Conceptualising work-related psychosocial risks

Current state of the art and implications for research, policy and practice

Stavroula Leka and Aditya Jain

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european trade union institute

Stavroula Leka
Centre for Organisational Health & Well-being, Lancaster University

Aditya Jain
Nottingham University Business School

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Abstract

Work-related psychosocial hazards are recognised as one of the key concerns to be addressed in modern working life across the world and in the future of work. They refer to unfavourable working conditions in terms of the way work is organised and managed (e.g. high workloads, long working hours, lack of autonomy and support at work, harassment and bullying at work). There is now ample evidence that exposure to psychosocial hazards can put the health of workers and the sustainability of organisations at risk. Indeed, several studies have evidenced the relationship between the risks arising from psychosocial hazards, work-related psychosocial risks (PSR), and negative outcomes such as work-related stress, cardiovascular disease, depression and anxiety, and mortality. Furthermore, PSR have been found to be related to sickness absenteeism and presenteeism as well as an early exit from the workforce due to disability.

There are numerous theories and models of relevance to work-related PSR, conceptual definitions and terminology, validated questionnaires, and frameworks for risk assessment and management. Concurrently, there is no consensus on a definitive PSR list, despite this being considered to be one of the most challenging risks to manage at work. In addition, legislation varies across European Union (EU) Member States, leaving workers unequally protected.

This report presents the findings of an ETUI project focusing on a review and systematisation of the existing evidence with the aim of providing clarity to the multidimensional concept of work-related PSR. It first provides a review of the literature that summarises the key theories and models of relevance to work-related PSR, the conceptual definitions and terminology, and the instruments which have been validated for risk assessment before delivering an overview of the relevant policy context at the EU level and in selected Member States.

Second, it presents the findings of a scoping review of the literature and of a validation exercise with expert networks, which have informed the development of a conceptual framework and taxonomy of work-related PSR with different components:

– Sources; such as aspects related to the macro context;
– Factors; including job security, work-life balance;
– Hazards; for example, job insecurity, work-life conflict;
– Impacts and outcomes in terms of individual health and wellbeing, and organisational outcomes.

Third, a selection of preventive measures related to the work-related PSR taxonomy is also described with a focus on the organisational level, and the evidence on the importance of these measures is discussed. Finally, conclusions are drawn on the current state of the art on work-related PSR, and recommendations are provided for the priorities to be addressed in research, policy and practice.

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1. Introduction

Work-related psychosocial hazards are recognised as one of the key concerns to be addressed in modern working life across the world and in the future of work (Schulte et al. 2020). They refer to unfavourable working conditions in terms of the way work is organised and managed (e.g. high workload, long working hours, lack of autonomy and support at work, harassment and bullying at work) and the social context of work (Leka et al. 2015). There is now ample evidence that exposure to psychosocial hazards can put the health of workers and the sustainability of organisations at risk. Indeed, several studies have evidenced the relationship between the risks arising from psychosocial hazards, work-related psychosocial risks (PSR), and negative outcomes such as work-related stress (see International Labour Organization (ILO) 2016; WHO 2010, 2022), cardiovascular disease (e.g. Eller et al. 2009; EU-OSHA 2023; Kivimaki et al. 2012), depression and anxiety (e.g. Madsen et al. 2017), and mortality (e.g. Taouk et al. 2020; Tsutsumi et al. 2006). Furthermore, PSR have been found to be related to sickness absenteeism (e.g. Russo et al. 2021) and presenteeism (e.g. Miraglia and Johns 2016; Navarro et al. 2018) as well as early exit from the workforce due to disability (e.g. Leineweber et al. 2019).

There are numerous theories and models of relevance to work-related PSR, conceptual definitions and terminology, validated questionnaires and frameworks for risk assessment and management. Concurrently, however, there is no consensus on a definitive list of PSR, which are considered to be one of the most difficult risks to manage at work (EU-OSHA 2010). In addition, legislation regarding these risks varies across European Union (EU) Member States leaving workers unequally protected (Cefaliello 2021; Jain et al. 2022).

This report presents the findings of an ETUI project focusing on a review and systematisation of the existing evidence with the aim of providing clarity to the multidimensional concept of work-related PSR. It begins by setting the context by providing an overview of the conceptual definitions, terminology and prevalence of work-related PSR, the key theories and models of relevance to work-related PSR, validated instruments for risk assessment and the relevant policy context at EU level and in selected Member States. It then presents the findings of a scoping review of the literature and a validation exercise with expert networks which informed the development of a conceptual framework and taxonomy of work-related PSR with different components:

– sources, such as aspects related to the macro context
– factors, including job security, work-life balance

– hazards, for example job insecurity, work-life conflict
– impacts and outcomes in terms of individual health and wellbeing, and organisational outcomes.

A selection of prevention measures related to the work-related PSR taxonomy is then described with a focus on the organisational level, and evidence on these measures is discussed. Finally, conclusions are drawn on the current state of the art on work-related PSR and recommendations are provided for priorities to be addressed in research, policy and practice.

2. Conceptual definitions and terminology of work-related psychosocial risks

In terms of terminology, in the literature we originally find terms such as 'psychosocial stimuli', 'psychosocial stressors' (Levi 1972, 1984), 'psychosocial factors' (French and Caplan 1970) and 'psychosocial risk factors at work' (WHO 1985) being used interchangeably. Interestingly, there was even reference to 'psychosocial climate' (ILO 1986) since the 80s. The term 'psychosocial factors' became more widely used in occupational safety and health (OSH) when a definition was provided in a report of the 9th session of the Joint ILO/WHO Committee on Occupational Health, held in Geneva on 18-24 September 1984, that was published by the ILO in 1986 under the title: 'Psychosocial factors at work: Recognition and control' (the French and Spanish editions were published under the title: 'Psychosocial factors at work: Nature, incidence and prevention'). In these documents, work-related psychosocial factors were defined as follows:

> Psychosocial factors at work refer to interactions between and among work environment, job content, organisational conditions and workers' capacities, needs, culture, personal extra-job considerations that may, through perceptions and experience, influence health, work performance and job satisfaction (ILO 1986: 3).

It is important to highlight that, in that 1986 report, it is acknowledged that the concept of psychosocial factors at work is difficult to grasp since it represents worker perceptions and experience, and reflects many considerations that relate to the individual worker, the conditions of work and the work environment, social and economic influences and other considerations outside the workplace which have repercussions within it. It is also acknowledged that, while the concept of psychosocial factors had been seen mostly in a negative way in published research, it is important that positive psychosocial factors at work are also recognised since they can have favourable influences on health and other aspects of life (ILO 1986).

The European Trade Union Institute has recognised that there continues to be a lack of clarity in relation to the conceptualisation and definition of psychosocial factors and their impact, something that has also been acknowledged by experts in this area (see, for example, Leka et al. 2017). This has been exacerbated by the use of multiple terms, often interchangeably, in this area such as psychosocial factors, psychosocial hazards, psychosocial risks, work and organisational characteristics, job characteristics, job demands and resources, job strain, effort-reward imbalance, and occupational stressors. Furthermore, even though there is now overall agreement that the work environment and working conditions can have a positive or negative impact on individual, organisational and societal

outcomes (Leka and Jain 2017), there is evidence of confusion in both the scientific and policy literatures between causes and outcomes. For example, there is often reference to work-related stress as a psychosocial risk[1] when work-related stress is an outcome of exposure to psychosocial risks.

In 2017, Leka, Jain and Lerouge elucidated some of the terms found in the literature, clarifying that the term psychosocial factors refers to aspects of work organisation, design and management that include, among others, work demands, the availability of organisational support, rewards, and interpersonal relationships in the workplace. These factors do not immediately carry a negative or positive connotation. However, when reference is made to psychosocial hazards, then it is implied that these aspects of work organisation, design and management have the potential to cause harm to individual health and safety as well as to lead to other adverse organisational outcomes such as sickness absence, reduced productivity or human error (Leka et al. 2015). Psychosocial risk is defined as the potential of psychosocial hazards to cause harm (BSI 2011). Whether an organisation will have a positive or negative psychosocial work environment will depend on how effectively it manages PSR (Leka et al. 2017).

According to the European Agency for Safety and Health at Work (EU-OSHA 2013), work-related PSR relates to the negative psychological, physical and social outcomes that arise from unfavourable organisation and management in the workplace, as well as a poor social context at work including, but not limited to:

- excessively demanding work and/or not enough time to complete tasks
- conflicting demands and lack of clarity over the worker's role
- a mismatch between the demands of the job and the worker's competency – underusing a worker's skills can be a source of stress just as much as overstretching workers
- a lack of involvement in making decisions that affect the worker and a lack of influence over the way the job is done
- working alone, especially when dealing with members of the public and clients, and/or being subject to violence from a third party, which may take the form of verbal aggression, unwanted sexual attention or the threat of or actual physical violence
- a lack of support from management and colleagues, and poor interpersonal relationships
- psychological or sexual harassment and bullying in the workplace — the victimising, humiliating, undermining or threatening behaviour of supervisors or colleagues towards an employee or group of employees
- an unjust distribution of work, rewards, promotions or career opportunities
- ineffective communication, poorly managed organisational change and job insecurity
- difficulties in combining commitments at work and at home.

1. See, for example, EU-OSHA: https://osha.europa.eu/en/facts-and-figures/esener

These issues are key psychosocial hazards identified in numerous scientific studies and key guidance provided to organisations. They have also been included in specific legislation on PSR in several EU Member States, as will be discussed later (see Section 6). It also should be noted here that the focus on PSR stemmed from research on work-related stress and the impact of PSR on various outcomes can be either direct or indirect through the experience of work-related stress (Cox 1993). As discussed earlier, work-related stress is an outcome of exposure to PSR and refers to the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope (WHO 2003).

Furthermore, contemporary theories and models of work-related stress and the psychosocial work environment (see Section 3) use concepts or theoretical domains such as job demands and job resources. It is important to clarify these as well since there is variety in their conceptualisation.

In the literature, there is reference to four main types of job demands: quantitative demands (e.g. time pressure or the amount of work); cognitive demands that impinge primarily on the brain processes involved in information processing (e.g. the difficulty of the work); emotional demands, which refer primarily to the effort needed to deal with organisationally desired emotions during interpersonal transactions (e.g. hiding emotions when dealing with difficult clients); or physical demands that are primarily associated with the musculoskeletal system (i.e. motoric and physical aspects of behaviour) (Eurofound 2021a).

On the other hand, job resources refer to the physical, psychological, social or organisational aspects of a job that either reduce job demands and the associated psychological and physiological costs, are functional in achieving work goals or stimulate personal growth, learning and development (Schaufeli and Bakker 2004). As with job demands, job resources basically comprise cognitive, emotional and/or physical components. Examples of cognitive job resources include organisational policies providing information, emotional resources include colleagues providing support, and physical resources include ergonomic aids.

Theoretical domains such as job demands and resources are broad and encompass various job, work and work environment characteristics. This is evident in the way these theoretical domains have been operationalised in the measurement instruments that have been developed over the years (see Section 7). Many of these instruments are quite long and include various scales capturing these characteristics. Therefore, some researchers argue that organisations need to choose those scales that best match the nature of work in their context based on other organisational data and/or some preliminary qualitative analysis (Bakker and Demerouti 2017; Demerouti et al. 2001). However, there is evidence that organisations might find it difficult to do so without specialist support and guidance (EU-OSHA 2010, 2014, 2019). Furthermore, there has been a healthy debate in the literature about the strengths and weaknesses of the theoretical models underpinning these instruments and their measurement which goes back to the early days of research on the psychosocial work environment.

Additionally, there has been a healthy discussion on how best to put knowledge on the psychosocial work environment to good use in policy and practice. With the accumulation of better-quality evidence on the health and organisational impacts associated with exposure to PSR, which are now accepted by all key stakeholders, the more pertinent question seems to be, how can we use knowledge and evidence to facilitate the design of healthy work and healthy organisations that will promote individual and societal health and wellbeing in the context of macro-level developments and challenges? Therefore, as will be discussed later in this report, the goal of this project to develop a conceptualisation and taxonomy of work-related PSR, should not be viewed solely as an exercise for research purposes but one that draws useful conclusions that will help answer this question.

3. Theories and models on the psychosocial work environment

Most theoretical models on the psychosocial work environment were developed as theories of work-related stress and burnout. Terminology and key domains in theoretical models have evolved over the years with researcher attempts to capture the impact of aspects of the non-physical work environment on health, safety and wellbeing and organisational outcomes. For example, the Person-Environment Fit (P-E Fit) model (French and Caplan 1972) suggested a balancing or matching mechanism between work environment demands and individual needs and abilities. This notion of an interaction between aspects of the work environment or fit and imbalance can be found in models such as the Job Demand-Control (JDC) model (Karasek 1979), the Effort-Reward-Imbalance (ERI) model (Siegrist 1996), and the Job Demands-Resources (JDR) model (Demerouti et al. 2001).

While in the P-E Fit model the notion of 'demand' was not specified precisely, later models provide more detail on the different types of demands associated with workload, work pace, interpersonal relationships, control over work, and recognition and rewards, among others. Since most of these models are discussed in the literature as models of work-related stress, most studies have focused on negative outcomes at the individual level. For example, the JDC model refers to job strain as the outcome of exposure to high demands and low control at work. However, there is also some explicit recognition of positive outcomes, for example the notion of 'active jobs' in the JDC model or work engagement in the JDR model. An overview of some key theoretical models is offered next.

3.1 Person-Environment Fit (P-E Fit) theory

The Person-Environment (P-E) Fit theory was developed in the early 70s (French and Caplan 1972). The theory argues that stress arises due to a lack of fit between the individual's skills, resources and abilities, on the one hand, and the demands of the work environment on the other. The P-E Fit theory makes explicit the interaction between the individual and the environment in shaping their response to work situations and events, but also highlights the importance of the individual's perception of the environment; and the interaction between them. This lack of fit can take three forms (Edwards et al. 1998): (1) the demands of the work environment exceed the employee's ability; (2) the employee's needs consistently fail to be met by the work environment; and (3) a combination of the two situations exists (i.e. where an employee's needs are not being met while at the same time their abilities are overstretched). Although the authors of this theory

stressed that they did not wish to provide a definitive taxonomy, several aspects of the work environment are identified in their publications including quantitative workload, variance in workload, responsibility for persons, job complexity, demands for concentration, role conflicts, job future ambiguity, underutilisation of abilities, inequality of pay and participation in decision-making (e.g. Caplan and Jones 1975).

3.2 Cooper and Marshall's Occupational Stress Model

Cooper and Marshall's (1976) occupational stress model focuses on the nature and detail of work stressors and their individual and organisational outcomes. The authors refer to two central features of stress at work, the interaction of which determines either coping or maladaptive behaviour and stress-related illness: (1) the dimensions or characteristics of the person; and (2) the potential sources of stress in the work environment. Additionally, they identify a third set of extra-organisational variables which can also be sources of stress and which are not linked directly to the individual's characteristics or the work environment but are related to outside relationships and events. The model provides a taxonomy of sources of stress in terms of those intrinsic to the job, role in the organisation, relationships at work, career development, organisational structure and climate, and the home-work interface. Additionally, it depicts the extra-organisational sources of stress which interact through the perception of the individual and result in various individual health outcomes and a range of organisational outcomes.

3.3 Job Demand-Control (Support) (JDC(S)) Theory

The Job Demand-Control (JDC) model (Karasek 1979) and its expanded version the Job Demand-Control-Support (JDCS) model or Iso-strain model (Johnson and Hall 1988) dominated the field of occupational stress research for more than three decades. The JDC model postulates that job strain results from the interaction between two dimensions of the work environment: psychological job demands and job control. Psychological demands refer to workload, time pressure and role conflict; whereas job control refers to the person's ability to control their work activities and is defined by two key components: (1) decision authority (the worker's ability to make decisions about their job); and (2) skill discretion (the breadth of skills used by the worker on the job).

The JDC theory suggests that individuals experiencing high demands paired with low control are more likely to experience psychological strain, work-related stress, and, in the long term, poor physical and mental health. The model is usually presented diagrammatically as a 2 x 2 matrix of 'low and high demand' against 'high and low control'. Simplistically, this allows for four different types of job (Karasek and Theorell 1990):

- 'high strain jobs': high demands with low control (the riskiest to health)
- 'active jobs': high demands with high control (less risky to health; average levels of job strain)
- 'low strain jobs': low demands with high control (below average levels of job strain)
- 'passive jobs': low demands with low control (the demotivating nature of this job type might induce average levels of job strain).

The model was later expanded to include a social support dimension (Johnson and Hall 1988). The JDCS model postulates that social support can moderate the negative impact of job strain on workers' physical and mental health. This model also suggests that the most at-risk group for poor physical and mental health are those workers who are exposed to job strain (high demands and low control) paired with low workplace support – a phenomenon referred to as iso-strain.

3.4 Vitamin Model (VM)

Warr's (1987) Vitamin Model (VM) challenges the belief of linear relationships that is found in other models such as JDC. Instead, it stipulates non-linear relationships between job characteristics and mental health outcomes, including employee wellbeing. The VM argues that mental health is affected by environmental psychological features such as job characteristics in a way that is analogous to the non-linear effects that vitamins are supposed to have on our physical health. According to the VM, vitamins exert a particular influence on the human body, while vitamin deficiency produces bodily impairment and, consequently, may lead to physical illness. Vitamin intake initially improves health and physical functioning but, beyond a particular level of intake, no further improvement is observed. First, a so-called constant effect might occur in which health neither improves nor are noxious consequences observed that impair the individual's physical health (e.g. vitamins C and E have such an effect on the human body). Second, an overdose of vitamins leads to a toxic concentration in the body which causes poor bodily functioning and ill health (e.g. vitamins A and D are known to be toxic when taken in large quantities). Therefore, the model groups job characteristics into nine categories that relate differently to mental health outcomes according to the type of 'vitamin' they represent. Warr (1987) argues that six job characteristics (job autonomy, job demands, social support, skill utilisation, skill variety and task feedback) have effects similar to vitamins A and D. The remaining three job characteristics (salary, safety and task significance) are supposed to follow the vitamins C and E pattern.

3.5 Effort-Reward Imbalance (ERI) Model

The ERI model was developed by Siegrist in the mid-1990s (Siegrist 1996). This theory assumes that effort at work is spent as part of a psychological contract based on the principle of social reciprocity in which effort spent at work is paired with the rewards provided in terms of money, esteem and career opportunities. An imbalance (non-reciprocal) relationship between effort spent and rewards

received can result in emotional distress associated with a stress response and an increased risk of illness. Siegrist suggests that stress related to the imbalance between effort and rewards can arise under three conditions, namely where an employee:

- has a poorly defined work contract or little choice concerning alternative employment opportunities
- accepts the imbalance for reasons such as the prospect of improved working conditions
- copes with the demands at work through overcommitment.

In the ERI model, effort refers to quantitative demands, qualitative demands and physical demands. Reward consists of three subcomponents which represent employees' perceptions of esteem reward, career reward (salary and promotion prospects) and job security. Overcommitment, in turn, describes strong commitment toward work in addition to a difficulty in detaching from work-related thoughts and activities. Siegrist has described overcommitment in terms of personal coping characteristics (Siegrist 1996). Therefore, the first two domains are about job, work and work environment characteristics and measure aspects of the psychosocial work environment.

3.6 Job Demands Resources (JDR) Model

The Job Demands Resources model was developed in an attempt to explain the precursors of burnout (Demerouti et al. 2001). It was later revised to include work engagement and job performance. It focuses not only on the negative effects of the work environment on health but also considers those situations in which employees can be more engaged and motivated (Bakker and Demerouti 2017). The model proposes that all work characteristics can be categorised into two groups: job demands and job resources (Bakker et al. 2004). Job demands refer to 'those aspects of a job that require sustained physical and/or psychological effort and are therefore associated with certain physiological and/or psychological costs' (Llorens et al. 2006: 2). These are aspects of work characteristics that may result in work-related stress. Job resources refer to positively valued aspects of the job and have been defined as 'those physical, psychological, social or organisational aspects of a job that may reduce job demands and the associated physiological and psychological costs, are functional in achieving task goals and stimulating personal growth, learning and development' (Hakanen et al. 2008: 225). Personal resources were subsequently added to the model because they interact with work characteristics to influence health and wellbeing (Schaufeli and Taris 2014). Job demands and resources interact and can either result in work engagement through a motivational process or burnout through a health impairment process.

Schaufeli (2017) provided insight regarding the key job demands and resources that the model measures. Job demands can be quantitative (work overload, work underload, pace of change), qualitative (emotional, physical, mental, home-work conflict) and organisational (negative change, bureaucracy, harassment, role conflict, interpersonal conflict). Job resources may be work (job control, person-

job fit, task variety, participation in decision-making, use of skills, availability of tools), organisational (communication alignment, trust in leadership, organisational justice, fair pay, value congruence), developmental (performance feedback, possibilities for learning and development, career perspective) and social (supervisor support, co-worker support, team atmosphere, team effectiveness, role clarity, fulfilment of expectations, recognition). Engaged leadership is also recognised separately as an important overarching factor.

3.7 Challenge-Hindrance Stressor Framework (CHSF)

First articulated by Cavanaugh et al. (2000), CHSF proposes that our understanding of the effects of stressors necessitates a consideration of how people think and feel about them. Hindrance stressors refer to work-related demands that tend to engender the belief that achievement is being constrained unnecessarily which, in turn, manifests in strains as well as negative job attitudes and behaviours. Therefore, hindrance demands do not support goal achievement but are actions that can distract the employee from the important task at hand. Examples of hindrance stressors include role conflict and role ambiguity. In contrast, challenge stressors refer to work-related demands that tend to give rise to the belief that coping will facilitate growth and achievement. Thus, although challenge stressors are strain inducing, they tend to manifest in positive job attitudes and behaviours. In short, CHSF advocates that not all job demands have a negative effect on wellbeing; some can be motivating and challenging, offering potential for personal growth and rewards. Examples of challenge stressors include time pressure and responsibility (LePine 2022). Additionally, perception of a particular work characteristic either as a hindrance or a challenge stressor varies with time and in relation to specific situations, highlighting the importance of appraisal.

3.8 Transactional models

Transactional models (Cox 1978; Cox and Mackay 1985; Cox and Griffiths 1995; Lazarus and Folkman 1984) build upon the interaction between the individual and their environment but provide an additional focus on the underlying psychological and physiological mechanisms which underpin the overall process. Central to these models is the individual's cognitive appraisal of the perceived demands made on the worker and their perceived capability, skills and resources to deal with those demands. That is, stress results when the perceived demands outweigh the perceived capability of the workers. What an individual finds or perceives to be stressful can vary both between and within individuals and can differ between occasions and over time. In this way, any aspect of the work environment can be perceived as a stressor and, therefore, unlike previous models, transactional models are not limited by the types and number of psychosocial hazards they account for. In addition, these models acknowledge that stress can manifest physiologically, psychologically, behaviourally and socially with detrimental consequences to both the individual and the organisation.

This conceptualisation of the stress appraisal process was then developed into a basis for the psychosocial risk management approach at organisational level. First, the work-related stress process was positioned within a health and safety framework; second, a psychosocial factor taxonomy was elaborated to facilitate risk assessment; and third, a set of process principles were developed and applied to psychosocial risk management (Cox and Griffiths 2010). The first explicit attempt to apply the risk management framework to the psychosocial work environment using the hazard-risk-harm typology was made by Cox in 1993 in a review for the UK Health and Safety Executive (HSE) and in guidance for WHO entitled 'Psychosocial and Organisational Hazards at Work: Control and Monitoring' (Cox and Cox 1993). In these documents, a taxonomy of psychosocial hazards is found that has since been extensively used in research, policy and practice publications, as will be discussed later. It includes workload, work pace, job content (or task design), work schedule, control, role in the organisation, environment and equipment, interpersonal relationships at work, career development, organisational culture and function, and the home-work interface.

This approach aimed to make a clear link with the requirements of EU Framework Directive 89/391/EEC on Safety and Health of Workers at Work to assess and manage any type of risk to workers' health and safety through a systematic risk management approach to psychosocial risks. According to this approach, the level of risk to workers' health and safety is determined by estimating the potential of psychosocial hazards (or aspects of the psychosocial work environment appraised by workers to have a negative impact on their health, safety and wellbeing) to cause harm (or negative impacts on health, safety and wellbeing). For this estimation to be possible, data has to be collected in relation both to potential hazards and impacts/outcomes.

The typology developed by Cox and Cox (1993) has been incorporated into the Psychosocial Risk Management European Framework (PRIMA-EF) (Leka and Cox 2008) which explicitly theorises and defines a psychosocial risk management model at enterprise and macro levels identifying several types of outcomes.

3.9 Psychosocial Risk Management – European Framework (PRIMA-EF)

PRIMA-EF (Leka and Cox 2008; Leka et al. 2008) at enterprise level links psychosocial risk management to organisational management and operational processes and to a number of key outcomes both within and outside the workplace. The design, development and operation of work and production interact and influence the psychosocial risk management process and are determinants not only of worker health, safety and wellbeing but also of organisational outcomes such as productivity, the quality of work and products, and innovation, as well as of societal outcomes. As such, best practice in relation to psychosocial risk management essentially reflects best practice in terms of organisational management, learning and development, social responsibility and the promotion

of good work and the quality of (working) life. At macro level, risk management can also be used to address the impact of policies affecting the world of work (e.g. public health, economic, labour, trade) in line with broader developments (e.g. technological innovations). These are determinants of public and occupational health, labour market participation, economic performance and country-level innovation.

3.10 Psychosocial Safety Climate Theory (PSC)

The Psychosocial Safety Climate (PSC) theory was proposed by Dollard and Bakker in 2010 and was developed on the basis of safety climate theories. PSC has been identified as 'the cause of causes' and is viewed as a leading indicator that can predict levels of psychosocial risk in relation to workplace demands and resources as well as worker health and productivity outcomes (Dollard and Bakker 2010). PSC is determined by organisational policies, practices and procedures for the protection of workers' psychological health and safety. It refers to management commitment to stress prevention, management priority for psychological health vs productivity concerns, organisational communication about psychological health issues and organisational participation and involvement in relation to protecting workers' psychological health (Dollard and Bakker 2010).

Leka et al. (2023) discuss that PSC aligns with key OSH policy principles which underpin and are explicitly included in OSH framework legislation and OSH management systems. These include management commitment to OSH, management prioritisation of OSH in business decision-making, organisational communication on OSH and employee consultation and participation (Tappura et al. 2022). Therefore, organisational OSH culture and climate constructs such as PSC that are based on these principles can be useful for monitoring and forecasting purposes as leading indicators of working conditions.

4. Mental health at work in the EU and the prevalence of work-related psychosocial risks

4.1 Mental health at work in the EU

Several studies on the state of mental health at work in the EU have consistently found that around a quarter of EU workers report experiencing stress in their work either 'always' or 'most of the time'. The proportion varies widely between EU Member States and is close to half of all workers in some countries (e.g. Greece, Malta). The European Survey of Enterprises on New and Emerging Risks (ESENER) (EU-OSHA 2010, 2015) shows that, within the EU, nearly 80 per cent of managers express concern about work-related stress and nearly one in five considers violence and harassment to be of major concern. Furthermore, a 2014 Eurofound and EU-OSHA report indicates that four per cent of workers report having been subjected to bullying or harassment in the previous year; two per cent report having been subjected to physical violence; and around one per cent say they were subject to sexual harassment (Eurofound and EU-OSHA 2014). The prevalence of burnout, as measured in the European Working Conditions Survey (EWCS) 2021 (feeling emotionally exhausted by work often or always), was 18 per cent across the EU, ranging from six per cent in the Netherlands to almost a third of workers (33%) in Cyprus (Eurofound 2023). The latest report from EU-OSHA (2024) indicates a similar picture in that some 26.8 per cent of respondents to EU-OSHA's OSH Pulse survey (2022) report stress, depression or anxiety caused or made worse by work.

4.2 Prevalence of work-related psychosocial risks

In considering the prevalence of psychosocial risks, the most prevalent are those related to the type of tasks being carried out (such as monotonous or complex tasks) and work intensity (such as working to tight deadlines or at high speed). Around half of the European workforce is exposed to some of these risks. Many workers report being affected by specific working time arrangements: one-third report working irregular schedules and one-fifth report working long hours.

As measured by the EU Labour Force Survey (Eurostat EU-LFS 2020), the most common psychosocial risks in the EU are time pressure and work overload, reported by 20 per cent of workers in 2020. Close to half of the EU-OSHA OSH Pulse survey (2022) respondents (46%) report experiencing severe time pressure or an overload of work. The proportion of workers who report being affected by time pressure and work overload ranged from 8 per cent in Lithuania to 40 per cent in Sweden (Eurostat EU-LFS 2020). According to the 2021 European

Working Conditions Survey (EWCS), the proportion of workers in the EU who work long hours (defined as 48 hours per week or more) is 17 per cent – with wide variation between Member States, ranging from 33 per cent in Greece to 11 per cent in Denmark, Finland, the Netherlands, Sweden and Slovenia. Furthermore, dealing with difficult customers/patients/pupils affects around one in 10 workers (10%) across the EU, ranging from four per cent in Finland to 20 per cent in Latvia. Job insecurity was reported to affect an estimated six per cent of workers in the EU in 2020 and was more common in certain Member States, for example Greece (23%), Slovakia (12%) and Romania (12%). EU-OSHA (2022) reports that workers in countries with weaker economies are more likely to be concerned about job insecurity/losing their job while in stronger economies workers are more likely to focus on other aspects such as meaningful work and social relationships at work.

