




EMPLOYEE RESILIENCE

An evidence review

Scientific summary
March 2021

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Employee resilience: an evidence review

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1 Introduction

Background

It is widely believed that employees who are 'resilient' are better able to cope with stress, organisational change, and adverse organisational events. As a result, it is assumed that those employees are not only likely to deliver better performance, but will also be more committed, satisfied and healthier. Although this belief is widely held, it is still unclear whether it is supported (or contradicted) by scientific evidence. Further, it is not clear what the most promising actions are for employers to take to support and help employees build resilience. For these reasons, the CIPD approached the Center for Evidence-Based Management (CEBMA) to undertake a review of the research literature to learn more about the evidence on employee resilience.

What is a rapid evidence assessment?

Evidence reviews come in many forms. One of the best-known types is the conventional literature review, which provides an overview of the relevant scientific literature published on a topic. However, a conventional literature review's trustworthiness is often low: clear criteria for inclusion are often lacking and studies are selected based on the researcher's individual preferences. As a result, conventional literature reviews are prone to severe bias. This is why 'rapid evidence assessments' (REAs) are being used. This type of review is a specific research methodology that aims to identify the most relevant studies on a specific topic as comprehensively as possible, and to select appropriate studies based on explicit criteria. In addition, the methodological quality of the studies included is assessed by two independent reviewers on the basis of explicit criteria. In contrast to a conventional literature review, an REA is transparent, verifiable and reproducible, and, as a result, the likelihood of bias is considerably smaller.

This scientific summary is based on an REA. A short discussion document is available at cipd.co.uk/evidence-resilience

Main question: what does the rapid evidence assessment (REA) answer?

What is known in the scientific literature about the relationship between employee resilience and work-related outcomes?

Sub-questions are:

- 1 What is employee resilience?
- 2 How can employee resilience be measured?
- 3 Does employee resilience affect work-related outcomes?
- 4 What are the antecedents (predictors) of employee resilience?
- 5 What is known about the effect of interventions aimed at enhancing employees' resilience?

2 Method

Search process: how was the research evidence obtained?

The following databases were used to identify studies: ABI/INFORM Global from ProQuest, Business Source Premier from EBSCO, and PsycINFO from Ovid. The following generic search filters were applied to all databases during the search:

- 1 scholarly journals, peer-reviewed
- 2 published in 1980–2020 for meta-analyses and 2010–2020 for primary studies
- 3 articles in English.

First, a broad search was conducted using the general term 'resilience' in order to identify meta-analyses and systematic reviews.¹ Next, an additional search was conducted using terms such as 'antecedents', 'drivers' and 'predictors' in order to identify longitudinal studies on the antecedents of resilience. Finally, a search was conducted using terms such as 'employee' and 'workplace' in order to find studies on employee resilience. We conducted nine different search queries, which yielded 163 meta-analyses and systematic review studies and 439 primary studies. An overview of all search terms and queries is provided in Appendix 1.

Selection process: how were the studies selected?

Study selection took place in two phases. First, the titles and abstracts of the studies identified were screened for their relevance to this review. In cases of doubt or lack of information, the study was included. Duplicate publications were removed. This first phase yielded 15 meta-analyses and 97 primary studies. Second, studies were selected based on the full text of the article according to the following inclusion criteria:

- 1 **type of studies:** focusing on quantitative, empirical studies
- 2 **measurement:** only studies in which relationships between resilience, antecedents and outcomes were quantitatively measured
- 3 **context:** focusing on studies related to workplace settings.

In addition, the following exclusion criteria were applied:

- studies on the nature of stress and work pressure
- studies involving people with mental disorders
- studies on organisational resilience (that is, how organisations cope with or recover from economic or market turbulence, and so on).

This second phase yielded a total number of 12 meta-analyses and 62 primary studies. An overview of the selection process is provided in Appendix 2.

Data extraction: what data were extracted?

Data extraction involves the collation of the results of the studies included. From each study we extracted and interpreted information relevant to the review question, such as year of publication, research design, sample size, population (for example, industry, type of employees), possible moderators or mediators, main findings, effect sizes and limitations.

Critical appraisal: how was the quality of the studies included judged?

In almost any situation it is possible to find a scientific study to support or refute a theory or a claim. Thus, it is important to determine which studies are trustworthy (that is, valid and reliable) and which are not. The trustworthiness of a scientific study is first determined by its methodological appropriateness. To determine the methodological appropriateness of the included study's research design, the classification system of Shadish et al (2002) and Petticrew and Roberts (2006) was used. In addition, a study's trustworthiness is determined by its methodological quality (its strengths and weaknesses). For instance, was the sample size large enough and were reliable measurement methods used? To determine methodological quality, all the studies included were systematically assessed on explicit quality criteria. Finally, the effect sizes were identified. An effect (for example a correlation, Cohen's d or omega) can be statistically significant but may not necessarily be of practical relevance: even a trivial effect can be statistically significant if the

¹ For more information on systematic reviews, meta-analyses and longitudinal studies, see [CEBMA's Guideline for Rapid Evidence Assessments in Management and Organizations](#).

sample size is big enough. For this reason, the effect size – a standard measure of the magnitude of the effect – was assessed.

For a detailed explanation of how the quality of included studies was judged, see *CEBMA Guideline for Rapid Evidence Assessments in Management and Organizations* (Barends et al 2017).

Critical appraisal: what is the quality of the studies included?

