	PR6 Overall	0.614	0.700	14.0%	0.972	<.001
	Job Satisfaction	0.629	0.676	7.5%	0.373	<.001
	Engagement	0.658	0.725	10.2%	0.558	<.001
	Co-worker Connection Quality	0.671	0.713	6.3%	0.366	<.001
	Work Context	0.581	0.608	4.6%	0.285	<.001
C: 0.7-<0.85	PR6 Overall	0.763	0.803	5.2%	0.487	<.001
	Job Satisfaction	0.693	0.741	6.9%	0.411	<.001
	Engagement	0.757	0.806	6.5%	0.398	<.001
	Co-worker Connection Quality	0.741	0.774	4.5%	0.285	<.001
	Work Context	0.640	0.659	3.0%	0.168	0.037
D: 0.85+	PR6 Overall	0.893	0.904	1.2%	0.176	0.262
	Job Satisfaction	0.772	0.814	5.4%	0.321	0.044
	Engagement	0.830	0.895	7.8%	0.562	<.001
	Co-worker Connection Quality	0.804	0.830	3.2%	0.246	0.119
	Work Context	0.724	0.740	2.2%	0.146	0.350

Note. Values are based on matched pre-post participants within each baseline PR6 group. Baseline groups were defined using participants' pre-assessment PR6 Overall scores. These bands correspond broadly to low, below average, above average, and high resilience. Change values represent percentage change from pre- to post-assessment. Cohen's d values are reported for paired comparisons.

Overall pre-post outcomes

Across the total sample, participation in HART was associated with significant improvements in overall resilience, all six PR6 domains, and all four broad workplace factors measured by the JSECC. The largest broad improvement was observed for PR6 Overall, which increased from 0.665 to 0.742, representing an 11.6% increase, $t(1055.79) = -9.883$, $p < .001$, $d = 0.599$ (Figure 1).

All six PR6 domains also improved significantly. The largest percentage gains were observed for Vision (+13.4%), Reasoning (+13.1%), and Collaboration (+12.4%), followed by Composure (+10.2%), Tenacity (+9.6%), and Health (+9.5%). Across the workplace factors, Engagement showed the largest increase (+10.2%), followed by Job Satisfaction (+8.8%), Co-worker Connection Quality (+7.1%), and Work Context (+5.0%). These findings indicate that HART was associated not only with improved resilience overall, but also with improved workplace motivation, satisfaction, connection, and broader work experience.

Table 3 presents the overall pre-post results for the total sample across the PR6 and JSECC measures.

Selected notable subfactor changes

To provide a more practical view of where change was most evident, selected JSECC subfactors with the largest percentage gains were examined. The strongest improvements in the total sample were found for Motivation (+16.2%), Development Opportunities (+14.6%), Interest (+14.6%), Work Mental Impact (+13.9%), Training Regimes (+11.7%), and Co-worker Association (+11.3%). These patterns suggest that the most visible gains were concentrated in motivation, learning and development climate, and relational aspects of work.

Several other subfactors also improved significantly, including Recognition (+11.0%), Involvement (+10.9%), Work Relationship Impact (+10.5%), and Job Enjoyment (+10.0%). By contrast, Commitment, Co-worker Harmony, Work Safety, Administrative Work, Public Interactions, and Work Social Impact did not show significant improvement in the total sample.

Outcomes by delivery format

Both live instructor-led and self-paced online delivery formats were associated with significant improvements across all broad PR6 and JSECC factors. However, the magnitude of change was generally larger in the online cohort.

For PR6 Overall, the live cohort improved from 0.665 to 0.733, representing a 10.2% increase, $t(828.38) = -7.765$, $p < .001$, $d = 0.535$, while the online cohort improved from 0.664 to 0.781, representing a 17.6% increase, $t(214.88) = -6.912$, $p < .001$, $d = 0.873$. Within the online cohort, especially large gains were observed for Collaboration (+21.8%), Reasoning (+20.0%), and Vision (+19.9%). At the workplace factor level, Work Context improved by 12.8% in the online group compared with 3.5% in the live group, while Engagement improved by 12.6% online compared with 10.2% live.

Overall, both delivery modes were associated with favourable outcomes, but the online format showed consistently larger gains across nearly all broad resilience and workplace indicators. Table 4 presents the broad pre-post outcomes by delivery format.

Outcomes by baseline PR6 group

To examine whether starting level influenced the magnitude of change, matched participants were grouped according to their baseline PR6 Overall score using four established PR6 bands: 0-<0.50, 0.50-<0.70, 0.70-<0.85, and 0.85+. These bands broadly represent low, below average, above average, and high resilience, with the 0.85+ band reflecting a previously identified protective resilience threshold (Rossouw, 2024).