In terms of sectoral and occupational differences, work intensity has been found to be higher among workers in certain occupations, covering a broad range from plant and machine operators in industry to managers in financial services. The workers most affected by monotonous tasks are those at lower occupational levels, whereas managers and professionals more often report carrying out complex tasks which can lead to the experience of stress, especially if they lack the appropriate competences. There are large differences between sectors in terms of emotional demands, with only a small percentage of workers in agriculture reporting that they have to hide their feelings, compared with a fairly considerable proportion of workers in health (38%) (EU-OSHA 2022). Psychosocial risks are of greatest concern to managers in the health and social work sector (Llorens Serrano 2022; Franklin and Gkiouleka 2021), followed by education. Working in the public sector is associated with high levels of work-related stress (EU-OSHA 2022), while health and social work (59%) and education (50%) were the industries with the highest reported exposure to risks adversely affecting mental wellbeing in EU countries in 2020. Such risks include high emotional labour and frequent skills mismatches (Eurofound and EU-OSHA 2014), rising patient quotas resulting in an increase in workload (EU-OSHA 2022), high job pressure and long working hours (Pisljar et al. 2011) and exposure to violence or verbal abuse (EU-OSHA 2022). In the 2022 OSH Pulse survey there was a high prevalence of mental health problems among workers in the education sector (31%), the information and communications/ finance/ technical services sector (30.3%) and the health and social care sector (29.8%). These sectors were particularly affected by changes related to Covid-19 (e.g. extra work due to rapid digitisation, high patient volume or the switch to remote teaching). A high level of psychosocial risks is reported in the transportation sector (48%) due to this sector having the highest percentage of workers with irregular hours (along with agriculture) (Eurofound and EU-OSHA 2014), as well as long working hours, social isolation, work pressure associated with delivery urgency (just in time delivery requirements), job strain and low rewards (Garbarino et al. 2018), weak support systems (Apostolopoulos et al. 2016) and low levels of job autonomy (Eurofound and EU-OSHA 2014). In the hospitality sector, there is poor work-life balance and stress due to excessive workloads and long and unsociable working hours (EU-OSHA 2022). Another sector with a high reported prevalence of exposure to PSR is the financial sector (48%) due to the high work intensity in this industry (Eurofound and EU-OSHA 2014) leading to

high levels of work-related stress, emotional exhaustion and an increased risk of burnout (Giorgi et al. 2017).

With regard to age differences, young workers report better conditions in terms of social support and career prospects. However, they have a greater need for further training to cope with their duties and they more often report job insecurity. Older workers, on the other hand, report better work-life balance, less irregular work schedules and lower work intensity. In certain EU Member States (Austria, Czechia, the Netherlands, Sweden), younger workers are also subject to higher levels of burnout (Eurofound 2018) and greater work strain. Younger workers are also more likely than older workers to be precariously employed (Eurofound and EU-OSHA 2014). However, older workers have fewer learning opportunities compared with younger workers and are less confident about their employment prospects if they were to lose their job (EU-OSHA 2007). In the OSH Pulse Survey 2022, respondents aged 25-39 or 40-54 years (28.8% and 27.3%, respectively) had a higher-than-average prevalence of poor mental health (EU-OSHA 2024).

Gender differences have been found in exposure to psychosocial risks; for instance, women face more difficulties in relation to handling angry clients and career prospects. However, the comparative situation between men and women is more complex as regards other risks. More men are exposed to working long hours (more than 48 hours per week), while a larger share of women work very short hours (less than 20 hours per week) (Eurofound and EU-OSHA 2014). In most countries, men report a slightly higher level of work intensity than women, for example in relation to working at very high speed. Men also have a slightly higher level of autonomy. Men in agriculture, transport, other services, financial services and health experience a high degree of irregularity in working hours, whereas women in public administration, construction and industry report low irregularity. Data show that some 18 per cent of workers indicate they have work-life balance problems with, on average, men (21%) having more difficulties than women (16%) (Eurofound and EU-OSHA 2014). Women are slightly more likely to report issues related to health and wellbeing, apart from the negative effects of work on health (of either a physical or psychosocial origin), which men (27%) are more likely to report than women (22%). For work-related stress, there is little difference in terms of gender: 27 per cent of women and 26 per cent of men report work-related stress always or most of the time. Sleeping disorders are reported by 20 per cent of women and 16 per cent of men, while musculoskeletal disorders are experienced by 61 per cent of women and 58 per cent of men. Women are more likely to suffer from poor mental wellbeing (22%) than men (17%).

As is the case with musculoskeletal disorders, the prevalence of poor mental wellbeing is higher among lower-skilled workers, while it increases with age. This was also confirmed by another study by Backhaus et al. (2023) for the ETUI which found that educational level appears to be a prominent factor associated with intersectional inequalities in mental health at work, both before and during the Covid-19 pandemic.

Across psychosocial working conditions, young women (18-35 years of age) completing only primary education presented, in general, worse mental health

outcomes than their male counterparts or employees with a higher level of education. Meanwhile, lower work-related mental wellbeing and less favourable psychosocial working conditions were seen among women compared to men in the OSH Pulse Survey 2022 (EU-OSHA 2024). Women also report more violence or verbal abuse at work and have less autonomy overall than their male colleagues.

A Eurofound (2018) report on burnout in the workplace reported that the prevalence of burnout is more frequent among women than among men. While some work-related factors – such as exposure to psychosocial risks including heavy workload, long working hours and overtime – have been found to trigger burnout, the influence of other factors, such as autonomy, the degree of influence of management and the role of rewards, is more ambiguous according to the results of different studies.

In terms of organisational size, exposure to psychosocial hazards in the EU is more common for workers employed by large organisations (50+ employees) compared with smaller ones. However, in certain Member States (Bulgaria, Czechia, Greece, Hungary, Poland, Slovenia), the differences according to organisation size are relatively small. A recent survey conducted by EU-OSHA (2022) found that workers in micro-companies in particular report lower exposure to psychosocial risks such as work overload, poor communication and a lack of autonomy. The 2014 Eurofound and EU-OSHA report also highlighted that workers in SMEs are exposed to psychosocial risks but to different extents depending on the psychosocial factor in question. In large companies, workers are more likely to experience organisational changes and the work can involve more complex tasks and, to some extent, greater intensity. Nevertheless, workers in larger companies have better conditions in terms of skills to cope with the work, as well as better career prospects and greater job security. On the other hand, SMEs present better conditions in terms of more regular working time although workers have fewer opportunities to influence this.

The biggest group of European workers (42%) work in microenterprises (between one and nine employees) and only 12 per cent work in large companies (more than 250 workers). Self-employed workers represent 33 per cent of workers in microenterprises, while their number is almost negligible in aggregate data for bigger companies. Self-employed people without employees constitute 11 per cent of the workforce, while 4 per cent are self-employed with employees. Job autonomy is greater in microenterprises than in large companies, while work intensity rises slightly with establishment size. Due to the large proportion of self-employed workers in microenterprises, more than double the percentage of workers in these companies work long hours (more than 48 hours per week) in comparison with workers in larger establishments. However, employees in SMEs are, to some extent, less exposed to working irregular hours than workers in large companies. In general, smaller workplaces have fewer available resources, are limited in terms of the availability of staff and often lack formal procedures to manage psychosocial risks (EU-OSHA 2022). The working time patterns of the self-employed might influence the greater likelihood of reporting poor work-life balance: 22 per cent against 18 per cent of employees. Despite these findings,

there is no relevant difference by workplace size in terms of the extent to which workers are able to reconcile work and private life.

Interestingly, self-employed workers are less affected by job insecurity (10%) than employees, while a higher percentage of self-employed people (92%) than the workforce average report doing useful work. However, it should be noted that the self-employed are affected more by economic insecurity. When looking at self-employment, it is clear that, overall, the self-employed report somewhat better health and wellbeing than employees. Interestingly, the largest differences are found for the indicators of work ability: absenteeism and the ability to do the job at the age of 60. No significant effects are found for musculoskeletal disorders, poor mental wellbeing and work-related stress (EU-OSHA 2022).

Recent technological developments and the Covid-19 pandemic have highlighted several new and emerging psychosocial risks associated with them. One of the biggest changes that occurred during the pandemic was an increase in telework (European Commission 2020; Aloisi and De Stefano 2021). While some studies show that, for some employees, work-life balance improved when teleworking began during the Covid-19 pandemic as a result of greater flexibility, autonomy and efficiency (Vargas Llave et al. 2022), other studies have shown that telework is associated with working longer and more irregular working hours, greater work pressure (Ahrendt et al. 2022; EU-OSHA 2021a; Vargas Llave et al. 2022), an inability to disconnect and a blurring of work and private life (Delfino and van der Kolk 2021; Vargas Llave et al. 2022).

A report from EU-OSHA (2017) on key trends and drivers of change in information and communications technologies (ICT) and work location forecasted that ICT, including ICT-enabled technologies (ICT-ETs) such as robotics and artificial intelligence (AI), are likely to have major impacts on the nature and location of work over the next years (EU-OSHA 2017). The occupational safety and health impact of the trends and drivers of change in ICT and work location include risks that are mainly psychosocial (e.g. relating to the emotional and cognitive load associated with the 24/7 economy, permanent connectivity, loss of traditional working hierarchies and social interaction at work) and ergonomic risks (e.g. relating to the increase in the use of mobile devices and new human-machine interfaces). Issues such as work-related stress are expected to rise. Bullying and discrimination and whether the new types of jobs and working patterns will provide sufficient employment to provide workers with a living wage are additional concerns. Digital technologies blur the boundary between work and family life, forcing workers to be 'switched on' and responsive to work communications at all times of the day and evening (European Parliament 2021a; Palumbo et al. 2022), thus undermining work-life balance (Eurofound 2021b). While digital technologies may enable greater autonomy at work, this autonomy can often lead to work intensification, particularly in work environments that are performance-focused (Eurofound 2020). For SMEs in the EU, greater use of digital technologies is associated with increased psychosocial risks, including time pressure, poor relationships with peers and irregular working hours (Palumbo et al. 2022). The results of the 2022 OSH Pulse Survey (EU-OSHA 2024) showed that exposure to psychosocial hazards related to the use of digitalisation (increased

workload, reduced autonomy) showed somewhat weaker associations with poor reported work-related mental health. Also, those reporting that the use of digital technologies increased their workload or reduced their work autonomy were more likely to report that work stress increased due to the pandemic.

In a recent survey by EU-OSHA (2022), a quarter of workers (25%) reported that digital devices were used to supervise or monitor their work. The proportion of workers who reported experiencing this kind of digital surveillance varied between Member States and was highest in Malta (46%), the Netherlands (43%) and Ireland (41%). Over a third (37%) of workers across the EU who took part in this survey indicated that digital technologies had increased surveillance of them at work (EU-OSHA 2022). Workers in low-paid jobs in sectors such as hospitality, retail and logistics may be more likely to experience digital monitoring, since their work is more easily measured and quantified (Nguyen 2021). Digital monitoring is also common in the gig economy (Bérastégui 2021), where many workers work under zero-hours contracts or as self-employed (European Parliament 2021a) and face a high prevalence of both physical and social isolation and a concurrent lack of support (Bérastégui 2021). Platform gig workers are subject to constant algorithmic management and digital surveillance, contributing to a high pace of work, alongside power asymmetries between these workers and the platform owners and customers. Gig workers are also often on fixed and short-term work assignments, causing greater feelings of job insecurity, emotional labour (from a high degree of transience in work, lack of career prospects and constant customer ratings and monitoring) and work-life conflicts compared with workers in more stable and permanent work (Bérastégui 2021).

5. Work-related psychosocial risk impact and avenues for prevention

Numerous studies have examined the impact of PSR with the majority focusing on outcomes at individual level. A review for WHO examined evidence on the health impact of psychosocial hazards (Leka and Jain 2010) across WHO regions and found evidence of impact on psychological and social health (burnout, depression and other common mental disorders, social and behavioural health) and physical health (musculoskeletal disorders, cardiovascular disease, metabolic syndrome, diabetes). It was highlighted that psychosocial hazards interact with other types of hazards (e.g. biological, chemical, physical, etc.). The review also found that a number of epidemiological and population-based studies had presented 'odds ratios', 'hazard ratios' and 'risk ratios'; however, these were found disproportionately around the world.

Studies based on the theoretical models discussed earlier have resulted in a wealth of evidence on the relationship between psychosocial hazards and negative outcomes such as work-related stress (ILO 2016; WHO 2010, 2022), cardiovascular disease (Eller et al. 2009; Kivimäki et al. 2012), depression and anxiety (Madsen et al. 2017) and mortality (Taouk et al. 2020; Tsutsumi et al. 2006). A meta-analysis by Niedhammer and colleagues (2021) of a total of 72 reviews and IPD-Work consortium studies found that these studies mainly focused on job strain as exposure and on cardiovascular diseases and mental disorders as outcomes. The associations between psychosocial risks and cardiovascular diseases and mental disorders were, in general, significant, with the magnitude of these associations being stronger for mental disorders than for cardiovascular diseases. Based on high quality reviews, significant associations were found between job/high strain and long working hours as exposures and coronary heart disease (CHD), (ischaemic) stroke and depression as outcomes.

Another recent study by Niedhammer et al. (2022) aimed to provide the fractions of cardiovascular diseases and mental disorders attributable in 2015 to five psychosocial work exposures in Europe, i.e. job strain, effort-reward imbalance, job insecurity, long working hours and bullying (35 countries, including 28 European Union countries), for each separately and all countries together. The attributable fractions (AFs) of depression were all significant: job strain (17%), job insecurity (9%), bullying (7%) and effort-reward imbalance (6%). Most of the AFs of cardiovascular diseases were significant and lower than 11%. Differences in AFs were observed between countries for depression and for long working hours. Differences between genders were found for long working hours, with higher AFs observed among men than among women for all outcomes. Overall AFs, taking

all exposures into account, ranged between 17 and 35 per cent for depression and between 5 and 11 per cent for CHD.

Other studies have found psychosocial hazards to be related to sickness absenteeism (Russo et al. 2021) and presenteeism (Navarro et al. 2018) as well as to early exit from the workforce as a result of disability (Leineweber et al. 2019). To a lesser extent, studies have examined positive outcomes and have found a better-quality psychosocial work environment to be related to, for example, work engagement (e.g. Bakker and Demerouti 2017), and innovation at both employee and country levels (Dediu et al. 2018). Sections 10.3 and 10.4 summarise findings on health and organisational impacts and outcomes of work-related PSR.

It is important to note here that a high quality psychosocial work environment has also been linked to the promotion of positive mental health and wellbeing at work. Probably the most well-known definition of mental health is that of the World Health Organization (WHO) that defines mental health as a state of wellbeing in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community. According to WHO (1948), health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity. Leka and Jain (2017) argue that an inclusive definition of mental health should not solely focus on (the absence of) mental health problems but on a positive state of psychological wellbeing. The European Commission defines wellbeing at work as individuals' ability to work productively and creatively, to engage in strong and positive relationships, fulfil personal and social goals, contribute to the community and have a sense of purpose (European Commission 2008, 2011). NIOSH in the USA links it explicitly to PSR in its definition:

> Worker well-being is an integrative concept that characterises quality of life with respect to an individual's health and work-related environmental, organisational, and psychosocial factors. Well-being is the experience of positive perceptions and the presence of constructive conditions at work and beyond that enables workers to thrive and achieve their full potential. (Chari et al. 2018: 590)

This approach underlines the need to address mental health in its totality by recognising the interrelationships among risks to mental health, sub-threshold conditions of poor psychological health and wellbeing (such as stress), even if they may not have yet resulted in diagnosed mental ill health but which may severely affect its appearance, and diagnosed mental ill health problems. At the same time, positive PSR should be considered that promote positive mental health and well-being at work and beyond. Accordingly, policies and practices should prioritise prevention while also developing awareness and facilitating treatment and rehabilitation.

Evidence in relation to the impact of PSR has driven policy and practice responses to prevent possible negative outcomes and promote healthier psychosocial work environments. Macro level interventions aiming at the primary prevention of PSR at source encompass the introduction of specific regulation on PSR (or hard law).

These range from framework legislation that includes clear reference to PSR to specific legislation focusing on particular psychosocial risks. However, macro-level interventions have also included several soft law approaches such as guidance and standards as well as social partner agreements. These are covered extensively in Section 6.

Interventions at the organisational level can be of different types and the evidence base has grown over the years. Primary prevention interventions aim at tackling PSR at source. Secondary interventions aim to give employees the skills they need to respond to PSR in a way that reduces the impact that PSR have on them. Tertiary interventions are aimed at employees who are already experiencing significant problems with their wellbeing (Randall and Nielsen 2010). Evidence on these types of interventions is mixed, depending on the timeframe of the intervention, the measures used, the outcomes evaluated and the implementation process involved (Leka and Jain 2017). Leka and Jain (2017) conclude that multi-modal approaches, including measures implemented at organisational level, should be promoted and evaluated. Such evaluation of organisational level interventions should include both process and outcome aspects in order to capture those effects that could otherwise go unnoticed (Nielsen and Randall 2013; Semmer 2006). A more detailed discussion on interventions can be found in Section 10.5.

From an economic perspective, a review by Westgaard and Winkel (2011) indicates the effectiveness of risk management and a way to improve economic indicators in complex organisational contexts. However, again, most of the existing economic literature has focused on the case for interventions targeted at individuals rather than organisational level interventions. This is not surprising as there have been few interventions where mental health components can be identified and even fewer where information on the costs and consequences of the intervention are provided (Corbiere et al. 2009). In research conducted for the HSE in the UK to evaluate its approach to reducing workplace stress (the Management Standards), several benefits were found (Bond et al. 2006). Improvements in the six factors identified by the HSE led to improved performance (measured both objectively and subjectively), lower absenteeism, reduced turnover intention, better team performance and fewer work withdrawal behaviours.

In terms of the economic case for workplace health promotion, there is a substantial body of evidence, albeit of variable quality, on the business case for workplace health promotion programmes in general, including mental health specific actions. For instance, an evaluation by the 'Initiative Gesundheit und Arbeit (IGA; Initiative for Health and Work) of several hundred studies concluded that costs can be reduced and the health of workers improved through properly constructed and implemented health promotion initiatives. A reduction in absenteeism rates and associated costs of between 12 and 36 per cent was achieved through such measures. Meanwhile, the 'return on investment' has been assessed as ranging between 1:4.9 and 1:10.1 for the costs of absenteeism and between 1:2.3 and 1:5.9 in respect of the healthcare costs avoided (Kleinschmidt 2013).

Many of the evaluated interventions appear to generate sufficient benefits that outweigh their costs (Knapp et al. 2011; Matrix Insight 2012; McDaid and Park 2011, 2014; NICE 2022). Matrix Insight (2012) estimated that the net range of economic benefits generated by workplace mental health promotion programmes and mental disorder programmes over a one-year period can range between 0.81 to 13.62 euros for every one euro of expenditure on the programme. These values fall within those estimated by other authors for similar types of programmes (Knapp et al. 2011; NICE 2022). A more recent study of Italian organisations (Russo et al. 2021) developed a cost-estimation model and found PSR to be related to sickness absenteeism and to carry a sizable economic cost.

In summary, there are now robust studies on the impact of various psychosocial risks on various outcomes, although studies tend to focus on outcomes at individual level (mainly cardiovascular disease and mental ill health) and examine negative impact and not positive outcomes of a healthy psychosocial work environment where PSR is managed well. Furthermore, the evidence base on prevention avenues and intervention studies is mixed. More systematic reviews and meta-analyses are now available. Cost estimation studies are still scarce, but the evidence so far does indicate the costs of the negative impacts of PSR as well as the positive benefits of PSR management interventions.

6. The European policy context on work-related psychosocial risks

The European Commission conducted a peer review on psychosocial risks at work in 2019 (Leka, Iavicoli & ICF 2020) and a second one in 2024 (Leka & ICF 2024). This section summarises information from these two reviews. Article 151 of the Treaty on the Functioning of the European Union (TFEU) requires Member States to work towards the promotion of employment and the improvement of working conditions. Framework Directive 89/391/EEC on Safety and Health of Workers at Work lays down employers' general obligations to ensure workers' health and safety regarding work, addressing all types of risk. Psychosocial risks and their management are among employers' responsibilities as stipulated in the Framework Directive 89/391/EEC as it obliges employers to address and manage all types of risk in a preventive manner, to implement preventive measures to guard against occupational accidents and diseases and to establish health and safety procedures and systems to do so. However, the Directive is meant as a framework, giving Member States the space for more detailed specification at national level to enable them to follow an approach that best suits their national situation. Accordingly, the degree to which psychosocial risks are included or explicitly mentioned in the legislation of Member States varies significantly (Leka & ICF 2024).

To target more specific aspects of safety and health at work, a series of individual directives were also adopted, although the Framework Directive continues to apply to all areas of work. Where the provisions in individual directives are more specific and/or stringent, these prevail. The individual directives tailor the principles of the Framework Directive to particular tasks, specific hazards at work, defined workplaces and sectors, given groups of workers and certain work-related aspects. Each one defines how to assess the risks involved. Any requirements established in the individual directives are the minimum deemed necessary to protect workers; however, Member States are allowed to maintain or establish higher levels of protection.

It should also be mentioned that a number of additional directives are indirectly related to psychosocial risks. For example, Directive 2000/78/EC establishes a general framework for equal treatment in employment and occupation. The purpose of the Directive is to lay down a general framework for combating discrimination on the grounds of religion or belief, disability, age or sexual orientation as regards employment and occupation, with a view to putting the principle of equal treatment into effect in the Member States. A European Commission report published in 2014 provides a comprehensive list of OSH directives and other hard law instruments of relevance to work-related PSR (European Commission 2014a; see also Annex 1).

More recently, in December 2023, the European Parliament and the Council reached agreement on the provisional rules that will comprise the AI Act, laying down harmonised rules on artificial intelligence. Among the banned applications of AI stated in the Act are biometric categorisation systems that use sensitive characteristics (e.g. political, religious or philosophical beliefs, sexual orientation, race), the untargeted scraping of facial images from the internet or CCTV footage to create facial recognition databases, emotion recognition in the workplace and educational institutions, social scoring based on social behaviour or personal characteristics, AI systems that manipulate human behaviour to circumvent free will, and the use of AI to exploit the vulnerabilities of people (due to their age, disability, social or economic situation) (Leka & ICF 2024).

Additionally, in February 2024, the European Parliament and the Council of the EU reached a deal on the Platform Work Directive. This is aimed at improving the working conditions of those working in the platform economy, notably that their employment status should be classified correctly. The Directive aims at banning the constant monitoring and surveillance of workers at work, while providing guarantees with respect to algorithmic management in all European workplaces. It specifically mentions PSR and requires digital labour platforms to evaluate these risks in the context of automated monitoring and decision-making systems (European Commission 2021a).

Furthermore, ILO conventions are also legally binding instruments when ratified by countries, including EU Member States. Apart from the Occupational Safety and Health Convention (C155) and the Promotional Framework for Occupational Safety and Health (C187), the ILO adopted the Violence and Harassment Convention (C190) concerning the elimination of violence and harassment in the world of work in 2019. In 2022, the principle of a safe and healthy working environment was added to the ILO's Fundamental Principles and Rights at Work. This landmark decision means that all ILO Member States commit to respect and promote the fundamental right to a safe and healthy working environment, whether or not they have ratified the relevant conventions (ILO 2022a). The ILO (2024a) has also reviewed the legal framework that specifically addresses violence and harassment at work, including OSH law, anti-discrimination and equality law, workers' compensation law, private law (for example, the law of obligations) and criminal law.

Apart from hard law – that is, legally binding instruments such as EU legislation, directives, decisions and ILO conventions – a number of non-binding/voluntary, or soft law, policies of relevance to psychosocial risks have been developed. These include the recommendations, resolutions, opinions, proposals and conclusions of EU institutions (Commission, Council, Parliament), the Committee of the Regions and the European Economic and Social Committee, as well as social partner agreements and frameworks of actions and the specifications, guidance, campaigns, etc. initiated by recognised European and international committees, agencies and organisations. They also include voluntary standards adopted by businesses and civil society (Leka 2024). Two key soft law instruments that have been developed within the context of European social dialogue are the framework agreements on work-related stress (2004) and harassment and violence at work (2007). These

agreements were signed by the European social partners and represent their recognition of the importance of psychosocial risks and their commitment to the development and application of the content of the agreements at national level. Annexes 2 and 3 provide a summary of the actions taken in Member States in relation to these social partner agreements. There are also additional relevant social partner agreements including telework (2002), inclusive labour markets (2010) and digitalisation (2020).

In 2012, the European Commission's Senior Labour Inspectors Committee (SLIC) ran an inspection campaign on psychosocial risks. The results of the campaign indicated that the number of workplaces which have included PSR in risk assessments had increased in recent years. Knowledge of psychosocial risks had also increased among labour inspectors in all countries. A psychosocial inspection toolkit was developed that provides labour inspectors in all participating Member States with information and guidelines on how best to conduct an inspection with regard to psychosocial risks. In the framework of the SLIC campaign, more than 13,000 inspections on psychosocial risks were made in the 26 participating Member States as well as Iceland (SLIC 2012). SLIC has recently adopted the non-binding publication 'Guide for Assessing the Quality of Risk Assessment and Risk Management Measures with regards to the Prevention of Psychosocial Risks' (SLIC 2018).

An important recent initiative is the EU Strategic Framework on Health and Safety at Work 2021-27 (European Commission 2021b) which addresses the specific issue of psychosocial risks in the workplace. It states that it is important to address work-related stress and the risks that arise due to remote work, such as a lack of social interaction and the increased use of ICT. It calls on Member States to host peer reviews addressing occupational mental health risks and to strengthen the collection of data on and the monitoring of mental and psychosocial risks across sectors.

Another initiative of importance is the European Parliament's resolution of 21 January 2021 with a recommendation to the Commission on the right to disconnect (2019/2181(INL)) (European Parliament 2021b). The European Parliament resolution of 10 March 2022 on a new EU strategic framework on health and safety at work post-2020 (including the better protection of workers from exposure to harmful substances, stress at work and repetitive motion injuries) (2021/2165(INI)) also called for a directive on work-related psychosocial risks and wellbeing at work (European Parliament 2022a). Closely related to the aforementioned resolutions, the European Parliament's resolution of 5 July 2022 on mental health in the digital world of work (2021/2098(INI)) points to work-related mental health problems in the EU and calls for preventive action to protect workers' mental health and work-life balance in the context of digitalisation (European Parliament 2022b). More recently, DG SANTE also launched 'A comprehensive approach to mental health' (European Commission 2023) which includes a direct consideration of mental health at work and psychosocial risks.

Some important international initiatives that are relevant to EU policy should also be mentioned here. WHO and the ILO have called for concrete measures to

tackle mental health issues at work in two publications – the WHO Guidelines on mental health at work; and a derivative WHO/ILO policy brief (WHO and ILO 2022) – while the ILO published 'Inspection actions to deal with psychosocial risks' in 2022 (ILO 2022b). Furthermore, the first national guidance standard on work-related PSR was published in 2011 in the UK by the British Standards Institution, Publicly Available Specification (PAS) 1010 (BSI 2011). The second was launched as a national standard on psychological health and safety in the workplace in Canada in 2013 and this is the first standard that is auditable in this area (CSA 2013). Both seek to support organisations in implementing psychosocial risk management as part of normal business operations. While ISO45001 on occupational health and safety management, published by the International Organization for Standardization, also covers psychosocial risk (ISO 2018), more specific guidance is provided through ISO 45003:2021 'Occupational health and safety management – Psychological health and safety at work – Guidelines for managing psychosocial risks' (ISO 2021).

6.1 National level legislation and policy approaches

In terms of more specific national level legislation in EU Member States, there is broad variety in the way legislation refers to PSR. Leka & ICF (2024: 9-10) provides a typology of national legislative approaches to addressing psychosocial risks at work. According to this, some Member States include a definition of work-related psychosocial risks in their legislation. These include Belgium, Denmark, Estonia, Hungary and Lithuania. In addition, in Italy work-related stress risks are defined while the Slovakian legislation specifically refers to mental workload and provides a list of risks associated with the content of work, irregular working time and the working environment. In Sweden, specific definitions are provided for demands at work, victimisation, unhealthy workloads, the organisational work environment, resources for work and the social work environment (Leka & ICF 2024). Additionally, legislation in other countries refers to psychosocial risks at work, including in Austria, Germany, Greece, the Netherlands, Portugal and Spain. In Czechia, psychosocial hazards are categorised according to work pace, work monotony (both movement and task) and shift work. In Croatia, there is reference to stress at work and a specification of work stressors. In Finland, there is reference to psychosocial workload, psychosocial workload factors and work strain (Leka & ICF 2024). Specific obligations for psychosocial risk assessment and management are included in the legislation in Austria, Belgium, Croatia, Denmark, Estonia, Finland, Germany, Greece, Hungary, Italy, Lithuania, the Netherlands, Portugal, Slovakia, Spain and Sweden. In Latvia, there are specific obligations to assess the work environment risks related to psychological load (Leka & ICF 2024). In some countries there is reference to and coverage of specific issues. For example, in Bulgaria and Cyprus, there is reference to mental health at work. In Malta, there is reference to psychological well-being at work. In Czechia, there is reference to work stress and mental stress. In France, there is reference and coverage of psychological and moral harassment, psychological violence and mental health at work. In Ireland, there is reference to the prevention of inappropriate behaviour and conduct that is likely to endanger health, safety and welfare and the obligation to assess known risks. In Luxembourg, there is reference to mobbing, moral

harassment and mental stress and specific legislation on mobbing. In Romania, there is reference to neuropsychic overload and harassment as well as specific legislation on harassment. In Poland there is reference and coverage of mobbing at work. In Portugal, a definition and coverage of harassment are included in the legislation. In Slovenia, there is reference to violence, victimisation, harassment and bullying and associated obligations. In Greece, additionally to including a reference to psychosocial risks and specific obligations for psychosocial risk assessment and management, there is coverage of specific issues like violence, harassment, sexual harassment and mental health (Leka & ICF 2024). Finally, a few EU Member States have enshrined the right to disconnect in law including Belgium, France, Greece, Ireland, Italy, Portugal and Spain (Makarevičienė et al. 2023).