Our search yielded 12 relevant meta-analyses, of which 6 were based on controlled studies. In addition, this review identified 11 prospective longitudinal studies and 10 controlled before-after studies which were classified as level B or higher, indicating a high level of trustworthiness. This indicates that the area of (employee) resilience is well established and has a large body of research.

3 Main findings

Question 1: What is employee resilience?

The word 'resilience' originates from the Latin verb *resilire*, meaning 'to leap back'. It is defined in the Oxford English Dictionary as '*being able to withstand or recover quickly from difficult conditions*'. In the field of psychology, there are two frequently used definitions of the construct, that is: (1) '*the ability of an individual to rebound or recover from adversity*' (Leipold and Greve 2009); and (2) '*the ability to maintain psychological and physical health despite exposure to a traumatic event*' (Bonanno 2004). Over the past decade, however, resilience has become a buzzword – promoted as a powerful remedy against the effects of adversity, which individuals, communities and whole economies are told to cultivate (Saner 2020). In the past decade, the term has also emerged in the domain of management and organisations, where it is referred to as 'employee resilience', which is defined as '*an employee's capacity to sustain and to bounce back from problems, conflicts, lack of success, or situations that imply an increase of responsibility*' (Lupşa et al 2020). In the context of the workplace the term is often extended further to include '*the capacity to thrive, rather than just survive, in high stress environments*' (Cleary et al 2018).

Most researchers consider resilience to be a personal attribute or trait that shields individuals against the impact of adversity or traumatic events. Other researchers, however, regard resilience as a state that can help individuals to recover from adversity. Finally, some researchers view resilience as a dynamic process in which individuals actively adapt to and recover rapidly from major adversities, and that can be developed to enhance their coping mechanism (Hu et al 2015).

Question 2: How can employee resilience be measured?

There are a wide range of scales available that measure resilience in both healthy adults and adults with mental health conditions – in 2013, a systematic review identified more than 100 measurement instruments (Smith-Osborne and Whitehill Bolton 2013). A systematic review of the psychometric properties of workplace resilience measurement scales identified 11 validated scales. The studies included in this review used scales that measure psychological resilience in the general population – such as the ten-item version of the Connor-Davidson Resilience Scale (CD-RISC 10) or the 14-item Resilience Scale (RS-14) – as well as scales that focus on employee resilience in particular, such as the nine-item Employee Resilience Scale (Näswall et al 2019).

Näswall's nine-item measure asks individuals to consider how often ('almost never' to 'almost always') the following are true:

- 1 I effectively collaborate with others to handle challenges at work.
- 2 I successfully manage a high workload for long periods of time.
- 3 I resolve crises competently at work.
- 4 I learn from mistakes and improve the way I do my job.
- 5 I re-evaluate my performance and continually improve the way I do my work.
- 6 I effectively respond to feedback, even criticism.
- 7 I seek assistance at work when I need specific resources.
- 8 I approach managers when I need their support.
- 9 I use change at work as an opportunity for growth.

The scale is free to use under certain conditions.²

Question 3: Does employee resilience affect work-related outcomes?

Finding 1: Resilience is a strong predictor for mental health indicators (level AA)

A large number of studies have found that resilience is a strong antecedent of both positive and negative mental health indicators, such as subjective wellbeing, life satisfaction, positive affect, anxiety, burnout and depression (Hu et al 2015, Lee et al 2013). In addition, prospective cohort studies have found that resilience is a strong predictor for the development of depressive symptoms among cancer survivors (Campo et al 2017), perceived stress among homeless people (Durbin et al 2019), post-traumatic symptoms among HIV patients (Garrido-Hernansaiz et al 2017), the usage of antidepressant and anxiolytic medication at middle age (Hiyoshi et al 2015), symptoms of psychological distress among trauma-exposed veterans (Isaacs et al 2017), the level of disability among people with a chronic illness (Manning et al 2016), quality of sleep and anxiety during pregnancy (Van der Zwan et al 2017), suicidality among war veterans (Youssef et al 2013), and the speed of recovery and level of daily functioning among geriatric patients after orthopaedic surgery (Rebagliati et al 2016).

Finding 2: Resilience is associated with a wide range of work-related outcomes (level B)

Work life consists of moments and events that both drain and require resources. Altogether research in the realm of management and organisations suggests that resilience helps employees protect and recoup resources at work and mitigate resource loss, resulting, for example, in psychological distress, emotional exhaustion and burnout. A large number of studies have found that (employee) resilience is associated with a wide range of work-related attitudes and outcomes (see Appendix 3). Based on the analyses of the included studies, an overview of the ten strongest associations is provided in Table 1. It should be noted, however, that most of the associations found were based on cross-sectional studies, meaning that the assumed causality of the associations cannot be verified.

Table 1: Outcomes associated with resilience

| Outcome | Effect size | No. of studies | Level of evidence |
|----------------------|-------------------|----------------|-------------------|
| Wellbeing | $r = .35 / .75$ | 3 | D |
| Psychological stress | $r = -.30 / -.70$ | 35 | C |

² For information on conditions of using the resilience measures, see Näswall et al (2019).

| | | | |
|-------------------------------|-----------------|---|----|
| Proactive work behaviour | r = .55 | 1 | D |
| Creative behaviour | r = .55 | 1 | D |
| Commitment to change | r = .10 / .50 | 2 | D |
| Performance (task/OCB) | r = .30 / .45 | 9 | D+ |
| Work engagement | r = .30 / .40 | 2 | D |
| Organisational commitment | r = .35 | 1 | D |
| Burnout, emotional exhaustion | r = -.15 / -.35 | 5 | D+ |
| Job satisfaction | r = .30 | 4 | D+ |

Finding 3: Resilience moderates the negative impact of exposure to work-related stressors (level C)

Cross-sectional studies suggest that resilience mitigates the negative impact of exposure to work-related stressors such as workplace bullying (Anasori et al 2020, Annor and Amponsah-Tawiah 2020, Gupta and Bakhshi 2018, Meseguer-de-Pedro et al 2019), work pressure (Ceschi et al 2017, Cooke et al 2019, Kimura et al 2018), role ambiguity (De Clercq 2019), work conflict (Lanz 2020), customer incivility (Al-Hawari et al 2020) and job insecurity (Shoss et al 2018).