Matched analyses showed a clear gradient in outcomes (Table 5, Figure 2). Participants with lower starting resilience showed the largest gains in PR6 Overall, while those entering with higher baseline resilience showed progressively smaller changes, consistent with reduced room for improvement.

Participants in the lowest baseline group (A: 0-<0.50) showed the largest improvement in PR6 Overall, increasing from 0.428 to 0.595, a 39.0% increase, $t(47) = 10.123$, $p < .001$, $d = 1.461$. This group also showed the strongest workplace-related gains, including Job Satisfaction (+20.3%), Engagement (+20.5%), Co-worker Connection Quality (+15.3%), and Work Context (+11.2%), all statistically significant.

The next group (B: 0.50-<0.70) improved from 0.614 to 0.700 on PR6 Overall, a 14.0% increase, $t(223) = 14.546$, $p < .001$, $d = 0.972$. Significant improvements were also observed across the broad JSECC factors, with Engagement (+10.2%) showing the largest gain, followed by Job Satisfaction (+7.5%), Co-worker Connection Quality (+6.3%), and Work Context (+4.6%).

Table 6: Broad pre-post outcomes by gender

Measure	Female Pre	Female Post	Female %	Male Pre	Male Post	Male %
PR6 Overall	0.643	0.717	11.50%	0.684	0.761	11.30%
Vision	0.627	0.707	12.80%	0.682	0.772	13.20%
Composure	0.665	0.724	8.90%	0.702	0.778	10.80%
Reasoning	0.638	0.732	14.70%	0.715	0.794	11.00%
Health	0.650	0.708	8.90%	0.676	0.742	9.80%
Tenacity	0.640	0.686	7.20%	0.688	0.761	10.60%
Collaboration	0.651	0.739	13.50%	0.644	0.718	11.50%
Job Satisfaction	0.633	0.687	8.50%	0.654	0.712	8.90%
Engagement	0.683	0.744	8.90%	0.693	0.767	10.70%
Co-worker Connection Quality	0.689	0.732	6.20%	0.690	0.742	7.50%
Work Context	0.600	0.620	3.30%	0.607	0.643	5.90%

Note. Corresponding effect sizes ranged from d = 0.15 to 0.60 for female participants and from d = 0.26 to 0.58 for male participants. Work Context improved significantly for males but not for females.

Participants in group C: 0.70-<0.85 improved from 0.763 to 0.803 on PR6 Overall, a 5.2% increase, $t(155) = 6.077$, $p < .001$, $d = 0.487$. This group also showed smaller but significant gains in Job Satisfaction (+6.9%), Engagement (+6.5%), Co-worker Connection Quality (+4.5%), and Work Context (+3.0%).

By contrast, participants in the highest baseline group (D: 0.85+) showed only a 1.2% increase in PR6 Overall, from 0.893 to 0.904, and this change was not statistically significant, $t(41) = 1.137$, $p = .262$, $d = 0.176$. However, this group still showed significant improvements in Engagement (+7.8%, $d = 0.562$) and Job Satisfaction (+5.4%, $d = 0.321$), while gains in Co-worker Connection Quality (+3.2%) and Work Context (+2.2%) were not significant.

Overall, these findings suggest that HART may be particularly beneficial for participants entering the program with lower resilience, while those already functioning at very high levels show less further movement on PR6 outcomes. At the same time, workplace-related gains, especially in Engagement and Job Satisfaction, remained evident across baseline groups, including among those with the highest starting resilience. Table 5 presents matched outcomes across baseline PR6 groups for PR6 Overall and the four broad JSECC factors.

Gender outcomes

The overall pattern of findings was broadly similar for female and male participants (Table 6). Female participants showed an 11.5% increase in PR6 Overall (0.643 to 0.717, $p < .001$, $d = 0.601$), while male participants showed an 11.3% increase (0.684 to 0.761, $p < .001$, $d = 0.583$).

Both groups showed significant improvements across all six PR6 domains, as well as Job Satisfaction, Engagement, and Co-worker Connection Quality. Although male participants generally began with slightly higher baseline scores, the magnitude and pattern of improvement were similar across gender. The main exception was Work Context, which improved significantly for males (+5.9%, $p = .002$) while the increase noted for females did not reach statistical significance (+3.3%, $p = .111$).

Participant feedback

Post-program feedback indicated high levels of participant satisfaction with HART. The proportion of participants rating HART positively as Satisfied or Very Satisfied was high across all three items, including 93.6% for instructor satisfaction, 92.3% for materials satisfaction, and 92.3% for overall program satisfaction.