Furthermore, reference to the specific expertise required for work-related psychosocial risk prevention, assessment and management is made in the legislation in Austria, Belgium, Croatia, Denmark, Finland, Italy and Lithuania. Guidelines and/or tools are provided at country level in Belgium, Croatia, Denmark, Estonia, France, Germany, Ireland, Italy, Lithuania, Spain and Sweden. Moreover, in Greece, Decision No. 82063 on 'Examples of policies for alleviating violence and harassment' provides guidance on the implementation and expected content of prevention policies (Leka & ICF 2024).

There is wide variation between countries in the recognition of mental ill health conditions as occupational diseases. In some of them, some such conditions are directly recognised as occupational diseases while in others they are recognised as occupational accidents. Post traumatic stress disorder, depression, anxiety and, in a few cases, burnout are recognised as occupational diseases in various countries (Eurogip 2013). Finally, most countries have adopted health and safety strategies to address various aspects of psychosocial risks and mental health at work (Makarevičienė et al. 2023).

Some examples of PSR coverage and other characteristics in selected EU Member States are shown in Table 1.

Table 1 **Characteristics of selected EU Member States and PSR coverage**

Countries	PSR specifically included in legislation	Legal framework	Policy framework	PSR management #	MSEs in the economy (% of all establishments and % of total workforce) $	Social protection and healthcare system %	Scope of OSH Labour inspection coverage ◊
Austria	Yes (term PSR is not directly referred to)	Health and Safety at Work Act 1994 (AschG)	Occupational Safety and Health Strategy 2021-2027	Average	99.8% enterprises 63.5% workforce	Bismarck (Continental) welfare model and mixed healthcare system	Broad
Belgium	Yes (term PSR is directly referred to)	Act on the well-being of workers in the performance of their work 1996	National action plan to improve the well-being of workers in the performance of their work, 2022-2027	High	99.9% enterprises 66.3% workforce	Bismarck (Continental) welfare model and social health insurance (Bismark) healthcare system	Restricted (Different directorates responsible for OSH and labour relations)

Croatia	Yes (term PSR is directly referred to)	Occupational Health and Safety Act 2014	National Plan for Labour, Safety at Work and Employment, 2021-2027	Low	99.8% enterprises 70.9% workforce	Central/Eastern European welfare state model and mixed healthcare system	Broad
Denmark	Yes (term PSR is directly referred to)	Working Environment Act 2021; Executive Order No. 1406 of 26 Sep 2020 on psychosocial working environment	Working Environment Strategy, 2020	High	99.7% enterprises 64.4% workforce	Scandinavian/ Nordic welfare state model and Beveridge healthcare system	Broad
Estonia	Yes (term PSR is directly referred to)	Occupational Health and Safety Act 1999	Welfare Development Plan, 2023-2030; National Health Plan, 2020-2030	Low	99.8% enterprises 79.9% workforce	Central/Eastern European (Baltic) welfare state model and social health insurance (Bismark) healthcare system	Restricted (Different departments responsible for OSH and labour relations)
Spain	Yes (term PSR is not directly referred to)	Prevention of Occupational Risks Act 1995	Spanish Strategy on Safety and Health at Work, 2023-2027	Average	99.9% enterprises 67.4% workforce	Southern-European welfare state model and Beveridge healthcare system	Broad

Notes: $ Information based on data from EU SBA Factsheets 2023[2]. EU Average: 99.8% enterprises, 64.4% workforce.

% The Beveridge model is financially granted by public taxes and the state directly finances structures; in the Bismarck model the financial funding of the health care system is granted through compulsory social security contributions by employers and employees; and in the Mixed model, funding from taxes or social security is supplemented significantly by private funding from voluntary insurance schemes or upfront payments[3]. Welfare systems across Europe can be categorised as five models[4]: Continental (Bismarckian), Anglo-Saxon, Nordic/Scandinavian, Mediterranean (Southern European) and Central/Eastern European.

◊ Labour inspectors focus on the application of national law in such matters as working conditions and occupational safety and health (a restricted scope), or also including working time, wages, occupational safety and health, discrimination, employment contracts etc. (broader scope). Based on information from the ILO Labour inspection country profiles[5].

ESENER-3 psychosocial risk management indicator

2. European Commission (2023) SME Performance Review - Small Business Act (SBA) Country Factsheets. https://ec.europa.eu/growth/smes/business-friendly-environment/performance-review_en#sba-fact-sheets
3. Gaeta M. et al. (2017) An overview of different health indicators used in the European Health Systems, Journal of Preventive Medicine and Hygiene, 58 (2), E114.
4. EASPD SensAge project (2014) Social welfare systems across Europe. https://easpd.eu/fileadmin/user_upload/Publications/d4-social_welfare_systems_across_europe.pdf
5. ILO (2013) Labour inspection country profiles. https://www.ilo.org/resource/labour-inspection-country-profiles

6.2 Evaluation of the EU legislation and policy context

Despite the plethora of hard and soft law initiatives in relation to PSR and mental health at work, the EU-OSHA ESENER survey found that only about 20 per cent of European enterprises inform their employees about psychosocial risks, let alone take appropriate actions to tackle them. Less awareness and action were reported among SMEs. Lack of awareness, lack of resources and a lack of technical support, guidance and expertise were key needs in this area that were identified irrespective of enterprise size, sector or country.[6] It should also be noted that limited awareness and expertise on how to conduct inspections on psychosocial risks associated with mental ill health were among the key drivers for the 2012 SLIC campaign.

Although OSH legislation is seen by European employers as a key driver to address health and safety issues, it has been less effective for the management of psychosocial risks and the promotion of mental health in the workplace. In relation to psychosocial risks, there have been several calls for clarification of the text of EU legislation through the inclusion of specific terms (such as work-related stress, psychosocial risks and mental health at work). Additionally, a regulatory approach is most likely to be effective in countries where a more advanced framework is available to translate policy effectively into practice (Leka et al. 2015). At the same time, other policy approaches have been found to be more precise and user friendly than legislation in relation to psychosocial risks and mental health in the workplace. However, it is important to underline that policies are made and implemented in multi-actor contexts and that the various stakeholders frequently view problems and solutions differently. Context has a direct impact on the policy framework, as well as on the implementation of these policies in practice (Leka et al. 2015).

EU-OSHA (2013: 9) research highlights ...that "a number of contextual and environmental factors are influential over OSH management practice generally and in relation to psychosocial risk specifically, as well as over the role of worker representation and consultation in both these areas. These factors operate at a number of levels and lead to different outcomes in different Member States, reflecting the countries' various circumstances and traditions and fall into five broad categories:

- EU and supranational influences, including: the Framework and other Directives; wider political and policy influences (such as the level of emphasis on OSH and the minimal implementation of, for example, the EU social partners' agreement on work-related stress); the 'Europeanisation' requirements of accession; and the economic crisis
- national governance and regulation and the OSH system, including: regulatory approach (in particular, the degree to which process-orientated participatory systems are embedded in traditional approaches,

6. https://osha.europa.eu/en/facts-and-figures/esener

and structures and provisions for various forms of participation and consultation); wider political and policy influences (e.g. the level of emphasis on OSH, deregulation and the role of occupational health professionals, as well as the length and depth of research and political focus on specific areas such as psychosocial risks); and the labour inspectorate (e.g. traditions and changes in relation to their provision of support, focus of attention, enforcement style and resourcing)

- labour relations, trade unions and employers' organisations and processes, including: employee voice (e.g. arrangements for worker representation and consultation and the balance of power between labour and capital); and social dialogue (in particular the traditions and relative maturity of labour relations systems and social partners' support provision)
- economic restructuring, including: economic, workforce and labour market changes; enterprise size; costs (including costs of implementation and legislative compliance as perceived by employers and employees); and wider political and policy influences (such as support for representation)
- other related systems (e.g. social welfare, health), including: the priority of and data available on OSH (e.g. workplace level understanding of the concepts and practicalities of process-based OSH management and the availability of reliable OSH data); specialist services (including their quality, independence and implications for enterprise-level expertise); and insurance and other institutional agencies.

The European Commission published evaluations of the practical implementation of the provisions of the OSH directives in 2004 and 2017 (European Commission 2004, 2017a). While these found that they remain relevant and have led to increased awareness and organisational action, a key area in which further action at EU level was recommended is psychosocial risks. The evaluation report recommended that the Framework Directive addresses this topic in a future revision (COWI 2015). The 2014 European Commission report concluded on the importance of clarifying EU legal obligations in this area and resulted in the publication of an interpretative document of the legal obligations of Framework Directive 89/391/EEC in relation to psychosocial risks and mental health in the workplace (European Commission 2014b).

Similar points were raised both in the 'EU Strategic Framework on Health and Safety at Work 2014-2020' (European Commission 2014c) and the European Commission 2017 Communication 'Safer and Healthier Work for All – Modernisation of the EU Occupational Safety and Health Legislation and Policy' (European Commission 2017b).

Finally, the latest report by the European Parliament (Makarevičienė et al. 2023) summarises key issues in relation to the policy context on work-related PSR in the EU. Specifically, the concepts of mental health and PSR in the workplace are understood differently by ministries, trade unions, employers and other stakeholders; and, moreover, although legislation clearly tasks employers with protecting their employees' mental health, the boundaries of these responsibilities are not clearly defined, leaving room for interpretation of legal provisions. New forms of employment and the associated psychosocial risks are not addressed

sufficiently in existing legislation with identified gaps in relation to precarious forms of employment and the impact of digital surveillance which particularly affect platform workers and workers in the gig economy (Countouris et al. 2023). Furthermore, lack of compliance with legislation was raised as a key issue due to lack of adequate inspections and inspections of smaller organisations. Both such organisations as well as larger employers lack awareness, especially around primary prevention, and require further technical support and guidance in many countries (Makarevičienė et al. 2023).

The same report clearly proposes new EU legislation in this area is needed as European countries still lack a unified concept of mental health and PSR at work. It is argued that such legislation could create greater uniformity across the EU, setting minimum standards and ensuring that legislation covers new and emerging PSR. This recommendation is in line with the European Parliament's call on the Commission to introduce a new directive on psychosocial risks and wellbeing at work, developed in consultation with the social partners (European Parliament 2022a). Makarevičienė et al. (2023: 13) recommend that an EU directive on work-related PSR should:

- distinguish between 'psychosocial risks' and 'mental health'
- refer to psychosocial risks in concrete and specific terms
- address the psychosocial risks related to telework and the digitalisation of workplaces
- recognise the right to disconnect
- be universally applicable to all workplaces, whatever the sector or size of company.

In parallel with various reports published by the European Commission, the need for clearer terminology and the further development of the EU legal framework on PSR at work has repeatedly been highlighted in various scientific publications (Leka et al. 2011, 2015; Potter et al. 2019, 2022, 2024). Recent evidence (Jain et al. 2022) agrees with ETUI research (Cefaliello 2021) and, through an analysis of ESENER and EWCS data, shows that the introduction of specific national-level legislation on PSR and work-related stress is associated with more organisations implementing actions to tackle work-related stress (Jain et al. 2022). However, this research also found that the existence of action plans was associated with increased job resources but not with decreased job demands. This raises questions on whether current interventions being implemented at organisational level to deal with work-related stress are geared more towards the development of individual resources and less towards better work organisation and job design, tackling psychosocial risks at source, and developing healthier psychosocial work environments.

7. Validated tools on the psychosocial work environment

The psychosocial risk management framework is the backbone of both national legislation on psychosocial risks (e.g. Legislative Decree 81/2008 in Italy; Executive Order No. 1406 on the psychosocial working environment in Denmark; and the Organisational and Social Work Environment (AFS 2015: 4) provisions in Sweden) and OSH management systems. It has also been incorporated into guidance by key organisations (e.g. European Commission 2014b; ILO 2016; WHO 2003, 2008, 2022), national standards (e.g. British Standard PAS1010 on psychosocial risk management (BSI 2011) and the Canadian standard on psychological health and safety (CSA 2013)) as well as ISO 45003 (2021). Taxonomies of psychosocial hazards are presented in these instruments, as discussed later in this report.

According to the various theoretical perspectives discussed earlier, as well as national policies and pieces of guidance, several instruments have been designed both to allow data to be collected and risk to be estimated by researchers, policymakers and organisations. Most such tools are self-reporting questionnaires. It is important to note that, while the authors of some of theoretical models state that the aim of their conceptualisations is theoretical in nature and not empirical in terms of making estimations of the risks associated with exposure to working conditions (Bakker and Demerouti 2017), the concepts of job strain and effort-reward imbalance (ERI) have been used in numerous studies as risk indicators in relation to various outcomes (see, for example, Niedhammer et al. 2022). The OECD uses job strain as an indicator of the quality of the work environment in its Job Quality Index (Cazes et al. 2015) and, indeed, both job strain and ERI relate to the quality of the psychosocial work environment. While the authors of these theoretical models provide norms for the instruments developed to measure job strain and ERI, in empirical studies in various sectors and countries, the validation of these and other tools (e.g. COPSOQ) has resulted in different cut-off risk scores, reflecting the nature of work in those different contexts. In some countries, for example the UK and Italy, extensive analysis of national level data has provided national risk cut-off scores that have been used to benchmark organisational practices at national level and in specific sectors.

Table 2 presents examples of some key validated tools that can be used to assess work-related PSR. As can be seen, these instruments include various scales that measure a range of psychosocial factors and hazards.

Table 2 **Examples of validated tools on psychosocial risk assessment**

Tool/ Instrument	Objective	Subscales
Australian Workplace Barometer (AWB) (2009)	The AWB is a surveillance tool used to monitor psychosocial risks in the workplace. This tool is underpinned by PSC theory and the JDR, JDC and ERI models. Within the AWB is a blend of pre-existing subscales from various risk assessment tools	A self-reporting questionnaire containing 16 subscales of the work environment: psychological demands, physical demands, emotional demands, organisational change, harassment, bullying, work-family conflict, psychosocial safety climate, skill discretion, decision authority, macro-decision latitude, supervisor social support, co-worker social support, recovery, organisational justice, organisational rewards, as well as health symptoms and workplace outcomes
Copenhagen Psychosocial Questionnaire (COPSOQ) (currently in version III) (2019) and COPSOQ-Istas21 version III	To assess psychosocial factors in the workplace. COPSOQ is a comprehensive, widely applicable and user-friendly tool that is designed to enable national and international comparisons, evaluate interventions and facilitate risk assessment at organisational level and benchmarking. It is not based solely on theoretical models such as ERI or JCQ (see below), but links occupational psychosocial risks, the work environment and effects on the worker's mental health	International COPSOQ III structure is composed by items labelled as core (23 subscales), and a further 20 subscales (in the medium and long versions; in italics). Quantitative demands, work pace, cognitive demands, emotional demands, demands to hide emotions, influence at work, possibilities for development, variation of work, control over working time, meaning of work, predictability, recognition, role clarity, role conflict, illegitimate tasks, quality of leadership, social support from supervisor, social support from colleagues, sense of community at work, commitment to the workplace, work engagement, job insecurity, insecurity over working conditions, quality of work, job satisfaction, work-life conflict, horizontal trust, vertical trust, organisational justice, gossip and slander, conflicts and quarrels, unpleasant teasing, cyber bullying, sexual harassment, threats of violence, physical violence, bullying, self-rated health, sleeping troubles, burnout, stress, somatic stress and cognitive stress
Demand-Induced Strain Questionnaire (DISQ) (2004)	This questionnaire assesses job demands and job resources as core concepts relevant to the demand-induced strain compensation model	DISQ comprises 31 items that measure three kinds of demands and three kinds of resources (in both cases cognitive, emotional, physical)
FPSICO version 4.1 (2022) Método de Evaluación de Factores Psicosociales FPSICO del Instituto Nacional de Seguridad e Higiene en el Trabajo (INSHT)	The FPSICO questionnaire is a tool for identifying and assessing psychosocial risks at work. Its aim is to provide information to identify these risks in a particular situation, taking into consideration the task, the time devoted to the task and the structure of the organisation, and then to diagnose psychosocial risks either for the whole or only a particular area of an organisation from the individual questionnaires	The tool presents 75 items in seven categories: mental (work) load, temporal autonomy, content of the task, supervision and participation, role definition, interest for the employee and personal relationships.
Psychosocial Safety Climate (PSC-12) (2010)	This tool is used to measure a leading indicator of psychosocial risks; the psychosocial safety climate. As such, this tool provides a better understanding of how organisational factors contribute to the development of risks and hazards in the workplace and helps guide intervention and prevention strategies	A self-reporting questionnaire in which current employees respond to 12 items measuring: corporate climate, organisational commitment, organisational participation, management priority and management commitment in relation to worker psychological health
Work Organisation Assessment Questionnaire (2006)	This tool is designed to assess work organisation aspects across five broad categories: relationships with management, relationships with colleagues, being valued physical work environment and workload	Physical work environment, role and responsibilities, workload, work pace, support from supervisor, support from colleagues, safety at work, consultation about change, effort recognition, task variety, training adequacy, senior management attitudes, work-life balance, career development, communication, working hours, recognition, clarity of organisational objectives, job satisfaction, wellbeing, bullying/harassment
Occupational Stress Indicator (OSI) (1988)	The OSI attempts to measure: (1) the major sources of occupational pressure; (2) the major consequences of occupational stress; (3) coping mechanisms and individual difference variables which may moderate the impact of stress	Sources of pressure – intrinsic to the job, organisational role, relationship with others, career and achievement, organisation structure/climate and home/work interface.

Tool/ Instrument	Objective	Subscales
Job Diagnostics Survey (JDS) (1974)	This tool is designed to (1) diagnose existing jobs to determine if (and how) they might be re-designed to improve employee productivity and satisfaction; and (2) for evaluating the effect of job changes on employees whether the changes derive from deliberate 'job enrichment' projects or from naturally occurring modifications of technology or work systems	Job dimensions (skill variety, task identity, task significance autonomy, feedback from the job itself, feedback from agents and dealing with others), psychological states (meaningfulness from work, responsibility for the work, knowledge of the results), affective responses (general satisfaction, internal work motivation, satisfaction with job security, satisfaction with pay, social satisfaction, supervisory satisfaction, satisfaction with growth) and individual growth needs strength
Job Content Questionnaire (JCQ) (1985)	The JCQ is a tool to assess the psychosocial aspects of a job. Underpinned by the Job Demand-Control-Support model, it measures job characteristics, job demands, job control and social support	Skill discretion, decision authority, decision latitude, psychological demands, physical demands, job insecurity, supervisor social support and co-worker social support
HSE Management Standards Indicators Tool (2004)	This tool was designed to be part of the Management Standards for Work-Related Stress approach to tackling work-related stress	Demand, control, managerial support, peer support, relationships, role and change
General Nordic Questionnaire (QPSNordic) (2000)	The General Nordic Questionnaire (QPSNordic) is employed to assess psychological, social and organisational working conditions as potential determinants of motivation, health and wellbeing	Control at work, work-family balance, job demands, leadership, mastery of work, organisational commitment, organisational culture, predictability at work, role expectations, social support, work centrality, work motive and working groups and teams
Effort-Reward Imbalance (ERI) Questionnaire	Based on the ERI model, this tool aims to explore the elements of the model to understand workers' susceptibility to poor health and organisational outcomes	Psychological demands (i.e. effort), rewards (financial, status, socio-emotional) and individuals' levels of overcommitment

Source: Adapted from Potter et al. (2016) and Tabanelli et al. (2008).

While this section has presented some examples of tools that have been validated for psychosocial risk assessment, it is important to underline that risk assessment on its own is not sufficient and is only one part of the risk management process. Appropriate control measures or interventions should follow on from the risk assessment findings. A detailed discussion of these and specific examples are presented in Section 10.5.

8. Aim of the project and research questions

Within this context, this project aims to examine and provide clarity on how the multidimensional concept of work-related psychosocial risks is conceptualised in the literature. It reviews and categorises existing evidence on work-related PSR using a scoping review methodology in order to construct a conceptual framework and taxonomy of work-related PSR with different components:

- sources, such as aspects related to the macro context
- factors, including job security, work-life balance
- hazards, for example job insecurity, work-life conflict
- impacts and outcomes in terms of individual health and wellbeing, and organisational outcomes.

The scoping review aims to answer the following research questions:

1. How are work-related PSR defined in the literature?
2. What dimensions of work-related PSR are identified in the literature?
3. What are the impacts/outcomes of exposure to work-related psychosocial factors?

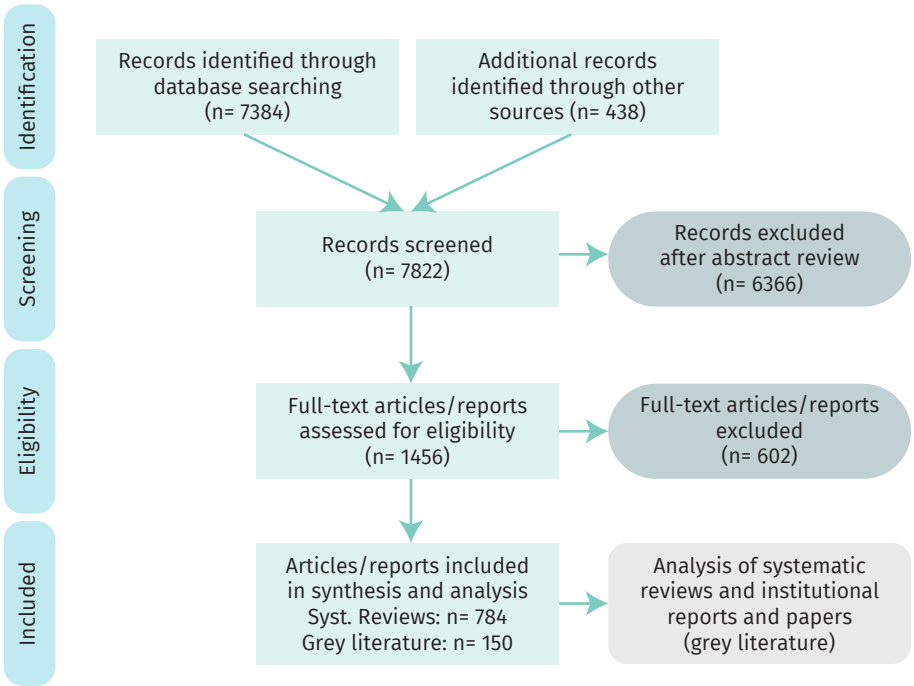
A selection of prevention measures related to the work-related PSR typology is also described with a focus on the organisational level including primary interventions that aim at tackling PSR at source; secondary interventions aim to give employees the skills they need to respond to PSR in a way that reduces the impact that they have on them; and tertiary interventions that are aimed at employees who are already experiencing significant problems with their well-being. A discussion of the evidence on these measures is also offered on the basis of the scoping review findings.

9. Methods

9.1 Study design

Given the aims of the project, a conceptual review design was adopted for this research. This involved an initial narrative review of the literature, a scoping review and expert feedback through a three-step validation exercise (as explained in Section 9.5). Scoping reviews are a type of knowledge synthesis which follow a systematic approach to map evidence on a topic and identify the main concepts, theories, sources and knowledge gaps (Tricco et al. 2018). Scoping reviews should be carried out to identify the types of available evidence in a given field, clarify key concepts/definitions in the literature, examine how research is conducted on a certain topic or field, identify key characteristics or factors related to a concept, as a precursor to a systematic review, and identify and analyse knowledge gaps (Munn et al. 2018).

Figure 1 **PRISMA-ScR flow diagram of the literature selection process**



Given the broad scope of this project, and the exponential increase in the number of studies being published, there were a number of key considerations in the process. The design was adapted, where necessary in discussion with the project advisory committee, to ensure that the review was objective, methodologically sound, transparent and undertaken using sensitive and specific search strategies devised by trained and experienced researchers (Wormald and Evans 2018). To ensure adherence to these standards, this scoping review was informed by the PRISMA-ScR approach (Tricco et al. 2018), as outlined in Figure 1.

9.2 Search strategy and source selection

The review was carried out using a systematic search strategy covering both the academic and grey literature (so as to include key guidance documents and reports). Papers and reports published up to November 2023 were included in the review:

- the academic literature search was carried out using multiple databases (medical as well as non-medical, due to the multi-disciplinarity of the study of work-related PSR) (these included: ABI/Inform Global (ProQuest), Web of Science/Scopus/Science Direct, the Cochrane library, Medline/PubMed and PsycINFO)
- regarding the grey literature search, relevant databases, websites and the publications contained within, and their reference lists, were reviewed for relevance. These include those of the ILO, WHO, the European Agency for Safety and Health at Work (EU-OSHA), the European Trade Union Institute, the (US) National Institute for Occupational Safety and Health (NIOSH) and other key agencies. Conference proceedings from key scientific associations were also reviewed, for example EAOHP, ICOH-WOPS, APA/NIOSH/SOHP; however, they did not provide sufficient detail required for the study and were excluded from the eventual sample.

Articles and reports published in English in a reputable (peer-reviewed) journal, and where the information provider is a 'credible source', the identities of the 'owner(s)' of the site and/or authors of the paper/report are clear and the information is original, were selected based on defined inclusion criteria in terms of relevance and quality. Addressing the review aim of identifying and describing taxonomies and terminology, this search focused on the terms being used, where they originated from, and what other terms and constructs are used in association with them. Keywords used in the search are as follows:

- sources: employment conditions, economic conditions, labour market, social conditions, social determinants, political conditions, digitalisation, automation, technology, AI, gig economy, platform work, job quality, precarious employment, ageing, vulnerable groups, social dialogue, occupational health services, health and safety regulation and policies, OSH enforcement, climate change, conflict and crises
- factors: organisational culture, organisational change, job design, job content, job design, workload, work pace, work schedule, working

hours, control, autonomy, decision latitude, environment, equipment, interpersonal relationships at work, social support, role in organisation, career development, home-work interface, job demands, psychological demands, quantitative demands, emotional demands, cognitive demands, job resources, effort, reward, organisational justice, psychosocial safety climate

- hazards: lack of variety, short work cycles, uncertainty, high workload, high emotional demands, high demands, work overload or underload, time pressure, work intensity, shift work, inflexible work schedules, long working hours, low participation in decision-making, job strain, effort-reward imbalance, inadequate equipment availability, lack of/ low control, job insecurity, bullying, harassment, work-related violence, poor environmental conditions, poor communication, social or physical isolation, interpersonal conflict, lack of/low social support, role ambiguity, role conflict, poor pay, job insecurity, algorithmic management
- impacts/outcomes: work-related stress, burnout, anxiety, distress, depression, fatigue, lower back pain, musculoskeletal disorders (MSDs), heart disease, coronary heart diseases (CHD), cardiovascular diseases (CVD), common mental disorders (CMDs), post-traumatic stress disorder (PTSD), psychological ill health, wellbeing, productivity, engagement, job satisfaction, innovation, sickness absence, absenteeism, presenteeism, turnover, retirement, return to work, injuries, accidents
- interventions: intervention, primary/secondary/tertiary, controls, measures, initiatives, organisational interventions, work (re)design, training, therapy, treatment, rehabilitation, return to work.

The list of keywords was informed by the narrative review. The reference lists of included articles were also reviewed to identify other citations that included alternative terms. Terms identified in the findings in terms of psychosocial factors and hazards (new conceptualisation presented in Table 3) were entered into an analysis in Atlas.ti in order to determine their occurrence in the final list of citations, and used to confirm the developed conceptualisation.

9.3 Study inclusion and exclusion criteria

All citations retrieved using the search strategy were downloaded into Mendeley. Automatic and manual searches of citations were conducted to identify and remove duplicate references. Full texts were then retrieved, and document screening was carried out, as outlined in Figure 1. The relevance criteria were determined on the basis of the review objectives. Full texts were obtained and screened using the inclusion/ exclusion criteria. As expected, given the breath of the search terms outlined above, a broad range of publications were identified. Aside from the parameters outlined above other inclusion criteria were also identified. As the primary objectives of this scoping review concerned the conceptualisation of work-related PSR, their dimensions and the impacts/outcomes of exposure to work-related PSR, qualitative, quantitative and mixed methods research was considered. Only research conducted in a work-related context was included while no studies were excluded based on sector, location of work, as well as the

nature and type of employment contract. The quality criteria were only applied for studies on impact/outcomes (due to the scale of the research, only systematic reviews, meta-analysis were included, with a few exceptions as will be explained in relevant sections). Quality criteria were informed by approaches that have been developed to support the evaluation of evidence and were informed by the review studies included in the analysis.

9.4 Data extraction and synthesis

Researchers independently extracted data, and any discrepancies were resolved by consensus. As expected, the searching was iterative, and checks were built into the process to ensure that the inclusion/exclusion criteria were implemented consistently, and feedback from the project advisory committee was sought on the review protocol. The final sample of documents was imported into Atlas.ti for data extraction and analysis. The review was used to carry out a conceptual analysis and extended content analysis.

The conceptual analysis was based on the analysis of: (1) academic literature: a review of 784 systematic literature reviews and meta-analyses on PSR; and (2) grey literature: 150 key reports and guidance documents. This led to the development of a 'typology of work-related PSR' with different components: sources (macro context), factors, hazards, and impacts and outcomes. These were finalised based on feedback reviewed in the validation exercise. The studies used in the analysis are detailed in Annex 2 Tables A.4-8.