Question 4: What are antecedents (predictors) of employee resilience?

Finding 4: There are a wide range of factors that predict resilience

Finding 5: The largest effect on resilience stems from protective factors

Finding 6: Demographic factors do not predict resilience

In the past two decades, a large number of studies have been published on the antecedents/predictors of resilience (see Appendix 3). The findings of these studies provide useful insights for managers as they can inform practices that increase or sustain employees' resilience. Researchers differentiate between 'risk' factors that negatively affect resilience and 'protective' factors that support or enhance resilience. It was found that, in general, the largest effect on resilience comes from protective factors, whereas risk factors have a moderate to small effect (Eshel et al 2017, Lee et al 2013). This finding suggests that enhancing the protective factors is more effective than reducing the risk factors. Finally, demographic factors such as age, gender, marital status, job tenure, experience and level of education were found to have a very small or no effect (Dyrbye et al 2010, Lee et al 2013, Al-Hawari et al 2020).

Based on the analyses of the included meta-analyses and primary studies,³ an overview of the five most impactful and relevant factors is provided in Table 2. In the next section, a short explanation of each factor is provided.

³ Findings from cross-sectional studies are omitted unless the direction of the association is self-evident.

Table 2: The greatest influences on resilience

| Factor | Effect size | No. of studies | Level of evidence |
|---------------------------|---------------|----------------|-------------------|
| Self-efficacy | $\rho = .60$ | 33 | C |
| Positive affect, optimism | $\rho = .60$ | 33 | C |
| Sense of coherence | $r = .50/.60$ | 3 | B |
| Social support | $\rho = .40$ | 40+ | B |
| Leader–member exchange | $r = .40$ | 1 | D |

Self-efficacy

The term self-efficacy refers to an employee’s confidence in their ability to accomplish a task, achieve a goal or demonstrate behaviour required to attain a certain outcome. As such, it represents a self-confident view of one’s capability to deal with certain stressors in life. The concept was originally developed by the psychologist Albert Bandura, who examined people’s beliefs about their capacity to exercise control over events that affect their lives in order to manage prospective situations (Bandura 1997). In the domain of management and organisations, self-efficacy is remarkably popular – in the past 30 years, more than 1,000 articles on self-efficacy have been published in academic journals. Virtually every area in organisational research has utilised the concept of self-efficacy, including team processes, learning, motivation and performance (Judge et al 2007). Longitudinal studies have found that self-efficacy positively predicts psychological resilience (Gillespie et al 2007, Kimhi et al 2017, Li 2008). That is, a greater level of self-efficacy was found to be closely related to an increase in an employee’s resilience, for example, having the ability to cope with organisational change (Lee et al 2013). Self-efficacy can be measured with the ten-item General Self-Efficacy Scale (Schwarzer and Fuchs 1995).

Positive affect, optimism

Positive affect refers to the extent to which a person subjectively experiences positive moods such as joy, cheerfulness, enthusiasm and alertness (Watson et al 1988), whereas optimism refers to the belief that one will generally experience good outcomes in life and work. Several studies have found that positive affect is strongly correlated with resilience (Lee et al 2013), indicating that resilient employees are able to use positive affect to protect themselves against the negative effects of adverse events in the workplace. A similar protective effect was found for optimism. Researchers have argued that employees who are optimistic are more likely to engage in practices that prevent or mitigate negative effects of adverse events. Conversely, people who are less optimistic are more likely to engage in maladaptive coping strategies (Carver et al 2010). The results from a ten-year cohort study has demonstrated that being optimistic enhances psychological resilience and, as a result, reduces the consequences of exposure to adverse events (De Terte et al 2014). Positive affect can be measured with the ten-item Positive and Negative Affect Schedule (PANAS) (Watson et al 1988). Optimism can be measured with the ten-item revised version of the Life Orientation Test (LOT-R) (Scheier et al 1994).

Sense of coherence

Sense of coherence (SOC) is a multidimensional construct that refers to the belief that what happens in one's life is comprehensible (rational, predictable, understandable), manageable (the availability of adequate and sufficient resources) and meaningful (Antonovsky 1993). Work-related sense of coherence (work-SOC) is *'the perceived comprehensibility, manageability and meaningfulness of an individual's current work situation'* (Vogt et al 2013). Although research on work-SOC is still in its early stages, several prospective longitudinal studies have indicated that higher levels of SOC predict greater resilience (Eshel et al 2017, Kimhi et al 2017, Surtees et al 2006). It is argued that employees with a strong sense of coherence perceive that they can mobilise additional resources, such as time, budget and good relationships with colleagues and supervisors, which may help them to cope with unexpected, adverse events (Muller and Rothmann 2009). In addition, employees with a strong sense of coherence might find the intrinsic nature of their work to be more meaningful. SOC can be measured with the 13-item SOC scale developed by Antonovsky (1993). Work-SOC can be measured with the nine-item scale developed by Vogt et al (2013).

