




# Factors Influencing Successful Coping among Crime Scene Investigation (CSI) Personnel: Recruiting for Resilience – A Mixed Methods Study

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## Abstract

Successful coping is important for staff well-being, retention and reducing absenteeism, especially for those employed in high emotional labour jobs such as crime scene investigation (CSI). Antecedents of successful coping can include self-efficacy, locus of control, optimism, resilience, and self-esteem. However, a dearth of literature exists attaining to the importance of emotion-regulation and mindfulness for successful coping in these roles, despite evidence revealing that both are conducive to better well-being. Additionally, few studies with CSI personnel have employed a mixed methods approach, which enables exploration of lived experiences in addition to survey analysis. Here, we recruited 84 CSI employees and 88 students undertaking a degree enabling employment within CSI, to comprehensively explore factors predicting successful coping. 75 CSI employees and 88 students took part in the quantitative aspect, where questionnaire data pertaining to the above well-being factors, as well as depression, anxiety and stress, were collected. In the concurrent qualitative aspect of the project, nine officers employed in CSI roles were recruited. Semi-structured interviews more deeply explored experiences of resilience and coping, including how the CSI personnel managed their occupation. Quantitative analyses revealed that, for CSI personnel, the greatest predictors of successful coping were resilience and emotional regulation. Compared to students, CSI personnel further reported greater self-esteem, optimism, coping self-efficacy, mindfulness and resilience; and fewer difficulties in emotion regulation, depression, anxiety and stress. Inductive qualitative analyses also revealed resilience and emotion regulation to be key coping factors; but additionally, that finding meaning in work/collegiate support enabled successful coping. Potential implications of findings are discussed and include pre-employment screening for emotion regulation and resilience, and inclusion of such in CSI training/CPD curricula.

**Keywords** CSIs · Well-being · Resilience · Emotion regulation · Coping · CSI training

## Introduction

Staff well-being, retention and absenteeism are considered a significant concern of organisations, yet research suggests that individual coping may also play a considerable role in these (Ferreira 2012; Jeanguenat and Dror 2018; Lorenz et al. 2016). A prevalent area of research in this field concerns employee well-being in ‘high emotional labour’ jobs (roles requiring significant emotional management), where successful coping is both essential and seriously tested (Janssens et al. 2018). Here, crime scene investigation

(CSI) is considered one of the most demanding professions – or high emotional labour roles – given that it involves being exposed to relentless, deeply harrowing experiences requiring considerable coping to protect personal well-being (Mrevlje 2016; Salinas and Webb 2018). As such, a focus of previous research has been to predict and screen for personality factors to support well-being in this profession (Kelty 2011; Kelty and Gordon 2012). Despite this, much of the coping literature, particularly within CSI, focuses on burnout and maladaptive coping (Janssens et al. 2018), with limited research exploring proactive approaches to well-being; i.e., successful coping.

Antecedents that underlie successful coping behaviours include self-efficacy, internal locus of control, trust, mastery, optimism and self-esteem (Lazarus and Folkman 1987; Quick and Cooper 2017). Quick and Cooper (2017) argue

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that a combination of these antecedents' manifest in a coping style that can be problem-, emotion-, meaning- or avoidance-focussed, with success dependent on their relevant use. For example, better coping has been attributed to higher levels of optimism, which encourages attempts at: problem focussed coping – such as decision-making; emotion focussed coping – such as support-seeking or humour (Sahler and Carr 2009; Vivona 2014); or meaning focussed coping – such as reframing (Kelty and Gordon 2015). These are considered active coping strategies; i.e., efforts that enable successful adaptation following a taxing demand that exceeds current resources (Chowdhury 2020a, b; Quick and Cooper 2017). An active coping style is therefore argued to be a useful predictor of successful coping. Indeed, a recent study among crime scene investigators (CSIs) in the USA indicated that the most frequently used successful coping techniques included acceptance, active coping and planning (Salinas and Webb 2018).

Mrevlje (2016) investigated the effects of coping style on post-traumatic stress disorder (PTSD) in 75 male Slovenian CSIs. They found that experience (familiarity with a situation rather than years of service), time to plan and previous success in the role enabled approach style or 'active' coping. However, Mrevlje (2016) further found that avoidance style coping was most frequently used, manifesting in negative behaviours. In fact, PTSD symptoms among the CSIs (17.19%) were higher than in the general population (1.7%), and higher PTSD correlated with higher avoidance style coping, as purported in other CSI studies (Clark et al. 2015; Sollie et al. 2017). This suggests that trauma from the role can affect coping outcomes in CSIs, supporting the need to more fully understand the antecedents of successful coping. These include 'hardiness', 'psychological capital' and 'resilience' (see Janssens et al. 2018; Lorenz et al. 2016; Maran et al. 2020; Queiros et al. 2020).

According to Janssens et al. (2018), hardiness is a construct that relates to an individual's ability to change events around them into something meaningful that they can control, relate to, adapt to and grow from. The relationship between hardiness and stress has been shown to be weak to moderate (Janssens et al. 2018); yet it has been found to aid resistance to stress and act as a predictor of burnout in the wider literature and high emotional labour roles such as police work (Garrosa et al. 2010; Kobasa et al. 1982; Talavera-Velasco et al. 2018). Whilst hardiness appears to align well with an active coping style, its defining element is perceived locus of control (Kobasa 1979). The construct of locus of control (LOC; Rotter 1966) can be internal (self-led) or external (led by other forces). When an individual perceives they have control over events surrounding them, this has been associated with feelings of personal competence and greater focus (Georgescu et al. 2019). An internal LOC has further been related to greater well-being and reduced

absenteeism in high stress work environments (Wang et al. 2010). Moreover, when individuals perceive some form of control over a situation or event, then enhanced successful coping is observed (Groth et al. 2019). In direct application to CSI, enabling self-selection of crime cases has been recommended to support coping within CSIs (Sollie et al. 2017), and a high internal LOC is postulated to moderate the effects of stress and trauma (Clark et al. 2015). However, a recent cross-sectional police study by Talavera-Velasco et al. (2018) does not support LOC as being positively related to well-being. They investigated psychosocial risk factors, burnout and hardiness as predictors of mental health among 223 police personnel. There was a significant negative relationship between problem perception, emotional exhaustion and poor mental health, yet the LOC element of 'control over work', did not predict psychological health. Thus, this is an area that requires further research.

Psychological capital (Psycap), described as the positive mental state of an individual's development (Lorenz et al. 2016), is strongly rooted in positive psychology. It is comprised of measures of self-efficacy, optimism and resilience, as well as hope (Luthans et al. 2008). Police officers who have high levels of these constructs have been found to be less vulnerable to anxiety, somatic symptoms, social dysfunction and depression (Ojedokun and Balogun 2015). As a single measure, self-efficacy is shown to be key within CSIs, with high levels of self-efficacy enabling more successful coping (Kelty 2011; Kelty and Gordon 2012, 2015). According to Bandura (1997), self-efficacy reflects one's perceived ability to carry out a required act in a prospective situation. Bandura defined it as a mix of competence and confidence that plays an important role in individuals' approaches to new behaviours when dealing with problems and pursuing goals.

Optimism, as a single measure, has also been found in police studies to be integral to coping, by reducing psychological distress (de Terte et al. 2014). Optimism can broadly be defined as either: 'dispositional' (trait-like), with the belief that a positive outcome will occur (Scheier and Carver 2018); or 'explanatory' (state-like), with a positive explanatory style evolving over time (Seligman 2011). Dispositional optimism has consistently been shown to positively correlate with psychological well-being (Augusto-Landa et al. 2011) and is additionally recognised as a predictive factor of resilience among medical students (Souri and Hasanirad 2011).

Resilience has been defined in different ways, it is generally perceived as the ability to 'bounce back' following challenges (Windle 2010; Janssens et al. 2018; Van-der-Meulen et al. 2019). Aside from optimism, further factors predictive of resilience include good intellectual functioning, self-regulation, self-esteem and altruism (Charney 2004). Together, these tend toward a 'positive response' or optimistic outlook to adversity, enabling self-efficacy/resilience to

continue to operate in times of stress (Windle 2010). Self-esteem is generally accepted as the confidence we place on our own worth or ability, and has a strong relationship with happiness (Rosenberg 1965). It is also a further antecedent to a positive outlook, optimism and hope (i.e., resilience), and a buffer to stress (Baumeister et al. 2003; Prati and Pietrantonio 2010). Increased levels of self-esteem have been found to increase levels of resilience and vice versa (Mehta et al. 2019). In police personnel, this includes supporting well-being through a propensity for positive reframing, directly strengthening self-efficacy and active coping (Prati and Pietrantonio 2010). Resilience has many beneficial facets, it independently predicts successful coping (Windle et al. 2011) and has been of interest to researchers in the field of CSI. For example, high levels of resilience have been shown to reduce the frequency and intensity of PTSD among CSIs, whereas high levels of PTSD correlated with lower resilience and maladaptive coping (Rosansky et al. 2019). Further studies in resilience and coping research have been conducted to understand the consequences of traumatic events on resilience. For example, Park et al. (2018) found a significant negative effect on resilience in relation to traumatic events and an indirect effect via social support and coping self-efficacy. The authors concluded that interventions to support coping self-efficacy that included social support are crucial to support resilience and future psychological well-being.

The importance of resilience to successful coping within CSI, however, has been most markedly demonstrated in a series of studies by Kelty (2011) and Kelty and Gordon (2012, 2015). They investigated the performance of CSIs in Australia and used psychometric testing to explore the concept of hiring well to promote well-being and reduce absenteeism. Their research included tests for cognitive abilities, emotional intelligence and problem solving, plus measures for stress symptoms, resilience and self-efficacy. Using this test battery, alongside interviews, Kelty and Gordon (2015) investigated the performance of 19 male and female top performing CSIs, as compared with normative data from university students, police recruits, police officers, clinical outpatients and members of the general population. They found the top level CSIs showed: significantly higher levels of critical thinking compared to police officers and the general population; similar stress resilience levels to the general population (although significantly higher resilience than clinical outpatients); significantly lower levels of depression than the general population (that was on a par with police officers); significantly lower anxiety than the general population and police officers; and, significantly elevated self-efficacy compared with the general population and police recruits. Additionally, in comparison with the general population, the top performing CSIs had significantly higher self-perceptions, were able to mentally detach from interfering thoughts whilst at work, had an active coping style and maintained focus on

tasks with an optimistic outlook. Thus, Kelty and Gordon (2015) concluded that there are measurable and assessable attributes possessed by highly performing CSIs that can be selected for. Their research further highlighted that successful CSIs were able to recognise and understand their emotions, express themselves efficiently, solve problems despite the emotional circumstances of their employment and resist impulses. This suggests the added importance of investigating emotion regulation within CSIs. In support of this, Rosansky et al. (2019) reported that CSIs frequently cope with stress by doing what has to be done, learning to live with the stress, trying to learn from their experience, and accepting what has happened.