9.5 Validation exercise

The validation exercise of the conceptual framework and work-related PSR taxonomy was conducted in three stages. First, the draft framework was presented at the ETUI Psychosocial Risk Network meeting on 21 November 2023. Following discussion and feedback, the revised conceptual framework was discussed with the project advisory committee which included experts on work-related PSR from across Europe and internationally. Feedback was incorporated in the third draft of the framework which was then shared with expert networks through the European Academy of Occupational Health Psychology and the International Commission on Occupational Health Scientific Committee 'Work Organisation and Psychosocial Factors' (about 500 experts). Feedback was sought on the following questions:

1. Is the conceptual framework of work-related PSR clear and understandable?
2. Is it comprehensive and general enough to cover all employees (sectors, companies, professions)?
3. Is there anything that is missing and needs to be added?
4. Is there anything that needs to be improved?
5. Do you have any additional comments to make?

Responses were received from 63 experts, of whom 59 (about 94%) thought the framework was clear and understandable, although two offered suggestions for

improvement in terms of the presentation of the results figure and for a clearer distinction across the PSR taxonomy.

All respondents thought the framework was comprehensive and general enough to cover all employees. Thirty-two respondents offered suggestions for additional elements to be added. These included: social attitudes, media, the gig economy, moral injury, more aspects of safety, psychological safety, work arrangements and working multiple jobs. It was also suggested that societal implications and the need for research on this topic could be further developed and that it might be useful to add a list of key findings to make the results section and figure easier to read.

Eight respondents (about 13%) offered some suggestions for improvement in terms of a greater focus on work stress, highlighting the intersection of PSR with other risks, the need for further research in this area and also the need for engagement of all key stakeholders. Finally, one expert suggested that, for a non-expert audience, and depending on the aim of use, it might make sense to focus more on psychosocial hazards.

The feedback received was taken on board and the conceptual framework was modified accordingly. It is presented in Table 3 and Figure 2. Some of the comments offered have been addressed in various sections of this report.

10. Findings

The analysis highlighted that there are several macro context dimensions which impact the psychosocial work environment at the organisational level. These include the political, social, economic, technological and ecological context which, in turn, determine the policy context, labour market dynamics, and occupational safety and health infrastructure. These macro context dimensions are discussed in section 10.1.

Section 10.2 then discusses the analysis of psychosocial work environment taxonomies. The analysis indicated that there are various taxonomies of work-related PSR which are different to theoretical domains. The most widely used taxonomy is the one by Cox (1993) and Cox and Cox (1993) which has been adapted in both research and practice. A comparative analysis of the dimensions of this taxonomy with other taxonomies indicated the dimensions are still relevant and broad enough to capture the changing nature of work. These include organisational culture and function, job content, workload and work pace, work schedule, control, environment and equipment, interpersonal relationships at work, role in organisation, career development, and home-work interface. However, additional detail needs to be added when concretizing it through specific examples of psychosocial factors and hazards to:

1. align the content of various taxonomies while ensuring conceptual clarity
2. include additional examples of both psychosocial factors and psychosocial hazards
3. capture new theoretical constructs and aspects of the changing nature of work and employment contracts, technological innovations, and environmental factors.

Subsequently, an expanded conceptual framework (see Table 3) was developed to depict the wider macro contextual influences and the impacts of the psychosocial work environment on health and organisational outcomes on the basis of the evidence presented in sections 10.3 and 10.4. Given the breadth of the review, the evidence presented is based on in-depth systematic review and meta-analysis studies. However, it was not possible to identify systematic literature reviews and meta-analyses on all issues of concern in relation to health and organisational impacts. These are included to the extent possible while recognising that there are limitations to the existing evidence base.

The conceptual framework presented in this report reflects, to some extent, the conceptual framework for research on the psychosocial work environment and

health articulated by Rugulies (2019), which depicts the relationship of the psychosocial work environment to phenomena both on the societal and impact at individual level and organisational level. The pathways in Rugulies' model start with (1) (macro-level) economic, social and political structures, such as the modes of production, division of labour, type of social welfare regime or the legal system; and (2) (meso-level) workplace structures, such as type of employment contract or adequacy of staffing, that; (3) impact the meso-level psychosocial working conditions such as job demands, work organisation, content of work or social relations at work. Our conceptual model also responds to the call by Muntaner and O'Campo (1993) to incorporate distal (social) determinants of health into PSR models. Therefore, the conceptual framework presented in this report incorporates distal determinants of health into the model (e.g. the social context, labour market dynamics) and related global changes affecting the labour process.

Figure 2 and Table 3 present the conceptual framework and taxonomy of work-related PSR with different components:

- sources, such as aspects related to the macro context
- factors, including job security, work-life balance
- hazards, for example job insecurity, work-life conflict
- impacts and outcomes in terms of individual health and wellbeing, and organisational outcomes.

Figure 2 **Conceptual framework of determinants and impacts of work-related psychosocial risks**

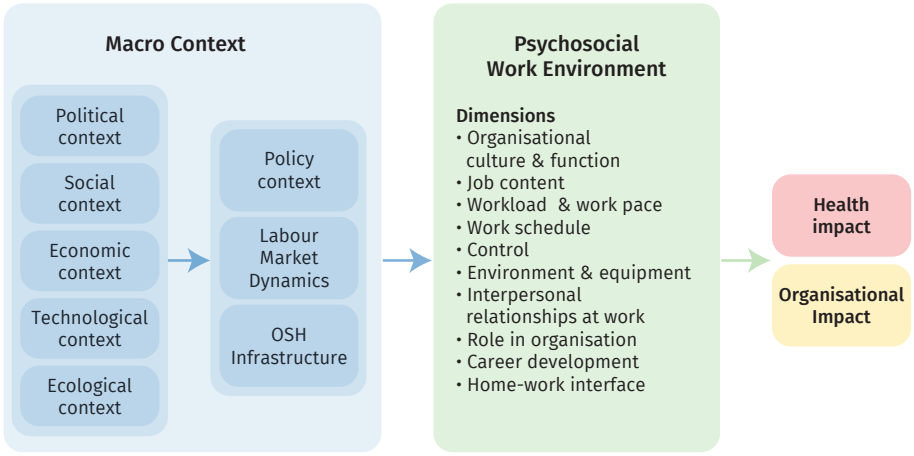


Table 3 **Conceptual framework of determinants and impacts of work-related psychosocial risks**

Macro context		Psychosocial work environment			Health impacts (evidence based on systematic reviews & meta-analyses)	Organisational impacts (evidence based on systematic reviews & meta-analyses)
		Dimensions	Psychosocial factors	Psychosocial hazards (psychosocial risk is the potential of psychosocial hazards to cause harm)		
Political context: - Governance - Political actors - Stable vs unstable political system - Political power relations **Social context:** - Social attitudes (including media) - Civic engagement - Social dialogue - Worker representation/ trade union density - Workforce demography (e.g. age, gender, vulnerable groups)	**Policy context:** - Health - Social protection - Economy and trade - Education - Environment - Labour policy (labour regulations, anti-discrimination regulations, industrial relations) - Occupational safety and health (OSH)	**Organi-sational culture & function**	Psychosocial safety climate (organisational policies, management awareness and prioritisation of psychosocial risks, employee consultation and participation), safety climate, psychological safety, leadership and management practices, communication processes, defined organisational objectives, organisational change management	Poor psychosocial safety climate, poor leadership and management practices, lack of procedural and interactional justice, discriminatory practices and stigma, lack of organisational trust, poor communication, lack of definition of or agreement on organisational objectives, value inconguence, poor organisational change management, heavily bureaucratic culture	CHD, burnout, sleep problems, anxiety, depression, stress, injuries	Absenteeism, return to work, presenteeism, retirement intention, disability retirement, accidents, job satisfaction, performance, productivity, work engagement, turnover intention
		Job content	Work tasks, use of skills, work variety, emotional demands, cognitive demands	Lack of variety, under-stimulating, monotonous work, short work cycles, unclear, fragmented or meaningless work tasks, underuse of skills, high uncertainty, continuous exposure to people through work (i.e. difficult clients, students, patients), high emotional demands, moral injury	Anxiety, stress, CHD, diabetes, burnout, sleep problems, suicide ideation, suicide, psychotropic drug use, MSDs (all regions), low back pain, neck/shoulder pain, upper extremity pain	Absenteeism, presenteeism, disability retirement
		Workload & work pace	Level of workload, workload planning, work organisation, quantitative demands, application of new technologies, level of work pace/work intensity, deadlines, training in the use of new technologies, staffing	Work overload or underload, information overload, poorly planned workload shifting, poorly planned changes in work organisation and work processes linked to the application of digital technologies, technology overload, machine or computer pacing, high levels of time pressure, work intensification, being continually subjected to deadlines, inadequate staffing	CHD, stress, stroke, ischaemic stroke, haemorrhagic stroke, peripheral artery disease, diabetes, obesity, physical inactivity, alcohol intake, smoking, sleep problems, suicide ideation, psychotropic drug use, MSDs (all regions), low back pain, neck/ shoulder pain, upper extremity pain, cancer (any), colorectal cancer, lung cancer, breast cancer, prostate cancer, oesophageal cancer, Crohn's disease, ulcerative colitis *Note: includes impact of job strain*	Absenteeism, return to work, presenteeism, disability retirement, productivity, work engagement, innovation, turnover intention *Note: includes impact of job strain*

Macro context		Psychosocial work environment			Health impacts (evidence based on systematic reviews & meta-analyses)	Organisational impacts (evidence based on systematic reviews & meta-analyses)
		Dimensions	Psychosocial factors	Psychosocial hazards (psychosocial risk is the potential of psychosocial hazards to cause harm)		
Economic context: - Globalisation - Macroeconomic stability - Welfare state model	**Labour market dynamics:** - Full employment - Unemployment - Wages/adequate earnings - Precarious and informal employment - Child labour - Slavery and bonded labour - Human-machine interaction - Skills development / employability - Gig economy	**Work schedule**	Shiftwork, working hours, working practices, work schedule planning, work arrangements, working multiple jobs	Shift working (especially irregular), night shifts, inflexible work schedules, unpredictable hours, long or unsociable hours, involuntary overtime	CHD, depression, anxiety, stress, stroke, arterial fibrillation, venous thromboembolism, diabetes, obesity, physical inactivity, alcohol intake, smoking, sleep problems, psychotropic drug use, miscarriage, preterm delivery, preeclampsia, gestational hypertension, small for gestational age, low birth weight, cancer (any), colorectal cancer, lung cancer, breast cancer, prostate cancer	Absenteeism, presenteeism, retirement, productivity, work engagement
		Control	Decision-making processes, control over workload, work tasks, methods, place and pace of work, use of algorithms and digital surveillance, data management	Low participation in decision-making, lack of control over workload, work tasks and work pace, levels of autonomy not matched to workers' abilities, continuous algorithmic management, digital surveillance	CHD, stroke, ischaemic stroke, haemorrhagic stroke, peripheral artery disease, diabetes, obesity, physical inactivity, smoking, alcohol intake, anxiety, depression, stress, burnout, sleep problems, suicide ideation, suicide, psychotropic drug use, MSDs (all regions), low back pain, neck/shoulder pain, upper extremity pain, low extremity pain, cancer (any), colorectal cancer, lung cancer, breast cancer, prostate cancer, oesophageal cancer, Crohn's disease, ulcerative colitis *Note: includes impact of job strain*	Absenteeism, return to work, presenteeism, retirement intention, retirement, ill-health disability retirement, productivity, work engagement, job satisfaction Note: includes impact of job strain

Macro context		Psychosocial work environment			Health impacts (evidence based on systematic reviews & meta-analyses)	Organisational impacts (evidence based on systematic reviews & meta-analyses)
		Dimensions	Psychosocial factors	Psychosocial hazards (psychosocial risk is the potential of psychosocial hazards to cause harm)		
Technological context: - Digitalisation - Automation - Robotisation - AI **Ecological context:** - Environmental conditions including climate change - Safe and secure environment	**OSH infrastructure:** - OSH enforcement - Occupational health services - Education and competencies (including labour inspectorate expertise)	**Environment & equipment**	Physical working conditions, environmental conditions, security conditions, work equipment, technology use, work arrangements (e.g. hybrid work)	Inadequate equipment availability, suitability or maintenance, technostress caused by automation, lack of appropriate training to use new equipment and technology, remote and isolated work, poor environmental conditions such as lack of space, poor lighting, excessive noise, working in extreme physical conditions or situations, working in unstable environments such as conflict zones and natural disaster zones, exposure to traumatic events or material	CHD, hypertension, ischaemic heart disease, stroke, MSDs, physical injuries, accidents, anxiety, burnout, depression, stress, PTSD, suicide	Absenteeism, retirement intention
		Interpersonal relationships at work	Quality of relationships at work including with managers, colleagues and customers/ service users, teamwork, social support from managers and colleagues, policies and procedures to deal with conflicts, diversity and inclusion	Social or physical isolation, poor relationships with superiors, colleagues and customers/service users, interpersonal conflict, lack of social support, violence, harassment, bullying/cyberbullying, incivility, discrimination	Diabetes, depression, stress, burnout, anxiety, sleep problems, suicide ideation, suicide, psychotropic drug use, MSDs (all regions), low back pain, neck/ shoulder pain, upper extremity pain, low extremity pain	Absenteeism, return to work, presenteeism, retirement intention, disability retirement, productivity, work engagement, job satisfaction, turnover intention
		Role in organisation	Roles and responsibilities, objective setting, professional identity	Role ambiguity, role conflict, responsibility for people, unclear/ fragile professional identity	CHD, burnout, depression, anxiety, stress	Absenteeism, presenteeism, work engagement
		Career development	Career prospects, use of skills and development, feedback mechanisms, training and learning opportunities, pay schemes, rewards and recognition, job security, evaluation systems, use of algorithms for evaluation and reward purposes	Career stagnation and uncertainty, under promotion or over promotion, effort-reward imbalance, lack of feedback, training and learning opportunities, poor pay, in-work poverty, microwork, job insecurity and precarious work, continuous work transience and unstable work, low social value to work, demeaning work, inappropriate use of rating systems and algorithmic bureaucracy	CHD, diabetes, depression, burnout, anxiety, stress, sleep problems, suicide ideation, psychotropic drug use, MSDs (all regions), low back pain	Absenteeism, presenteeism, disability retirement, productivity, work engagement, turnover intention
		Home-work interface	Organisational policies and practices around work-life balance (e.g. flexible working hours, parental leave, etc.)	Conflicting demands of work and home, low support at home, issues arising from dual careers and boundaryless careers, constant worker mobility	Stress, sleep problems, psychotropic drug use	Absenteeism, productivity, turnover intention

10.1 Macro context

Both the nature of work and of workplaces, as well as certain workforce characteristics, depend on wider socioeconomic and political influences. The changing social, economic, technological and environmental landscape has an impact on the availability and quality of work and employment in organisations across all sectors and regions of the world (Jain et al. 2018; Schulte et al. 2020, 2022). In 2022, as noted in Section 6, the principle of a safe and healthy working environment was added to the ILO's Fundamental Principles and Rights at Work which led to the recognition of a safe and healthy working environment as a fundamental principle and human right (ILO 2022a). This development was significant for several reasons, but it is important in the context of this report as it highlights how the macro context is relevant in the creation of healthy workplaces and in the promotion of sustainable work and wellbeing (Eurofound 2021a; EU-OSHA 2013, 2018; ISSA 2023; WHO 2010). Human rights have been defined as fundamental civil, cultural, economic, political and social rights, inherent to all human beings whatever our nationality, place of residence, gender, national or ethnic origin, race, religion, language or any other status (OHCHR 2008). They touch upon nearly every dimension of a society's basic institutional structure, from protections against the misuse of state power to requirements for the political process, health and welfare policy, and levels of compensation for work, and are indispensable to achieving sustainable development (UN 2008, 2015). The International Covenant on Economic, Social and Cultural Rights (ICESCR) is the most comprehensive treaty with respect to the right to decent work (Bedggood and Frey 2010), with four work rights that mirror and bolster the four ILO Decent Work pillars (Frey and MacNaughton 2016) and which are intrinsically related to promoting a positive psychosocial work environment.

A large body of literature has examined and summarised these macro context influences under the areas of the social determinants of health (Benach et al. 2013; EMCONET 2007; Frank et al. 2023; CSDH 2008, Siegrist et al. 2016), job quality (Cazes et al. 2015; Eurofound 2021a; OECD 2012, 2013, 2017) and more recently in the context of the future of work (ILO 2019; EU-OSHA 2019; Smits et al. 2020; OECD 2019a; WEF 2020; Schulte et al. 2020, 2022). The relationships between employment, work and health outcomes are highly complex and involve pathways that act at different levels, for example at the macro structural levels of economic development, labour markets and national policies, as well as at occupational group, sector, enterprise level, etc. (Tausig and Fenwick 2011). Various forecasts suggest that these relationships and pathways will only become more intertwined and complex in the rapidly changing world of work (EU-OSHA 2018, 2023; OECD 2018). Lund and colleagues developed a conceptual framework for the social determinants of mental disorders that is aligned with the SDGs, to conduct a systematic review of reviews to identify potential mechanisms and targets for interventions. Based on their findings they highlighted that it was possible to interrupt the negative cycles of poverty, violence, environmental degradation, and mental disorders, and establish virtuous cycles of mental health, well-being, and sustainable development that include the workplace level (Lund et al. 2018).

Based on a review of the scientific and grey literature to identify critical themes that will influence the future of work, Schulte and colleagues (2020) found that most of the forecast scenarios indicate the potential for a large prevalence of psychosocial hazards at work or arising from the lack of work. They identify the following themes, all of which are relevant to the psychosocial work environment: technological, demographic (young, older, women, migrant workers, disabled workers), temporal (time, work and leisure), global, urban, climate-related, human enhancements (cognitive, physical, worker monitoring), hazardous exposures, advanced manufacturing, biotechnology, synthetic biology, sustainability, and political and economic factors (Schulte et al. 2020). Optimistic scenarios described a world of full employment and environmental sustainability, whereas pessimistic scenarios depicted a world with fundamentally weak labour markets, fewer worker protections, and large social inequality. The mixed scenarios revealed a world in which technological change has driven the automation of work, human-machine cooperation, including skilled jobs, to the point of widespread technological unemployment and fragmented tasks, resulting in social and economic change, to political and economic turmoil, and to self-actualised economies throughout the world (Daheim and Wintermann 2019; Healy et al. 2017).

This changing landscape has led to the recognition that, while wellbeing at work is primarily an employer's responsibility, the wellbeing of the worker or the workforce is also the responsibility of others in society and that public policy should consider the social, economic, technological and political contexts (Schulte et al. 2015). Based on multidisciplinary literature reviews, Chari and colleagues (2018) develop a framework for worker wellbeing which recognises that promoting and evaluating the wellbeing of workers is a complex undertaking requiring partnerships and commitments across employers, individuals and communities.

The next sections present the relationship between the various determinants of the macro context on the psychosocial work environment and its outcomes. These include the political, social, economic, technological and ecological context which, in turn, determine the policy context, labour market dynamics and the occupational safety and health infrastructure, and are discussed in this order. Table A4 provides further details on the studies identified in relation to the macro context.

10.1.1 Political context

Over the past decades, several authors have highlighted that, to understand approaches to the improvement of workers' health and safety, as well as health outcomes more broadly, what must be taken into account is not only different views on what is scientifically or economically possible but also differing political and ideological beliefs about what is deemed desirable (Bambra et al. 2005; Carson and Heneberg 1989; Elling 1989; Labonte et al. 2005). It is therefore important to consider the political context, which focuses on the activities and strategies of political actors as well as their role and power relationships that often shape the political system and models of governance in place at regional, national and international levels.

- **System of governance**

A key feature of the political context relates to the political system – the system of governance – that is, the set of formal legal institutions that constitute a government or a state (federal, central, unitary, etc.). The political context is closely related to the economic context (as discussed in Section 10.1.3) which includes, for example, the welfare state model, the availability and provision of resources, unemployment rates and labour productivity, and also the social context which incorporates factors such as freedom of association and union participation in public policy (Section 10.1.2). The system of governance has a direct impact on the policy framework for health, safety and wellbeing, the actors who are included or excluded from the development of policies and their perception of health, safety and wellbeing risks, the processes of the negotiation, development and implementation of these policies, and the policy outcomes. These have an impact on the actions taken by governments, regions and organisations to manage health, safety and wellbeing in order to reduce their impact in terms of the incidence of accidents, diseases, health conditions and related business outcomes (e.g. absenteeism, presenteeism, productivity, etc.) (Jain et al. 2018). However, for any system of governance to function effectively, political stability is essential.

- **Stable vs unstable political system**

Political stability, characterised by the preservation of an intact and smoothly functioning government or political system, functioning without significant disruptions or changes over an extended duration, is essential in the public policy process where 'a set of interrelated decisions are taken by a political actor or group of actors concerning the selection of goals and the means of achieving them within a specified situation' (Peters and Pierre 2006). Political stability signifies a state of peace, sustained continuity within the political domain and consistent institutions and policies (Ake 1975), and is key to ensuring the desired policy outcomes (or impacts) – consequences, intended or unintended, resulting from political action or inaction (Jenkins 1978).

The absence of political stability may have substantial public health implications, affecting both mental and physical health. There have been increased attempts to understand the contributing factors to the relationship between healthy populations, political stability and governance regimes that enable 'healthy nations' to survive and thrive. These have been largely informed by longitudinal studies on the relationship between regime type, provision of healthcare and conflict prevention (Davies 2014). Persistent political conflict results in a critical deterioration in economic conditions, educational and social services availability of food and goods, and affect health outcomes and the availability of employment and income (Hobfoll et al. 2012). The findings of these studies reinforce and expand the increasing recognition of the important role of the political domain in the explanation of wellbeing in populations (Barber et al. 2012).

Current societies are characterised by unprecedented change in demographic, economic and political terms. Research also indicates that these changes may be stressful, especially for those who have most to lose – both member of (formerly)

high-status groups as well as disadvantaged groups (Scheepers and Ellemers 2018). Managing these transformations to ensure population wellbeing requires changes, to work processes and to systems, that are often more challenging to implement (Schulte and Vainio 2010). This requires various political actors to cope with additional management issues, including multiple agencies, a range of organisational mandates and constituencies, longer appropriation timelines and the challenge of maintaining strategic continuity even as political administrations change (OECD 2016, 2022).

- **Political actors**

The policy process is elaborate and complex, and involves a large number of choices made by a potentially significant number of individuals and organisations, often encompassing complex interactions between political actors (state and non-state) (Lindblom and Woodhouse 1993; Dye 2010). Since policies are made and implemented in multi-actor contexts, and the various actors/stakeholders frequently view problems and solutions differently, each tries to influence the aim and direction of a policy through the policy process. This calls for more attention to be paid to different rationalities and lines of argument (Hanberger 2001).

As discussed in Section 6, policy approaches can be developed and implemented where civil actors, with or without the involvement of governmental actors, organise to promote health, safety and wellbeing at work. In addition to state actors, non-state actors also play a key role in policymaking. However, differences in perception (in terms of perspectives, priorities and interests) of psychosocial risks between the various political actors are a challenge to effective social dialogue on psychosocial risk management (as discussed in more detail in Section 10.1.2) and for the effective development and implementation of policy approaches to managing psychosocial risks (Ertel et al. 2010; Houtman et al. 2020; Iavicoli et al. 2011).

- **Political power relations**

Managing these complex relationships between various political actors also requires recognition of the underlying political power relations. It has been highlighted that power relations are not discussed in general discourse, but an imbalance of power can potentially act as a barrier to the development and implementation of psychosocial risk management interventions both at the macro and at the enterprise level. Although social dialogue has been reported to play a key role in advancing political dialogue and action, differential power relations between national stakeholders can pose barriers to the development of policy level interventions (Leka et al. 2010), as has been shown in research on the reduction of health inequalities. This highlights that attempts carried out at the level of social policy largely depend on the distribution of power among key political actors and the role of the state (Korpi and Palme 2003). Interestingly, Karasek (1989) argues that conventional 'left/right' or capitalist/socialist political dialogues fail to capture many important wellbeing distribution issues in increasingly large population groups. He plotted occupations against decision latitude and psychological and physical work demands, respectively, and found that there

are very large differences amongst occupational groups, and these differences continue to exist and are manifest in different ways in the changing world of work. He highlights that a conventional understanding of power relations does not take into account psychosocial job characteristics such as skill development and use, autonomy, psychological stimulation and overload, physical demands and creative and supportive social interactions.

10.1.2 Social context

Social context has an impact on the organisational psychosocial work environment in several ways. Social attitudes, as reflected in the public discourse, civic engagement and the media, influence risk perception and prioritisation which feed into the development of policies, strategies and other key actions. Attitudes, perceptions and knowledge also influence the prioritisation of PSR by the social partners in the context of social dialogue. Relevant to this are issues like power dynamics, as reflected at national and organisational levels, that affect worker representation and employee voice. Finally, and importantly, workforce characteristics also relate to PSR and necessitate specific actions to address the social inequalities which are often reflected in the world of work.

- **Social attitudes and civic engagement**

OSH risk perception as well as sensitivity and tolerability (Slovic 1993) may affect the social acceptability and social attitudes that exist around specific risks, including psychosocial risks. The social amplification and social attenuation of risk theory (Kasperson et al. 1988; Kasperson 1992) argues that hazard-related messages interact with psychological, social, institutional and cultural processes in ways that can increase or attenuate individual and social perceptions of risk and shape risk behaviour. Social attitudes are dynamic and associated with perceptions, understanding and action, including civic and policymakers' engagement with specific issues.

However, Almond and Esbester (2019) argue that we should be cautious about accepting that there is any single, simple, public opinion towards health and safety issues. The attitudes that underlie these surface opinions are more subtle, complex and contradictory, and often reflect ambiguity, misunderstanding and a lack of knowledge. Löfstedt (2005) suggests a number of explanations for this including regulatory scandals, the rise of 24-hour television and the internet offering alternative non-expert sources of information, the increasing concentration of political power, and media amplification of risk among the public (Petts et al. 2001). This is even more pertinent in our age of social media which is affected by the possibility of misinformation and privacy breaches (Siegmund 2020).

In relation to PSR (and mental health more broadly), stigma is an important concern that needs to be addressed both at societal and workplace levels. Klinefelter et al. (2021) argue that, in order to respond to PSR concerns, organisations need information on their nature and impact. However, employees often hesitate to discuss their stress-related concerns with their employer, which may be because

of the social stigma that surrounds admitting that PSR are adversely affecting one's health (Klinefelter et al. 2021). The authors contend that stress-reporting stigma can be attributed to the perceived potential for harm to the employee's career, negative treatment by the employee's supervisor and/or by the employee's coworkers, and employees evaluating themselves adversely as a function of admitting a stress-related problem (Vogel et al. 2006). They also show that stigma is associated with an organisation's psychosocial safety climate and various outcomes, including bullying and harassment at work. Stigma on PSR and mental health at work is also often reflected in prioritisation and actions of policymakers and the social partners.

- **Social dialogue**

Social dialogue on PSR at work has grown in OSH over the past decades and, as discussed earlier, has resulted in the development of several social partner agreements. Few studies have specifically focused on the influence that social dialogue has on PSR. Ertel et al. (2010) conducted a mixed methods study with a focus on European Social Dialogue on psychosocial risks at work. They found a mixed picture, with questions being raised on the appropriateness and effectiveness of the social partner 'autonomous agreements' on work-related stress and harassment and violence at work. These challenges are accentuated by the diversity of national industrial relations systems and weak social dialogue structures and capacities, particularly in the new Member States. A related and even more important challenge for effective social dialogue on work-related stress results from differences (in terms of perspectives, priorities and interests) between social actors, particularly between employer organisations and trade unions. Employers tend to favour less binding, 'business-friendly' approaches and are therefore interested in social dialogue as a voluntary tool. Unions, on the other hand, in general prefer enforceable regulations, in particular under circumstances where social dialogue structures are weak and power relations between employers and unions are imbalanced.

These concerns have become more prevalent in recent years in relation to the impact of digitalisation, platform work and the gig economy (Voss and Riede 2018). The social partners have been actively involved in debates and the development of policies regarding digital transformation processes and their impact on employment and work. Negotiations on these issues have resulted in new legislation on the right to disconnect, AI and platform work (see Section 6). These developments, in turn, influence organisational practices where perception, awareness and a shared understanding of PSR has been found to have positive outcomes. For example, Houtman et al. (2020) explored the added value of agreement between managers and employee representatives on risk perception and awareness in terms of explaining the management of more 'subjective' psychosocial risks compared to more 'objective' traditional OSH risks. ESENER-1 data was used from 7226 enterprises in which both managers and employee representatives were interviewed. Differences in risk perception and awareness between managers and employee representatives indeed explained greater variance in psychosocial risk management compared to more traditional OSH risk management. The findings stress the importance of social dialogue to achieve

positive outcomes, particularly in the case of psychosocial risk management as opposed to general OSH management.

- **Worker representation/trade union density**

Employee voice and representation have been found to be particularly crucial concerning a healthy psychosocial work environment. Knudsen et al. (2011) explored how employee participation influences the quality of the work environment and workers' wellbeing in 11 Danish workplaces within six different industries. Both direct participation and representative forms of participation at workplace level were studied. Statistical as well as qualitative comparative analyses reveal that work environment quality and high levels of participation go hand-in-hand. Within a typology of participation models, the highest level of participation, including strong elements of collective participation, and also the best work environment, measured as 'psychosocial wellbeing', were found in workplaces managed in accordance with democratic principles. In another study, Llorens et al. (2019) examined the relationship between the psychosocial work environment and labour management practices involving direct participation among salaried workers, and whether this relationship varies according to occupational group and sex. Social support and rewards are significantly and positively associated with direct participation, after adjusting for ten indicators of other labour management practices (including working hours, contractual relationships, promotion, salary and staffing) and three socioeconomic characteristics (occupational group, sex, age). No association is observed with factor demands. When used in conjunction, delegative and consultative direct participation practices obtain more frequent and stronger associations with psychosocial work environment factors than when used separately. The authors conclude that direct participation practices appear to be valid components of preventive interventions at workplace level and may help to reduce occupational health inequalities.