Social support

A large number of longitudinal studies have consistently shown that social support is a strong predictor for psychological resilience (see, for example, Dyrbye et al 2010, Jain et al 2012, De Terte et al 2014). Social support is referred to as *'the extent to which a job provides opportunities for getting assistance and advice from either supervisors or co-workers'* (Karasek et al 1998). Most of the studies included in this review distinguished different sources of social support, such as colleagues, peers, supervisors, friends or family. Of these sources, colleagues were found to have the largest positive impact on employees' resilience. Social support can be measured with the Social Support Scale developed by Caplan et al (1975) that assesses the support an employee perceives is available from their supervisor, co-workers, family and friends.

Leader-member exchange

Given the central role of leaders in organisations, it is no surprise that a recent cross-sectional study found that leaders who build positive interpersonal relations with their employees (also referred to as leader-member exchange, or LMX) also have a positive effect on employees' psychological resilience (Kakkar 2019). It is assumed that by actively creating a high-quality LMX, leaders help decrease work-related stress and provide psychological resources for coping (Thomas and Lankau 2009). This is even more important during adverse situations when subordinates look towards their supervisor for reassurance, directions and support. LMX can be measured with the seven-item scale (LMX-7) (Graen and Uhl-Bien 1995).

Question 5: What is known about the effect of interventions aimed at enhancing employees' resilience?

Finding 7: There is strong evidence that resilience interventions have positive effects on psychological resilience (level AA)

There is consensus among scholars that psychological resilience can be developed to enhance coping. There is indeed strong evidence from recent meta-analyses and systematic reviews based on randomised controlled studies that interventions aimed at enhancing people's resilience have, in general, a moderate positive effect (see, for example, Joyce et al 2018, Lupşa et al 2020, Cleary et al 2018, Macedo et al 2014, Robertson et al 2015). Most of the interventions examined workshops or training involving techniques to develop self-awareness, critical reflection, relaxation and mindfulness in combination with goal-setting, coaching and small group discussions to improve participants' emotional self-efficacy and stress reactivity. Some of these interventions included 'off the shelf' programmes such as Promoting Adult Resilience (PAR). Most of these programmes are based on the principles of cognitive behavioural therapy.

Finding 8: However, the effect sizes reported show considerable variability, indicating that the effect of the intervention is contingent upon various moderating factors (level AA)

The scientific literature indicates that resilience interventions may not always be effective – meta-analyses have demonstrated large variations of effectiveness. In fact, some interventions had inconsistent results and cannot be said to have enhanced resilience overall (Cleary et al 2018). These findings suggest that the effect of resilience interventions is moderated and/or mediated by several factors, such as delivery, content, and facilitation and implementation characteristics.

Finding 9: The content of the intervention (slightly) moderates the effect (level AA)

Several meta-analyses based on controlled studies indicate that the content of intervention only slightly moderates the effect on resilience outcomes. In general, interventions based on cognitive behavioural techniques (for example, cognitive behavioural therapy, or CBT) and increasing psychological capital⁴ tend to have slightly larger effects than other types of intervention (for example, stress management, job demands resources interventions). Interventions that used reflection, mentoring, mindfulness and relaxation techniques had small to moderate positive effects, whereas mixed interventions tend to have somewhat larger effects. This suggests that a combination of interventions might represent the best chance of success (Joyce et al 2018, Lupşa et al 2020, Rogers 2016).

Finding 10: The duration and volume of the intervention moderates the effect (level B)

Two recent meta-analyses of controlled studies found that the length of the intervention had a moderating effect: interventions with the duration of four to five weeks showed larger effect sizes than interventions with a longer duration (Lupşa et al 2020, Vanhove et al 2016). However, it was found that interventions that include 8 to 12 sessions tend to have larger effects than interventions with only a few sessions (Cleary et al 2018). In addition, it was found that the effect of intervention programmes tends to decrease over time. Interventions that had more and longer sessions were more likely to have a sustained effect (Vanhove et al 2016).

Finding 11: The mode of delivery of the intervention moderates the effect (level B)

A meta-analysis of controlled studies found that programmes targeted at employees experiencing higher stress or lacking protective resources tend to have weaker effects than universal programmes (Vanhove et al 2016). However, targeted programmes were more likely to have a sustained effect (more than one month) than universal programmes. Finally, one-to-one and small face-to-face group programmes tend to have stronger effects than classroom- and computer-based programmes.

Finding 12: The evidence on the economic return on investment of resilience intervention programmes is unclear

The studies included in this review indicate that, in general, resilience intervention programmes have positive effects on employees' resilience. However, limited information is provided on their economic utility or return on investment, whereas most of these programmes are rather time- and resource-intensive. For example, the PAR programme involves one-hour sessions delivered over a period of 11 consecutive weeks. This lack of a clear cost–benefit analysis could preclude the use of such programmes in organisations with limited resources.

⁴ Psychological capital (PsyCap) is described as a developmental state that helps people be more productive, realise their potential and find life more meaningful. Its four components are identified as resilience, self-efficacy, optimism and hope.