Whilst the above review reveals personality factors, resilience and emotion regulation to positively influence coping, more recent research on successful coping has widened to include mindfulness (Christopher et al. 2016; Fitzhugh et al. 2019; Wang and Kong 2019; Tweedy 2020). Mindfulness is considered as '*paying attention on purpose, in the present moment, non-judgmentally*' (Kabat-Zinn 1994, p.4), thereby enabling improved emotion regulation, perspective and a greater clarity of thought and action (Jeanguenat and Dror 2018). These are demonstrated as important factors within CSI (Kelty and Gordon 2015; Roach et al. 2017), yet mindfulness remains relatively unexplored within this field. Mindfulness interventions in high emotional labour roles have resulted in improvements in resilience and lowered burnout levels (Christopher et al. 2016); increased resilience, locus of control and well-being (Fitzhugh et al. 2019); increased inter-personal reflection and improved emotional functioning (Eddy et al. 2019, 2021); reduced stress, burnout, avoidant coping and increased self-efficacy (Tweedy 2020). All of these are important indicators of successful coping in CSIs (Kelty and Gordon 2015) and, as such, mindfulness could provide a useful profiling tool for use within CSI selection.

Finally, although Kelty and Gordon (2015) employed semi-structured interviews and an inductive analytic approach as part of their research design, qualitative research within the CSI and coping literature is rare. Sollie et al. (2017) used a multi-method approach, including individual semi-structured interviews with five team leaders and thirty CSIs and also observational analysis – embedding a researcher within a CSI team – to understand the environmental and operational context of their CSI sample. They conducted an inductive thematic analysis (Braun and Clarke 2006) and reported that six CSIs reported having previously suffered with 'burnout'. They concluded that sharing emotions, strict management of thoughts and visualisation could help CSIs overcome workplace stress. The report highlighted the need for investment by forces in organisational resources to support these strategies and also the potential benefits of mixed methods approaches, noting their study lacked

investigation of personality factors (typically investigated using quantitative methods).

In summary, the research of Kelty (2011), Kelty and Gordon (2012, 2015), Sollie et al. (2017) and Rosansky et al. (2019) reveals that successful coping, within CSIs, is greatest for those who effectively manage their thoughts, focus on sense-making, effectively share their emotions and have control over their responsibilities. Additionally, the above literature highlights a variety of factors that might contribute to successful coping in high emotional-labour jobs including vulnerability to stress, locus of control, optimism, self-esteem, self-efficacy, resilience, emotion regulation and mindfulness. Yet, in no single study have these factors been explored in combination. Moreover, little research to date has explored the lived experience of CSIs; that is, how they manage their roles, build resilience and handle exposure to trauma and make sense of these in their own words (i.e., research that makes use of rich phenomenological exploration). Thus, the purposes of this study were twofold: (i) to explore the extent to which LOC, optimism, self-esteem, self-efficacy, resilience, emotion regulation and mindfulness, as well as depression, anxiety and stress, predict successful coping in current and future CSI personnel; and (ii) to explore, through qualitative analyses, current CSIs' understanding of personal resilience and factors that have supported and hindered their ability to perform their job roles. To this end, a mixed methods approach was taken with both positive and negative attributes of coping included to explore factors influencing successful coping among CSI Personnel; and as compared to future CSI personnel.

## Methods

### Design

The first element of the study (the online quantitative survey element) comprised of an online questionnaire of 7

psychometric scales. The second element involved 9 in-depth interviews with CSIs (the qualitative element). The two elements ran concurrently (Tashakkori et al. 2020), one did not inform the other. The interview sample was separate to the survey sample to add methodological rigour (Regnault et al. 2018), with both strands having clear aims within the overarching project. A critical realism stance was adopted; a philosophical approach that is compatible with both methods (Maxwell and Mittapalli 2010). Ethical clearance was gained for both the online and interview elements of the study via the relevant University ethics sub-panel (Human Sciences). Data clearance was obtained for CSIs from the regional Chief Commissioner.

### Participants

For the online quantitative survey, two groups of participants were recruited, professional CSI personnel and students in training to be in CSI roles.

#### Professional CSIs

Participants were recruited from UK CSI and Special Operations Units either directly via the Constabulary Manager or via The Chartered Society of Forensic Sciences Monthly Bulletin, UK (n = 115). Demographic data for the 75 CSIs who completed the survey in full is overviewed in Table 1.

#### Student CSIs

To understand attributes of well-performing CSIs, a normative sample of students wishing to progress careers in this general field was also recruited. These were students recruited from Forensic Science Programmes across 5 UK Universities. All participants were aged 18 or over. Demographic data for the 88 student participants who completed the survey in full is overviewed in Table 2.

**Table 1** Demographics of CSI personnel participants in the study ( $\bar{x}$  = mean)

Age in years (average)	Gender (%)	Ethnicity (%)	CSI level (1 to 4)	Length in role (average)	Length in CSI (average)	No. of cases (average)	No. 2019 absences (average)
23–65 ( $\bar{x}$ 33.36)	Female 40 (53%) Male 35 (47%)	Mixed 1 (1%) White British 68 (91%) White Scottish 3 (4%) White Irish 1 (1%) White European 2 (3%)	Level 1 15 (20%) Level 2 27 (36%) Level 3 11 (15%) Level 4 8 (11%) Other 14 (19%)	1 month–35 years ( $\bar{x}$ 10.4)	1 month–35 years ( $\bar{x}$ 14.1)	0–40,000 ( $\bar{x}$ 3,341.3)	0–65 ( $\bar{x}$ 4.6)

**Table 2** Demographics of CSI student participants in the study

Age range (years)	Gender	Ethnicity	Degree	Year of study
18–46 ( $\bar{x}$ 22.9)	Female	White British 76 (86%)	MSc	0=3 (3%)
	Male	Mixed British 1 (1%)	BSc	1=31 (35%)
		Pakistani British 1 (1%)		2=27 (31%)
		Asian 1 (1%)		3=24 (27%)
		Black Arab 1 (1%)		4=3 (3%)
		European 5 (6%)		
		Greek 1 (1%)		
		Mixed 1 (1%)		
		White Latin 1 (1%)		

## Interviews

For the qualitative interviews, participants were recruited from UK regional constabulary Forensic Investigation Units. From the 24 people invited to take part, 9 consented (6 males, 3 females). They ranged in age from 24 to 52 and had an average of 15 years' experience working within a Forensic Investigation Unit.

## Measures and Materials

### Online Survey Materials

#### Brief Resilience Scale (BRS; Smith et al. 2008)

The BRS is supported by Windle et al. (2011) as a highly valid and reliable measure of trait resilience (Cronbach's  $\alpha$  score of 0.91) providing a good indication of an individual's capability to 'bounce back' from challenges. The BRS is a 6-item scale (Smith et al. 2008). Example items include "it does not take me long to recover from a stressful event." It is rated on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree, with items summed and averaged to create a total score, whereby higher scores indicate greater resilience e.g., 1.00–2.99 reflects low resilience, 3.00–4.30 reflects normal resilience and 4.31–5.00 reflects high resilience (Smith et al. 2013). The BRS has been used in recent studies within police research in relation to well-being and mindfulness (Christopher et al. 2016; Fitzhugh et al. 2019).

#### Coping Self-efficacy Scale (CSE-13; Chesney et al. 2006)

The CSE-13 is a short form of the 26-item coping self-efficacy measure. It provides a measure of self-efficacy (or

confidence) in performing coping behaviours in the face of adversity (Chesney et al. 2006). It has 13 items and example items include "When things aren't going well for you, or when you're having problems, how confident or certain are you that you can break an upsetting problem down into smaller parts?". It has anchor points on an 11-point Likert scale from 0 = can't do at all, to 10 = certain can do, with scores ranging between 0 and 130, whereby high scores indicate higher coping self-efficacy. The CSE has been used within previous police coping research (e.g., Park et al. 2018; Kelty and Gordon 2015) with a Cronbach's  $\alpha$  score of 0.8–0.91.

#### Depression, Anxiety and Stress Scale (DASS-21/DASS-42; Lovibond and Lovibond 1996)

The DASS-21 is a shortened measure of the DASS-42. It provides a measure to understand current levels of personal distress. It has 21 items with participants asked to indicate which score best applied to them over the past week for each statement, e.g. "I felt downhearted and blue." Items are rated on a 4-point Likert scale to assess participant reactions from 0 = did not apply to me at all, to 3 = applied to me very much or most of the time. Scores are summed to provide a total DASS-21 score which is converted to the full DASS-42 score by multiplying by 2. Higher scores indicate higher levels of distress (Lovibond and Lovibond 1996). A total DASS-42 score of  $\geq 60$  is considered the clinical cut-off point for depression, anxiety & stress with ranges from 0 to 120 (Beaufort et al. 2017). The scale has a Cronbach's  $\alpha$  score of 0.81–0.91 (Lovibond and Lovibond 1996) and has been used in other CSI studies as a measure of stress resilience (Kelty and Gordon 2012, 2015).

#### Difficulty in Emotion Regulation Scale (DERS-18; Victor and Klonsky 2016)

The DERS-18 offers a cross sectional measure of participant awareness, emotional acceptance, impulse control and access to strategies of emotion regulation that assess difficulties in emotion regulation at a clinical level (with a focus on negative emotions) (Victor and Klonsky 2016). It consists of 18 items. Example items include "I pay attention to how I feel." Items are rated on a 5-point Likert scale from 1 = almost never, to 5 = almost always, and summed to create a final score (Victor and Klonsky 2016). Total scores can range from 18 to 90, with higher scores indicating greater difficulty with emotion regulation (Gratz and Roemer 2004). The scale has a Cronbach's  $\alpha$  score of 0.98 (Victor and Klonsky 2016) and has been shown to correlate with both mindfulness and resilience in other studies (Christopher et al. 2016; Sunbul and Guneri 2019).

### Five Facet Mindfulness Questionnaire (FFMQ-24; Bohlmeijer et al. 2011)

Trait mindfulness is popularly researched using the FFMQ, which measures facets of describing, observing, non-judging of inner experience, acting with awareness and non-reactivity to inner experience (Bohlmeijer et al. 2011). The short form uses 24 items, 11 of which are reverse scored. Example items include “I’m good at finding the words to describe my feelings”. It uses a Likert scale from 1 = never or very rarely true, to 5 = very often or always true. Scores can range from 24 to 120, whereby higher scores indicate greater mindfulness. It has a Cronbach’s  $\alpha$  score of 0.73–0.91 (Bohlmeijer et al. 2011). The short form has been used in both clinical and non-clinical populations to explore the efficacy of mindfulness in coping with real life problems (Baer 2019).

### Locus of Control (IE4; Kovaleva 2012)

The IE4 provides a reliable short form of locus of control (Cronbach’s  $\alpha$  scores of 0.75–0.8) that independently measures both internal and external locus of control (Kovaleva 2012). The IE4 has only 4 items, two for each separate subscale. For the purposes of this study, the internal locus of control sub-scale was used. Example items include “If I work hard, I will succeed.” A 5-point Likert scale was applied from 1 = doesn’t apply at all to 5 = applies completely. Scores were averaged by the number of subscale items to provide a final mean score whereby high scores indicated high internal locus of control with a range of 1.0 to 5.0 (Bomba et al. 2018).