Qualitative feedback was also broadly positive. Participants most commonly valued the practical nature of the training, describing HART as providing usable tools and strategies for managing stress and adversity. Other recurring themes included the relevance of the content to both work and personal life, the quality of facilitation, and the benefits of the interactive learning environment.

Participants also highlighted increased self-awareness, appreciation of the clear six-domain framework, and a sense that the training reinforced existing strengths while offering new perspectives. Feedback on areas for improvement was generally modest, with many respondents indicating that no major changes were needed. Where suggestions were made, they mainly focused on increasing interactivity, allowing more time for discussion and practical application, and making minor refinements to pacing, materials, and delivery.

Discussion

The present study provides applied outcome evidence that participation in High Adversity Resilience Training (HART) was associated with broad improvements in resilience and workplace-related functioning across a large real-world sample of workers in high adversity contexts. Across the total sample, participants showed significant improvement in PR6 Overall, all six PR6 resilience domains, and all four broad JSECC workplace factors. These outcomes align with the design of the HART program to assist not only with operational impact of high adversity occupations, but also the organisational and relational risk factors that affect mental health over time (Rossouw et al., 2024, Figure 3).

The strongest broad gains were observed in Vision, Reasoning, Collaboration, and Engagement, with particularly notable subfactor improvements in Motivation, perceptions regarding Development Opportunities, Interest (feeling hopeful about work), and Work Mental Impact (improvement indicates positive impact of work on mental state). Taken together, these findings suggest that HART may support not only personal resilience capacity, but also aspects of motivation, workplace experience, and relational functioning that are highly relevant in high adversity occupations.

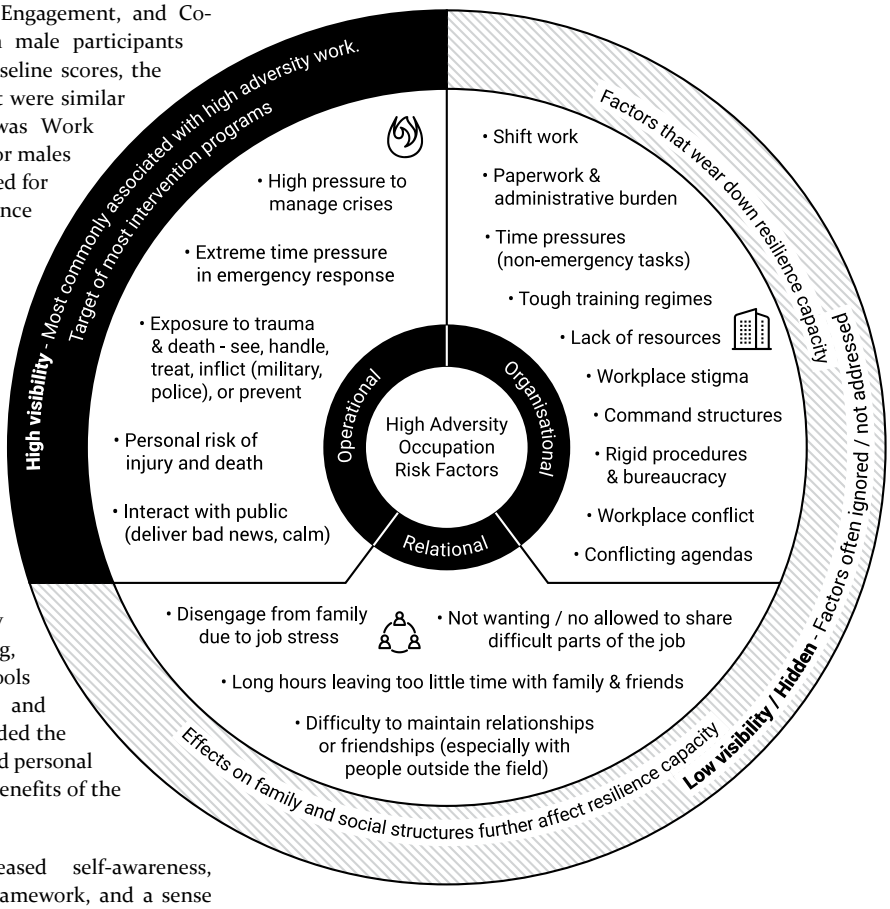


Figure 3: High adversity occupation risk factors

These findings are consistent with the broader rationale of HART, which was developed in response to concerns that resilience and prevention programs in high adversity settings often focus too narrowly on post-traumatic stress and potentially traumatic events, with insufficient attention to operational, organisational, and relational contributors to distress (Rossouw et al., 2024; McCreary, 2019; Wild, Greenberg, et al., 2020). In the present study, improvements were not limited to resilience domains alone, but extended to workplace experiences such as job satisfaction, engagement, co-worker connection quality, and work context. This pattern supports the value of a broader, strength-based and preventative approach to resilience development in high adversity occupations.