4 Conclusion

The studies included in this review consistently demonstrate that employee resilience has an impact on a wide range of work-related attitudes and behaviours. Resilience helps employees adapt, cope, gain resources, and thus protect and recoup from resource loss stemming from stressors in the workplace. In addition, the review indicates that self-protective resources such as self-efficacy, positive affect, work-related sense of coherence and social resources such as social support from co-workers and a high-quality leader–member exchange are strong predictors of employees' resilience. Finally, interventions aimed at enhancing employees' resilience are effective, but this effect is contingent on various design and delivery characteristics.

5 Limitations

This REA aims to provide a balanced assessment of what is known in the scientific literature about employee resilience by using the systematic review method to search and critically appraise empirical studies. To be 'rapid', concessions were made in relation to the breadth and depth of the search process, such as the exclusion of unpublished studies, the use of a limited number of databases and a focus on empirical research published in the past 20 years. As a consequence, some relevant studies may have been missed.

A second limitation concerns the critical appraisal of the studies included, which did not incorporate a comprehensive review of the psychometric properties of their tests, scales and questionnaires.

A third limitation concerns the focus on meta-analyses and longitudinal studies. As a consequence, new, promising findings from cross-sectional studies may have been missed.

Given these limitations, care must be taken not to present the findings presented in this REA as conclusive.

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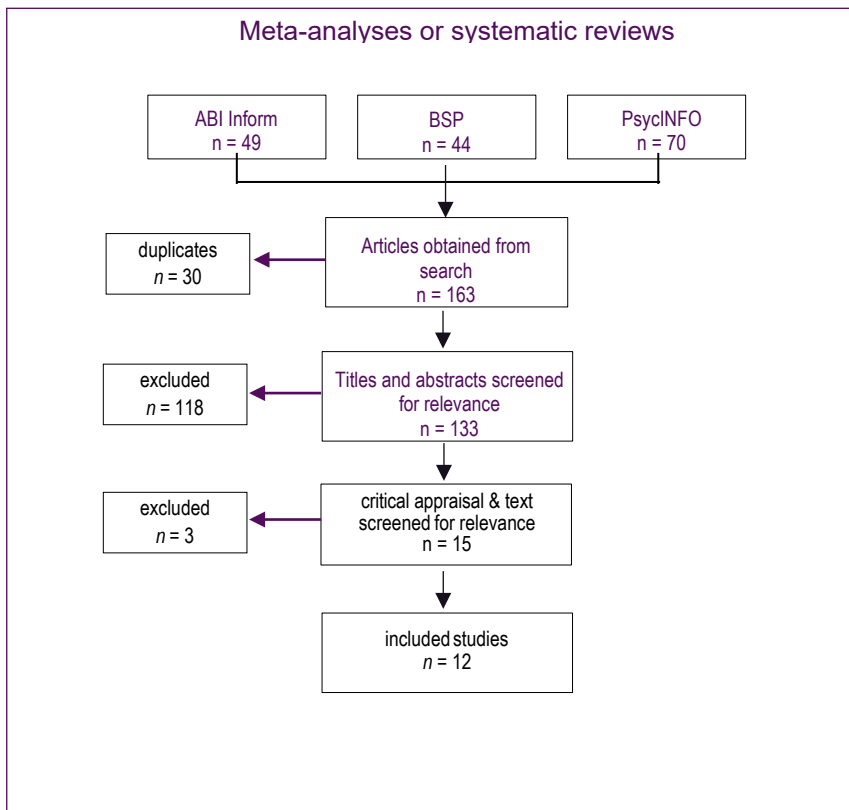
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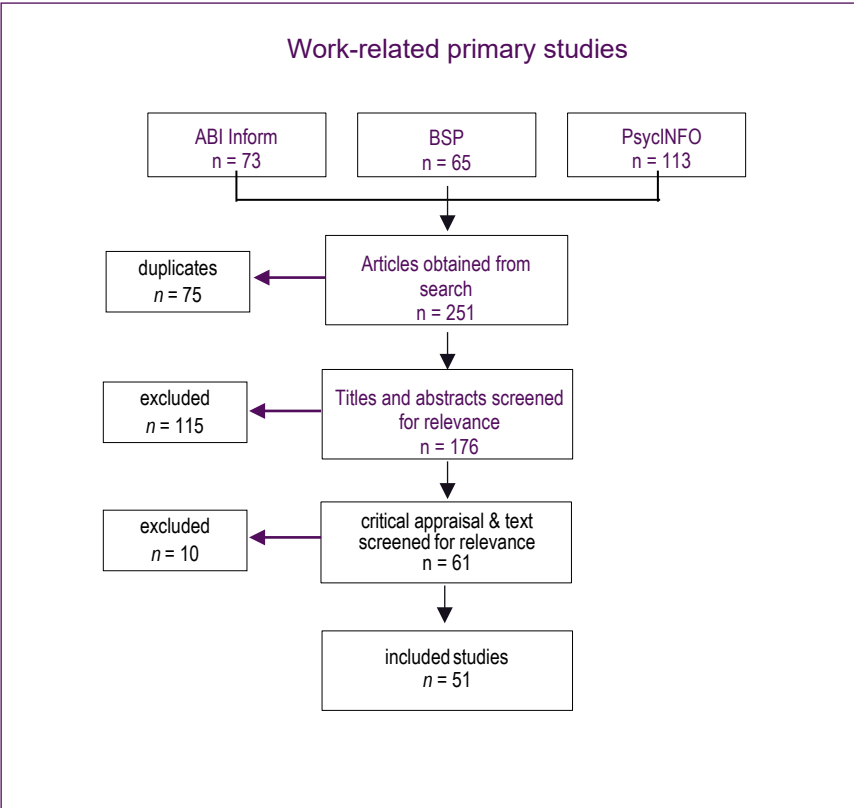
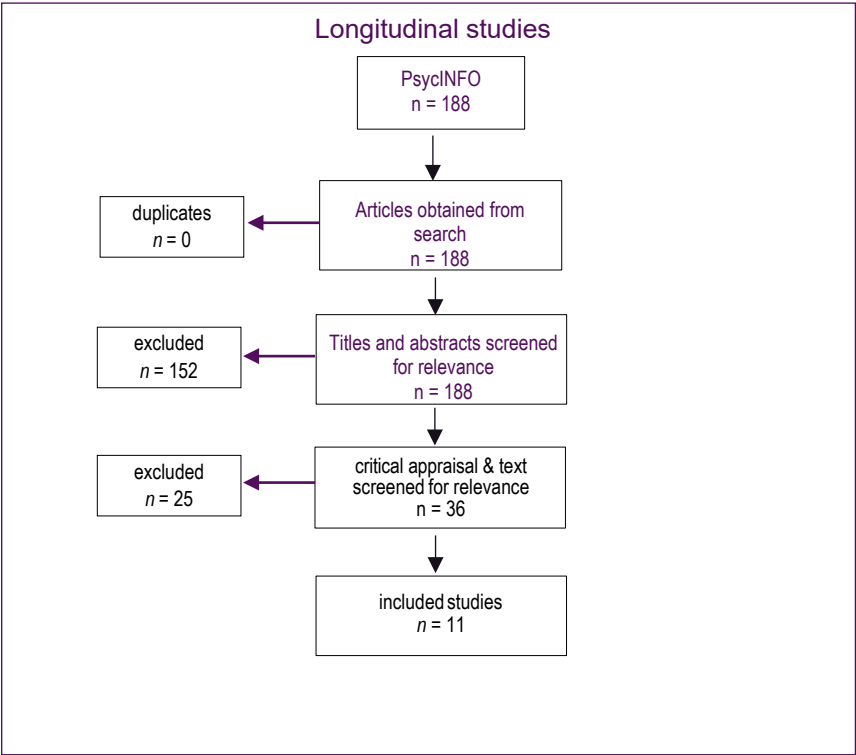
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Appendix 1: Search terms and hits