### Optimism (Revised Life Orientation Test) (LOT-R; Scheier et al. 1994)

The LOT-R is a well-cited scale for measuring dispositional optimism during adjustment to adversity. The LOT-R has 10 items, 4 of which are fillers. Each item is rated on a 5-point Likert scale from A = I agree a lot (4), to E = I disagree a lot (0). Example items include “In uncertain times, I usually expect the best”. Higher values imply higher optimism e.g., 0–13 reflects low optimism, high pessimism, 14–18 reflects moderate optimism and 19–24 reflects high optimism, high pessimism (Chowdhury 2020a, b). The scale is reported to have a Cronbach’s  $\alpha$  score of 0.82 (Janssens et al. 2018) and has been used within police resilience studies (de Terte et al. 2014).

### Rosenberg Self-Esteem Scale (SE; Rosenberg 1965)

The Rosenberg self-esteem scale measures global self-worth using 10 items. Example items include “I feel that I am a person of worth, at least on an equal plane with others.” The

scale is used with a 4-point Likert scale from 3 = strongly agree to 0 = strongly disagree, whereby higher scores indicate higher self-esteem. The scale ranges from 0 to 30, with scores between 15 and 25 considered within the normal range. It has been shown to measure self-esteem with a Cronbach’s  $\alpha$  score of 0.77 to 0.88 (Rosenberg 1965). It has further been used in the wider field of police coping research (Oginska-Bulik 2005).

## In-depth Interview Materials

### Semi-Structured Interview Questions

Interviews were designed from a phenomenological stance to explore the lived experience of the CSIs. Open ended questions were used to enable the participants to speak openly on the topic and express their voice (Creswell 2020). A semi-structured approach enabled the interviewer to probe and explore responses and build rapport by demonstrating listening and acknowledgment of the individual’s significant contributions (Bryman 2004). Topics covered a range of aspects of the role e.g. recruitment, training, coping and support. Questions included:

- How well do you think the induction process helped you in preparing you for the role?
- Could you describe to me what things you have around you, either at home or work, which you feel most support your ability to cope with potentially difficult or upsetting situations that you might encounter at work?
- How would you describe the working culture within the team?
- Which qualities do you think mark a colleague out as someone who is able to cope well or thrive in what some people might find a potentially upsetting or difficult situation?

## Procedure

### Online Survey Procedure

A Qualtrics online survey platform was used to create two electronic surveys (one for CSI employees; one for students) that included participant information sheets, consent forms, the questionnaire measures and the debrief information. The quantitative element of the survey consisted of the individual psychometric scales amounting to 108 items in total. As outlined above, the short form of any scale over 20 items was selected according to their validation for use in large cross-sectional surveys to reduce participant burden. The scales were presented in a random order with forced responding. Brief profiles for each group were included to capture data

pertaining to: CSI level, time in current role, total number of years of service, total number of cases to date and number of absences in the past year; and for the student group: degree, year of study and University. Basic demographics data was also collected across all participants. Surveys were distributed through a Qualtrics link and took an average time of 22 min (CSI students) and 39 min (CSI personnel) to complete.

### Interview Element

Participants were recruited via an invitation to participate that was sent via the Crime Scene Manager. These CSIs were recruited separately from personnel who responded to the survey. Each participant gave their consent by signing a participant consent form online. The invitation and materials stated the voluntary nature of any participation and right to have data withdrawn. Participants' identities were kept confidential by assigning each interviewee a unique code. The interviews were held via a phone call and took an average of 55 min. This included a reiteration of each participant's right to withdraw their data or halt the interview at any point. The venue and method of each interview was chosen by each participant and, as a result, all were held via phone call, with participants in a private room, enabling them to speak freely. No webcams were used. A USB digital recorder was used to record the interviews, and all were transcribed verbatim. At the end of the interview, a debrief sheet was sent to each participant, including details of support organisations.

## Data Analysis and Screening

### Online Survey

#### Quantitative Analysis

A series of independent samples t-tests/Mann–Whitney U tests were undertaken to explore the similarities and differences between CSI personnel and the student group across the seven questionnaire measures. The latter reflected data screening revealing that the data was skewed and kurtosed for the CSI personnel for both the DERS-18 and the DASS-42 (created by multiplying the DASS-21 by 2 as prescribed by Lovibond and Lovibond 1996) and skewed for CSE-13 and IE4. Data was skewed for the CSI students for IE4, BRS, DERS-18 and DASS-42. The set of Z-scores also showed that there were outliers in the CSI data for both DERS-18 and DASS-42. Therefore, parametric assumptions for an independent t-test were only met for the FFMQ-24, SE & LOT-R. For BRS, IE4, DERS-18 and DASS-42 the non-parametric equivalent, the Mann–Whitney U test, was used in data analyses (Coolican 2014). Thereafter, multiple

regression was used to explore predictors of coping within the two populations, with locus of control (IE4), resilience (BRS), difficulties in emotion regulation (DERS-18), mindfulness (FFMQ-24), depression, anxiety and stress (DASS-42), self-esteem (SE) and optimism (LOT-R) entered as predictor variables and coping self-efficacy (CSE) as the outcome variable.

For the multiple regression analyses, the abnormal distribution of data for the CSI and CSI Students is not considered a concern (Field 2017). Z-scores were satisfactory with scatter plots for each variable in both data sets showing linear relationships. A later Durbin-Watson test showed that adjacent residuals were not correlated and the variance inflation factor was satisfactory for each data set. However, due to the presence of outliers for the DERS-18 and DASS-42 in the CSI data set, Cook's Distance was also calculated to ensure validity of the data reported in the results section.

### Qualitative Analysis

The interviews were analysed using the six-stage Thematic Analysis (TA) process (Braun and Clarke 2006). The data was read and re-read, the initial codes and label creation then produced, and the codes then combined to create themes. The themes, designed as “an idea or concept that captures and summarises the core point of a coherent and meaningful pattern in the data” (Braun and Clarke 2006, p. 82), were developed in a reflective way driven by the participants' experiences. The process of creating themes also acknowledges the need for the researcher to reflect on their involvement in the process and accept how their own beliefs, background, assumptions and position within the social world in which the study has taken place in, can affect the analysis outcomes (Ackerly and True 2010). To support this criteria, reflective visual mind maps were created, linking together the ‘data buckets’ (Braun and Clarke 2019), alongside personal notes of reflection. The original codes were guided by frequency of occurrence and also by the strength of emotion and the detail and depth (represented by duration of time covered). This approach followed recommendations from prior qualitative research which suggested that counting responses misses the point of the discipline and studies should “seek not to measure but rather to understand and represent” (Pyett 2003, p1170). This in-depth analysis of individual experiences aimed to enable coping mechanisms employed within the demands of CSI work to be viewed inductively through the perspective of the participants. The themes were developed by the second author, who also conducted the interviews and were checked by the third author. The ‘deeply problematic’ (Braun and Clarke 2022 p 28) concept of saturation was rejected for this analysis, instead the themes were developed to capture the richness of experience that was present across the data-set, drawing

out the similarities and shared experiences on a descriptive and also conceptual level within the participant narratives, using both semantic and latent analytic lenses as per Braun and Clarke's reflexive approach to thematic analysis (Braun and Clarke 2022).

## Results

### Online Survey

#### Quantitative Data

Table 3 shows the mean, median, interquartile range and standard deviation for each group (CSI students and CSI personnel) with coping self-efficacy (CSE-13), locus of control (IE4), resilience (BRS), difficulties in emotion regulation (DERS-18), depression, anxiety and stress (DASS-42), mindfulness (FFMQ-24), self-esteem (SE) and optimism (LOT-R), for the 75 CSI personnel and the 88 students.

As compared to CSI students, CSI personnel were demonstrated to have significantly greater self-esteem ( $t(161) = -5.457, p < 0.001$ , two-tailed,  $r = .40$ ), optimism ( $t(161) = -4.926, p < 0.001$ , two-tailed,  $r = .36$ ), coping self-efficacy ( $U(n_1 = 88, n_2 = 75) = 2020.5, p < 0.001$ , two-tailed,  $r = -0.33$ ), mindfulness ( $t(161) = -5.44, p < 0.001$ , two-tailed,  $r = .39$ ) and resilience ( $U(n_1 = 88, n_2 = 75) = 1963, p < 0.001$ , two-tailed,  $r = -.35$ ). They

**Table 3** A table to show the mean, median, interquartile range (IQR) and standard deviation (SD) for coping self-efficacy (CSE-13), locus of control (IE4), resilience (BRS), difficulties in emotion regulation (DERS-18), depression, anxiety and stress (DASS-42), mindfulness (FFMQ-24), self-esteem (SE) and optimism (LOT-R) for CSI students and CSI personnel

Variable	Group	Mean	Median	IQR	SD
<b>CSE-13</b>	CSI personnel	91.88	97	31	20.88
	CSI students	75.94	76	34	23.60
<b>IE4</b>	CSI personnel	3.29	3.5	1.5	0.89
	CSI students	3.51	3.5	1	0.80
<b>BRS</b>	CSI personnel	3.68	3.83	1	0.74
	CSI students	3.11	3.25	0.96	0.77
<b>DERS-18</b>	CSI personnel	34.55	33.00	10	9.17
	CSI students	45.75	44.00	17	13.09
<b>DASS-42</b>	CSI personnel	14.24	10	14	13.77
	CSI students	39.89	34.00	37	27.69
<b>FFMQ-24</b>	CSI personnel	85.05	84.00	14	12.43
	CSI students	75.36	75.50	16	10.29
<b>SE</b>	CSI personnel	21.69	21.00	9	5.27
	CSI students	16.66	17.00	9	6.34
<b>LOT-R</b>	CSI personnel	14.77	15.00	8	5.30
	CSI students	11.03	11.00	8	4.39

also reported significantly lower difficulties in emotion regulation ( $U(n_1 = 88, n_2 = 75) = 1564.5, p < 0.001$ , two-tailed,  $r = -.45$ ), depression, anxiety and stress ( $U(n_1 = 88, n_2 = 75) = 1256, p < 0.001$ , two-tailed,  $r = -.53$ ). However, there was no significant difference between CSI personnel and CSI students in report of locus of control ( $U(n_1 = 88, n_2 = 75) = 2852, p = 0.128$ , two-tailed,  $r = .12$ ). For all significant differences, effect sizes were large or medium.

#### Exploration of the Predictors of Coping within CSI

In order to establish predictors of coping in each population, two multiple regressions were conducted, with locus of control (IE4), resilience (BRS), difficulties in emotion regulation (DERS-18), depression, anxiety and stress (DASS-42), mindfulness (FFMQ-24), self-esteem (SE) and optimism (LOT-R) as predictors and coping self-efficacy (CSE-13) as the outcome variable using the enter method.

#### CSI Personnel

Prior to conducting the multiple regression, correlations between variables were explored (see Table 4). These revealed that there were correlations between locus of control (IE4), resilience (BRS), difficulties in emotion regulation (DERS-18), depression, anxiety and stress (DASS-42), mindfulness (FFMQ-24), self-esteem (SE), optimism (LOT-R) and coping self-efficacy, but that multicollinearity was not evident (Field 2017).