Union density has also been shown to be associated with a better organisational psychosocial safety climate (PSC) and other positive outcomes. For example, Dollard and Nesser (2013) examine union density and PSC as determinants of country differences in worker health and productivity in 31 European countries. The most important factors explaining worker self-reported health and GDP between nations are two levels of labour protection; that is, macro-level (union density) and organisational-level PSC (i.e. the extent of management concern for worker psychological health). The majority of countries with the highest levels of union density and PSC (i.e. workplace protections) are social democratic in nature (Sweden, Finland, Denmark and Norway). Another study by Potter et al. (2024) developed a National Policy Index (NPI) for worker mental health and examined its relationship with enterprise PSC. The correlation between NPI and enterprise-level PSC found in the study highlights the critical role of national policy in protecting worker population mental health. Yet above and beyond national policy, national union density is also related to enterprise PSC.

- **Workforce demography**

Exposure to PSR at work and the associated negative outcomes have been found to be associated with certain workforce characteristics resulting in vulnerabilities and inequalities for specific groups of workers. Such 'vulnerable groups' may include younger workers, older workers, pregnant workers, disabled workers and some migrant workers.

For example, studies on older workers have examined the impact of PSR on issues such as the menopause, cognitive capacity, productivity and retirement intention (for studies on productivity and retirement intention, see Section 10.4). Martelli et al. (2021) conducted a systematic review of the influence of work on the andropause and the menopause. Work-related factors, such as psychological stress, physical effort and sleep disorders, show a significant correlation with andropause manifestations whereas age at menopause and the severity of menopausal symptoms are both influenced by factors such as pesticide exposure, high job strain and repetitive work. Huang et al. (2020) provided a systematic review and meta-analysis of the association between occupational factors and dementia or cognitive impairment. In terms of occupation type, mental work confers a 44 per cent reduced risk of mild cognitive impairment. In terms of work complexity, higher work complexity confers a 5 per cent reduced risk of dementia. In terms of occupational exposure, high strain and passive job in the longest-held job confers a 1.21 and 1.15-fold excess risk of cognitive decline. The systematic review by Then et al. (2014) of the effect of the psychosocial working environment on cognition and dementia found evidence of a protective effect of high job control and high work complexity. Moreover, cognitively demanding work conditions were found to be associated with a decreased risk of cognitive deterioration in old age. The authors underline that, as the world of work is undergoing fundamental changes, such as accelerated technological advances and an ageing working population, optimising working conditions is essential in order to promote and maintain cognitive abilities into old age.

Studies have also examined PSR in younger workers. van Veen et al. (2023) conducted a systematic review to examine psychosocial work factors affecting the mental health of young workers (defined as workers up to 35 years of age). Their findings are in line with the conclusions of two previous systematic reviews among young workers (Law et al. 2020; Shields et al. 2021) in that the evidence base is currently insufficient. The systematic review by Shields and colleagues included only three studies in the final synthesis and analysis Results show that concurrent exposure to sexual harassment and poor psychosocial job quality is associated with poorer mental health outcomes among young workers. Meanwhile, longitudinal evidence shows that exposure to low job control is associated with incident depression diagnosis among young workers. Law et al. (2020) included three cross-sectional studies and six longitudinal cohort studies in the final analysis of their systematic review. The cross-sectional evidence shows that adverse work conditions including overtime, job boredom, low skill variety, low autonomy, high job insecurity and lack of reward are associated with poor mental health in young workers. Longitudinal evidence shows that high job demands, low job control,

effort-reward imbalance and low work support (the latter only among men) is associated with poor mental health.

There are several studies that have examined work-related PSR in relation to gender and race/ethnicity. For example, Kaplan and Schulhofer-Wohl (2018) found that work is reported to have become happier and more meaningful for women, but more stressful and less meaningful for men, changes which are reported to be concentrated at lower education levels. Rydström et al. (2023) systematically reviewed work organisation, work environment and employment conditions in warehousing in relation to gender and race/ethnicity. Twenty-one studies were included in the review which defined racial/ethnic inequality as inequality related to country of birth and (im)migration status. The results highlight inequality based on gender and race/ethnicity in both work organisation (different tasks are performed by different groups of employees), work environment conditions (physical and psychosocial aspects differ) and employment conditions (in terms of disparate employment types and incomes between groups of employees). Health differences, as a possible result of unequal working conditions, are evident between different racial/ethnic groups of employees. A hierarchy that includes both gender and race/ethnicity was found, with (im)migrant and women of colour positioned at the bottom.

Studies have also focused on job insecurity, precarious employment and race/ethnicity. Hawkins and Alenó Hernández (2022) sought to assess if there were differences in exposure to job insecurity, shift work, work-life imbalance, workplace harassment and nonstandard work arrangements according to race and ethnicity in the United States. Compared to non-Hispanic White workers, Hispanic and non-Hispanic Asian workers report more job insecurity. Non-Hispanic Black workers are more likely to report working in shifts, while Hispanic workers report being employed in alternative work arrangements more often than non-Hispanic White workers. Non-Hispanic White workers are slightly more likely to report work-life imbalance and workplace harassment than other races/ethnicities. Occupational segregation accounts for some of the racial/ethnic differences in shift work and alternative work arrangements. Additionally, the systematic review by Ornek et al. (2022) of quantitative and qualitative studies on precarious employment and migrant workers' mental health identifies the following risk factors of poor mental health: temporariness, vulnerability, poor interpersonal relationships, disempowerment, absence of workers' rights and low income. Landsbergis et al. (2014) conducted a review on work organisation, job insecurity and occupational health disparities. They found consistent evidence that workers in lower socioeconomic or social class positions are exposed to greater job insecurity and other work organisation hazards than workers in higher socioeconomic positions. Likewise, racial and ethnic minorities and immigrants are exposed to greater job insecurity.

Some studies have explored accidents and injuries in migrant workers. For example, Hargreaves et al. (2019) carried out a systematic review and meta-analysis of occupational health outcomes among international migrant workers. In the meta-analysis, among 7260 international migrant workers, the pooled prevalence of having at least one occupational morbidity as 47 per cent. Among

3890 migrant workers, the prevalence of having at least one injury or accident, including falls from heights, fractures and dislocations, ocular injuries and cuts, is 22 per cent. The authors conclude that international migrant workers are at considerable risk of work-related ill health and injury, and that their health needs are critically overlooked in research and policy.

Exposure to PSR shows some differences by gender, as discussed earlier in the report; however, study findings are mixed. For example, Fida et al. (2023) explored gender differences in terms of exposure to stressors at work in a systematic review and conclude that, for all stressors, a significant proportion of studies finds no significant gender differences. However, Campos-Serna et al. (2013), in their systematic review, were able to identify a set of working and employment conditions as determinants of gender inequalities in occupational health. They found that employed women have greater job insecurity, lower control, worse contractual working conditions and poorer self-perceived physical and mental health than men. Conversely, employed men have a higher degree of physically demanding work, lower support, higher levels of effort-reward imbalance and higher job status, while they are more exposed to noise and work longer hours than women.

Differences by gender were also found by Biswas et al. in two separate studies. In 2022, they examined the differences between men and women in their risk of work injury and disability though a systematic review. Among all occupations, the association between physical exposures, job demands, noise and repetitive tasks and the risk of injury is stronger among men, whereas the relationship between repetitive tasks and sickness absence is stronger among women. They report that most studies examining psychological exposures have found no risk differences for men and women across occupations. Men are at higher injury risk in certain occupations in primary and secondary industry sectors involving physical exposures and some chemical/biological exposures, whereas women are at higher injury risk associated with physical demands and repetitive tasks in healthcare and aluminium production occupations. In their other study, Biswas et al. (2021) conducted a scoping review on sex and gender differences in occupational hazard exposures, comparing men and women working in the same occupations. Fifty-eight studies were included in the analysis. Within the same occupations, men are more likely to be exposed to physical hazards, with the exception of women in healthcare occupations and where exposed to prolonged standing. Women are more likely to experience harassment while men are more likely to report higher work stress. Finally, men are more likely to report greater exposure to hazardous chemicals.

On the other hand, Hoff and Lee (2021) carried out a systematic review on burnout and gender among physicians. They found that both male and female doctors experience high burnout regardless of where they work, their clinical speciality, workload or age. However, the authors did report a higher likelihood of female doctors experiencing higher emotional exhaustion in comparison to male doctors. The systematic review of Roche et al. (2016) found higher levels of depression among workers in male-dominated workforce groups.

10.1.3 Economic context

The importance of political and economic systems to population health and health inequalities has been shown in various empirical cross-national studies (Bambra 2011). The impact of the unequal distribution of wealth, income, opportunity, gender, race and access to information are considered in many scenarios in the future of work literature and there is broad awareness and a growing discourse on the negative consequences of inequality for health as well as for employability, job maintenance and job opportunities (Del Castillo and Meinert 2017; Schulte et al. 2020). The importance of understanding the impact of the political and economic context on mental health has been recognised for many years. Forecast reports on the increasing prevalence of psychosocial risks at work from the beginning of the 21st century have also identified the sociopolitical developments of increasing globalisation and the dominance of the free market economy, as well as significant demographic changes with an impact on labour market conditions, as being among the key changes that characterise the development of the modern workplace (Kompier 2006; EU-OSHA 2007).

- **Globalisation**

The modifications of work caused by globalisation are numerous and have been so profound as to change the nature of work itself. The changes induced by this process are partly dependent on different national variables, such as the level of industrialisation, political/ economic orientation, welfare state model and labour market conditions (Schulte et al. 2022). Globalisation has been highlighted as a key challenge to public health, especially in developing countries, but the linkages between globalisation and health are complex. They encompass both the indirect effects on health, operating through the national economy, household economies and health-related sectors, as well as the more direct effects on population level and individual risk factors for health, and on the healthcare system (Woodward et al. 2001).

A systematic review of the impacts of globalisation on health confirms these direct linkages and highlights that, while there has been undeniable economic development and technological progress to support the level of health around the world, improving the health status of certain populations with a beneficial increase in life expectancy, globalisation has also led to many challenges (Ioannou et al. 2013). The global integration of economies worldwide has led to increased pressure for labour flexibility, leading to the rise in non-standard work arrangements (part-time work, temporary agency-based work, contingent work, platform work/gig economy, etc.) which, while opportune for employers, are often associated with poor pay and an absence of social security, pension and health benefits as well as a lack of protection from unions and labour laws (Kawachi 2008).

Globalisation has been referred to as a race to the bottom (often characterised by deregulation), where the global marketplace and its associated neoliberal discourse has had a huge impact on the legitimacy of OSH regulation and on the abilities of workers to mobilise to resist changes that are fundamentally harmful to their health (Lippel et al. 2017). For instance, based on their review of the health of

gig workers around the world, Bajwa and colleagues suggest that this relationship must be understood in the context of neoliberalism, which has increased both globalisation and the precaritisation of work. They found that, while gig workers share some vulnerabilities, which have important negative consequences on their health, with other workers, the platform-specific vulnerabilities of such workers require further inquiry. In particular, the precise health and overall experience of gig workers in different regions of the world – with different labour policies and sociopolitical contexts for work – must be disentangled as workers in the Global North and South experience this work very differently (Bajwa et al. 2018). Similarly, other scholars have highlighted the rise of employment flexibility and the resulting precarity which have been exacerbated by financial crises and economic uncertainty throughout much of the world. Additionally, there is a call for a different understanding of workplace health promotion, research and intervention that goes beyond enabling healthier lifestyle choices or advocating safer workplace conditions, including the psychosocial work environment, to ensure adequate social protection floors that provide people with sufficient resources to lead healthy lives, and for advocacy for taxation justice to finance such protection (Caldbick et al. 2014).

- **Macroeconomic stability**

The impact of globalisation and neoliberalism have been further exacerbated by recent financial crises which have had a damaging impact on work, employment and living standards resulting from macroeconomic instability. This is evidenced by a growing body of research which shows the relationship between access to financial resources and health and wellbeing, both at individual and national/population levels (Sinclair and Cheung 2016). Large swings in economic activity, high inflation, unsustainable debt levels and volatility in exchange rates and financial markets can all contribute to job losses and increasing poverty, endangering progress towards achieving the SDGs. Maintaining macroeconomic stability is, therefore, a prerequisite for sustained and inclusive development (UN 2012).

Studies on the impact of economic crisis on mental health highlight that job-related problems, particularly unemployment, are the key determinant risk factors for mental health-related difficulties (Ng et al. 2013). Results from systematic literature reviews examining recent evidence of the association between economic recession and mental health outcomes point out that specific social groups are more vulnerable during periods of economic crisis in terms of mental health impact, with depression, anxiety and stress reported as the most common outcomes (Volkos and Symvoulakis 2021). It is clear that periods of economic recession are associated with a higher prevalence of mental health problems, including common mental disorders, substance disorders and, ultimately, suicidal behaviour (Frasquilho et al. 2016). Systematic reviews also show that financial stress is positively associated with depression in both high-income and low and middle-income countries, but that the relationship is generally stronger among populations with low income or wealth (e.g. Guan et al. 2022). Swarup and colleagues, in a systematic review and meta-analysis of the literature, found a significant association between financial stress and major cardiac outcomes,

providing support for calls for the development of health policies that recognise economic strain as a basis from which to enhance cardiovascular health outcomes and overall wellbeing (Swarup et al. 2024).

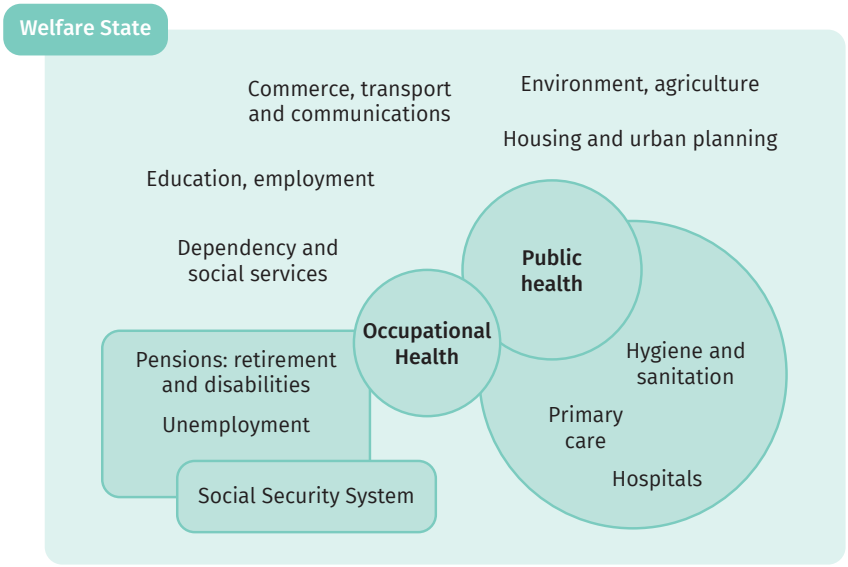
In light of this growing evidence base, the Economy of Wellbeing model proposed by the OECD and discussed by the European Council puts the focus on health and wellbeing in-all policies and on reducing environmental, work-related and economic stressors. This approach aims to strengthen resilience and contribute to better health outcomes and the prevention of diseases (EuroHealthNet 2022). While Economy of Wellbeing is predicated on a sound and sustainable economic policy, it highlights the importance of investing in effective, efficient and equitable policy measures and structures ensuring access for all to public services including health and social services, long-term care, the promotion of health and preventive measures and social protection, as well as education, training and lifelong learning. It emphasises employment, active labour market policies and occupational health and safety, alongside decent working conditions, as measures to guarantee wellbeing at work. It stands for equal opportunities, gender equality and social inclusion (European Council 2019). Such an approach can be useful to address the challenges that arise due to the changing nature of work and might highlight opportunities for developing holistic, integrative ways of addressing PSR at macro level.

- **Welfare state model**

As discussed in Section 6.1, welfare states and healthcare systems vary across the world.[7] In the Scandinavian welfare state model, countries often have a Beveridge-style healthcare system and strong national institutions in which coverage by health services is relatively universal and relatively well institutionalised. In the Bismarckian welfare state model, with insurance-based healthcare systems, health services as a benefit are related to one's employment and position in the labour market. Southern European welfare states have a mixed system with state-centred and bilateral healthcare services which can be decentralised towards regions and local communities. Anglo-Saxon welfare states differ in health systems, as some countries are characterised by universal health services while others have mixed systems. In relation to financing, most welfare or healthcare benefits are covered by taxation or insurance (Hämäläinen 2008). The health indicators of people living in countries with a more universal and generous welfare state remain better than those living under less generous and more individualist welfare regimes (Benavides et al. 2019).

7. In the Beveridge 'public' model, funding is based mainly on taxation and is characterised by a centrally organised national health service where medical/health services are provided by mainly public health providers (hospitals, community doctors, etc.). The Bismarck 'mixed' model is funded mainly by a premium-financed social/mandatory insurance and results in a mix of private and public providers. In the private insurance model, funding of the system is based on premiums, paid into private insurance companies (Lameire et al. 1999). Mixed healthcare systems combine the provisions of the Beveridge, Bismarck and private insurance models.

Figure 3 **Occupational health as the bridge between public health and the social security system in the context of welfare state policies**



Source: Adapted from Benavides et al. (2019).

Occupational safety and health systems can play a unique role in the sustainability of the welfare state, as depicted in Figure 3, as they bridge health policies and other social policies (education, environment, mobility, social protection, etc.) which influence the determinants of the health of people (as discussed further in the next sections). Occupational health and safety as part of national policy emphasises the importance of work for social protection and the funding arrangements of occupational health services and statutory accident insurance. Improvements in working conditions and the working environment make contributions to national development and are a constituent part of successful economic and social policies (Benavides et al. 2019). In addition, occupational health services and employers make up an important part of prevention, protection and the promotion of health as part of health policy and public health. Through their taxes, workers and employers support the welfare state and make the necessary contributions to cover the costs of ill health and to improve health, safety and wellbeing at work in organisations (Hämäläinen 2008). Occupational health and safety, therefore, by preventing injury and illness, and promoting the health and wellbeing of working people, can contribute significantly to the existence of decent work and a quality labour market (Benavides et al. 2019).

10.1.4 Technological context

As highlighted by the Global Commission on the Future of Work, new forces are transforming the world of work by changing who works and when, and how work is organised and managed (ILO 2019). Technological advancements are a key driver of organisational change and have led to many changes and innovations in work processes. For organisations to adjust to these technological advances, and

to reap the benefits, it is becoming ever more essential that their leaders adapt their models and their culture (Eurofound 2018; Schwarzmüller et al. 2018).

- **Digitalisation, automation, robotisation and AI**

As discussed in several reports, digitalisation emanates from ICT-enabled technologies such as artificial intelligence, advanced robotics, widespread connectivity, the internet of things and big data, augmented and virtual reality, wearables, mobile devices and online platforms that now provide essential services to all sectors of our economy and society and which, moreover, are likely to have major impacts on the nature and location of work over the next decades (e.g. EU-OSHA 2018, 2019; OECD 2019a; Christensen et al. 2020). Technological advance in automation, robotisation and AI, particularly since the early 2000s, has also brought about 'the looming possibility of mass job displacement, untenable skills shortages and a competing claim to the unique nature of human intelligence now challenged by artificial intelligence' (WEF 2020).

Changes in technology are associated with frequent changes in work processes, increased job insecurity and more frequent job changes and organisational change (EU-OSHA 2018). With many people working remotely and from home, social isolation is expected to increase, while interpersonal issues and cyberbullying might increase, especially since more workers work in virtual teams, often having little opportunity to get to know their fellow workers who might be living in other countries or who might have been hired only to complete a particular task/project. These issues are expected to result in a rise in mental ill health problems such as anxiety and depression (EU-OSHA 2018, Leka 2021; Moore 2019).

Research on telework has a long history and re-emerged with the Covid-19 pandemic. Vleeshouwers et al. (2022) conducted a systematic review on telework from home and the psychosocial work environment. They found that teleworking partially from home has a positive effect on work engagement, while working fully from home may have negative effects. Several of the studies included in the review point to the need for freedom and flexibility in telework from home for this type of arrangement to have positive effects on the experienced psychosocial work environment. Antunes et al. (2023) also carried out a systematic review of the PSR of part-time and full-time telework from home. The results revealed scant practice of full-time teleworking prior to the pandemic. Full-time telework was identified as bringing important changes in working conditions and as having the potential to affect the living and health conditions of teleworkers in a negative way. On the other hand, part-time teleworking may have a positive impact on PSR, specifically work-home balance, communications and social relationships. The systematic review by Ferrara et al. (2022) of remote work and employee wellbeing also found mixed results.

It is therefore important that the future of work and the workforce must be seen against the backdrop of technological change and working life, not just at the level of a single job or task. Digitalisation will continue to affect all work and non-work periods over the course of a working life. Hence, OSH and other public policies should address not only the hazards in a single job but the hazards along the whole

working-life continuum. This means addressing the precarious nature of work, as well as focusing on the lack of appropriate skills among present and future workers (Schulte et al. 2019). This requires significant efforts to upskill and reskill the workforce, and to decrease the divides between organisations and workers in terms of job level, content, education and pay (Cedefop 2018).

The evidence base in relation to the technological context and PSR at work has been growing. It acknowledges the excessive workload and increased mental strain associated with modern technology and that the pressure of being accessible 24/7, as well as intensified work processes, changing expectations of managers and customers, working long hours, uncertainties and the use of artificial intelligence or autonomous machines can cause stress among employees and hinder their engagement (Akyıldız 2023). This is discussed further in Section 10.1.7.

10.1.5 Ecological context

As discussed, the wider environmental context has an impact on work and working conditions and related outcomes. Most studies on the ecological context and PSR have focused on the impact of climate change and exposure to insecure working conditions during conflicts and natural disasters.

- **Environmental conditions including climate change**

Numerous health effects on workers have been linked to climate change including injuries, cancer, cardiovascular disease, respiratory conditions and effects on their psychosocial health (ILO 2024b). There are both direct and indirect effects of climate change on mental health: mental distress, anxiety, mood disorders, stress, PTSD, substance abuse, domestic violence and depression after acute events. Potential threats can lead to stress, depression, burnout and climate anxiety – that is, worries about the effects of climate change (ILO 2024b). Excessive heat can lead to sleeping disorders, behavioural changes and a lowered ability to concentrate (Ebi et al. 2021; Lundgren et al. 2013).

The consequences of climate change, as a result of exposure to extreme weather events or job/livelihood loss, can trigger feelings of helplessness or worry, loss of appetite and panic attacks. Damaged infrastructure or buildings can put workers in new or unfamiliar situations which may lead to traumatic injury or mental stress (ILO 2024b). Moreover, a loss of work capacity may result in a loss of income that is likely to cause mental health issues. For example, a wide range of psychological symptoms and disorders among farmers, such as anxiety, mood disorders, stress, depression or feelings of hopelessness, fear, despair, suicide ideation, increased drug abuse and heat-related deaths have been linked to adverse climate changes (EU-OSHA 2020, 2021b). Yazd et al. (2019) conducted a systematic literature review to identify the key risk factors affecting farmers' mental health. They found that the four most-cited such influences in the reviewed literature are pesticide exposure, financial difficulties, climate variabilities/drought and poor physical health/past injuries. Furthermore, the waste management industry poses

significant risks, including work organisation challenges and psychosocial issues (EU-OSHA 2020).

There are some systematic review studies, including that by Patwary et al. (2024) of observational studies published between 1 January 2000 and 20 January 2024, that have examined the impact of extreme weather events on the mental health of the South and South-East Asian population. The analysis included 70 studies, the largest single number coming from India (n= 22) and most using a cross-sectional study design (n= 55). Poor mental health outcomes are associated with six types of extreme weather events: floods, storm surges, typhoons, cyclones, extreme heat and riverbank erosion. Most of the studies (n= 41) report short-term outcome measurements. Findings included outcomes with predictable symptomatology including PTSD, depression, anxiety, general psychological distress, emotional distress and suicide. The few studies on the long-term effects show higher mental disorders after floods and typhoons, while cyclone-exposed individuals have more short-term distress. However, the authors recognise that the quantitative evidence linking extreme weather events to mental health is limited due to a lack of longitudinal data, a lack of control groups and the absence of objective exposure measurements.

In another study with a focus on Africa, Deglon et al. (2023) carried out a scoping review to determine the adverse mental health outcomes associated with extreme weather events between 2008 and 2021. Adverse mental health outcomes were identified resulting from flood (n= 4), drought (n= 4), extreme heat (n= 1), bushfire (n= 1) and multiple events (n= 2). Findings include pathological outcomes with symptoms including mood disorders, trauma- and stressor-related disorders and suicide. Additionally, the study identified several conditions indicating psychological distress which were below the pathological threshold and which include difficulties in regulating emotions, disturbed sleep, alcohol use, stress and anxiety. Similarly, the authors acknowledge the limited evidence based on good quality studies in this area.

- **Safe and secure environment**

The literature highlights that the burden of mental disorders is high in conflict-affected populations (Charlson et al. 2019; Rockhold and McDonald 2008) and that stability and security are key social determinants of health (Aguirre et al. 2022). Other studies have focused on specific occupations where workers are exposed to insecure conditions and trauma. Smith et al. (2019b) conducted a review examining the physical and mental health challenges experienced by 9/11 first responders and recovery workers in which PTSD was the most prevalent identified mental health problem. Another review from the same authors (Smith et al. 2019a) explored the physical and mental health challenges associated with emergency service call-taking and dispatching. Challenges to mental health include being exposed to traumatic calls, working in high-pressure environments with little downtime between stressful calls, inadequate debriefing after stressful calls, inappropriate training for mental health-related calls and being exposed to verbally aggressive callers. Lack of support from leadership is an additional source of stress.

Studies in the humanitarian sector have focused both on PSR exposure and health outcomes. Two relevant studies, although not systematic reviews, were found by Jachens and colleagues. One was a cross-sectional survey with humanitarian aid workers among whom more than half of the participant sample report psychological distress and one-third report high effort-reward imbalance and high job strain (Jachens et al. 2019). The other was a qualitative study that examined work-related stress in humanitarian aid workers (Jachens et al. 2018). Here, the analysis revealed eight main topics of interest, including that an emergency culture was found where most employees felt compelled to offer an immediate response to humanitarian needs; employees identified strongly with humanitarian goals and reported a high level of engagement; the rewards of humanitarian work were perceived as motivating and meaningful; constant change and urgent demands resulted in work overload; and managing work-life boundaries and receiving positive support from colleagues and managers helped to buffer perceived stress, work overload and negative health outcomes.

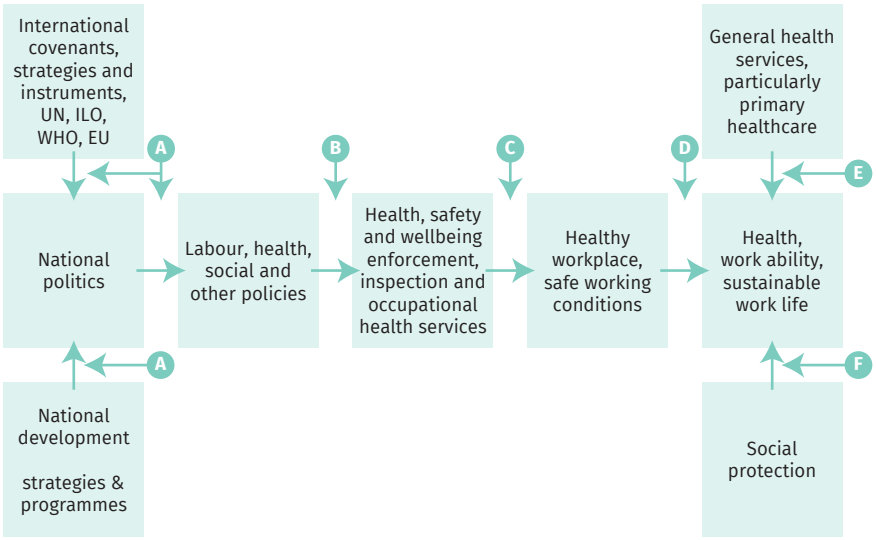
Additionally, a systematic review of health outcomes among disaster and humanitarian responders by Garbern et al. (2016) found that PTSD and depression are the most studied diagnoses with prevalence of PTSD ranging from 20-34 per cent and depression from 21-53 per cent. Brooks et al. (2015) conducted a systematic review to examine the risk and resilience factors affecting the psychological wellbeing of individuals deployed in humanitarian relief roles after a disaster. The key themes identified were pre-deployment factors (preparedness/training), peri-deployment factors (deployment length/timing, traumatic exposure, emotional involvement, leadership, inter-agency cooperation, support, role, demands and workload, safety/equipment, self-doubt/guilt, coping strategies) and post-deployment factors (support, media, personal and professional growth). They conclude that, as well as role-specific stressors, many psychosocial risks not specific to humanitarian relief (e.g. poor leadership, poor support) present a significant health risk to relief workers. The authors recommend that humanitarian organisations should prioritise strengthening relationships between team members and supervisors, and dealing effectively with non role-specific stressors, to improve the psychological resilience of their workforces.

10.1.6 Policy context

Increased recognition of interdependence and complementarity across different policy areas (health, social protection, economy and trade, education and environment, labour policies, occupational safety and health) and the role played by various stakeholders has led to the development of the Health in All Policies (HiAP) approach. 'HiAP is an approach to public policies across sectors that systematically takes into account the health and health systems implications of decisions, seeks synergies and avoids harmful health impacts, in order to improve population health and health equity' (Ollila et al. 2013: 3). It can, therefore, facilitate the mainstreaming of OSH policy across sectors and levels. Rantanen and colleagues (2013) applied the HiAP approach to work, health and employment. Recognising the roles of national, intergovernmental and supranational political

and policy actors, and the need to integrate their various OSH policy mandates, approaches and initiatives, they proposed a multisectoral policy intervention framework. This framework is a chain process with several entry points that can be used to align varied approaches and initiatives, as illustrated in Figure 4. Policymakers can utilise such entry points as opportunities arise, as they work towards reaching the objective of sustainable health, work ability and quality of working life for workers (i.e. decent work and a decent life) and implement the actions which call for active multisectoral and tripartite collaboration and contributions (Rantanen et al. 2013).