| ABI/Inform Global, Business Source Elite, PsycINFO peer reviewed, scholarly journals, December 2020 | | | |
|---|-----------|-----------|------------|
| Search terms | ABI | BSP | PSY |
| S1: ti(resilience) OR ab(resilience) | 6,758 | 7,229 | 16,896 |
| S2: filter meta-analyses or systematic reviews | 49 | 44 | 70 |
| S3: ti(antecedent*) OR ab(antecedent*) OR ti(predict*) OR ab(predict*) OR ti(driver*) OR ab(*driver) OR ti(moderat*) OR ab(moderat*) OR ti(mediat*) OR ab(mediat*) | – | – | 646,660 |
| S4: ti(develop*) OR ti(build*) | – | | 140,306 |
| S5: S3 OR S4 | – | | 764,760 |
| S6: ti(resilience) AND S5 | – | – | 2,570 |
| S7: S4 AND filter longitudinal studies | – | – | 188 |
| S8: ti(employe*) OR ti(work*) | 103,344 | 95,158 | 107,100 |
| S9: ti(resilience) AND S8 AND filter quantitative studies | 73 | 65 | 113 |

Appendix 2: Study selection





Appendix 3: Overview of effect sizes

| Construct | Effect size | Design | Level | 1st author & year |
|--|---|--|-------|--|
| Abusive supervision | $r = -.15$ | cross-sectional time-lagged study | D+ | Al-Hawari, 2020 |
| Affect | positive $\rho = .60$ negative $\rho = -.30$ | MA of 33 cross-sectional studies | C | Lee, 2013 |
| Anxiety | $\rho = -.40$ | MA of 33 cross-sectional studies | C | Lee, 2013 |
| Burnout | $\beta = -.65$ | cross-sectional study | D | Khaksar, 2019 |
| Commitment to change | affective $r = .50$ continuance $r = -.25$ | cross-sectional study | D | Cho, 2017 |
| | affective $r = .10$ normative $r = .10$ behavioural supp $r < .1$ | cross-sectional time-lagged study | D+ | Shin, 2012 |
| Coping skills | $\beta = .25/.40$ | randomised controlled study | A | Parker, 2015 |
| Creative behaviour | $r = .55$ | cross-sectional study | D | De Clercq, 2019 |
| Customer incivility | $r = -.25$ | cross-sectional time-lagged study | D+ | Al-Hawari, 2020 |
| Cynicism | $r = -.30$ | cross-sectional study | D | Shoss, 2013 |
| Demographic factors (age, gender, marital status, job tenure, experience, education) | <.1 or ns | SRs, MAs, longitudinal (prospective) studies and cross-sectional studies | D - B | Dyrbye, 2010; Lee, 2013; Al-Hawari, 2020; Annor, 2020; Ayala, 2014; Galatzer-Levy, 2013, Yu, 2019; Caniels-Baaten, 2019; Gupta, 2018; Ferris, 2005; Kimura, 2018 |
| Depression | $\rho = -.40$ | MA of 33 cross-sectional studies | C | Lee, 2013 |
| Emotional intelligence | $r = .60$ | cross-sectional study | D | Kinman, 2010 |
| | soc competence $r = .45$ | cross-sectional study | D | Kinman, 2010 |
| Emotional exhaustion | $r = -.15$ | cross-sectional time-lagged study | D+ | Al-Hawari, 2020 |
| | $r = -.35$ | cross-sectional time-lagged study | D+ | Kacmar, 2020 |
| | $r = -.35$ | cross-sectional study | D | McFadden, 2018 |
| | $r = -.25$ | cross-sectional time-lagged study | D+ | Shoss, 2018 |
| Emotion sharing | $r = .45$ | cross-sectional study | D | De Clercq, 2019 |
| Family-work enrichment | $r = .30$ | cross-sectional time-lagged study | D+ | Kacmar, 2020 |
| Generational differences | $\beta \sim .20/.30$ | cross-sectional study | D | Chakradhar, 2018 |
| Healthy lifestyle | $r = .15$ | prospective cohort study | B | De Terte, 2014 |