The regression equation was significant  $F(7, 67) = 15.37, p < 0.001$ . It produced a large effect size ( $R^2 = 0.616, R^2_{adj} = 0.576$ ), and indicated that the model significantly predicted coping self-efficacy, accounting for 62% of the variance in coping (i.e., a large effect, Cohen 1988). Two of the predictors showed unique predictive power with coping self-efficacy. The BRS, measuring resilience ( $t = 4.036, df = 15, p < 0.001, \beta = 0.413$ ), which accounted for 20% of the variance. Here, the model predicted that a one unit increase in resilience would correspond with an increase of 11.65 in coping self-efficacy. Secondly, the DERS-18, measuring difficulties in emotion regulation ( $t = -3.515, df = 15, p = 0.001, \beta = -0.429$ ), which accounted for 16% of the variance. Here, the model predicted that a one unit increase in difficulties in emotion regulation would correspond with a decrease of 0.976 in coping self-efficacy. No other variables had unique predictive power. Table 5 summarises the unstandardized (B) and standardized ( $\beta$ ) regression coefficients,  $t$  values and significance of each predictor variable on coping self-efficacy.



**Table 4** Correlation coefficients (and significance levels) for the predictor variables of locus of control (IE4), resilience (BRS), difficulties in emotion regulation (DERS-18), depression, anxiety and stress (DASS-42), mindfulness (FFMQ-24), self-esteem (SE) and optimism (LOT-R) with the outcome variable of coping self-efficacy (CSE-13) among CSI personnel

	IE4	BRS	DERS	DASS	FFMQ	SE	LOT-R
CSE	.214(0.032*)	.632(0.001**)	-.670(0.001**)	-.591(0.001**)	.628(0.001**)	.461(0.001**)	.305(0.004**)
IE4		.291(0.006**)	-.255(0.014*)	-.209(0.036*)	.303(0.004**)	.492(0.001**)	.499(0.001**)
BRS			-.401(0.001**)	-.594(0.001**)	.529(0.001**)	.509(0.001**)	.317(0.003**)
DERS				.665(0.001**)	-.701(0.001**)	-.513(0.001**)	-.340(0.001**)
DASS					-.561(0.001**)	-.499(0.001**)	-.346(0.001**)
FFMQ						.672(0.001**)	.445(0.001**)
SE							.446(0.001**)

\* $p < 0.05$ ; \*\* $p < 0.01$

## CSI Students

Prior to conducting the multiple regression, correlations between variables were explored (see Table 5). These revealed that there were correlations between locus of control (IE4), resilience (BRS), difficulties in emotion regulation (DERS-18), depression, anxiety and stress (DASS-42), mindfulness (FFMQ-24), self-esteem (SE), optimism (LOT-R) and coping self-efficacy, but that multicollinearity was not evident (Field 2017).

The regression equation was significant. It produced a large effect size ( $R^2 = .475$ ,  $R^2_{adj} = .429$ ), indicating that the model significantly predicted coping self-efficacy,  $F(7, 80) = 10.36$ ,  $p < 0.001$ , accounting for 47% of the variance in coping (i.e. a large effect, Cohen 1988). Whilst none of the variables had unique predictive power, two predictors trended towards significance. The BRS measuring resilience, ( $t = 1.93$ ,  $df = 10$ ,  $p = .054$ ,  $\beta = .220$ ), accounted for 5% of the variance, with the model predicting that a one unit increase in resilience would correspond with a 6.7 unit increase in coping self-efficacy. The FFMQ-24 measuring mindfulness, ( $t = 1.98$ ,  $df = 10$ ,  $p = 0.051$ ,  $\beta = .214$ ) also accounted for 5% of the variance, with the model predicting that a one unit increase in mindfulness would correspond with a 0.490

unit increase in coping self-efficacy. Table 6 summarises the unstandardized (B) and standardized ( $\beta$ ) regression coefficients, t values and significance of each predictor variable on coping self-efficacy.

## Qualitative Results

In total, six men and three women (mean age 39 years) were interviewed. They had an average of 16 years' experience as a CSI. The data analysis resulted in five main themes being developed from the participants' reported experiences of managing stress, the psychological predictors they felt contributed to resilience and their experience of coping mechanisms. Each theme incorporated specific sub-themes.

### Theme 1: Being Resilient: Perceived Self-efficacy and Confidence

There was a lack of clarity as to whether their ability to cope was a trait or a learned style of coping. The participants didn't always know what about their personality or skills helped them thrive, but their experiences captured a level of comparative self-efficacy and self-belief/confidence:

**Table 5** A table to show the unstandardized (B) and standardized ( $\beta$ ) regression coefficients, t values and the significance of each relationship for each independent variable; locus of control (IE4), resilience (BRS), difficulties in emotion regulation (DERS-18), depression,

Variable	B	Beta value	T	Sig.
IE4	-0.809	-0.34	-0.361	0.719
BRS	11.615	0.413	4.036	0.001**
DERS-18	-0.976	-0.429	-3.516	0.001**
DASS-42	-0.18	-0.012	-0.102	0.919
FFMQ-24	0.258	0.153	1.181	0.242
SE	-0.243	-0.061	-0.531	0.597
LOT-R	0.001	0.001	-0.001	0.999

\* $p < 0.05$ ; \*\* $p < 0.01$

anxiety and stress (DASS-42), mindfulness (FFMQ-24), self-esteem (SE), and optimism (LOT-R) with the outcome variable of coping self-efficacy (CSE-13) among CSI personnel

**Table 6** Correlation coefficients (and significance levels) for the predictor variables of locus of control (IE4), resilience (BRS), difficulties in emotion regulation (DERS-18), depression, anxiety and stress (DASS-42), mindfulness (FFMQ-24), self-esteem (SE) and optimism (LOT-R) with the outcome variable of coping self-efficacy (CSE-13) among CSI students

	IE4	BRS	DERS	DASS	FFMQ	SE	LOT-R
CSE	0.252 (0.009**)	0.568 (0.001**)	-0.593 (0.001**)	-0.574 (0.001**)	0.520 (0.001**)	0.522 (0.001**)	0.506 (0.001**)
IE4		0.325 (0.001**)	-0.226 (0.02*)	-0.165 (0.06)	0.122 (0.12)	0.305 (0.002**)	0.192 (0.04*)
BRS			-0.627 (0.001**)	-0.602 (0.001**)	0.438 (0.001**)	0.531 (0.00**)	0.524 (0.001**)
DERS				0.780 (0.001**)	-0.642 (0.00**)	-0.649 (0.001**)	-0.586 (0.001**)
DASS					-0.487 (0.001**)	-0.651 (0.001**)	-0.603 (0.001**)
FFMQ						0.515 (0.001**)	0.438 (0.001**)
SE							0.668 (0.001**)

\* $p < 0.05$ ; \*\* $p < 0.01$

“I don’t know what it is in my brain or in my mind that allows me to finish up at one horrific scene and then go home and go to sleep and not think about it again. I don’t know what that is that means I am able to do that but for some reason I can. I don’t know if that’s something I have before the job or developed doing the job, but I can honestly say it’s something that’s not going to bother me.” (P1)

Participants described colleagues they felt were resilient:

“I mentioned earlier a pretty vague term of underlying confidence. High self-value thing, they [CSIs with resilience] know what they are looking at, they are aware of general forensic principles. Some people are confident with their own knowledge about how procedures work, so tend to do well at new incidents as they are applying the same principles. It gives you a good sort of basis dealing with something you haven’t seen before.” (P6)

The CSIs linked how their confidence and sense of self supported them to handle potentially traumatic situations, by enabling them to proactively seek help if it were needed, for example:

“If you do feel like there is this something knocking your resilience you have to have the confidence to actually say it and someone will be able to help you and you still get the job done still. It’s better to ask for help rather than soldiering through and making a mistake.” (P2)

The participants took on personal responsibility for resilience, and clearly valued resilience as an essential part of being able to fulfil their professional duties. The importance

of doing a good job and being part of the team was expressed by a number of the CSIs and managing their resilience levels was seen as part of that. This collective sentiment is summarised in the following:

“Definitely it [resilience] is important, because if you go along to a job and it affects you too much then it will affect your ability to either go and do any more jobs or certainly if you go to similar type of job you will be worried about how it will affect you.” (P4)

This sense of responsibility and duty as a core value supported the CSIs to manage difficult situations at work. One participant recognised their work identity enabled them to handle potentially upsetting situations:

“Some people, if someone started shouting and swearing at them, would break down in tears. Which isn’t unreasonable. But you can’t do that can you as you are representing the police and obviously you’ve got to put on a professional front. For me, I think that’s really important.” (P6)

The CSIs were clear about their own personal ability to manage potentially upsetting scenes, even if they could not describe what about their character enabled them to do so. They applied performance experience (i.e. attending similar types of crime scenes and managing these well) and imaginal experience (i.e. envisaging what they may have to handle in advance, before they reached the crime scene) to build their self-efficacy, which in turn reinforced their confidence in dealing with crime scenes.

This theme suggests that elements of coping may have the potential to be taught through experience, training and role modelling, especially once in the role.

## Theme 2: Utilisation of Positive Coping Mechanisms – Collegial Support, Humour and Exercise

This theme describes the coping mechanisms used by the CSIs and how they used them. All the participants expressed self-awareness of the coping mechanisms they used. Social support – and in particular support from colleagues — was cited frequently. As one participant noted:

“I had the chance to move for more money, but I turned it down as I do really like the team I work with. We do a lot of things outside of work, and we’ve been on holiday together and go out together. Things that help personal relationships. And I feel like if I did have a concern, they would be the perfect people to address it. They have so much experience, you are talking to someone who understands it.” (P6)

This perceived support from peers was reported as being very important and participants described a very close-knit relationship with their co-workers, including outside of work. The participants reported how social support helped with difficult experiences as it ensured they always had someone to talk to if they needed to. The need to respect confidentiality around cases at work and not burden friends and family with details was important to participants and was presented as a potential barrier to sharing experiences about their work. This suggests that those without a social network within work – even if they had strong connections outside of their professional colleagues – may feel isolated, out of a sense of responsibility towards their profession and to protect others:

“Family...it’s obviously you don’t potentially want to describe some of the stuff to them because it could encourage more worry. It’s not that extreme [what we deal with], but people have obviously different thresholds of what they think is hard to deal with, so I keep it close to work friends I say.” (P2)

Another coping tactic mentioned by at least two-thirds of participants was humour. Its use seemed to vary amongst participants, with more than half capturing it as a way of having a conversation and seeking social support from others. It was presented as a way of building bonds and sharing experiences but also as a form of detachment (or emotion-regulation) from the reality of the experience:

“You couldn’t write it sometimes...you are dealing with the public and it can be mind-blowing at times and you just have to talk through it and laugh. Some of the things, you might take a photograph and then you get back to the office and say look guys ‘I’ve done X, Y or Z’ and you have to have a laugh about.” (P2)

“For me personally, I think humour helps. Others might disagree. You’re not laughing or having a joke about the sad situation. You aren’t laughing at them. You are having a laugh about a particular aspect to take your mind off it.” (P4)