Figure 4 **Entry points for multisectoral policy interventions for health, safety and wellbeing**



Source: Adapted from Rantanen et al. (2013).

- **Health policies**

In most countries across the world, the prime responsibility for prevention measures and promoting occupational health at enterprise level lies with the employer, with national health systems and policies supervising and supporting employers in their duties. These arrangements are often built on a tripartite approach based on social dialogue between workers and employers, enforcement of the legal provisions by the competent safety and health authorities (through labour inspection) and the support provided through occupational health and prevention services, including the services of social security institutions, etc. (ISSA 2017; WHO 2007). Work injuries and occupational health risks are usually insured under a state-run social security system (e.g. social accident insurance scheme, workers' compensation board, etc.) which, in most cases, covers both occupational accidents and occupational diseases. However, in a number of countries, it is not a specialised institution that manages insurance but a social security fund covering multiple branches of social security, such as unemployment, pensions, health or family benefits and work injuries. Additionally, in some countries where a compulsory insurance system for occupational risks is not available, private sector

schemes exist (ISSA 2017). OSH and employers make up an important part of protection, prevention and promotion of health as part of health policy and public health. Employers cover the costs of OSH and make a necessary contribution to cover the costs of ill health and to improve health and safety at work in enterprises (Hämäläinen 2008).

- **Social protection**

Social protection and the inspection of working conditions are of paramount importance and these need to be grounded in an appropriate and comprehensive policy framework. While regulation needs to be updated to address the changing nature of work and the emerging risks linked to digitalisation and AI, other forms of policy (such as guidelines, sectoral agreements and standards) can also help employers clarify and implement good practice (Leka 2021).

A crucial issue is how to achieve a good balance between regulation and other types of policy in order to address new and emerging risks in new forms of work while not hindering rapid progress (Leka 2021). In terms of policy and practice, the increasing focus on psychosocial conditions in the workplace in national public health strategies is important and may also have the potential to reduce health inequalities (Bambra et al. 2009). The priority for regulators should be to address the challenges resulting from changes in work organisation which result in its intensification (i.e. requiring workers to do more in less time) or extensification (i.e. requiring workers to invest longer hours to earn their living) and from forms of employment that seem generally to be driven by a principle of flexibility favouring employers (in work schedules, in forms of employment, geographical location of work, etc.) that can have negative consequences for workers' health, safety and wellbeing (Lippel et al. 2017; Doki et al. 2018).

Pathways in the macro-theoretical framework of employment relations and the health inequalities arising from power relations, labour markets and welfare states explain the dimension of power over the labour market, its ensuing characteristics, such as labour regulations, collective bargaining and the power of trade unions (as discussed in sections 10.1.2 and 10.1.6), as well as the level of development of the welfare state itself; that is, the extent to which the state exerts its distributive power through the implementation of social policies. This global framework implies that workers' welfare depends on both the functioning of the labour market and the social protection policies implemented by the state, modifying social stratification and therefore social inequalities (EMCONET 2007).

- **Economic and trade policies**

Similarly, it is important to monitor and evaluate the impact of economic policies and trade agreements on health, safety and wellbeing, particularly since trade policies are complex and affect society and population health in both direct and indirect ways (Friel et al. 2015). The broad objective of macroeconomic policy is to contribute to economic and social wellbeing in an equitable and sustainable manner. Unemployment and underemployment are the main causes of poverty, so a critical task is to maintain the economy as close as possible to full employment. In

addition to active macroeconomic policies, countries that have achieved sustained economic growth have used a range of supportive policy interventions entailing a country-specific mix of trade, finance and investment policies, along with active labour market and social policies (UN 2012).

Decent work and employment not only contribute to an individual's sense of worth and wellbeing and ensure economic sustenance, but are also critical for national progress as they form the basis for a sustainable and just society. Improving the health and longevity of the poor is an end in itself, a fundamental goal of economic as well as human development, characterised by improvements in human wellbeing (Alkire 2002). The linkages of health to poverty reduction and to long-term economic growth are powerful and have been shown to be much stronger than had generally been understood (WHO and OHCHR 2008). The increasing integration of national economies into a world market involves major changes including a redistribution of work and the reorganisation and relocation of enterprises (Rantanen 2008), all of which can affect the health, safety and wellbeing of workers.

It is important to ensure that enterprises do not derive competitive advantage through cost-minimisation in the areas of health, safety and wellbeing (Stiglitz 2002) as this could lead to further increases in occupational diseases, including non-communicable diseases and work-related injuries, further propagating the poverty cycle. Poor working conditions are not only a symptom of poverty but are often also a cause of system inefficiency and a lack of product quality, resulting in an inability to compete in markets. Poor working conditions are therefore not only a social condition but are becoming a serious economic factor determining income and employment opportunities for poor and disadvantaged people (Herr and Muzira 2009). A lack of investment in good employment and working conditions and reduced working capacity of workers may cause economic loss of 10-20 per cent of gross national product while, globally, occupational deaths, diseases and illnesses account for an estimated loss of four per cent of gross domestic product (Takala et al. 2014).

Developing countries may find it hard to engender the capacity and contacts needed to take part in international investment or trade. The danger is that they may compete with each other to keep a small part of world trade by lowering wages and making other trade concessions (Bineau Montalbano 2011). The poverty cycle can only be broken by sustainable industrialisation and economic progress; however, despite the obvious connection between health, paid employment and poverty and its importance in the policy agenda given the link to Sustainable Development Goals, progress in promoting health, safety and wellbeing in industrialising countries has been painfully slow (Jain et al. 2018).

- **Education and environment**

Being prepared for the unexpected is crucial to ensure competitiveness and sustainability, and societies globally need to be ready to adapt to rapid technological development, climate change, global pandemics, demographic shifts and globalisation which, collectively, are transforming the world of work by affecting

who works, where and when, and how work is organised and managed. Forecasts on the future of work unequivocally highlight the importance of promoting wellbeing and sustainable work (ILO 2019). Sustainable work means achieving living and working conditions that support people in engaging in and remaining in work throughout an extended working life. This requires policy interventions that embrace education and lifelong learning (Eurofound 2021a). Lifelong learning is core to the concept of sustainable work and education is a key driver of wellbeing, as also identified in the OECD Learning Framework 2030 (OECD 2018). Effective education policies will be essential if individuals and societies are to minimise the risks and maximise the benefits of changes in the labour market (stemming from migration, climate change, etc.).

The OECD (2019a, 2019b) stresses that reaping the opportunities and addressing the challenges of the digital age requires narrowing the gap between technological developments and both public and organisational policies. Many policies are the legacy of the pre-digital era, and difficulties in understanding the changes underway and their implications may delay their review and adaptation. Such an understanding is imperative as digital transformation affects organisations, the entire economy and society (OECD 2019b). It is important to reiterate that it is not technology by itself that creates benefits or risks; it is, instead, how technology is implemented that creates negative or positive outcomes (EU-OSHA 2019). Managing transitions well and avoiding growing disparities can be achieved if effective and adequately resourced policies are put in place. The future of work will largely depend on the policy decisions that countries and organisations make (OECD 2019a).

Climate change and environmental degradation are also jeopardising future environmental and economic sustainability at global level, prompting urgent calls for a shift towards more sustainable development and greener economies, with ‘green jobs’ a key policy strategy to overcome the economic and ecological crisis. However, despite the importance ascribed to the green economy, OSH issues, including the psychosocial work environment, have only received limited attention. It is therefore important to assess both the traditional and the new OSH risks within green jobs in order to facilitate the transfer of OSH knowledge to green technologies while identifying OSH training needs (Valenti et al. 2016; Stanef-Puică et al. 2022; Kozar and Schulich 2023).

- **Labour policies**

The institutional and policy framework governing the labour market profoundly contributes to shape the quality of work at individual level. Jobs do not exist in a vacuum: social and employment policies provide workers with a range of benefits conditional on employment, such as in-work benefits for low-income families, unemployment and health insurance benefits, paid sick leave, pension rights, etc. Taking into account these aspects of employment quality is particularly important when undertaking international comparisons, as there are large differences between countries in the range of the employment-conditional benefits that are available and in the entitlement rights that employment and social policies provide to workers (OECD 2012, 2013).

A study examining heterogeneities in trends in working conditions by country groups defined by their amount of investment in labour market policy (LMP) programmes found that, for employees in countries with the least LMP spending, job strain increased by 10 per cent between 1995 to 2015 compared to a smaller, and insignificant, change in middle and high-LMP countries. The findings also indicate the vulnerable position of the least skilled workers and highlight the importance of LMP investments in buffering some of the adverse impacts of globalisation and technological changes and effectively improving the labour market situation of the least skilled (Rigó et al. 2022).

Such challenges are further compounded due to the inadequate enforcement of legislation as a result of poor resourcing, weak training and inefficiencies in enforcement systems, as well as bureaucracy and political interference in enforcement decisions (SLIC 2015).

- **Occupational safety and health**

Employment legislation, including OSH, and public health legislation place emphasis on prevention through tackling PSR and preventing stigma and discrimination. In addition, several other policy initiatives have been implemented across the world. Examples include strategies and campaigns, social dialogue initiatives including social partner agreements, action frameworks and guidance (EU-OSHA 2011; Leka et al. 2015). As discussed in Section 6, several efforts have been made both at policy and practice level to address PSR and mental ill health in the workplace.

Since health, safety and wellbeing at national or international level are relevant for socioeconomic policies, priority setting for the range of policies will always be influenced by factors such as:

- international trade agreements and the procurement policies (especially) of multinational organisations
- impact on the functioning of the labour market (e.g. access to the labour market)
- total productivity of the workforce, including the need to be more productive and innovative
- the need of an ageing population to work longer (later pensions) – implying the need for sustainable employability
- the 'burden of legislation' and the costs of compliance
- impact on the (rising costs) of healthcare
- potential contribution to social innovation and the impact of high quality jobs on national competitiveness
- the reduction of health inequalities
- the reduction of liability costs
- capabilities in the country or region (including risk awareness and understanding, knowledge, experts, services available, methods and tools available, etc.)

- the costs or investments needed and their expected economic benefits (including benefits for social security arrangements and the development of healthcare costs)
- the feasibility of interventions (sufficient support from social partners, business organisations and the general public)
- anticipation of future changes in the national economy (Jain et al. 2018).

Decisions in relation to the development of policies of relevance for health, safety and well-being are complex and the actors involved in the process represent different political, cultural and processual influences and, therefore in turn, have a differential impact on the decisions made when translating knowledge into policy and practice which address these issues. The development of comprehensive, integrated and coordinated initiatives targeted at managing psychosocial risk and promoting mental health at work requires consultations between the several stakeholders (both public and private) across sectors and user groups at national and supranational levels (Jain et al. 2018), as discussed further in Section 10.1.8.

10.1.7 Labour market dynamics

As discussed in previous sections, changes in employment conditions in the global economy over the past decades have had a significant impact on labour market dynamics leading to increased job insecurity and other psychosocial hazards which, in turn, play a role in creating and sustaining occupational health disparities. There is consistent evidence that workers in lower socioeconomic or social class positions are exposed to greater job insecurity and psychosocial hazards than workers in higher socioeconomic positions, while racial and ethnic minorities and immigrants are exposed to greater job insecurity (Landsbergis et al. 2014). Jolivet and Postel-Vinay (2020) have demonstrated the dynamic link between individual labour market trajectories (employment, wages, occupations) and mental health outcomes, which demonstrates the two-way interaction between work and (mental) health: ill health affects labour supply and, conversely, working in a psychologically taxing or stressful job affects future mental health. Changes in the distribution of occupations have also affected the aggregate non-pecuniary costs and benefits of working.

- **Full employment and unemployment**

Favourable employment conditions are crucial for people's social status and social identity, and threats to social status due to job instability or job loss affect health and wellbeing via several health-related behaviours and psycho-physiological changes (Siegrist et al. 2016). Shifting labour market dynamics can lead to increased unemployment, which is a stressful life event comprising the loss of both the latent and the manifest benefits associated with employment. This can be from financial limitation, stigma, reduced social connectedness and social support and disadvantages to social identity via damaging self-perception, as well as the absence of increases to self-esteem associated with a working life (e.g. productivity, goals and achievements, etc.) (Sumner and Gallagher 2017). It is well known that unemployment has an adverse health impact, as documented

by several epidemiological studies; for instance, unemployment increases the risk of heart disease and rates of depression (Dorling 2009; McKee-Ryan et al. 2005). The focus of policymakers has, therefore, been to create jobs and boost employment.

However, evidence also challenges the notion that any job is better than none, highlighting that it is important to pay attention to the quality of jobs available rather than any type of job or employment (Siegrist et al. 2016). Research indicates that facing unemployment does not always exert worse effects on mental health than staying in work and being exposed to poor working conditions. For example, in a longitudinal study, Butterworth and colleagues (2011) observed that the effects on mental health of jobs with very poor psychosocial work quality were no better, or even worse, than those attributed to unemployment.

- **Wages/adequate earnings**

Participation in (through various forms of employment) or exclusion from the labour market determines a wide range of life opportunities that are mainly mediated through regular wages and salaries. Material deprivation (e.g. in the case of unemployment or low skilled jobs) and feelings of unfair pay contribute to physical and mental ill health (Siegrist et al. 2016). In addition, exposure to physical, chemical, biological and ergonomic hazards at the workplace, being physically demanding or dangerous work, can adversely affect the health of working people. The same holds true for an adverse psychosocial work environment characterised by high demand and low control, an imbalance between effort spent and reward received, long or irregular work hours, shift work, prolonged sedentary work, experiences of discrimination and harassment, conflict at work, lack of support, and poor interpersonal relationships in the workplace (Leka and Jain 2010). Adverse economic impacts for workers, organisations and society can, in turn, also have further impacts on the health, safety and wellbeing of workers as well as having an influence in health and economic terms on society at large (Jain et al. 2018).

- **Precarious and informal employment**

Employment precariousness is a social determinant that affects the health of workers, families and communities. Increased awareness of this has been spearheaded by three main developments: the surge in 'flexible employment' and its associated erosion of workers' employment and working conditions since the mid-1970s; growing interest in the social determinants of health, including employment conditions; and the availability of new data and information systems (Benach et al. 2014). Precarious and atypical employment arrangements and non-standard working times are associated with a disadvantaged status in the labour market and with exposure to unsafe and hazardous working conditions. The potential consequences for workers' health are not just limited to precarious contracts; even permanent contracts can potentially pose a threat to workers' wellbeing due to the other 'atypical' features which they may possess (Eurofound 2017).

Precarious employment is closely related to various psychosocial factors such as job content, workload and work pace, work schedule (long/irregular working hours, shiftwork), job control, organisational culture and function, interpersonal relationships and support at work (Benach et al. 2013), all of which have a significant impact on health. Non-standard forms of employment are often related to job insecurity. Additionally, workers under these types of contracts are more vulnerable than permanent workers as they usually carry out the most hazardous jobs, work in poorer conditions and receive less OSH training that may increase the risk of occupational accidents (EU-OSHA 2013).

Research indicates that such types of employment tend to be associated with several health problems such as: distress, fatigue and musculoskeletal disorders (Benavides et al. 2006); poor self-perceived health, liver disease and mental disorders (Kim et al. 2008); and absenteeism and work-related stress (ILO 2016). The risks associated with temporary work have been found to include an increased occurrence of alcohol-related causes of death in both genders and an increase in smoking-related causes of death in men (Kivimäki et al. 2003). Mortality risks have also been found to be substantially stronger if temporary work is continued on an involuntary basis or in combination with feelings of dissatisfaction (EMCONET 2007).

- **Child labour, slavery and bonded labour**

Labour market dynamics result from the interplay between labour market and social policies which determine not only employment conditions such as precariousness or unemployment but also informal jobs, child labour or slavery which are closely related to problems such as having high insecurity, low paid jobs or working in hazardous conditions. These heavily influence health inequalities (Benach et al. 2013; ILO 2011).

Informal work (which is often unrecognised and, at best, less regulated) is heterogeneous and highly segmented by economic sector, workplace, social group and gender. Informal workers are offered little or no training, guidance or supervision, they have irregular working hours and improvised and precarious workplaces, alongside fewer opportunities to file complaints and, sometimes, the exploitation involved in child or forced labour (modern slavery). These lead to an increased likelihood of occupational accidents and hazardous exposures, culminating in diseases and/or incapacities (Schulte et al. 2022).

Modern slavery practices sit at the extreme end of a continuum of exploitation ranging from decent work to the most severe forms of exploitation. This is a criminal justice issue and a serious violation of people's fundamental human and labour rights (BSI 2022).

Furthermore, evidence indicates that, when children become workers, they are subject to many of the same psychosocial risks in the working environment as adult workers, but also to more specific risks due to the deprivation of childhood, schooling and education, family life conflict, poor interpersonal relationships at work and the highly adverse socioeconomic and family backgrounds that may

have compelled children to join the labour force in the first place and which are themselves a source of stress (ILO 2011).

- **Human-machine interaction**

As discussed in Section 10.1.4, the impact of technological change on jobs has become an increasingly important issue (Valenduc and Vendramin 2017). While new evidence suggests that mass unemployment due to digitalisation seems unlikely, there will be significant changes to the nature of tasks and how work itself is undertaken (OECD 2019a). It is expected that dynamically evolving technologies will render many workers' skills obsolete while placing a high premium on others, exacerbating the digital divide (Cedefop 2017, 2018). Over a ten year period (2006-16), employment rates in most OECD countries were on an upward trend, growing by nearly seven per cent (OECD 2019c) as digitalisation created jobs at a faster rate than those that were replaced, with greater opportunities opening up to participate in the labour market for many people who were formerly excluded. Four out of ten new jobs in the OECD are created in highly digital intensive sectors (OECD 2019b), although there are significant differences between countries around the world.

However, labour markets in most OECD countries have been polarising with substantial growth in the share of high-skilled occupations and some growth in low-skilled jobs, but a fall in the share of intermediate ones. Employment in the manufacturing sector in particular has been in long-term decline (shrinking by 20 per cent over the period 1995-2015) but, at the same time, the share of jobs in the service sector has been steadily rising (growing by 27 per cent over the same period) while in emerging economies there has been a substantial decline in the share of agricultural employment (OECD 2019a). Similar estimations have been made by European agencies (EU-OSHA, Eurofound, Cedefop) which have projected that the sectors with the largest potential rates of job losses in the future due to digitalisation are manufacturing, distributive trades, and administration and support services. The areas with the greatest potential for a growth in jobs are professional, scientific and technical activities, information and communications, and repair of computers and household goods, with knowledge intensive and professional sectors expected to see most activity taking place virtually (Cedefop 2019; EU-OSHA 2018; Eurofound 2020).

- **Skills development/employability**

The extent to which technological progress translates into a jobless society will depend on the effectiveness with which education and training reforms, combined with smart innovation and product and labour market regulation, will empower rather than disable individual skills and incomes (Cedefop 2018). Effective skills policies will be essential if individuals are to minimise the risks and maximise the benefits of changes in the labour market. In a context of shifting skills needs, adult learning can help prevent skills depreciation and obsolescence, facilitating transitions from declining jobs and sectors to expanding ones.

However, many adults do not have the right skills for emerging jobs and six out of ten lack basic ICT skills or have no computer experience (OECD 2019a). Evidence shows that, to keep up with digital developments, simply improving digital literacy is not enough (Cedefop 2017). The importance of the type/level of training needed might not be fully recognised by organisations or workers. Despite the high returns from training the low-skilled, organisations still provide more training to high-skilled workers (OECD 2019b), while employee-level data from the European Skills and Jobs Survey indicates that many EU workers believe that some of their skills will become outdated in the future (Cedefop 2020).

Policies and training initiatives often fail to reach those adults who are most at risk from the changes that lie ahead (OECD 2019a; WEF 2020). On average across OECD countries, participation in training by low-skilled adults – those who potentially need it the most as their jobs are at highest risk of being automated – is 40 percentage points below that of high-skilled adults. Similarly, workers whose jobs are at high risk of automation are 30 percentage points less likely to engage in adult learning than their peers in jobs with a lower risk. Even when the low-skilled and those in jobs at risk of automation participate in training, its low quality and limited relevance may be letting them down (OECD 2019a). Training provided by employers helps to motivate and reward employees, as well as to align their competences to the needs of the organisation. Training may also help to reduce income inequality and provide low-skilled workers with the skills needed to navigate the digital transformation. However, in all countries on average, %high-skilled workers have the highest incidence of training (almost 75 per cent), compared to the figures of almost 55% of medium-skilled workers and 40% of low-skilled workers who are engaging in training (OECD 2019c).

Age plays a key role in the context of continuous skill development, particularly when it overlaps with low skills, jobs at high risk of automation or in sectors undergoing structural change (Martin 2018). In countries with rapidly ageing populations, shortages of qualified labour may arise as the number of older workers retiring rises relative to the number of young people entering the labour market. These shortages may, in turn, lead to faster automation or stronger pressures to attract immigrant workers. Ageing will also have a direct impact on skills demands and the types of jobs available as consumption patterns shift and economies become more service oriented (OECD 2019a). Older adults are likely to experience significant skills obsolescence, particularly in the context of technological change, unless further training is available to upgrade what they learned in initial education. At the same time, incentives for adults to train and for employers to provide training opportunities tend to decline with age as there is less time to recoup the investment made before retirement (OECD 2017).

In some emerging economies, the challenge is to integrate into the workforce large numbers of young people with varying levels of education. The labour market experiences of many young people, in particular those with lower than tertiary education, have already worsened in several respects. The risk of non-employment and underemployment has increased over the past decade more for men than for women in most countries but still remains much higher for women. Women are also still more likely than men to be working in low-paid jobs and less likely to

be working in high paid ones. Failing to address these disparities will potentially result in a future of work with deeper social divisions, which could have negative ramifications for productivity, growth, wellbeing and social cohesion (OECD 2019a). It is anticipated that competition for high-skill workers will increase while displacement will mainly affect low-skill workers, continuing a trend that has exacerbated income inequality and reduced middle-wage jobs (Bughin et al. 2018).

- **Gig economy**

Finally, as discussed in Section 10.1.4, technological advancements have led to the rise of the gig economy which poses several challenges for the health of workers (OECD 2017). Bajwa and colleagues reviewed the literature, categorising gig worker vulnerabilities as occupational (connected to the work being performed), precarious (owing to the short-term, contingent nature of the work) and platform-based (particular to the way platform labour is structured). They found that gig workers share some vulnerabilities with other workers and which have important negative consequences for their health. Moreover, the platform-specific vulnerabilities of workers require further inquiry as they include worker misclassification, information asymmetries and the culture of surveillance (Bajwa et al. 2018). A systematic review by Bérastégui (2021: 5) provides further insight in this context, establishing that gig work generates challenges for workers in three broad areas:

- physical and social isolation: tasks are performed individually, without contact with, but often in competition with, fellow workers, thereby resulting in a lack of workplace social support, a blurring of boundaries between work and personal life and difficulties in establishing a consistent professional identity
- algorithmic management and digital surveillance: constant monitoring and automated managerial techniques contribute to an increasingly hectic pace of work, a lack of trust towards the platform and pronounced power asymmetries limiting workers' opportunities to develop effective forms of internal voice
- work transience and boundaryless careers: gig work is based on short-term assignments providing work only for a limited period of time; thus, gig workers experience persistent feelings of job insecurity and engage in forms of emotional labour to preserve employability.

European Commission (2021c) and European Parliament (2017) studies argue that platform workers who provide services using global profit-oriented platforms face high risks of precarious working conditions, irrespective of their employment status. EU-OSHA (2022) and STAMI (2020) identified the key psychosocial risks in platform work as excessive workload, time pressure, long working hours, a blurring of the boundaries between work and personal time and spaces, isolation, bullying and cyber-bullying, verbal abuse and harassment, high emotional demand, lack of control and job insecurity. A recent analysis by Piasna for the ETUI (2024) on job quality and digitalisation reveals that the effects of computerised systems on work include more unpredictable, hectic and intense work rhythms, as well as

the encroachment of paid work beyond its boundaries, longer working hours and poorer work-life balance.

Bucher and colleagues (2021) investigated the practices that workers develop to comply with the (assumed) mechanisms of algorithmic management on digital work platforms. They found that workers adopt direct and indirect 'anticipatory compliance practices', such as undervaluing their own work, staying under the radar, curtailing their outreach to clients and keeping emotions in check in order to ensure their continued participation on the platform, which takes on the role of a shadow employer. The review by Vignola et al. (2023) concluded that algorithmic management is likely to influence several dimensions of job quality with known links to worker health including workload, income security, task significance, schedule stability, socioemotional rewards, interpersonal relations, decision authority and organisational trust. Algorithmic management tools can create significant job-related psychosocial stressors (e.g. pressure to increase earnings and app-related pressures to realise delivery targets) and may cause increased work pace and long work hours which, in turn, can lead workers to cut corners and forego basic health and safety protections while increasing fatigue and other risk factors in work-related injuries (such as the likelihood of collisions, skipped toilet breaks and other health risks). Workers' negative reactions to algorithmic control are likely to exceed their positive reactions, especially when related to workers' sense of autonomy, the power imbalances created by information asymmetry and the perceived opacity and unfairness of algorithmic decision-making. However, the authors conclude that such negative outcomes are not inevitable and that algorithms can be designed and implemented in ways that might balance organisational needs with worker needs, especially when carried out with worker input.

Several studies have focused on technostress. Five techno-stressors have been reported in the literature: techno-overload (technology forces workers to work more and faster); techno-invasion (invasion of private life due to technology that creates pressures for constant connectivity); techno-complexity (technology is complex, leading to a sense of lack with regard to computer skills); techno-insecurity (workers feel threatened about losing their jobs because of new technologies); and techno-uncertainty (constant technological changes that may create stress for workers) (Ragu-Nathan et al. 2008; Tarafdar et al. 2007). In their systematic review, Berg-Beckhoff and colleagues (2018) examined the associations between ICT use and both stress and burnout, finding a trend towards positive associations between technostress and burnout across different study designs.

There have been studies showing that ICT could act both as a job demand and a job resource. As a job demand, ICT can cause technostress and negatively affect employees' physical and psychological wellbeing through factors such as response expectations, employee monitoring and over-involvement in ICT-related activities. However, when framed and communicated by organisations as a source of employee empowerment, ICT can also act as a job resource, promoting techno-work engagement, satisfaction and performance, as well as improving work-life integration. For example, Pansini et al. (2023) conducted a systematic literature review on technostress from the job demands resources perspective. They found

that technostress can lead to decreased job satisfaction, increased burnout and decreased wellbeing in employees. However, they also identified some positive outcomes of technological advance in terms of increased efficiency and productivity, improved communication and collaboration, and enhanced learning and knowledge acquisition. These can result in higher job satisfaction and a sense of accomplishment.

Finally, Berx et al. (2022) sought to identify and classify the risk factors in human-robot collaboration through a systematic review. They found a high prevalence of PSR, including trust issues and a lack of control, associated with human error, work-related stress, cognitive load and loss of situation awareness.

10.1.8 Occupational safety and health infrastructure

Infrastructure in relation to occupational safety and health is an important determinant of OSH standards including a healthy psychosocial work environment. Key issues in relation to OSH infrastructure are OSH enforcement and labour inspection of work-related PSR, the role of occupational health services, and education and competencies in work-related PSR among key stakeholders. These are examined in turn in the rest of this subsection.

- **OSH enforcement and work-related PSR**

As mentioned earlier, SLIC has developed tools for inspectors in Europe and conducted an awareness campaign in 2012, noting that some countries had never inspected psychosocial risks before that campaign (SLIC 2012). The tools and guidance are now available in several languages (SLIC 2018).

Few systematic reviews have been conducted in the area of labour inspection. Three have focused on the impact of labour inspections in terms of injuries and occupational diseases (MacEachen et al. 2016; Tompa et al. 2016; Mischke et al. 2013) while one focused specifically on labour inspections and the prevention of work-related PSR. MacEachen et al. (2016) report evidence from Canada on regulatory ambiguity and a lack of training of inspectors on PSR and mental health, resulting in them avoiding pursuing relevant claims. Similarly, inspectors in Australia were found to avoid psychological harm cases, despite an inspectorate which prioritised bullying and harassment, reporting that psychological harm cases were problematic because they involved heavy reliance on verbal evidence and were difficult to verify and link clearly to OSH. In addition, workers fearing reprisals were reluctant to give evidence or talk to inspectors. A more recent study by Potter et al. (2019) found that inspectors in Australia lacked confidence in dealing with psychosocial risks, while another study, also from Australia (Popple et al. 2023), found that psychosocial hazards were less likely to be actioned than non-psychosocial hazards and, when they were, they saw more inspector activity but fewer enforcement notices.

Weissbrodt and Giauque (2017) conducted a systematic literature review of labour inspection of PSR using realist synthesis and found positive outcomes in four

cases, possibly positive ones in two, mixed outcomes in another four and no or only poor effects in no fewer than ten. In terms of the focus of inspector activities, dialogue between inspectors and employers, employees, staff representatives or social partners was most frequently mentioned, with inspectors disseminating information to create a positive dynamic. Enlightenment was also reported, aimed at educating, building capacity and promoting voluntary compliance through advice, guidance, tools and consultant-based support. Frequently, inspectors audited systems, such as OSH management system implementation, and required risk assessments to be carried out. Johnstone et al. (2011) refer to the concept of responsive regulation, according to which inspectors tailor their responses to the ability of an employer to self-regulate, especially in the case of PSR. Finally, inspectors may often focus on specific psychosocial issues (such as bullying) and tend to concentrate on particular symptoms rather than on their generative context.