| | | | | |
|---|---|-----------------------------------|----|-----------------|
| HR practices > wellbeing | r = .25 | cross-sectional time-lagged study | D+ | Cooper, 2019 |
| Humour | r = .10 | cross-sectional time-lagged study | D+ | Kacmar, 2020 |
| Job insecurity | r = -.3 | cross-sectional study | D | Shoss, 2013 |
| Job satisfaction | r = ns | cross-sectional study | D | Athota, 2020 |
| | r = .30 | cross-sectional time-lagged study | D+ | Kacmar, 2020 |
| | r = .30 | cross-sectional time-lagged study | D+ | Meneghel, 2016 |
| | r = .30 | cross-sectional study | D | Youssef, 2009 |
| Leader-member exchange | r = .40 | cross-sectional study | D | Kakkar, 2019 |
| Leadership | empowering r = .35 contingent reward r = .25 | cross-sectional study | D | Nguyen, 2016 |
| | transformational r = .20 | cross-sectional study | D | Wang, 2017 |
| Learning climate | OR = 2.0 | prospective cohort study | B | Dyrbye, 2010 |
| | r = .30 | cross-sectional study | D | Caniëls, 2019 |
| Life satisfaction | ρ = .40 | MA of 33 cross-sectional studies | C | Lee, 2013 |
| | r = .30 | cross-sectional study | D | Athota, 2020 |
| Mental health | r = .50 | MA of 111 cross-sectional studies | C | Hu, 2015 |
| Mindfulness | r = .70 | cross-sectional study | D | Anasori, 2020 |
| Moral foundations (care, fairness, reciprocity, loyalty, respect, purity) | r = .30 | cross-sectional study | D | Athota, 2020 |
| Optimism | ρ = .40 | MA of 33 cross-sectional studies | C | Lee, 2013 |
| | r = .50 | prospective cohort study | B | De Terte, 2014 |
| Organisational commitment | r = .35 | cross-sectional study | D | Happy, 2016 |
| Organisational justice | r = .15 | cross-sectional study | D | Youssef, 2009 |
| Performance | service r = .25 | cross-sectional time-lagged study | D+ | Al-Hawari, 2020 |
| | service r = .40 | cross-sectional study | D | Nadeem, 2019 |
| | task r = .30 | cross-sectional study | D | Athota, 2020 |
| | task r = .20 | cross-sectional time-lagged study | D+ | Cooper, 2019 |
| | task β = .30 | cross-sectional time-lagged study | D+ | Parker, 2015 |
| | job r = .10 | cross-sectional study | D | Youssef, 2009 |
| | OCB r = .45 | cross-sectional study | D | Happy, 2016 |
| | OCB r = .35 | cross-sectional study | D | Nadeem, 2019 |
| | entrepreneurial r = .3/.4 | longitudinal prospective study | B | Ayala, 2014 |

| | | | | |
|---------------------------------|---|-----------------------------------|----|--------------------|
| Performance feedback | seeking $r = .25$ | cross-sectional study | D | Caniëls, 2019 |
| | job $r = .30$ supervisor $r = .20$ | cross-sectional study | D | Kuntz, 2017 |
| Personality traits | neuroticism $\beta = -.25$ extraversion $\beta = .25$ conscientious $\beta = .20$ openness $\beta = .10$ | cross-sectional time-lagged study | D+ | Palma-Garcia, 2017 |
| | extraversion $r = .30$ | cross-sectional study | D | Athota, 2020 |
| Prevention focus | $r = -.25$ | cross-sectional study | D | Kakkar, 2019 |
| Promotion focus | $r = .75$ | cross-sectional study | D | Kakkar, 2019 |
| Proactive work behaviour | $r = .55$ | cross-sectional study | D | Caniëls, 2019 |
| Physical safety outcomes | $r = .20$ | cross-sectional study | D | Chen, 2017 |
| Psychological contract | relational $r = .35$ | cross-sectional study | D | Cho, 2017 |
| | transactional $r = -.10$ | cross-sectional study | D | Cho, 2017 |
| | breach $r = -.10$ | cross-sectional study | D | Shoss, 2013 |
| Psychological stress | perceived $\rho = -.30$ | MA of 33 cross-sectional studies | C | Lee, 2013 |
| | perceived $r = .20$ | cross-sectional study | D | Chen, 2017 |
| | stress/fatigue OR = .90 | prospective cohort study | B | Dyrbye, 2010 |
| | life events OR = .80 | prospective cohort study | B | Dyrbye, 2010 |
| | psyc. distress $r = -.50$ | cross-sectional study | D | Anasori, 2020 |
| | psyc. distress $r = -.55$ | cross-sectional study | D | Kinma, 2010 |
| | psyc./social strain $r = -.70$ | cross-sectional study | D | Ferris, 2005 |
| PTSD | $\rho = -.30$ | MA of 33 cross-sectional studies | C | Lee, 2013 |
| Role ambiguity | $r = -.60$ | cross-sectional study | D | De Clercq, 2019 |
| Safety climate | management $r = .50$ supervisor $r = .45$ co-workers $r = .20$ | cross-sectional study | D | Chen, 2017 |
| Safety knowledge | $r = .55$ | cross-sectional study | D | Chen, 2017 |
| Self-efficacy | $\rho = .60$ | MA of 33 cross-sectional studies | C | Lee, 2013 |
| | $r = .40$ | longitudinal (prospective) study | B | Kimhi, 2017 |
| Self-enhancement | $r \sim .25^*$ | longitudinal (prospective) study | B | Bonanno, 2005 |
| Self-esteem | $\rho = .55$ | MA of 33 cross-sectional studies | C | Lee, 2013 |
| | $r = .40$ | longitudinal (prospective) study | B | Kimhi, 2017 |
| Sense of coherence | $r = .50^*$ | longitudinal (prospective) study | B | Eshel, 2017 |
| | $r = .60$ | longitudinal (prospective) study | B | Kimhi, 2017 |
| | $d = .35$ | prospective cohort study | B | Surtees, 2016 |