Exercise as an effective coping mechanism was another common tactic described by half of the participants. It was used by some as a way of switching off and distraction:

“When I go out cycling on my own I might sometimes I might go out for four hours. It’s four hours where you aren’t thinking. When you are exercising you aren’t thinking about anything else really. You are concentrating on what you are doing.” (P5)

Others also recognised how exercise offered a route to reinforcing or building a support network and was another opportunity to connect with others. For instance:

“One thing I do, is play tennis. I really enjoy that. Well, I can tell you exactly how long, seven years ago, I got involved in police tennis. Every year we have a national competition which a different police force hosts that every year. I’ve been to Glasgow, Cardiff, Devon, Belfast, Norfolk, Liverpool... and met people from the whole country. And that’s brilliant. It’s once a year for a few days. You get to know these people, all different ranks and roles. I could recommend something like that for sure to someone.” (P7)

One behaviour the majority of participants consistently described was the two-way communication between colleagues. Part of processing potentially upsetting scenes involved telling their story to others who understood, with even more senior team members recognising that by asking others, they themselves also benefitted:

“I make sure that we have that conversation. To ask, ‘How are you, anything worrying you?’ Just made sure their well-being...that they were fine. It helped me sort of talk about my well-being too. I found that quite useful.” (P3)

This importance of talking and being heard was confirmed by other participants with less seniority, with many commenting on how open the office culture was and the willingness to ensure everyone was ok. For example:

“It’s very easy just to speak to each other about things. If you go to something that is likely to cause a reaction, others ask how you are when you get back so that’s good.” (P6)

“It’s important to generally be an open person, to be talking to people. If all your plates are on the table, it builds up trust which I think helps coping. They are

asking you questions, and you are asking them questions.” (P4)

The participants’ experiences suggest those without a strong relationship with colleagues could be at risk of an increased negative response if exposed to traumatic situations. The theme also revealed humour and exercise as successful coping strategies to manage the day-to-day stresses of being a CSI employee.

### **Theme 3: Managing the Unknown – the Importance of Mental Preparation**

A number of participants described how they thought planning and preparation helped them cope with both the expected and unexpected. They frequently depicted their role as different from other emergency services and how this distinction of being given advanced knowledge of a scene helped them mentally and physically prepare. Even in very usual situations and ones which would be distressing to the general public, this sense of being prepared supported the CSIs to handle and process what they were seeing, this collective sense of being forewarned and forearmed is articulated below:

“A big part of it for me, is obviously the police officers are the first to attend and they go in and they see whatever they see. Then it tends to get fed back to us so we’re like second response. So, by the time I go I should know if there’s someone dead in the address, where they are and what’s happened to them. And if there’s anyone alive at the address. Or was anyone. All those facts beforehand I think put me into part of...it’s not like a horror movie where they go into a house on your own and you know there’s a murderer in there and your heart rate is going because you are thinking at any point I might be in danger. It’s already a predetermined scene. What we are going into should be known, not unknown. It’s still a big shock when you first see a person who has had their face eaten off... but you know you are going into see that. So, there’s a level of you that can anticipate what will look like so it’s less of a shock.” (P6)

“I’ve also thought I’m quite fortunate in that I know what I’m going to. So, it might be a terrible murder, or something like that, but when I turn up at a scene or a body, I know what I’m getting into. I can imagine what I’ve got to do. Rather than a member of the public or police officer opening the door and finding something in front of them. I think that would be more disturbing than some of the things I do.” (P5)

Several participants described taking steps to prepare for the unknown, by controlling the factors that they felt were within their power to do so. For example:

“You need to be logical. You’ve got to be able to work something through from start to finish methodically and be able to come up with a plan of how you’re going to do it and carry it out. If you go in and think ‘I can see that, I can see that, I can see that, I can see that’...it’s much better to be able to say ‘I’m going to get this sorted with this first and then this’...I like to know where everything is so when I need it I know where it is. Where stock levels are things like that, so I know if I’m at a job and I need something, I’d like to be able to think in the back door third drawer that’s where this is.” (P1)

This participant’s descriptions of their systematic approach to working at crime scenes appeared to provide the CSIs with a way of managing complex and potentially upsetting situations, for example:

“You’ve always got to have a plan b, a c, maybe a d, maybe an e. It never goes the way you think when you work for the emergency services. You’ve got to try and second guess yourself. When you are at a major scene, you see things which you think, ‘oh that’s really simple’. And then someone might say ‘Have you looked at that window? What happens if someone climbed in through that window?’ You are always second guessing yourself. If we don’t turn up or do something, there’s no one else. You have to have something in the back pocket to save the day.” (P3)

The participants expressed clearly how they approached scenes methodically. They reported the value of drawing on existing experience and how that helped them cope with new situations. The quality and level of detailed information received before they attended a scene helped them mentally and physically prepare for what they were about to experience.

### **Theme 4: Embracing Meaning in Work**

This theme reflects the participants’ enjoyment of their role, and the privilege they felt in helping others and how they found meaning in their work.

There was a repeated acknowledgment of the pride in their work and a recognition of the importance of taking care of their psychological needs as one part of being good at their job. This extracts captures this common sentiment:

“I’ve always thought it’s about being professional. If you are to say you are professional that covers a gambit of being good at your job, whether that’s your skills, your well-being, emotions, the way you talk to

people, the respect for the job, your confidence. It's a global thing. I think if you can say you've done the most professional job I can, then that covers everything really, including resilience." (P3)

One aspect of their role that participants emphasised was the link between crime reduction and their everyday work. References to the importance of accurate processes and evidence collection and the wider role within the justice system were frequent, suggesting again that finding meaning in their work was important. For example:

"I like, perhaps it doesn't happen as much as they used to because we don't tend to get as much notification now about results, but there is still quite a satisfaction in knowing that you've actually recovered something that's identified someone or help disprove or proven it. There is that satisfaction that you've done a good job and you got the evidence that has been crucial." (P1)

"You get to serve the public, help people out in difficult situations like if they've been broken into. You get the opportunity to find the baddie, to find the nugget of evidence to find out who has done it. You are part of that little sort of chain of evidence...you find it, someone else identifies that fingerprint you find to a suspect and then someone goes and arrests them." (P3).

The sense of purpose found in helping people and the meaning of the CSIs' work to wider society was identified as a driver of their professional pride. Their skills underpinned this, enabling a task-focussed approach which could potentially support participants to handle difficult situations.

### **Theme 5: Induction: Supportive Mentoring V "Thrown in At the Deep End"**

Within the experiences shared by the CSIs, a key contrast was present between those who had recently joined the force and those who had served for over 20 years. A core initial residential course was a common part of everyone's induction, but the process after that course differed significantly; older colleagues described how they were "thrown in at the deep end," (P7) with the expectation they would immediately undertake significant crime scenes alone.

"You came back [from the course] and you did the job really. You could find yourself doing a murder in the first week of coming back. Usually not on your own, but we wouldn't expect new recruits to do that now... back then they were so stretched and there was not much time. You couldn't afford those luxuries really." (P5)

There was a universal recognition by older colleagues that current recruits have more support on hand and have a staged learning process compared to their own experiences. The majority of longer-serving participants reflected that these changes were for the better, but that they did not feel any negative personal impact despite the lack of support they received at the time:

"It's better to offer more support when people start out should they need it. It didn't cause me too much of a problem, I just got on with it. But I'm just that way. I can't say how I got into the job had any negative effect on me, but thinking about it, it's probably better now. I didn't find it [the lack of support during induction] detrimental to me." (P9)

Those who had undergone their induction more recently described a detailed checking process, designed to measure the quantity and quality of their work. The dominant view was that this supports resilience and helped them prepare for working alone:

"You have to be checked off against all the different crime types and evidence recovery types and you have to witness it being done once and do it twice I believe. Or witness twice and do it once. You have to make sure you are signed off with your mentor, and then you are unleashed on the world." (P3)

Observing and learnt behaviour appeared to be a key feature of the newer recruits' induction experience:

"I joined and had a month of shadowing, just attending the crime scene with anyone who is on. I had a set mentor and most of my work was done with him. When you return to the force you get an induction pack and a portfolio which has jobs to be signed off. You have to witness that you've gone to three types with a senior to mentor you. Once they've signed you off for a further three, it's deemed you are competent." (P6)

It was clear that all the CSIs valued their induction experience. They felt it appropriately prepared them for their role, whether they had gone through the older or new process. There was a shared recognition amongst the more experienced CSIs that formal shadowing and mentoring support was beneficial and an improvement on previous practice.

Our qualitative data therefore supported and complemented our quantitative data in that factors such as resilience (including self-efficacy and self-belief/confidence) and ability to regulate one's emotion for example, through processes of planning, mental preparation and humour, were key to coping, but that further aspects of the role, not assessable by questionnaire, such as collegial support and finding meaning in work were also important.

## Discussion

To enable exploration of factors influencing successful coping among CSI Personnel we explored: (i) the extent to which optimism, self-esteem, resilience, LOC, emotion regulation and mindfulness as well as depression, anxiety and stress, predicted successful coping in current and future CSI personnel; and (ii) current CSIs' understanding of personal resilience and factors that have supported and hindered their ability to perform their job roles. Main findings of the current study were that CSI employees, as compared to those in training (i.e., students), reported greater self-esteem, optimism, coping self-efficacy, mindfulness and resilience. CSI personnel, as compared to students, further reported lower difficulties in emotion regulation as well as depression, anxiety and stress. Additionally, and more importantly, for CSI personnel the main factors predictive of successful coping were resilience and emotion regulation, whereas for students no unique predictors emerged (although mindfulness and resilience trended towards being a significant predictor). These findings fit well with the qualitative data, collected concurrently, where resilience (comprising of self-efficacy, self-belief/confidence, emotion regulation) was deemed to be an important trait for coping with the challenges of being a CSI and also for performing the job well. However, these qualitative analyses further revealed that finding meaning in work, as well as good collegial relations were key factors for CSI personnel that engendered better coping and resilience. Results will now be discussed.

In CSI personnel, quantitative analyses revealed resilience and emotional regulation to be unique significant predictors of coping. Resilience is generally perceived as an ability to bounce back following challenges (Janssens et al. 2018; Windle 2010; Van-der-Meulen et al. 2019). In the current study, it accounted for 20% of the variance in coping. This accords with the research of Rosansky et al. (2019) who found that high levels of resilience reduced the frequency and intensity of PTSD among CSIs. Resilience has also been found to be: (i) an antecedent to a positive outlook, optimism, and hope; (ii) a buffer to stress (Baumeister et al. 2003; Prati and Pietrantonio 2010); and (iii) lead to increased levels of self-esteem and vice versa (Mehta et al. 2019). These latter findings all fit with a further result of the present study, this was the observation that CSIs not only had greater levels of resilience as compared to our student 'trainee' population, but also greater levels of self-esteem, optimism and coping self-efficacy, and reduced levels of depression, anxiety and stress. Indeed, similar to our research, Kelty and Gordon (2015) also found that 'resilient' successful CSIs demonstrated significantly lower anxiety, but significantly elevated self-efficacy, as compared with the general population and police recruits. Thus, resilience appears to be: (i)

one of the main attributes that can promote active coping (see here also Prati and Pietrantonio 2010); (ii) correlates well with self-esteem, optimism, LOC, emotion regulation, coping self-efficacy, depression, anxiety and stress in CSI employees (see our Table 7); and (iii) is a measurable and assessable attribute that can be selected for.