The SLIC findings agree with these and indicate that traditional inspection methods may not be suitable in the case of PSR, but rather that inspectorates should raise awareness, educate, challenge and advise organisations, and promote partnership beyond formal consultation (SLIC 2012). Inspectors could contribute to change processes to attain long-term improvements where they have the right level of resources and time to do so. Furthermore, several studies recommend more precise legislation and clear duties to enable inspectors to act more effectively. Similarly, an evolution of inspectors' role and competencies has been deemed necessary and the provision of more training in assessing and preventing psychosocial risks and in the use of the relevant tools (SLIC 2018).

It is also interesting to note a recent study by Finnanger Garshol et al. (2022) which was a cluster randomised controlled trial examining the effects of the labour inspectorate's regulatory tools on psychosocial and biomechanical work factors in Norwegian homecare services. Labour inspections did not affect psychosocial and biomechanical work factors in the home care services, although a favourable effect was observed of a guidance intervention on psychosocial work factors, this was not evident after adjusting for multiple testing. The authors suggest a need to design inspection protocols and guidance through workshop sessions that more carefully emphasise psychosocial and biomechanical work exposures.

In a report on perspectives on the OSH challenges and opportunities for Nordic labour inspectorates in the future (Mattila-Wiro et al. 2020), several challenges are identified and recommendations made for the work of the inspectorates, as follows:

- develop and evaluate new methods and legal frameworks for inspectors to assess web-based work, including work organised through a digital interface, for example video-based real time inspections and guidance
- use new technology (virtual reality, video and drone technology) to enhance the competence, efficiency and impact of labour inspections as well as the safety and health of inspectors

- enhance the utilisation of new technologies such as machine learning, big data and geographical information systems to target businesses for risk-based inspections
- increase the visibility of labour inspectorates on digital forums and social media by providing tools, resources and training to inspectors in online communication
- utilise social media influencers to communicate OSH messages effectively
- consider strategic collaboration between labour inspectorates and agencies of data protection, environment, food hygiene, emergency preparedness and public health on issues related to the future of work and OSH
- strengthen research institutions by supporting funds for future of work and OSH projects that would yield knowledge for labour inspectorates' policy and practice.

- Occupational health services and work-related PSR

The development and enhancement of occupational health services at national level is central to ensuring the sustainable health, wellbeing and work engagement of the working population. However, due to differences in national health, social security and occupational safety and health systems, the content, capacity, coverage and provisions of OHS vary considerably across national contexts. Research highlights that, while many countries across the world have drawn up policies, strategies and programmes for OHS, there are gaps in the implementation, capacity and coverage of such provisions. Infrastructures and institutional and human resources for the implementation of strategies remain insufficient in the majority of countries (implementation gap); the estimated coverage of services is low, with only a quarter of the total global employed population having access to OHS (coverage gap); and, while the content and multidisciplinary nature of OHS corresponds to international guidance, the coverage, comprehensiveness and content of services remain largely incomplete due to a lack of infrastructure and the shortage of multi-professional human resources (capacity gap) (Rantanen et al. 2017).

No systematic literature review studies were identified that focused specifically on occupational health services and PSR. However, one recent paper discussed a comparative case study analysis across 12 industrialised countries on the role of OHS in psychosocial risk management and the promotion of mental health and wellbeing at work (Jain et al. 2021). The findings from this study highlight that, while most countries reviewed have laws governing the provision of OHS, the structure of the legislation, its content and the workers covered by it vary widely. Similarly, in most countries included in the study, mental health and psychosocial risks in the workplace have been recognised as priorities in occupational health and safety, while a number of hard and soft law policies of relevance have been developed over the years that have promoted awareness and action among the social partners, organisations and, indeed, individual workers. However, there are still significant gaps in terms of implementation, capacity and the coverage of these provisions, as well as a lack of integration of multi-disciplinary OHS provision with others relating to the management of psychosocial risks and the promotion of mental health (Jain et al. 2021).

- Education and competencies in work-related PSR

Several studies have focused on the competencies of key stakeholders such as labour inspectors, occupational health service personnel and OSH professionals and practitioners. The issue of labour inspectors' competence on PSR has been raised repeatedly in the literature. For example, Jespersen et al. (2016) argue that PSR resemble 'wicked problems', characterised by unclear cause-effect relationships and uncertain solutions due to their complexity, uncertainty, value and power divergences. They suggest that inspectors and auditors need to possess qualifications and knowledge of psychosocial risks, health consequences and related preventive measures, organisation and management skills, contextual knowledge of the sectors and type of work, and facilitation skills in order to ensure a confident interview situation as well as dialogue about the results of the assessment.

The ILO has recently developed a Curriculum on Building Modern and Effective Labour Inspection Systems that includes two modules on psychosocial risks: module 14 - 'Ensuring compliance with legislation on psychosocial risks'; and module 15 – 'Inspection actions to deal with psychosocial risks' (ILO 2022b). The ILO curriculum also includes modules on dealing with vulnerable groups, cooperation and partnership, non-discrimination and using soft skills. Together with the SLIC (2018) materials, there is now a very good basis for the training of labour inspectors.

The review of national case studies of occupational health services in 12 industrialised countries referred to just previously (Jain et al. 2021) found that, in most countries, there are intentions to develop the competencies of occupational health professionals and to increase the level of multidisciplinarity. However, the medical professions are predominant in most countries and the focus has generally been on the provision of curative services rather than on preventive action. Where multidisciplinary services are found, their composition tends to vary greatly and, among these additional specialists, the training of occupational health nurses, psychologists and other experts has not received the same level of national attention as that of occupational physicians. The study concludes that, currently, PSR and mental health at work are not addressed sufficiently well by OHS and there is a lack of focus on prevention.

Pryor et al. (2019) discuss the development of a global framework for OSH professional practice. However, they state that, due to variations in OSH maturity across countries and in approaches to managing occupational health, psychosocial hazards had not been prioritised in this framework. A recent review by the ILO (2023) focused on the qualifications systems of OSH professionals at workplace level in selected countries. The review identified key emerging challenges through interviews with OSH experts, including the management of psychosocial risks, the changing world of work and job design (such as the gig economy and telework) and the introduction of new technologies with unknown risks. The experts highlighted that psychosocial hazard identification and management have traditionally been excluded from OSH professionals' skill sets, but that this is changing due in part to the Covid-19 pandemic. The findings also question whether OSH professionals

are sufficiently qualified or have enough confidence to deal with psychosocial risks in the workplace and suggest that greater specificity is needed in legislation on psychosocial topics to ensure consistency across training programmes. The changing world of work also poses challenges for OSH professionals as they will need to adapt to new ways of working and new types of workers such as gig economy workers. Additionally, emerging technologies and public health emergencies are concerns for OSH professionals as they will need quickly to identify and manage new hazards as they arise.

Finally, Ertel et al. (2010) and Iavicoli et al. (2011) argue that various stakeholder perceptions of PSR at work, including those of social partners and policymakers, require attention through training and awareness raising efforts. OSH experts and practitioners need to be trained on the nature, impact and management of PSR and work-related stress, and health and prevention services must take a wider multidisciplinary approach.

The previous subsections have provided an overview of the macro context and the effects it has on the nature of work, the work environment and the workforce. As outlined, this includes several impacts in relation to the psychosocial work environment and mental health and wellbeing at work. The discussion of the various aspects of the macro context addressed the aim of this project to describe and discuss sources of impact on the psychosocial work environment and health and well-being at macro level. These were incorporated in the expanded conceptual framework presented earlier. This report now turns to the review of taxonomies on the psychosocial work environment and describe how findings of their analysis have been incorporated into the development of the conceptual framework.

10.2 Psychosocial work environment

The review of existing taxonomies on the psychosocial work environment included those that are found in key theoretical models and relevant instruments, and those that are found in key guidance documents. The outcomes of each of these reviews are explored successively in the following two subsections.

10.2.1 Review of psychosocial work environment taxonomies included in key theoretical models and relevant instruments

Table 4 presents the psychosocial work environment taxonomies that are found in key theoretical models.

Table 4 **Psychosocial work environment taxonomies in theoretical models**

Theory	Taxonomy
Cooper and Marshall's Occupational Stress model (1976)	Sources of stress in terms of those intrinsic to the job (e.g. workload, work pace, task design), role in the organisation, relationships at work, career development, organisational structure and climate, and the home-work interface
Job Demand-Control (Support) (JDC(S)) theory (Karasek 1979; Johnson and Hall 1988)	Psychological demands: workload, time pressure and role conflict Job control: decision authority (worker's ability to make decisions about their job or decision latitude) and skill discretion (the breadth of skills used by the worker on the job) Social support (from the organisation, manager and co-workers)
Transactional models (Cox 1978; Cox and Mackay 1985; Cox and Griffiths 1995) and PRIMA-EF (Leka and Cox 2008; Leka et al. 2008)	Organisational culture and function, job content (or task design), workload and work pace, work schedule, control, environment and equipment (refers to the physical work environment), interpersonal relationships at work, role in organisation, career development, home-work interface
Vitamin model (Warr 1987)	Job autonomy, job demands, social support, skill utilisation, skill variety, task feedback, salary, safety, task significance
Effort-Reward Imbalance model (Siegrist 1996)	Effort: quantitative demands, qualitative demands, physical demands Reward: esteem reward, career reward (salary and promotion prospects) and job security
Job Demands Resources model (Demerouti et al. 2001)	Job demands: quantitative (work overload, work underload, pace of change), qualitative (emotional, physical, mental home-work conflict), organisational (negative change, bureaucracy, harassment, role conflict, interpersonal conflict) Job resources: work (job control, person-job fit, task variety, participation in decision-making, use of skills, availability of tools), organisational (communication alignment, trust in leadership, organisational justice, fair pay, value congruence), developmental (performance feedback, possibilities for learning and development, career perspective), social (supervisor support, co-worker support, team atmosphere, team effectiveness, role clarity, fulfilment of expectations, recognition) Engaged leadership is also recognised separately as an important overarching factor
Psychosocial Safety Climate theory (Dollard and Bakker 2010)	Management commitment to stress prevention, management priority for psychological health vs productivity concerns, organisational communication about psychological health issues, and organisational participation and involvement in relation to protecting worker psychological health

The analysis of key grey literature reports and guidance documents highlighted that the most widely used taxonomy is by Cox (1993) and Cox and Cox (1993). This has been used, for example, by Safework Australia (2022), EU-OSHA in several reports (e.g. 2000), SLIC (2012, 2018), WHO (2003, 2022) and ILO (2016, 2022b), among others. It was also adapted in the PRIMA-EF guidance (Leka and Cox 2008; Leka et al. 2008), which was then incorporated in the first standard in the area of psychosocial risk management, developed in the UK in 2011, PAS1010 (BSI 2011). Later, it was further adapted by Leka et al. (2017) to show not only the key dimensions of the psychosocial work environment and associated psychosocial hazards but also what a healthy psychosocial work environment would look like (see Table 5). This updated version was incorporated in guidance on how to develop a healthy workplace by ISSA (2023). This updated taxonomy also incorporates PSC.

Table 5 **Conceptualisation of negative and positive psychosocial work environment**

Dimensions	Negative psychosocial work environment (psychosocial hazards)	Positive psychosocial work environment
Organisational culture & function	Poor psychosocial safety climate, poor communication, low levels of support for problem solving and personal development, lack of definition of or agreement on organisational objectives	Good psychosocial safety climate, clear organisational objectives, appropriate support for problem solving and personal development, good communication processes
Job content	Lack of variety or short work cycles, fragmented or meaningless work, underuse of skills, high uncertainty, continuous exposure to people through work	Meaningful work, appropriate use of skills, work retaining employee interest and engagement, appropriate support
Workload & work pace	Work overload or underload, machine pacing, high levels of time pressure, continually being subject to deadlines	Appropriate level of workload, appropriate work pace, sensible and achievable deadlines
Work schedule	Shift working (especially irregular), night shifts, inflexible work schedules, unpredictable hours, long or unsociable hours	Sensible shifts and reasonable working hours to maintain work-life balance, flexible working practices
Control	Low participation in decision-making, lack of control over workload pacing, shift working	Participation in decision-making, control at work
Environment & equipment	Inadequate equipment availability, suitability or maintenance, poor environmental conditions such as lack of space, poor lighting, excessive noise	Good physical working conditions according to good practice guidance
Interpersonal relationships at work	Social or physical isolation, poor relationships with superiors, interpersonal conflict, lack of social support, harassment, violence	Good relationships at work, teamwork, social support, appropriate policies and procedures to deal with conflicts
Role in organisation	Role ambiguity, role conflict, responsibility for people	Clear roles and responsibilities, appropriate support to meet objectives
Career development	Career stagnation and uncertainty, under-promotion or over-promotion, poor pay, job insecurity, low social value to work	Appropriate career prospects & development matching skills & performance, effort reward balance, valuable/meaningful work, job security
Home-work interface	Conflicting demands of work and home, low support at home, dual career problems	Work-life balance, supportive organisational policies and practices to achieve 'life balance'

Source: Leka et al. 2017.

Furthermore, two more recent papers were identified that review and discuss psychosocial work environment taxonomies.

The first by Wiegand et al. (2012) described the process employed by the US National Institute for Occupational Safety and Health (NIOSH) to ensure its officers are using the most appropriate tools for identifying stressors in their services. This involved assembling a panel of eight experts in occupational health psychology to perform a content analysis of the existing job stress literature and to recommend constructs and measures that are appropriate and practical for measuring stress-related factors in a variety of work contexts. The main taxonomies used by the panel were those by Beehr and Newman (1978), Hurrell and McLaney (1988) and the NIOSH Quality of Worklife Questionnaire. At the end of the panel session, 22 constructs were selected which included: job demands, job control, meaningful work, perceptions of risk (physical environment), predictability of work, responsibility for others, role demands, utilisation of skills, job insecurity,

organisational constraints (lack of equipment), organisational justice, perceived organisational support, trust in management, safety climate, violation of psychological contract, cohesiveness (cooperation and sense of belonging), harassment and discrimination, inclusion/exclusion, interpersonal conflict, social undermining, workplace incivility and work-family conflict.

The second paper by Kop et al. offered a comparative content analysis of 17 psychosocial work environment theories, aiming to provide a taxonomy of the 'work environment characteristics involved in psychosocial risks' (Kop et al: 138, 2016). To develop their taxonomy, they first extracted the work environment characteristics identified in these 17 models and phrased them in a neutral way (i.e. psychosocial factors). The resulting taxonomy was composed of 53 categories divided into five hierarchical levels as follows:

I. Physical environment: (1) Physical characteristics: (a) noise; (b) light; (c) temperature; (d) air; (e) smell; (f) radiation; (g) vibration; (h) chemical/biological agents; (i) other hazards. (2) Working rooms: (a) furnishing/ergonomics; (b) aesthetics/hygiene. (3) Resources – equipment.

II. Social environment: (1) Range of relationships. (2) Quality of relationships: (a) colleagues; (b) superiors; (c) subordinates; (d) persons outside work (customer, provider, etc.). (3) Social support: (a) instrumental: (i) colleagues; (ii) superiors; (b) emotional: (i) colleagues; (ii) superiors.

III. Work activity: (1) Work content: (a) responsibilities: (i) for persons; (ii) for equipment; (b) variety; (c) interest; (d) meaning. (2) Demands: (a) physical; (b) cognitive; (c) emotional. (3) Appropriateness of demands: (a) quantitative (workload); (b) qualitative (type of skills).

IV. Activity management: (1) Assigned role: (a) clarity; (b) coherence: (i) of work requirements; (ii) of status. (2) Feedback. (3) Autonomy – control: (a) decision latitude; (b) dependence: (i) of pace; (ii) interruptions; (iii) of other persons. (4) Time-related pressure – urgency.

V. Organisational context: (1) Time-based organisation: (a) schedule; (b) hours. (2) Human resources management: (a) career; (b) salary; (c) skills development; (d) work assessment; (e) management style. (3) Perceived fairness. (4) Involvement in decision-making. (5) Organisational climate. (6) Organisational communication. (7) Prospective: (a) job security; (b) changes – restructuring.

They then analysed the content of 17 of the 19 questionnaires available in English and listed in Tabanelli et al. (2008) that were accessible, concluding that none exhaustively assessed work environment characteristics and that they differed widely in their approach.

The work by these authors is commendable in attempting to synthesise various theoretical models. However, there are a few issues in their approach.

First, they refer readers to one of their earlier papers (Althaus et al. 2013) for an explanation of how they derived their taxonomy on the basis of a theoretical review. However, in reviewing that paper the analysis presented is conceptual and does not include the taxonomy level. Therefore, it is not possible to assess the validity of this analysis and how it led to the development of the taxonomy they present in their second paper.

Second, they state that they excluded certain theories. For example, they excluded the transactional model by Cox and Mackay (1985) as it did not include a taxonomy. They later refer to the PRIMA-EF taxonomy and state that it is unclear where it came from, when this was originally developed by Cox (1993) on the basis of the transactional model by the same author, as explained earlier. Therefore, there is evidence that the inclusion criteria for the theoretical analysis are not always reliable.

Third, their taxonomy depicts five hierarchical levels with some only applying to three of the five major areas of the work environment they identify. Therefore, while it is clear that these are hierarchical levels, this taxonomy is more complex than others which might not be useful in terms of practicality and especially for purposes other than research.

The authors further state that their taxonomy includes aspects covered in many other taxonomies and that the aim of their paper is to assess to what extent widely used instruments measure various aspects of theoretical models. They find major discrepancies depending on theoretical perspective and conclude that no instrument covers all the work environment characteristics identified in their taxonomy. Therefore, the authors advise readers to choose carefully and on the basis of the purpose of the assessment they wish to carry out. This is indeed a valid point, and one which is already asserted in principles of good practice in psychosocial risk management since instruments that operationalise specific theoretical models could be expected to differ in content, as discussed earlier in this report.

Although not directly relevant to psychosocial work environment taxonomies, it is worth mentioning a study by Lindberg and Vingard (2012) which was a systematic review of indicators of healthy work environments. Nine factors considered as important for a healthy workplace were identified including collaboration/teamwork, growth and development of the individual, recognition, employee involvement, being a positive, accessible and fair leader, autonomy and empowerment, appropriate staffing, skilled communication, and safe physical work. All of these factors also represent aspects of a healthy psychosocial work environment, as discussed in the last section of this report.

Scientific studies on the psychosocial work environment use instruments that have operationalised theoretical domains such as job demands, job resources, effort and reward (see Table 2). For example, the JCQ (1985), which is underpinned by the Job Demand-Control-Support model, measures job characteristics (job insecurity, skill discretion), job demands (psychological demands, physical demands), job control (decision authority, decision latitude) and social support

(supervisor social support, co-worker social support). FPSICO (2022) includes seven broad categories: mental (work) load, temporal autonomy, content of the task, supervision and participation, role definition, interest for the employee, and personal relationships. The Job Diagnostic Survey (1974) refers to job dimensions such as skill variety, task identity, task significance autonomy, feedback from the job itself, feedback from agents, dealing with others and psychological states (e.g. meaningfulness from work, responsibility for work and knowledge of the results). In the Australian Workplace Barometer (2009) we find reference to psychological demands, physical demands, emotional demands, organisational change, psychosocial safety climate which includes corporate climate, organisational commitment, organisational participation (employee participation and consultation), management prioritisation and commitment, skill discretion, decision authority, macro-decision latitude, supervisor social support, co-worker social support, recovery, organisational justice and organisational rewards. COPSOQ also includes several of these and additional dimensions (see Table 2).

These operationalisations of the psychosocial work environment vary conceptually. Some instruments include scales that measure psychosocial factors (e.g. role definition) while others measure psychosocial hazards (e.g. job insecurity) or there is a combination of both. Reviews of taxonomies included in scientific instruments can be found in Tabanelli et al. (2008), WHO (2010), Potter et al. (2016), ILO (2016) and Kop et al. (2016). A recent paper by Oakman et al. (2022) also reviews 26 instruments for the identification of workplace physical and psychosocial hazards, four of which are discussed in detail, and in line with the conclusions of previous studies (see also Table A5).

It is also important to note that the PSC dimensions differ to those of other models since, theoretically, it is a different construct that is determined by organisational policies, practices and procedures for the protection of workers' psychological health and safety. It also aligns with the key OSH policy principles of management commitment to OSH, management prioritisation of OSH in business decision-making, organisational communication on OSH and employee consultation and participation (Leka et al. 2023). However, similar constructs,such as safety climate, are included in some taxonomies (e.g. Wiegand et al. 2012) while, in the Leka et al. (2017) taxonomy, PSC has been incorporated as an indicator of organisational culture.

10.2.2 Review of psychosocial work environment taxonomies included in key guidance documents

In addition to the review of taxonomies included in key theoretical models, we also conducted a review of the taxonomies found in key reports and guidance documents. This is presented in Table 6.

Table 6 **Psychosocial work environment taxonomies in guidance documents**

Psychosocial factors at work: recognition and control (ILO 1986)	Physical work environment, factors intrinsic to the job (workload, work pace), working time arrangement, management and operating practices in the enterprise (worker's role, worker participation, relationships at work, implementation of changes), technological changes (industrialisation and associated lack of training/skills, automation, computerisation) and other factors (unemployment, underemployment, insecure employment)
ISO 10075-1:2017 Ergonomic principles related to mental workload (ISO 2017)	Classifies four main categories of sources of job demands, including task requirements (job content and control, workload, work schedule), work equipment (work equipment, ergonomic workplace facilities), physical work environment (lightning, noise, climate conditions, vibration, weather conditions, smell), social factors (relationships, e.g. among colleagues or between employees and superior, team structures, social contacts, e.g. customer relations and conflicts) and organisational factors (cultural standards, structure of communication, organisational principles, leadership style)
National Standard of Canada for Psychological Health and Safety in the Workplace (CSA 2013)	Specifies the following factors to assess in relation to psychological health and safety: psychological support, organisational culture, clear leadership and expectations, civility and respect, psychological job demands, growth and development, recognition and reward, involvement and influence, workload management, engagement, work/life balance, psychological protection from violence, bullying and harassment, protection of physical safety and other chronic stressors as identified by workers
A Consensus Method for Updating Psychosocial Measures Used in NIOSH Health Hazard Evaluations (Wiegand et al. 2012)	Job demands, job control, meaningful work, perceptions of risk (physical environment), predictability of work, responsibility for others, role demands, utilisation of skills, job insecurity, organisational constraints (lack of equipment), organisational justice, perceived organisational support, trust in management, safety climate, violation of psychological contract, cohesiveness (cooperation and sense of belonging), harassment and discrimination, inclusion/exclusion, interpersonal conflict, social undermining, workplace incivility and work-family conflict
National guidance on work-related psychological health and safety (Safe Work Australia 2019), **Code of Practice on Management of Psychosocial Hazards at Work** (Safe Work NSW Australia 2021)	Low job control, poor support, lack of role clarity, poor organisational change management, inadequate reward and recognition, poor organisational justice, traumatic events or material, remote or isolated work, poor physical environment, violence and aggression, bullying and harassment including sexual harassment, harmful behaviour that does not amount to bullying (such as single instances), conflict or poor workplace relationships and interactions
ISO 45003:2021 Occupational health and safety management – Psychological health and safety at work – Guidelines for managing psychosocial risks (ISO 2021)	Aspects of how work is organised (roles and expectations, job control or autonomy, job demands, organisational change management, remote and isolated work, workload and work pace, working hours and schedule, job security, precarious work), social factors at work (interpersonal relationships, leadership, organisational/workgroup culture, recognition and reward, career development, support, supervision, civility and respect, work-life balance, violence at work, harassment, bullying and victimisation) and work environment equipment and hazardous tasks
Safe Work Australia (2022) **EU-OSHA** (e.g. 2000) **WHO** (2003, 2008, 2022) **BSI** (2011): PAS1010 **SLIC** (2012, 2018) **ILO** (2012, 2016, 2020, 2022b, 2024a)	Cox (1993), Cox and Cox (1993): organisational culture and function, job content (or task design), workload and work pace, work schedule, control, environment and equipment (refers to the physical work environment), interpersonal relationships at work, role in organisation, career development, home-work interface
ISSA (2023)	Leka et al. (2017): also depicts positive psychosocial work environment

It should be noted that one of the modules included in the ILO Curriculum on 'Building Modern and Effective Labour Inspection Systems', Module 15 on 'Ensuring compliance with legislation on psychosocial risks' (ILO 2022b), includes a mapping of the Cox (1993) and ISO 45003 psychosocial hazard taxonomies. Additionally, it is worth mentioning that many psychosocial factors are identified as key aspects of work and employment quality by the OECD (2013, 2017); for example, working hours, job security, workplace relationships and career advancement.

Some observations can be made on the taxonomies presented in these reports and guidance documents. In ISO 45003 it can be observed that, while most of the examples included refer to psychosocial factors, others are conceptually distinct and represent psychosocial hazards (e.g. remote and isolated work, violence at work, harassment, bullying and victimisation), and that they are also included as examples of psychosocial hazards under interpersonal relationships.

In the literature we also frequently find the term 'psychosocial risk factor'. Here, it should be noted that, in some languages, the word used for hazard and risk is the same (e.g. in Danish) and therefore, psychosocial risk factors refer to psychosocial hazards. Specific examples of psychosocial hazards are included in several taxonomies. For example, on its website,[8] NIOSH defines psychosocial hazards as factors in the work environment that can cause stress, strain or interpersonal problems for the worker, while the taxonomy it provides includes aspects of work organisation such as management and supervisory practices, job factors, organisational factors and poor safety climate, shiftwork, long working hours, fatigue, violence, bullying and incivility. In this NIOSH description, we find a mix of psychosocial factors (e.g. work-life balance), psychosocial hazards (e.g. bullying) and outcomes (e.g. fatigue) which is contrary to the taxonomy presented by Wiegand et al. (2012).

In the Canadian standard (2013) on psychological health and safety in the workplace, we also see a mix between dimensions of the psychosocial work environment (e.g. organisational culture, recognition and reward, work/life balance), and outcomes of exposure to the psychosocial factors such as engagement.

Finally, it is important to note that factors associated with new technologies, digitalisation, new forms of work and the environment (in terms of both security and climate change), discussed earlier, are not explicitly identified in many of the instruments and taxonomies, or there is limited reference to them when examples are provided of psychosocial hazards. For example, there is reference to technological changes, industrialisation and associated lack of training/skills, automation and computerisation in the ILO 1986 guidance. ISO 45003 includes working in unstable environments such as conflict zones, while Safe Work Australia (2022) incorporates traumatic events including exposure to natural disasters or seriously injured or deceased persons.

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8. https://www.cdc.gov/niosh/learning/safetyculturehc/module-2/8.html

10.2.3 Conclusions

This review of taxonomies presented on the basis of the grey and scientific literature allows for some key conclusions to be drawn.

First, there is a difference between the taxonomies of psychosocial factors and their associated hazards and theoretical domains. Theoretical domains such as job demands, job resources, effort and reward have been operationalised in different ways in various instruments and measure various psychosocial factors and/or psychosocial hazards. While theoretical domains aim to depict key constructs in terms of the psychosocial work environment in an economic way, more detail is needed to capture the nature of work and psychosocial working conditions in various contexts and work environments in order to improve organisational practices.

Second, some taxonomies list psychosocial factors while others list psychosocial hazards. In some cases there is a mix of the two while, in others, there is a mix of factors and outcomes. This can result in confusion among key stakeholders including employers, trade unions and policymakers who need clarity to implement good practice.

Third, most theoretical models (and, as a result, scientific studies) focus on psychosocial hazards and there has been less focus on the positive characteristics of the psychosocial work environment across all its dimensions. This is understandable given the origin of psychosocial work environment research in work-related stress theory and research, and given the positioning of psychosocial risk management within occupational health and safety. However, additional focus on a positive psychosocial work environment will send clear messages to key stakeholders on how to promote healthy work and healthy organisations and also highlight how psychosocial risk management can contribute to positive outcomes, making its case stronger.

Fourth, the most widely used taxonomy is the one by Cox (1993) and Cox and Cox (1993) and its later adapted versions. This has been incorporated in guidance by key organisations such as EU-OSHA, European Commission, SLIC, ILO and WHO. The key dimensions of the psychosocial work environment depicted in this taxonomy align well with those of other taxonomies and are broad enough to capture developments in terms of the nature of work. These include organisational culture and function, job content, workload and work pace, work schedule, control, environment and equipment, interpersonal relationships at work, role in organisation, career development and the home-work interface.

Fifth, overall, there is agreement on the key dimensions of the psychosocial work environment presented in various taxonomies, but also some differences in the specific examples of the factors and hazards they include.

Finally, only the taxonomy of Leka et al. (2017) incorporates PSC, as an indicator of organisational culture. Even though PSC has been found to be a leading indicator of psychosocial working conditions, similar constructs, e.g. safety climate from

which PSC theory came, are included in some taxonomies (see, for example, Wiegand et al. 2012). PSC refers to management commitment to promote mental health at work, management prioritisation of PSR and mental health at work in business decision-making, organisational communication on PSR and mental health at work, and employee consultation and participation in psychosocial risk management. Management commitment, communication, participation and consultation are all aspects of organisational culture (Leka et al. 2023). Therefore, it is vital to include PSC in taxonomies on the psychosocial work environment in a way that will facilitate its inclusion in the psychosocial risk management process.

Here, it is important to recall that, as mentioned at the beginning of this report, the goal of this project to develop a conceptualisation and taxonomy of work-related PSR should not be viewed solely as an exercise for research purposes but one that will draw useful conclusions that will help answer the following question: how can we use knowledge and evidence to facilitate the design of healthy work and healthy organisations that will promote individual and societal health and wellbeing in the context of macro-level developments and challenges? Research is only part of the answer and, indeed, evidence has driven developments in policy and practice, all the more so since the Covid-19 pandemic when the health, organisational and societal impacts associated with exposure to PSR became more pronounced and obvious, and more accepted by key stakeholders.