A central finding was the improvement in PR6 Overall and across all six PR6 domains. The strongest gains were seen in Vision, Reasoning, and Collaboration, suggesting that HART may be especially relevant for strengthening future orientation, adaptive thinking, and supportive interpersonal functioning. This pattern aligns with resilience literature linking purpose, cognitive reappraisal, flexible thinking, and social support to better adaptation under stress (Bonanno, 2004; Cai et al., 2017; Jackson et al., 2007; Mealer et al., 2012). It is also consistent with the theoretical grounding of the PR6 model, which conceptualises resilience as a multidimensional set of protective factors rather than a single trait (Rossouw & Rossouw, 2016; Rossouw et al., 2017). The workplace-related findings are also important. Among the broad JSECC factors, Engagement showed the strongest improvement, and at the subfactor level the largest gains were observed for Motivation, Development Opportunities, and Interest. These outcomes suggest that the effects of HART may extend beyond symptom prevention or emotional coping into the motivational systems that support sustained functioning at work.

In high adversity settings, where cumulative strain, fatigue, and emotional overload can erode enthusiasm and effort over time, gains in motivation and engagement may represent an especially meaningful practical outcome. This interpretation is consistent with literature suggesting that resilience is associated not only with reduced distress, but also with stronger functioning, persistence, and workplace adaptation (Carver, 1998; Robertson et al., 2015; Tugade et al., 2004). It also resonates with work on meaning, positive emotion, and psychological resources suggesting that positive orientation and perceived capability can broaden coping and support sustained action under pressure (Fredrickson, 2001, 2003; Kermott et al., 2019; Money et al., 2009).

Improvement in Job Satisfaction and related subfactors such as Job Enjoyment, Recognition, and Development Opportunities may also have practical significance. Earlier PR6 research found resilience to be positively associated with job satisfaction (Rossouw et al., 2017), and the present findings are consistent with that relationship. In high adversity occupations, job satisfaction is closely linked to morale, burnout risk, retention, and quality of service delivery (Aiken et al., 2013; Embriaco et al., 2007; Poncet et al., 2007). The gains observed here therefore suggest that resilience-focused training may have value not only as an individual support strategy, but also as part of broader workforce sustainability efforts.

The pattern of change in Co-worker Connection Quality is also noteworthy. Improvements in co-worker association, communication, and trust are consistent with the view that resilience in high adversity environments is partly social and relational, not merely individual. Prior research has highlighted the protective role of social support, supportive teams, and high-quality workplace relationships in buffering trauma exposure and occupational strain (Cacioppo & Cacioppo, 2012; Chamberlin & Green, 2010; Regehr et al., 2003; Stephens et al., 2012). The earlier HART paper likewise emphasised the importance of shared resilience language, peer support, and supportive culture in high adversity systems (Rossouw et al., 2024). The current findings provide applied support for that position.

The Work Context findings were smaller than those observed for resilience and engagement but remained meaningful. Work Context improved significantly in the total sample, and especially in the online group. Subfactors such as Training Regimes, Work Mental Impact, and Work Relationship Impact also showed notable gains. This suggests that participants' perceptions of how work affects them, and how well training supports them, can shift even in the absence of major structural organisational change. At the same time, some context-related subfactors, such as Work Safety, Administrative Work, and Public Interactions, did not improve significantly overall. This is understandable, as these areas are likely to be shaped by broader operational realities and organisational systems that a training program alone may not readily change. In this respect, the findings reinforce the argument that resilience training is likely to be most effective when embedded within a wider organisational approach rather than treated as a stand-alone intervention (Rossouw et al., 2024).

Baseline starting groups

One of the most practically important findings was the difference by baseline resilience level. Participants with lower starting PR6 scores showed the largest improvements, while those already scoring highly at baseline showed smaller change in PR6 Overall, consistent with a ceiling effect. The lowest baseline group not only showed the largest gains in PR6 Overall, but also the strongest improvements across Job Satisfaction, Engagement, Co-worker Connection Quality, and Work Context.

This strengthens the interpretation that HART may be particularly useful for participants with greater initial vulnerability or lower resilience capacity. At the same time, the highest baseline group still showed significant gains in Engagement and Job Satisfaction, indicating that even participants already functioning at a relatively high level may derive workplace-related benefits from the program.