Importantly, the above findings concurred with our qualitative results. Here, resilience was considered by CSIs to be essential for them to cope with their role and included self-efficacy and self-belief. The coping mechanisms identified in the qualitative interviews were consistent with previous studies into CSI stress coping methods. Indeed, findings further showed that social support (Perez et al. 2010), humour (Salinas and Webb 2018), and exercise (Rosansky et al. 2019) were frequently used coping mechanisms.

A further main finding of the quantitative survey data was that emotion regulation was also a unique significant predictor of coping for CSI personnel (but not for students), accounting for 16% of the variance. Emotion regulation reflects emotional competence level, that is, the use of emotions and the ability to understand emotions (Parker 2005). Emotion regulation is considered important for psychological health and well-being (Aldoa et al. 2015; Augusto-Landa et al. 2011) and has been shown to impact on emotional states, responses and clarity of thought (Jha et al. 2017). Quick and Cooper (2017) suggest its benefit within CSI as a support to active coping. Somewhat consistent with this, Kelty and Gordon (2012) purport emotional intelligence (EI) as an important screening factor for top CSIs. EI is conceptually related to emotional regulation (Bucich and McCann 2019). Yet, whereas EI relates to the capability to perceive emotion, use emotion to enable thought processes, comprehend and manage emotions (Mrozowicz and Kobylinska 2011), emotion regulation considers the processes involved in controlling which emotions are present and when they

**Table 7** A table to show the unstandardized (B) and standardized ( $\beta$ ) regression coefficients, t values and the significance of each relationship for each independent variable; locus of control (IE4), resilience (BRS), difficulties in emotion regulation (DERS-18), depression, anxiety and stress (DASS-42), mindfulness (FFMQ-24), self-esteem (SE), and optimism (LOT-R) with the outcome variable of coping self-efficacy (CSE-13) among CSI students

Variable	B	Beta value	T	Sig.
IE4	2.277	0.077	0.874	0.385
BRS	6.703	0.220	1.953	0.054
DERS-18	-0.136	-0.076	-0.489	0.626
DASS-42	-0.153	-0.179	-1.265	0.210
FFMQ-24	490	0.214	1.978	0.051
SE	0.124	0.033	0.260	0.796
LOT-R	0.583	0.108	0.933	0.354

occur (Gross 1999). To date, no studies have explored emotion regulation in CSIs, but as emotion regulation is trainable (see Maratos et al. 2019), whereas EI is generally considered a static trait and therefore largely inherent (Petrides and Furnham 2001), understanding its role in coping is an important advancement in understanding successful coping in CSI personnel and what factors should be screened for, or can be promoted in training programmes. Notably, in our research, unique variance accounted for by emotion regulation was similar to that accounted for by the more traditional measure of resilience.

The importance of emotion regulation for successful coping in CSI personnel was also evident in our qualitative data analyses. Here, the participants articulated the importance of task-oriented focus in building resilience to a scene. The participants described how they often only later absorbed the severity of their work, having instead at the time, and at the scene, concentrated on performing their role to a high-professional standard. CSI personnel regulated their emotion at the scene and sought social support later. This clearly evidences how successful coping for CSIs involved good emotion regulation, i.e., controlling which emotions are present and when they occur (and using humour as a shared emotion regulator).

Surprisingly, we did not find that optimism, self-esteem, locus of control, mindfulness nor depression, anxiety and stress predicted successful coping in our quantitative analyses. One reason for this is that the various factors we measured are interrelated or intertwined with resilience and/or emotion regulation. Certainly, it has been purported that increases in resilience may be contingent on levels of optimism (and vice-versa) (de Terte et al. 2014; Souri and Hasanirad 2011). Additionally, self-esteem has been shown to support resilience, coping and self-efficacy (Charney 2004; Mehta et al. 2019; Prati and Pietrantonio 2010); and resilience has been shown to increase self-esteem (Mehta et al. 2019). Together, these attributes may have acted as protective factors against the effects of trauma under the super-ordinate construct of resilience, minimising levels of depression, anxiety and stress, as has previously been reported (Park et al. 2018; Prati and Pietrantonio 2010). This would suggest that these coping attributes may all be related aspects—as we found in our correlational analyses. Alternatively, it could be that resilience is the super-ordinate coping attribute, as verbally expressed by participants in our qualitative analyses and, alongside, emotion regulation, that which is most important when understanding (or screening for) successful coping among CSI Personnel.

In exploring our data further, we investigated differences in our key variables/attributes in CSIs as compared to potential future CSI personnel. Here, we found differences in coping self-efficacy per se, with our CSIs demonstrating better coping self-efficacy. In accounting for this result,

higher coping self-efficacy in our CSI sample may reflect natural attrition; e.g., trainee CSI students reporting lower in this attribute pursue careers outside of CSI; in other words, self-selection for the role, or otherwise, occurs (Sollie et al. 2017). Alternatively, consistent with Mrevlje (2016), it could be that coping self-efficacy increases over time as experiences within the day-to-day role allows for development in such. Mrevlje reported that experience (familiarity with a situation rather than years of service), time to plan and previous success in the role enabled approach style or ‘active’ coping and this was further evidenced in our qualitative data. In our qualitative research element, participants placed a distinction between their role as a secondary attendance on scenes compared to other emergency service personnel. They reported how they found that this time and information before arrival at a potentially traumatic situation supported planning and potentially reinforced situational confidence and self-efficacy. This supports the concept of psychological mastery (Aldwin et al. 1996), which suggests getting through one situation increases confidence about future events. The qualitative findings also showed the value the participants’ placed on their induction and how they saw mentoring as an important way to helping CSIs develop successful coping mechanisms. They reflected on how this compared to their own inductions. They stated how this vicarious learning and an opportunity for learnt behaviour provided a means of building confidence before working crime scenes alone.

We further found self-esteem and optimism to be higher in our CSI sample than our student recruits in the survey element. As self-esteem is an important coping factor in high trauma roles (Prati and Pietrantonio 2010) and optimism a key trait among successful CSIs (Kelty and Gordon 2015), self-selection for the role may also be in evidence here. Likewise, our CSI population possessed better emotion regulation, greater mindfulness and reported lower depression, anxiety and stress levels, despite the probable increase in their emotional labour due to the role (as compared with being a student). In explaining this, the qualitative interviews revealed that for CSI personnel, coping was often achieved through receiving perceived and actual collegial social support. Indeed, the CSI personnel in this study relied on their professional networks to provide a safe place to seek practical and emotional support and talk about experiences. This is consistent with other qualitative studies into police officers, fire fighters, and National Health Service staff (Ching et al. 2020; Shakespeare-Finch and Daley 2017). The CSI personnel reported a reluctance to seek support from their personal networks, being mindful of overburdening family; for example, causing distress or worry, and potentially breaching confidentiality of cases.

Finally, one further result of the quantitative data was that we observed no difference between the CSI and student population with respect to locus of control (LoC) and

nor was it a significant predictor of successful coping. This suggests that LOC, as measured using the IE4 (Kovaleva 2012), was not a particularly important attribute of successful coping in the current sample of CSI personnel. This finding accords with the previous research of Talavera-Velasco et al. (2018), but is in direct contrast to the previous research of: Sollie et al. (2017) in relation to self-selection of cases; Salinas and Webb (2018) in relation to planning; and Groth et al. (2019) in relation to successful coping. However, our qualitative data provided examples of strong perceived behavioural control and situational confidence. This data revealed CSI personnel see themselves as at a reduced risk of experience of an adverse mental health impact compared to others. Their discussions also revealed that a lack of control over the type of jobs they were sent to, negatively influenced perceived coping. The frequency of exposure to the same type of incidents was cited by several participants as a potential contributory factor in a decline in resilience. The participants reflected that multiple trauma could cause more of a psychological impact compared to a single-experience (also found in Littleton et al. 2012). They reported how single, high-profile cases where well-being support was often offered, actually had less of an impact on their ability to cope, compared to multiple concentration of a specific type of case — say attending three hangings in as many days or several road traffic accidents. Thus, the qualitative data revealed that either varying case load or introducing additional measures to allow CSI personnel to voluntarily veto cases which they self-identified as being more likely to reduce their general successful coping, may increase locus of control and by association successful coping.

In our qualitative analyses, we further explored understanding of personal resilience and factors that have supported and/or hindered the ability of CSI personnel to perform their job roles. A key finding here was the CSIs' professional pride, skills, and their finding meaning in work. The CSIs interviewed linked their professional pride to their and others' ability to cope. This again supports the findings of previous studies investigating stress amongst those in the emergency services (Olsson et al. 2003; Rosansky et al. 2019). The qualitative findings showed how CSIs see themselves as part of the wider justice framework and how they find meaning and satisfaction in helping people in crisis and delivering a public service. This supports the theory of Janoff-Bulman (1989) who identified Self-Worth — namely an individual's assumption that he or she is a good, moral, worthy, and decent individual — increases resilience to trauma. It further fits with the construct of psychological hardiness, which Janssens et al. (2018) suggests relates to an individual's ability to change events around them into something meaningful.

## Summary, Future Directions and Limitations

In summary, both the quantitative and qualitative findings of the present study revealed that of the various attributes explored, resilience and emotional regulation were key factors that enabled successful coping in CSI personnel. These, we would argue, are therefore important factors that should be screened for when considering selecting for CSI recruits. However, our qualitative analyses further revealed both locus of control and finding meaning in work to be important for the lived experience of successful coping. These antecedents of successful coping, whilst difficult to untangle using traditional quantitative measures, would be important to include in potential training and CPD curricula. Indeed, training and education among CSI personnel (and students) has been stated as being crucial for longevity, and reducing attrition rates (National Research Council; 2009). Therefore, future research should aim to build on findings of the current study by investigating the effects of behaviour change interventions employed with CSI personnel to improve emotion regulation and resilience training, and to educate CSI individuals as to the importance of locus of control and finding meaning in their work. This could be achieved via role modelling of those already accomplished in their role. Certainly, our qualitative data spoke to the importance of how mentoring in the induction process for CSIs helps to prepare new recruits well for their future role. It is also suggested that conversations that encourage new recruits to find a sense of meaning in their work and potential coping strategies (e.g., humour, collegial support, exercise etc.) could be introduced at this early stage.

Additionally, whilst not included in this study, in future investigation, interviewing new recruits prior to their induction and training would be useful in understanding their experiences of coping and resilience prior to their immersion in the world of CSI work. Longitudinal approaches that revisit these staff members over time would give rich understandings of the development of strategies and the impact of support and training on these newer members of the CSI team.