| | | | | |
|-----------------------------|---|-----------------------------------|----------------|-----------------|
| Social capital | structural $\beta = .40$ relational $\beta = .55$ cognitive $\beta = .60$ | cross-sectional study | D | Khaksar, 2019 |
| | social context $r = .40$ | cross-sectional time-lagged study | D+ | Meneghel, 2016 |
| | social exchange $r = .30$ | cross-sectional time-lagged study | D+ | Shin, 2012 |
| Social support | family OR = 1.9 | prospective cohort study | B | Dyrbye, 2010 |
| | family OR = 1.4 | prospective cohort study | B | Jain, 2012 |
| | family $r = .15^*$ | prospective cohort study | B | De Terte, 2014 |
| | friends OR = 1.3 | prospective cohort study | B | Jain, 2012 |
| | peers OR = 1.2 | prospective cohort study | B | Jain, 2012 |
| | colleagues $r = .40^*$ | prospective cohort study | B | De Terte, 2014 |
| | colleagues $r = .45$ | cross-sectional study | D | Cooke, 2019 |
| | colleagues $r = .25$ | cross-sectional study | D | Kuntz, 2017 |
| | supervisor $r = .25^*$ | prospective cohort study | B | De Terte, 2014 |
| | supervisor $r = .35$ | cross-sectional study | D | Cooke, 2019 |
| | supervisor $r = ns$ | cross-sectional study | D | Kuntz, 2017 |
| | general $r = .60$ | longitudinal (prospective) study | B | Kimhi, 2017 |
| | general $\rho = .40$ | MA of 33 cross-sectional studies | C | Lee, 2013 |
| | general $r = .40^*$ | longitudinal (prospective) study | B | Eshel, 2017 |
| general $r = .35$ | prospective cohort study | B | De Terte, 2014 | |
| Surface acting | $r = -.35$ | cross-sectional time-lagged study | D+ | Kacmar, 2020 |
| Task interdependence | $r = .35$ | cross-sectional study | D | De Clercq, 2019 |
| Turnover | intentions $r < -.1$ | cross-sectional time-lagged study | D+ | Lanz, 2017 |
| | intentions $r = -.25$ | cross-sectional study | D | Yu, 2008 |
| | $r < .1$ | cross-sectional time-lagged study | D+ | Shin, 2012 |
| Wellbeing | $r = .35$ | cross-sectional study | D | Annor, 2020 |
| | $\beta = .25$ | cross-sectional study | D | Athota, 2020 |
| | $r = .75$ | cross-sectional study | D | Gupta, 2018 |
| Workplace bullying | $r = -.45$ | cross-sectional study | D | Anasori, 2020 |
| | $r = -.35$ | cross-sectional study | D | Gupta, 2018 |
| | $r = -.10$ | cross-sectional study | D | Meseguer, 2019 |
| | victimisation $r = -.84$ | cross-sectional study | D | Gupta, 2018 |
| Work demands | pressure $r = -.50$ | cross-sectional study | D | Chen, 2017 |

| | | | | |
|------------------------|--------------------------|-----------------------------------|----|----------------|
| | worked hours $r = -.15$ | cross-sectional time-lagged study | D+ | Cooper, 2019 |
| | role overload $r = -.30$ | cross-sectional study | D | Chen, 2017 |
| | role overload $r = -.15$ | cross-sectional time-lagged study | D+ | Kacmar, 2020 |
| | job demands $r = -.40$ | cross-sectional study | D | Ferris, 2005 |
| | job demands $r = .20$ | cross-sectional study | D | Ceschi, 2017 |
| | workload $r = -.15$ | cross-sectional time-lagged study | D+ | Lanz, 2017 |
| | workload $r = .20$ | cross-sectional study | D | McFadden, 2018 |
| Work engagement | $r = .30$ | cross-sectional study | D | Marche, 2015 |
| | $r = .40$ | cross-sectional study | D | Wang, 2017 |

* Effect size concerns outcomes implying resilience (resilience indices)

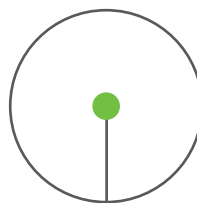


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