Delivery formats

The comparison between live and self-paced online delivery also warrants attention. Both formats were associated with significant improvement, but the online group showed larger gains across nearly all broad indicators. The result is encouraging in practical terms, as it suggests that self-paced delivery may be a viable and scalable option for high adversity workforces who face scheduling, workload, and geographic barriers to attending live training. This is especially relevant in emergency, healthcare, and other high-demand settings, and aligns with prior work suggesting that resilience training can be delivered effectively through digital and blended formats when designed in a structured and engaging way (Jakel et al., 2016; Joyce et al., 2019; Magtibay et al., 2017).

Gender-based results

Gender findings were broadly similar, with both female and male participants showing significant gains in PR6 Overall, all six PR6 domains, Job Satisfaction, Engagement, and Co-worker

Connection Quality. The main difference was that Work Context improved significantly for males but not for females. Given the observational nature of the study and the absence of more detailed gender-stratified contextual data, this difference should not be overinterpreted. However, it may point to the value of future research examining how workplace culture, role expectations, and organisational experience shape training outcomes across subgroups. Earlier reviews have noted that gender differentiation has often been limited in prevention research in high adversity occupations (McCreary, 2019), and the present findings reinforce the value of retaining this lens in future evaluation work.

Limitations

Several limitations should be considered. First, the primary analyses compared aggregate pre-assessment and post-assessment cohorts rather than fully matched within-person change across the full sample, which limits causal inference. Matched baseline-group analyses provided additional support for the observed pattern of improvement, but do not remove the broader limitations of the aggregate cohort design. Second, the study was conducted under routine program delivery conditions across mixed workplace settings, including a combination of voluntary and effectively mandatory participation, and the proportions of these were not available. Third, the live and online groups were not randomised, so observed differences between delivery formats may partly reflect sample differences rather than delivery mode itself. Fourth, the study relied on self-report measures, which are appropriate for assessing perceived resilience and workplace experience but may be influenced by response bias.

Despite these limitations, the findings have several practical implications. They support the value of resilience training as a preventative rather than purely reactive strategy in high adversity settings and suggest that such training may be especially useful when it addresses not only individual coping, but also motivation, team functioning, and broader aspects of workplace experience. The results also support continued development of scalable digital delivery options for large or distributed workforces.

Future directions

Future research should build on these findings using matched longitudinal designs, longer follow-up periods, and where possible comparison or control groups. It would also be valuable to examine whether gains in resilience and workplace functioning are associated with downstream outcomes such as reduced burnout, lower psychological distress, improved retention, or stronger help-seeking culture. Further work could also explore whether particular HART components are especially important for improving motivational and workplace outcomes, including the notable changes observed here in Motivation, Interest, and Development Opportunities.

Overall, the present findings suggest that HART may offer a promising and practically relevant resilience-building approach for workers in high adversity occupations. The pattern of results supports the broader premise that resilience in these environments is not only about managing trauma exposure, but about strengthening purpose, reasoning, collaboration, motivation, and the work environment in which these capacities are enacted. In this sense, the current study extends the earlier conceptual foundation of HART by providing applied evidence that a broader, strength-based, and multimodal approach may produce meaningful gains across both personal and workplace-related domains.

Conclusion

This study provides applied outcome evidence that participation in High Adversity Resilience Training (HART) was associated with meaningful improvements in resilience and workplace-related functioning among workers in high adversity contexts. Across the total sample, participants showed significant gains in overall resilience, all six PR6 domains, and the broad workplace factors of Job Satisfaction, Engagement, Co-worker Connection Quality, and Work Context. Particularly notable improvements were observed in Vision, Reasoning, Collaboration, and Engagement, alongside strong gains in motivational and developmental subfactors such as Motivation, Interest, and Development Opportunities.

The findings also suggest that HART may be especially valuable for participants entering training with lower initial resilience, while still offering workplace-related benefits for those already functioning at relatively high levels. Both live and self-paced online delivery were associated with favourable outcomes, supporting the practical scalability of the program for high adversity workforces with diverse operational demands.

Taken together, these results support the value of a broader, strength-based, and preventative approach to resilience training in high adversity occupations. Rather than focusing only on trauma exposure or post-incident response, HART appears to offer a practical framework for strengthening adaptive thinking, purpose, social connection, motivation, and workplace functioning. Further longitudinal and controlled research is warranted, but the present findings suggest that HART is a promising and practically relevant intervention for supporting resilience and sustainability in high adversity work.

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