However, despite the merits of our study, no research is without limitation. For example, conducting mixed methods research is fundamentally challenging given the adequate training and expertise needed (Ponterotto et al. 2013). In the present research, this was enabled via the two senior research team members (FM & FH). Indeed, when conducted rigorously and by those with the relevant training, such mixed methods quantitative and qualitative approaches are seen as a way to pragmatically enable complementary methods to be used to thoughtfully answer research questions in a rich and nuanced way (Zachariadis et al. 2013); in



our case by combining lived experiences and more generalisable quantitative data.

Moreover, generalisability is not a hallmark of qualitative studies. However, it is of quantitative data when adequately powered. Indeed, that findings from our two project arms more often than not complemented each other demonstrates the benefits and utility of the approach as a strength of this research. Importantly, as “context matters” (Braun and Clarke 2021, p.145) our mixed methods approach enabled us to more confidently assert that findings of the present study may be transferable to other groups of CSIs.

Finally, whilst a known limitation of both qualitative and quantitative research can be socially desirable responding (Sollie et al. 2017), in our study, to limit such, we ensured the quantitative data collection was anonymous, and the qualitative data collection conducted by independent non-CSI individuals. We would hope this circumvented the need for participants to respond in a socially desirable manner.

## Implications and Conclusions

This paper offers unique context to the existing CSI coping literature and knowledge advancement. Importantly, although previous literature has been predominantly quantitative in nature, our mixed methods approach enabled us to understand predictors of successful coping and explore the lived experiences of resilience and coping within a sample of CSIs. It enabled us to understand key factors influencing successful coping among (CSI) personnel elucidated by common quantitative and qualitative findings. By utilising a mixed methods approach, we have not only added to the sparse qualitative understandings around this topic within the broad field of criminal justice and investigation (e.g. finding meaning in ones work), but additionally can assert with greater confidence that resilience and, now also, emotional regulation are key factors that contribute to successful coping in CSI personnel. We propose this has significant implications as to the induction and training of new recruits, and for the support of existing staff members. To expand, CSIs who are able to cope successfully in this high emotional labour role possess good emotion regulation skills, are resilient (i.e., bounce back from challenges), have a strong in-work social support network, have locus of control over their work type and crime scenes, and find meaning in their work. We therefore recommend that if these attributes are either selected for in recruitment processes or are introduced in training curricula, they may serve as a means to increase coping and longevity in the profession via increased staff well-being and retention (and therefore also reduced absenteeism). We further recommend that researchers continue to build upon the limited research exploring lived experience in CSI personnel, as this adds depth of understanding to

broader survey studies. Mixed methods approaches offer a pragmatic way to achieve this. Finally, and in extension to our research, it would be beneficial to replicate our mixed methods study in more extensive samples to understand the extent to which cultural differences affect findings. This reflects that, typically, studies conducted within CSI populations reflect those of Western cultures.

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## Declarations

**Conflict of Interest** The authors declare no competing interests.

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## References

- Ackerly BA, True J (2010) Doing feminist research in political and social science. Red Globe Press
- Aldoa A, Sheppes G, Gross JJ (2015) Emotion regulation flexibility. *Cogn Ther Res* 39:263–278. <https://doi.org/10.1007/s10608-014-9662-4>
- Aldwin CM, Sutton KJ, Lachman M (1996) The development of coping resources in adulthood. *J Pers* 64(4):837–871. <https://doi.org/10.1111/j.1467-6494.1996.tb00946.x>
- Augusto-Landa JM, Pulido-Martos M, Lopez-Zafra E (2011) Does perceived emotional intelligence and optimism/pessimism predict psychological well-being? *J Happiness Stud* 12:463–474
- Baer R (2019) Assessment of mindfulness by self-report. *Curr Opin Psychol* 28:42–48. <https://doi.org/10.1016/j.copsyc.2018.10.015>
- Bandura A (1997) Self-efficacy: the exercise of control. Freeman, W. H
- Baumeister RF, Campbell JD, Krueger JI, Vohs KD (2003) Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles? *Psychol Sci Public Interest* 4:1–44
- Beaufort IN, De Weert-Van Oene GH, Buwalda VAJ, De leeuw JRJ, Goudriaan AE (2017) The depression, anxiety and stress scale (DASS-21) as a screener for depression in substance use disorder

- inpatients: a pilot study. *Eur Addict Res* 23:260–268. <https://doi.org/10.1159/000485182>
- Braun V, Clarke V (2006) Using thematic analysis in psychology. *Qual Res Psychol* 3(2):77–101
- Braun V, Clarke V (2019) Reflecting on reflexive thematic analysis. *Qual Res Sport Exerc Health* 11(4):589–597
- Braun V, Clarke V (2021) *Thematic analysis: a practical guide*, 1st edn. Sage Publications
- Braun V, Clarke V (2022) *Thematic analysis: a practical guide*. Sage, London
- Bohlmeijer E, Klooster PM, Fledderus M, Veehof M, Baer R (2011) Psychometric properties of the five facet mindfulness questionnaire in depressed adults and development of a short form. *Assessment* 18(3):308–320
- Bomba F, Markwart H, Muhlan H, Menrath I, Ernst G, Thyen U, Schmidt S (2018) Adaptation and validation of the German Patient Activation Measure for adolescents with chronic conditions in transitional care: PAM 13 for adolescents. *Res Nurs Health* 41(1):78–87. <https://doi.org/10.1002/nur.21831>
- Bryman A (2004) Qualitative research on leadership: a critical but appreciative review. *Leadersh Q* 15(6):729–769
- Bucich M, McCann C (2019) Emotional intelligence and day-to-day emotion regulation processes: examining motives to social sharing. *Personality Individ Differ* 137:22–26
- Charney D (2004) Psychobiological mechanisms of resilience and vulnerability: implications for successful adaptation to extreme stress. *Am J Psychiatry* 161:195–216
- Chesney MA, Neilands TB, Chambers DB, Taylor JM, Folkman S (2006) A validity and reliability study of the coping self-efficacy scale. *Br J Health Psychol* 11(3):421–437. <https://doi.org/10.1348/135910705X53155>
- Ching SSY, Cheung K, Hegney D, Rees CS (2020) Stressors and coping of nursing students in clinical placement: a qualitative study contextualizing their resilience and burnout. *Nurse Educ Pract* 42(102690):1–7
- Chowdhury MR (2020a) What is coping? Resilience & coping. *Positive Psychology.com*. <https://www.positivepsychology.com/coping-theory/>
- Chowdhury MR (2020b) What is the life orientation test and how to use it? (LOT-R). *Positive Psychology.com*. <https://www.positivepsychology.com/life-orientation-test-revised/>
- Christopher MS, Goerling RJ, Roges BS, Hunsinger M, Baron G, Bergman AL, Zava DT (2016) A pilot study evaluating the effectiveness of a mindfulness-based intervention on cortisol awakening response and health outcomes among law enforcement officers. *J Crim Psychol* 31:15–28. <https://doi.org/10.1007/s11896-015-9161>
- Clark RD, Distelrath C, Vaquera GS, Winterich D, DeZolt E (2015) Critical-incident trauma and crime scene investigation: a review of police organisational challenges and interventions. *J Forensic Identification*. 65(6):929–951. <https://collected.jcu.edu/soc-facpub/32>
- Cohen J (1988) *Statistical power analysis for the behavioural sciences*. Academic Press
- Coolican H (2014) *Research methods and statistics in psychology*, 6th edn. Psychology Press
- Creswell JW (2020) *Educational research: planning, conducting, and evaluating quantitative and qualitative research*, 6th edn. Pearson Education, Inc
- de Terte I, Stephens C, Huddleston L (2014) The development of a three part model of psychological resilience: stress and health. *Int J Soc Investig Stress* 30(5):416–424. <https://doi.org/10.1002/smi.2625>
- Eddy A, Bergman AL, Kaplan J, Goerling RJ, Christopher MS (2021) A qualitative investigation of the experience of mindfulness training among police officers. *J Police Crim Psychol* 36(1):63. <https://doi.org/10.1007/s11896-019-09340-7>
- Eddy A, Bergman AL, Kaplan J, Goerling RJ, Christopher MS (2019) A qualitative investigation of the experience of mindfulness training among police officers. *J Police Crim Psychol*. <https://doi.org/10.1007/s11896-019-09340-7>
- Field AP (2017) *Discovering statistics using IBM SPSS*, 5th edn. Sage Publications
- Fitzhugh H, Michaelides G, Connolly S, Daniels K (2019) Mindfulness in policing: a randomised controlled trial of two online mindfulness resources across five forces in England and Wales. College of policing, College.policing.uk. [https://whatworks.college.police.uk/Research/Documents/Mindfulness\\_RCT\\_report.pdf](https://whatworks.college.police.uk/Research/Documents/Mindfulness_RCT_report.pdf)
- Ferreira N (2012) Hardiness in relation to organisational commitment in the human resource management field. *SA J Hum Resour Manag* 10(2):1–10
- Garrosa E, Rainho C, Moreno-Jiménez B, Monteiro MJ (2010) The relationship between job stressors, hardy personality, coping resources and burnout in a sample of nurses: a correlational study at two time points. *Int J Nurs Stud* 47:205–215. <https://doi.org/10.1016/j.ijnstu.2009.05.014>
- Georgescu D, Duiu A, Cheiban T, Mazilu T, Rotariu A, Toma D, Barangă A (2019) The relationship between locus of control, personal behaviour, self-efficacy and resilience. *Rom J Cogn Behav Ther Hypn* 6(1–2):1–12
- Gratz KL, Roemer L (2004) Multidimensional assessment of emotion regulation and dysregulation: development, factor structure, and initial validation of the difficulties in emotion regulation scale. *J Psychopathol Behav Assess* 26(1):41. <https://doi.org/10.1023/b:jobs.0000007455.08539.94>
- Gross JJ (1999) Emotion regulation: past, present, future. *Cogn Emot* 13:551–573
- Groth N, Schnyder N, Kaess M, Markovic A, Rietschel L, Moser S, Michel C, Schultze-Lutter F, Schmidt SJ (2019) Coping as a mediator between locus of control, competence beliefs, and mental health: a systematic review and structural equation modelling meta-analysis. *Behav Res Ther*. <https://doi.org/10.1016/j.brat.2019.103442>
- Janoff-Bulman R (1989) Assumptive worlds and the stress of traumatic events: applications of the schema construct. *Soc Cogn* 7(2):113–136
- Janssens KME, Van-Der-Velden PG, Taris R, Van-Veldhoven MJPM (2018) Resilience among police officers: a critical systematic review of used concepts & predictive values of resilience. *J Police Crim Psychol*. <https://doi.org/10.1007/511896-018-9298.5>
- Jeanguenat AM, Dror E (2018) Human factors effecting forensic decision making: workplace stress and well-being. *J Forensic Sci* 63(1):258–261. <https://doi.org/10.1111/1556-4029.13533>
- Jha AP, Morrison AB, Parker SC, Stanley EA (2017) Practice is protective: mindfulness training promotes cognitive resilience in high stress cohorts. *Mindfulness* 8(1):46–58
- Kabat-Zinn JK (1994) *Wherever you go, there you are: mindfulness meditation in everyday life*. Westport, Hyperion
- Kelty SF (2011) Professionalism in crime scene examination: recruitment strategies using the seven key attributes of crime scene examiners. *Forensic Sci Policy Manage Int J* 2:198–204
- Kelty SF, Gordon H (2012) Professionalism in crime scene examination: recruitment strategies part two: Using a psychometric profile of top crime scene examiners in selection decision making. *Forensic Sci Policy Manage* 3(4):189–199
- Kelty SF, Gordon H (2015) No burnout at this coal face: managing occupational stress in forensic personnel and the implications for forensic criminal justice agencies. *Psychiatry Psychol Law* 22:273–290
- Kobasa SC (1979) Stressful life events, personality, and health: an inquiry into hardiness. *J Pers Soc Psychol* 37:1–11. <https://doi.org/10.1037/0022-3514.37.1.1>

- Kobasa SC, Maddi SR, Kahn S (1982) Hardiness and health: a prospective study. *J Pers Soc Psychol* 42:168–177. <https://doi.org/10.1037/0022-3514.42.1.168>
- Kovaleva A (2012) The IE4: Construction and validation of a short scale for the assessment of locus of control. *Soc Sci Open Access Repository*. <https://doi.org/10.21241/ssoar.37119>
- Littleton HL, Grills-Tauchel AE, Axsom D, Bye K, Buck KS (2012) Prior sexual trauma and adjustment following the Virginia Tech campus shootings: examination of the mediating role of schemas and social support. *Psychol Trauma Theory Res Pract Policy* 4:578–586
- Lazarus RS, Folkman S (1987) Transactional theory and research on emotions and coping. *Eur J Pers* 1:141–169
- Lorenz T, Beer C, Putz J, Heinitz K (2016) Measuring psychological capital: construction and validation of the compound Psy-cap scale (CPC-12). *PLoS ONE* 11(4). <https://doi.org/10.1371/journal.pone.0152892>
- Lovibond SH, Lovibond PF (1996) Manual for the depression anxiety stress scales. Psychology Foundation of Australia
- Luthans F, Avey JB, Patera AL (2008) Experimental analysis of a web-based training intervention to develop positive psychological capital. *Acad Manag Learn Edu* 7(2):209–221
- Maratos FA, Montague J, Ashra H, Welford W, Wood W, Barnes C, Sheffield D, Gilbert P (2019) Evaluation of a compassionate mind training intervention with school teachers and support staff. *Mindfulness* 10:2245–2258. <https://doi.org/10.1007/s12671-019-01185-9>
- Maran DA, Zito M, Colombo L (2020) Secondary traumatic stress in Italian police officers: the role of job demands and job resources. *Front Psychol*. <https://doi.org/10.3389/fpsyg.2020.01435>
- Maxwell J, Mittapalli K (2010) Realism as a stance for mixed methods research. In: Tashakkori A, Teddlie C (eds) *SAGE handbook of mixed methods in social & behavioural research*, SAGE Publications Ltd, p 145–168. <https://doi.org/10.4135/9781506335193>
- Mehta MH, Grover RL, DiDonato TE, Kirkhart MW (2019) Examining the positive cognitive triad: a link between resilience and well-being. *Psychol Rep* 122(3):776–788. <https://doi.org/10.1177/0033294118773722>
- Mrevlje TP (2016) Coping with work-related traumatic situations among crime scene technicians. *Stress Heal* 32(4):374–382
- Mrozowicz MSM, Kobylinska D (2011) Emotional intelligence and emotion regulation strategies. *Studia Psychologiczne* 49:55–64. <https://doi.org/10.2478/v10167-010-0040-x>
- National Research Council (NRC) (2009) Strengthening forensic science in the United States: a path forward. Committee on Identifying the Needs of the Forensic Sciences Committee, National Research Council. <http://www.nap.edu/catalog/12589.html>
- Oginska-Bulik N (2005) The role of personal and social resources in preventing adverse health outcomes in employees of uniformed professions. *Int J Occup Med Environ Health* 18(3):233–240
- Ojedokun O, Balogun SK (2015) The costs of policing: psychosocial capital and mental health outcomes in a Nigeria police sample. *Span J Psychol* 18(78):1–10. <https://doi.org/10.1017/sip.2015.76>
- Olsson CA, Bond L, Burns JM, Vella-Brodrick DA, Sawyer SM (2003) Adolescent resilience: a concept analysis. *J Adolesc* 26:1–11
- Park O, Im H, Na C (2018) The consequences of traumatic events on resilience among South African police officers. *Policing Int J* 41(1):144–158. <https://doi.org/10.1108/PIJPSM-08-2016-0133>
- Parker JDA (2005) The relevance of emotional intelligence for clinical psychology. In: Schulze R, Roberts RD (eds) *Emotional Intelligence: An International Handbook*. Hogrefe & Huber, pp 271–287
- Perez L, Jones J, Englert D, Sachau D (2010) Secondary traumatic stress and burnout among law enforcement investigators exposed to disturbing media images. *J Police Crim Psychol* 25(2):113–124
- Petrides KV, Furnham A (2001) Trait emotional intelligence: psychometric investigation with reference to established trait taxonomies. *Eur J Pers* 15(6):425–448. <https://doi.org/10.1002/per.416>
- Ponterotto JG, Mathew JT, Raughley B (2013) The value of mixed methods designs to social justice research in counseling and psychology. *J Soc Action Couns Psychol* 5(2):42–68
- Prati G, Pietrantonio L (2010) Risk and resilience factors among Italian municipal police officers exposed to critical incidents. *J Police Crim Psychol* 25(1):205–219. <https://doi.org/10.1007/s11896-009-9052-0>
- Pyett PM (2003) Validation of qualitative research in the “real world.” *Qual Health Res* 8:1170
- Queiros C, Passos F, Bartolo A, Faria S, Fonseca SM, Marques AJ, Silva CF, Pereira A (2020) Job stress, burnout and coping in police officers: relationships and psychometric properties of the organizational police stress questionnaire. *Int J Environ Res Public Health* 17(18): 6718. <https://doi.org/10.3390/ijerph17186718>
- Quick JC, Cooper C (eds) (2017) *The handbook of stress and health: a guide to research and practice*. <https://ebookcentral.proquest.com>
- Regnault A, Willgoss T, Barbic S (2018) Towards the use of mixed methods inquiry as best practice in health outcomes research. *Journal of Patient-Reported Outcomes* 2(1):1–4
- Roach J, Cartwright A, Sharratt K (2017) Dealing with the unthinkable: a study of the cognitive and emotional stress of adult and child homicide investigations on police investigators. *Journal of Police Criminal Psychology* 32:251–262. <https://doi.org/10.1007/s11896-016-9218-5>
- Rosansky JA, Cook J, Rosenberg H, Sprague JE (2019) PTSD symptoms experienced and coping tactics used by crime scene investigators in the United States. *J Forensic Sci* 64(5):1444–1450
- Rosenberg M (1965) *Society and the adolescent self-image*. Princeton University Press
- Rotter J (1966) Generalized expectancies for internal versus external control of reinforcement. *Chronical Monographs* 80(1):1–28
- Salinas CR, Webb HE (2018) Occupational stress and coping mechanisms in crime scene personnel. *Occup Med* 68:239–245. <https://doi.org/10.1093/occmed/kqy030>
- Sahler OJZ, Carr EJ (2009) Coping strategies in developmental. In Coleman, Elias & Heidi Feldman (Eds.). *Behavioural pediatrics*, 4th edn. Elsevier. 491–496
- Scheier MF, Carver CS (2018) Dispositional optimism and physical health: a long look back, a quick look forward. *Am Psychol* 73(9):1082–1094. <https://doi.org/10.1037/amp0000384>
- Scheier MF, Carver CS, Bridges MW (1994) Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a re-evaluation of the life orientation test. *J Pers Soc Psychol* 67:1063–1078
- Seligman M (2011) Flourish: a visionary new understanding of happiness and well-being. *Policy* 27(3):60–61
- Shakespeare-Finch J, Daley E (2017) Workplace belongingness, distress, and resilience in emergency service workers. *Psychol Trauma Theory Res Pract Policy* 9(1):32–35
- Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J (2008) The brief resilience scale: assessing the ability to bounce back. *Int J Behav Med* 15(3):194–200
- Smith BW, Epstein EE, Oritz JA, Christopher PK, Tooley EM (2013) The foundations of resilience: what are the critical resources for bouncing back from stress? In: Prince Embury S, Saklofske DH (eds) *Resilience in children, adolescents and adults: Translating research into practice*. The Springer Series on Human Exceptionality, Springer, pp 167–187
- Sollie H, Kop N, Euwema MC (2017) Mental resilience of crime scene investigators. How police officers receive and cope with the impact of demanding work situations. *Crim Justice Behav* 44(12):1580–1603
- Souri H, Hasanirad T (2011) Relationship between resilience, optimism & psychological well-being in students of medicine. *Procedia Soc Behav Sci* 30:1541–1544

- Sunbul ZA, Guneri OY (2019) The relationship between mindfulness and resilience: the mediating role of self-compassion and emotion regulation in a sample of underprivileged Turkish adolescents. *Personality Individ Differ* 139:337–342
- Talavera-velasco B, luceno-Moreno L, Martin-Garcia J, Garcia-Auberne Y (2018) Psychological risk factors, burnout & hardy personality as variables associated with mental health in police officers. *Front Psychol*. <https://doi.org/10.3389/fpsyg.2018.01478>
- Tashakkori A, Johnson RB, Teddlie C (2020) Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences. Sage publications
- Tweedy RS (2020) The impact of a Mindfulness Based Intervention group on stress, burnout and coping in a UK police force : a controlled study (Doctoral dissertation, University of Essex). <https://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.818686>
- Van-Der-Meulen E, Van-Veldhoven MJPM, Van-Der-Velden PG (2019) Stability of psychological resilience of police officers: a three wave latent class analysis. *Personal Individ Differ* 144:120–124
- Victor SE, Klonsky ED (2016) Validation of a brief version of the difficulties in emotion regulation scale (DERS-18) in five Samples. *J Psychopathol Behav Assess*. <https://doi.org/10.1007/s10862-016-9547-9>
- Vivona BD (2014) Humor functions within Crime Scene Investigators: group dynamics, stress and the negotiation of emotions. *Police Q* 17:127–149
- Wang Q, Bowling NA, Eschleman KJ (2010) A meta-analytic examination of work and general locus of control. *J Appl Psychol* 95:762–768. <https://doi.org/10.1037/a0017707>
- Wang K, Kong F (2019) Linking trait mindfulness to life satisfaction in adolescents: the mediating role of resilience and self-esteem. *Child Indic Res* 13:321–335
- Windle G (2010) What is resilience?. A review and concept analysis. *Rev Clin Gerontol* 21(2):152–169. <https://doi.org/10.1017/S0959259810000420>
- Windle G, Bennet KM, Noyes JA (2011) A methodological review of resilience measurement scales. *Health Qual Life Outcomes*, 9(1), 1–18. <https://doi.org/10.1186/1477-7525-9-8>
- Zachariadis M, Scott S, Barrett M (2013) Methodological implications of critical realism for mixed-methods research. *MIS Q* 37(3):855–879

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