However, knowledge from research needs to be translated into policies and tools in a pragmatic way. Therefore, in synthesising the information presented in the taxonomy analysis, it was important not to re-invent the wheel but to assess whether it would be possible to:

- capture various taxonomies in an economical way across a limited number of key dimensions
- include new theories and aspects of the changing nature of work and employment contracts, technological innovations and environmental factors
- avoid confusion between psychosocial factors, hazards and outcomes
- adapt a taxonomy that has been widely used in research, policy and practice and is familiar to key stakeholders.

Therefore, based on the findings of this review and the conclusions drawn, the Cox and Cox (1993) taxonomy was adapted to:

1. align the content of various taxonomies while ensuring conceptual clarity
2. include additional examples of both psychosocial factors and psychosocial hazards
3. capture new theoretical constructs and aspects of the changing nature of work and employment contracts, technological innovations and environmental factors.

Subsequently, an expanded conceptual framework (see Table 3) was developed to depict the wider macro contextual influences discussed earlier and the impacts of the psychosocial work environment on health and organisational outcomes on the

basis of the evidence presented in the next two sections. These present the findings of the scoping review in relation to the health and organisational impacts of work-related PSR. Given the breadth of the review, the evidence presented is based on systematic review and meta-analysis studies, although some additional studies are included in relation to PSC where the evidence base is not yet as developed. Each of the next two sections presents key findings as identified in the literature and summarises the evidence base.

10.3 Health impacts of work-related PSR

As mentioned in the previous section, scientific studies are underpinned by various theoretical models and use instruments that have operationalised theoretical domains such as job demands, job resources, effort and reward. Therefore, in their report of their findings, these studies capture these theoretical domains and several psychosocial hazards. For example, studies using the JCQ (1985), which is underpinned by the Job Demand-Control-Support model, measure job characteristics (job insecurity, skill discretion), job demands (psychological demands, physical demands), job control (decision authority, decision latitude) and social support (supervisor social support, co-worker social support).

Reviews on the health impact of PSR at work by WHO (2010) and on work-related stress by the ILO (2016) also include evidence on PSR until those points in time and refer to the same broad taxonomy of PSR presented in this report. However, it should be noted that the number of published studies, in this area has grown exponentially in recent years, including systematic reviews, meta-analyses and meta-reviews which were not available to the same extent then. Meta-reviews were particularly useful for the purposes of this scoping review as concerns health impact of PSR. These meta-reviews cover various types of health impact and will be discussed first. As is evident from the selection of key studies discussed in this section, PSR discussed in the literature are in line with the previously discussed PSR taxonomies, within the scope of various theoretical models and associated instruments. Table A6 provides further details on the studies identified in relation to the health impacts of work-related PSR.

The most recent meta-review by Niedhammer et al. (2021) reports findings of a meta-review with meta-analysis of 72 literature reviews from 2000 to 2020 of psychosocial work exposures and health outcomes. In this study, 'psychosocial work exposures' include job strain or high strain, psychological demands and decision latitude, emotional demands, social support, long working hours, effort-reward imbalance, job insecurity or temporary employment, workplace bullying, workplace violence, organisational injustice and work-life imbalance. The authors report that JDC model exposures were the ones most frequently studied exposures: job strain or high strain (37 reviews, 51%), psychological demands and decision latitude (17 reviews each, 24%) and social support (13 reviews, 18%). Long working hours were the second most frequently studied exposure (23 reviews, 32%). Effort-reward imbalance was explored in 12 reviews (17%) and job insecurity or temporary employment in 11 (15%). Workplace bullying or violence were studied in five reviews (7%), as was organisational injustice, while there were

two reviews each on emotional demands and work-life imbalance. A number of reviews examined more than one exposure from different concepts or models (14 reviews, 19%).

The paper includes detailed information on the association of various psychosocial hazards with various outcomes which have been captured in Table 3. This meta-review show that the strongest associations were found between psychosocial work exposures and cardiovascular diseases (CHD and stroke) and mental disorders, particularly depression, with the magnitude of the associations being a little stronger for mental disorders than for cardiovascular diseases. High-quality reviews also reported significant pooled estimates for job/high strain and long working hours in association with the 3 outcomes of CHD, (ischaemic) stroke and depression, as well as for effort-reward imbalance with CHD, and job insecurity with depression. Based on high-quality reviews, other significant associations were found between job strain, job insecurity and diabetes, long working hours and obesity, high strain and physical inactivity, and job insecurity and anxiety and psychotropic medication use.

The authors also compare their findings to those of four previous meta-reviews, on the outcomes of cardiovascular diseases (Fishta and Backé 2015), common mental health problems (Harvey et al. 2017), exposure to long working hours (Rivera et al. 2020) and workplace bullying (Nielsen and Einarsen 2018), concluding that their results are in line with these findings. Fishta and Backé (2015) report moderate evidence for the associations between psychosocial work factors (mainly job strain) and cardiovascular outcomes. According to Harvey et al. (2017), there is moderate evidence for the associations of high job demands, low job control, effort-reward imbalance, low justice, role stress, bullying, and low social support with common mental health problems. Nielsen and Einarsen (2018) show that bullying is associated with a large number of health outcomes, while Rivera et al. (2020) conclude that stroke was the only outcome with moderate evidence in association with long working hours. In contrast, the Niedhammer et al. (2021) review indicates that long working hours may have an impact on other health outcomes: principally, CHD and, to a lesser extent, obesity and depression.

Another study by Niedhammer, Sultan-Taïeb, Parent-Thirion and Chastang (2022) conducted analysis to update the fractions of cardiovascular diseases and mental disorders attributable to psychosocial work factors in Europe. This study focused on five psychosocial work exposures, i.e. job strain, effort-reward imbalance, job insecurity, long working hours and bullying. The attributable fractions (AFs) of depression were all significant: job strain (17%), job insecurity (9%), bullying (7%) and effort-reward imbalance (6%). Most of the AFs of cardiovascular diseases were significant and lower than 11%. Differences in AFs were observed between countries for depression and for long working hours, while differences between genders were found for long working hours, with higher AFs observed among men than among women for all outcomes. Overall AFs, taking all exposures into account, ranged between 17 and 35 per cent for depression and between five and 11 per cent for CHD. Similar findings are reported in another paper by Sultan-Taïeb et al. 2022) that showed a high burden of CHD and depression attributable to the particular psychosocial work exposures studied (i.e. job strain, effort-reward

imbalance, job insecurity, long working hours and bullying) in the EU28 in 2015, with a higher burden for depression.

Rugulies et al. (2023) conducted an umbrella review of seven systematic reviews with meta-analyses to examine the work-related causes of mental health conditions. They found exposures to job strain (high job demands and low job control), effort-reward imbalance and organisational injustice (consisting of the subdimensions of procedural and relational justice) to be associated with the onset of depressive disorders, sickness absence due to mental disorders, or both. The results were most robust for job strain, which was examined in the largest number of studies. Strong association was also found for long working hours. Exposure to workplace bullying was associated with a 2.58 times higher risk of depressive disorders, the strongest estimate among all working conditions. However, this estimate was based on only four studies with a wide confidence interval indicating a low precision of this estimate. The pooled estimate for workplace violence and threats indicated a 1.42 times higher risk of depressive disorders with a narrow confidence interval.

Boini et al. (2022) also carried out an umbrella review, in their case to examine the effect of working night shifts on cardiovascular risk factors. The results confirmed an excess risk of diabetes of about 10 per cent regardless of the type of night work. A stated excess risk of being overweight of around 25 per cent was also highlighted for shift workers overall, which could reach 38 per cent among night shift workers, while an increased risk of obesity, estimated at 5 per cent for night shift workers and at 18 per cent for rotating shift workers, was also observed. An excess risk of hypertension was estimated at around 30 per cent when considering the broad definition of shift work and when night periods were included in rotating shifts. The literature provided inconsistent results for the link between lipid disorders and night shift work, while shift workers appeared to be more likely to smoke.

Following on from these key meta and umbrella review studies, this report turns next to the findings of some selected systematic reviews. Li et al. (2020) conducted a systematic review and meta-analysis from the WHO/ILO joint estimates of the work-related burden of disease and injury to examine the effect of exposure to long working hours on ischaemic heart disease. Evidence on exposure to working 55 hours per week or more was judged as 'sufficient evidence of harmfulness' for the incidence of ischaemic heart disease and mortality. Similarly, Descatha et al. (2020) conducted a systematic review and meta-analysis from the WHO/ILO joint estimates of the work-related burden of disease and injury to examine the effect of exposure to long working hours on stroke. The review found sufficient evidence for harmfulness in relation to stroke incidence for exposure to ≥55 hours per week.

Taouk et al. (2020) conducted a systematic review and meta-analysis of psychosocial work stressors and risk of all-cause and CHD mortality. They found that workers with low job control are at increased risk of all-cause and CHD mortality compared to workers with high job control. Milner et al. (2018) conducted a systematic review and meta-analysis to examine the relationship between psychosocial job stressors and suicidality. Overall, exposure to job stressors was associated with an elevated risk of suicide ideation and behaviours. The odds ratio (OR) for suicide

ideation (14 studies) ranged from 1.45 (with a 95% confidence interval (CI) of 1.01 to 2.08) for poor supervisor and colleague support to 1.91 (95% CI: 1.22 to 2.99) for job insecurity. For suicide (six studies), exposure to lower supervisor and co-worker support produced an OR of 1.16 (95% CI: 0.98 to 1.38), while low job control resulted in an OR of 1.23 (95% CI: 1.00 to 1.50). There were only two studies that examined suicide attempt, both of which suggested an adverse effect of exposure to job stressors.

Rugulies et al. (2021) conducted a systematic review and meta-analysis of the effect of exposure to long working hours on depression from the WHO/ILO joint estimates of the work-related burden of disease and injury. The authors judged the existing bodies of evidence as 'inadequate evidence for harmfulness' for all three exposure categories, 41-48, 48-54 and ≥55 h/week, for depression prevalence, incidence and mortality; and the available evidence insufficient to assess effects of the exposure.

Van Der Molen et al. (2020) conducted a systematic review and meta-analysis of work-related psychosocial risk factors for stress-related mental disorders (SRD). The meta-analysis revealed moderate evidence of associations between SRD and effort-reward imbalance, high job demands, organisational justice, social support, high emotional demands and decision authority. No significant, or only inconsistent, associations were found for job insecurity, decision latitude, skill discretion and bullying. The authors conclude that effort-reward imbalance, low organisational justice and high job demands exhibit the largest increased risk of SRD, varying from 60 to 90 per cent.

Another systematic review and meta-analysis by Gerhardt et al. (2021) specifically focused on social stressors at work (e.g. aggression, harassment, incivility or abusive supervision) related to wellbeing and health. Social stressors were found to be significantly related to all outcomes referring to wellbeing (high-arousal negative, low-arousal negative, physical, mental, burnout, general), behavioural characteristics (turnover intention, absenteeism, organisational citizenship behaviour, performance, counterproductive work behaviour) and attitudinal outcomes (commitment, life satisfaction, job satisfaction). All associations except absenteeism and life satisfaction were about moderate in size. Both absenteeism and life satisfaction were represented by comparably few samples, which makes the results more likely to be influenced by possible outliers. In particular, emotional exhaustion (burnout), commitment and job satisfaction showed comparably high relations with experienced social stress at work. The overall relation between social stressors and health/well-being was of medium strength. Lack of justice, supervisor mistreatment, and mobbing/bullying were especially important for attitudes. Furthermore, harassment, social exclusion, and interpersonal conflicts were important especially when measuring counterproductive work behaviour. Incivility showed comparatively high effects on all outcomes. It was found to be associated with health and well-being to a much higher extent than more obviously threatening stressors (e.g. mistreatment, aggression, and violence), which might be due to its higher occurrence compared to high-intensity behaviours.

The systematic review and revised meta-analysis carried out by Eddy et al. (2023) had a different focus – the relationship between effort-reward imbalance (ERI) and hypothalamic-pituitary-adrenal (HPA) axis measures of stress. Specifically, their meta-analysis assessed the associations of ERI and overcommitment in the workplace with measures from the HPA axis. Greater ERI was associated with increased HPA axis activity. The cortisol waking concentrations were the only subgroup associated with ERI. Studies that contained more men had stronger ERI to HPA marker associations. When all HPA markers were considered collectively, overcommitment was not associated with greater HPA axis activity, and only cortisol (pm) was associated with overcommitment.

Another study examined inflammatory markers. Eguchi et al. (2023) conducted a systematic review and meta-analysis to examine work-related psychosocial factors and inflammatory markers (e.g. interleukin-6, tumor necrosis factor-alpha, and C-reactive protein). The pooled coefficient between adverse work-related psychosocial factors and inflammatory markers was significant and positive; however, a clear association was only observed for interleukin-6. Meta-regression showed that effect size decreased depending on the follow-up period.

Yang et al.'s (2019) meta-analysis of observational studies examined the relationship between work stress and the risk of cancer. They found a significant association between work stress and the risk of colorectal, lung, and oesophageal cancers. A statistically significant effect of work stress on colorectal cancer risk was observed in North America but not in Europe; in contrast, a significant association between work stress and oesophageal cancer was found in Europe but not in North America. No association was found between work stress and the risk of prostate, breast or ovarian cancers.

Additional studies have focused on issues such as burnout, MSDs, safety, leadership, bullying and moral injury. For example, Aronsson et al. (2017) carried out a systematic review including meta-analysis of work environment and burnout symptoms. Moderately strong evidence was concluded for the association between job control and reduced emotional exhaustion and between low workplace support and increased emotional exhaustion. Limited evidence was found for associations between workplace justice, demands, high workload, low reward, low supervisor support, low co-worker support, job insecurity and change in emotional exhaustion. Cynicism was associated with most of these work factors. Reduced personal accomplishment was only associated with low reward.

Bezzina et al. (2023) conducted a systematic review of longitudinal studies to examine workplace psychosocial factors and their association with MSDs. The most common MSDs investigated were lower back pain, neck and shoulder pain and upper extremity symptoms and disorders. Included articles identified that psychosocial workplace factors of support, collaboration, job control and job demands were statistically significantly associated with the risk and progression of MSDs. Taibi et al.'s (2021) systematic overview focused on the risk effects of psychosocial work characteristics on MSDs, absenteeism and workplace accidents. High job demands, high job strain, high effort-reward imbalance and low social support show strong evidence of increasing the risk of MSDs. In addition to

job demands and job strain, low perceived fairness proved to be a risk factor of absenteeism with strong evidence. Due to the small number of studies, no reliable evidence assessment for workplace accidents was possible. Buruck et al.'s (2019) systematic review and meta-analysis focused specifically on chronic low back pain. They found this to be significantly positively related to workload and significantly negatively related to overall job control, decision authority and the two measures of social support. No significant association was identified for skill discretion and reward. Other variables such as exposure time, mean age and sex also affected these relationships. Bernal et al. (2015) conducted a systematic review and meta-analysis on work-related PSR and MSDs in hospital nurses and nursing aides. An association was identified between high demands-low job control with prevalent and incident low back pain, prevalent shoulder pain, prevalent knee pain and prevalent pain at any anatomical site. Effort-reward imbalance was associated with prevalent MSD at any anatomical site and low social support with incident back pain.

Turning to studies focusing on safety, Derdowski and Mathisen (2023) explored the relationship between psychosocial factors and safety in high-risk industries on the basis of a systematic review. The results indicate preliminary evidence of a link between exposure to workplace psychosocial factors and safety in high-risk industries. Studies of the linkages between psychosocial factors and safety behaviour were more prevalent and more often established significant associations between the variables than studies that had investigated the associations between psychosocial factors and safety outputs. Moreover, the results indicate that job demands are likely to trigger employees' health-impairing mental/physical conditions that can constitute a precursor of unsafe behaviour. The results also imply the existence of a link between work-induced psychosocial states (typically in the form of stress or exhaustion) and safety.

In another systematic review, Koranyi et al. (2018) examined the relationship between precarious employment and occupational accidents and injuries. The review supported an association between some of the dimensions of precarious employment and occupational injuries, most notably for multiple jobholders and employees of temp agencies or subcontractors at the same worksite. However, the results for temporary employment were inconclusive.

An interesting study by Kyung et al. (2023) was a systematic review examining the underreporting of workers' injuries or illnesses and the contributing factors. The review indicated that 20-91 per cent of workers do not report their injuries or illnesses to management or worker compensation programmes. From quantitative studies, the contributing factors for injury or illness underreporting are injury type and severity, sociodemographic factors (age, gender, education, race/ethnicity), general health and functioning, the worker's knowledge of reporting, job and employment characteristics (working hours, job tenure, work shift, type of occupation, and physical demand), psychosocial work environment (supervisor support, co-worker support, and safety climate) and healthcare provider factors. From the review of qualitative studies, the reasons for underreporting include fear or concern, cumbersome time and effort in the reporting process, lack of knowledge regarding reporting, perceptions of injuries as not severe or part of the

job, and distrust of reporting consequences. The review findings indicate that low wage earners, racial/ethnic minority workers and workers who perceive a poor psychosocial work environment encounter more barriers to reporting a work-related injury or illness.

Several studies have examined organisational culture dimensions and leadership dimensions. Skakon et al. (2010) conducted a systematic review of three decades of research to explore whether leaders' wellbeing, behaviours and style are associated with the affective wellbeing of their employees. The review found some support for the view that leader stress and affective wellbeing are associated with employee stress and affective wellbeing. Additionally, leader behaviours, the relationship between leaders and their employees and specific leadership styles are all associated with employee stress and affective wellbeing.

Feijó et al. (2019) conducted a systematic review to examine risk factors for workplace bullying. Women were reported to be at higher risk of being bullied in most studies, while authoritarian and laissez faire leadership styles were positively associated with bullying. Several psychosocial factors, such as stress and the occupational risks related to work organisation, including flexible work methods, role conflict, role ambiguity, monotonous or rotating tasks, high demands, pressure of work and lack of clarity of duties were also strongly associated with bullying.

The systematic review by Bronkhorst et al. (2015) of studies of healthcare organisations explored organisational climate and employee mental health outcomes. Perceptions of a good organisational climate were significantly associated with positive employee mental health outcomes such as lower levels of burnout, depression and anxiety. More specifically, the findings indicated that group relationships between co-workers are very important in explaining the mental health of healthcare workers. There was also evidence that aspects of leadership and supervision affect mental health outcomes. Relationships between communication, or participation, and mental health outcomes were less clear, however.

Another systematic review examined virtual leadership in relation to employees' mental health, job satisfaction and perceptions of isolation (Efimov et al. 2022). The overarching review findings suggest a positive link between virtual leadership and wellbeing, job satisfaction and a negative link to psychological strain, stress and the perceptions of isolation of digitally collaborating employees.

Turning to moral injury, Hall et al. (2022) carried out a systematic review on moral injury, mental health and behavioural health outcomes. The majority of studies found significant positive associations between moral injury-related constructs, mental health and behavioural health outcomes (depression, substance use, suicidality). An earlier systematic review and meta-analysis by Williamson et al. (2018) focused on occupational moral injury and mental health. Potentially morally injurious experiences accounted for 9.4 per cent of the variance in PTSD, 5.2 per cent of the variance in depression and 2.0 per cent of the variance in suicidality. Potentially morally injurious experiences were associated with more symptoms of

anxiety and behavioural problems (e.g. hostility), although this relationship was not consistently significant.

Several studies have also focused on specific sectors. Thibodeau et al. (2023) conducted a systematic review on the association between moral injury and healthcare clinicians' wellbeing. Moral injury was found to be associated with professional wellbeing factors and with mental health outcomes. The scoping review by Xue et al. (2022) explored the potential circumstances associated with moral injury and moral distress in healthcare workers and public safety personnel across the globe during Covid-19. Potentially morally injurious or distressful events included the risk of contracting or transmitting Covid-19, an inability to work on the frontlines, the provision of suboptimal care, care prioritisation and resource allocation, perceived lack of support and unfair treatment by the organisation, and stigma, discrimination and abuse. On the other hand, Jamieson et al. (2023) specifically examined the association between moral injury and suicidal behaviour in military populations in their systematic review. Exposure to morally injurious events substantially amplified the risk of suicide, with higher levels of potential exposure being linked to increased moral injury and heightened levels of suicidal behaviour.

Finally, there are some interesting studies on psychosocial safety climate (PSC). Amoadu et al. (2023) conducted a scoping review to examine the association between PSC and occupational health and safety. PSC was found directly to affect job demands, job insecurity, effort-reward imbalance, work-family conflict, job resources, job control and quality leadership. Moreover, PSC directly affected social relations at work, including workplace abuse, violence, discrimination and harassment. Therefore, the authors conclude that PSC has a direct effect on health, safety and performance outcomes because it moderates the impact of excessive job demands on workers' health and safety. Additionally, PSC boosts the job resources effect on improving workers' wellbeing, safety and performance.

A study by Hamre et al. (2023) investigated the hypothesis that an organisation's PSC moderates the well-established relationships between the individual experience of role stressors (role ambiguity, role conflict) and employees' exposure to workplace bullying. Role ambiguity and role conflict were related to reports of exposure to workplace bullying. Furthermore, organisations' PSC was negatively related to reports of such exposure. The results also show that PSC moderates the association between role conflict and workplace bullying across organisations. The association between role ambiguity and workplace bullying is also moderated by PSC, although not to the same extent.

Finally, another study focused on PSC and remote work. Juutinen et al. (2023) examined the relationship between PSC and wellbeing (perceived stress, job exhaustion, work engagement) in a four-wave longitudinal study of remote working. PSC was negatively associated with concurrent stress and job exhaustion, and positively associated with concurrent work engagement at each measurement. Moreover, PSC predicted subsequent stress between each time point. Cross-lagged effects were also evident for job exhaustion and for work engagement, while the mean level of PSC decreased during enforced remote work. Therefore,

PSC predicts wellbeing over time and shows subsequent relationships with job exhaustion and work engagement.

This section has summarised evidence on the health impact of work-related PSR. The reviewed evidence included meta-reviews, umbrella reviews, systematic reviews, meta-analyses and scoping reviews. Some additional recent studies were presented for PSC although evidence is still developing in this area. The evidence base can be improved in terms of more high-quality studies, but it can be concluded that several such studies on the health impact of work-related PSR are now in place. These show consistently that various psychosocial risks can lead to a range of health outcomes and therefore need to be prioritised in a preventive manner within organisations.

Additional evidence is presented in the next section in relation to organisational outcomes which make the case for the prioritisation of PSR even stronger.

10.4 Organisational impacts of work-related PSR

In comparison to the evidence base on health impact, evidence on organisational impacts is not developed to the same extent and therefore it was not possible to find meta-reviews in this area. However, systematic reviews, meta-analyses and scoping reviews were identified, examining issues such as financial burden and cost of illness, absenteeism, presenteeism, return to work, retirement intention, disability retirement, work engagement, performance and productivity, job satisfaction and turnover intention. These have been captured in Table 3.

Given the breadth of the review, this section summarises some key studies in these areas and their findings. Table A7 provides further details on the studies identified in relation to health impact of work-related PSR. In reviewing these studies, it is again evident that the same theoretical domains and types of PSR are being investigated.

- **Financial burden**

Hassard et al. (2018a) conducted a systematic review to examine the cost of work-related stress to society. Fifteen studies were reviewed which originated from Australia, Canada, Denmark, France, Sweden, Switzerland, the United Kingdom and the EU-15. The total estimated cost of work-related stress was observed to be considerable and ranged substantially from 221.13 million US dollars to 187 billion. Productivity-related losses were observed to contribute proportionally the majority of that total cost (between 70 and 90%), with healthcare and medical costs constituting the remaining 10 to 30 per cent.

The same authors (Hassard et al. 2018b) carried out another systematic review of cost of illness studies to examine the financial burden of psychosocial workplace aggression (both at individual and at societal level). This review included 12 studies from five national contexts: Australia (n= 2), Italy (n= 1), Spain (n= 1), the United Kingdom (n= 3) and the United States (n= 5). The annual cost of psychosocial

workplace aggression again varied substantially, ranging between 114.64 million US dollars and 35.9 billion.

In another systematic review study, Hassard, Teoh and Cox (2019) examine the economic burden to society of work-related violence. Here, ten cost of illness studies were reviewed, all of which used a bottom-up (person-based) approach to derive their economic estimates, with only two national contexts examined. In general, a limited number of indirect (productivity-related) and intangible cost components were accounted for in these studies which, additionally, were also notably dated, only two being published post-2010. The derived economic estimates ranged from 2.36 million dollars to 55.86 billion (figures inflated to 2016 US dollars).

- **Absenteeism, presenteeism and return to work**

Starting with absenteeism, several systematic reviews were identified. For example, Taibi et al. (2021) conducted a systematic overview on the risk effects of psychosocial work characteristics on musculoskeletal disorders, absenteeism and workplace accidents. In addition to job demands and job strain, low perceived fairness was a risk factor of absenteeism with strong evidence. Amiri and Behnezhad (2020a) conducted a systematic review and meta-analysis of prospective cohort studies examining the association between job strain and sick leave. Job strain and sick leave were found to be associated, and the risk of sick leave based on job strain in men and women was equal. Another study by Bernstrøm and Houkes (2017) was based on a systematic review of the relationship between working hours and sickness absence. Evidence supporting a relationship between sickness absence and working part-time, or with working hours as a continuous variable, was inconclusive. Support for a negative relationship between long working hours and sickness absence was moderately strong.

Studies have also looked at sickness absence across health conditions. For example, Duchaine et al. (2020) conducted a systematic review and meta-analysis of psychosocial stressors at work and the risk of sickness absence due to a diagnosed mental disorder. They found that workers exposed to low reward had a higher risk of sickness absence compared with non-exposed workers, as were those exposed to effort-reward imbalance, job strain, low job control and high psychological demands. An older study by White et al. (2013) conducted a stakeholder-centred best-evidence synthesis of systematic reviews on modifiable workplace risk factors contributing to workplace absence across health conditions. Modifiable work factors found to have consistent evidence across two or more health conditions included lack of social support, increased physical demands at work, job strain, lack of supervisory support, increased psychological demands, low job satisfaction, low worker control and poor leadership quality.

Another set of studies has examined the determinants of return to work. De Vries et al. (2018) conducted a scoping review of the determinants of sickness absence and return to work among employees with common mental disorders (CMDs). They found consistent evidence that previous episodes of common mental disorders, higher symptom severity, previous absenteeism, co-morbidity, high job

demands, low job control, high job strain, female gender, lower educational level, smoking behaviour and low perceived general health were predictors of sickness absence in people with CMDs. An earlier return to work was consistently predicted by lower symptom severity, having no previous absenteeism, younger age and positive expectations concerning the duration of the sick leave or return to work. Another systematic review by Etuknwa et al. (2019) sought to evaluate the impact of important personal and social factors on sustainable return to work after ill health due to MSDs and CMDs and to compare the effects of these personal and social factors across both conditions. Sustainable return to work was defined by the authors as a stable full-time or part-time return, either to the original job or modified job for a period of at least three months without relapse or a reoccurrence of the sickness absence. The most consistent evidence for achieving a sustainable return to work for both MSDs and CMDs was in relation to support from line managers or supervisors and co-workers, positive attitude, self-efficacy, young age and higher education levels.

In another systematic review, Peters et al. (2016) focused on the prognostic factors in the return to work following surgery for carpal tunnel syndrome. Prognostic factors for a poorer outcome included, among others, worse mental health status, job accommodation availability, high job strain, high job demands with high job control, poor co-worker relationships, poor baseline work role functioning and less supportive workplace policies.

Turning to presenteeism, Lui et al. (2018) conducted a systematic review on presenteeism exposures and outcomes amongst hospital doctors and nurses. Presenteeism was found to be positively associated with most work stressors other than extensive stooping and the quality of the work process. Brborovic et al. (2017) also used a systematic review to examine sickness presenteeism in nurses. Three antecedents were associated with sickness presenteeism; namely, job demands, burnout and exhaustion. Depersonalisation was an outcome of sickness presenteeism over time.

Miraglia and Johns (2016) carried out a meta-analysis on the correlates of presenteeism. These included general ill health, constraints on absenteeism (e.g. strict absence policies, job insecurity), elevated job demands and perceived stress, lack of job and personal resources (e.g. low support and low optimism), negative relational experiences (e.g. perceived discrimination) and positive attitudes (satisfaction, engagement, commitment).

- **Retirement intention and disability retirement**

The impact of population ageing and early retirement due to mental ill health has resulted in several studies exploring the determinants of retirement intention and disability retirement. For example, Carolina et al. (2024) conducted a systematic review of the individual, family, job and organisational factors associated with retirement intentions among older long-term care workers. Findings showed weak social support, high physical job demands and type of long-term care occupation as important determinants of early retirement intentions. Strong social support and good job resources were, on the other hand, important determinants of late

retirement intention. In contrast to earlier research on other groups of older workers, this review showed no statistically significant associations between health or emotional job demands and early retirement intention among long-term care workers. The systematic review of Browne et al. (2019) examined the relationship between the workplace psychosocial environment and retirement intentions and actual retirement. High job satisfaction and high job control were associated with later retirement intentions and actual retirement. No consistent evidence was found, however, for an association of job demands with retirement intentions or actual retirement. In another study, Scharn et al. (2018) conducted a systematic review of longitudinal studies to examine the determinants of retirement timing. Having high time pressure or a physically demanding job did not influence retirement decisions in the Netherlands or Europe. Having challenge at work was associated with retiring later in Europe. In addition, low job control was a predictor for early retirement in the Netherlands. Apart from consistent evidence on control at work, age stereotypes have also been found to be associated with retirement intention. A systematic review of individual consequences of age stereotypes on older workers was conducted by Weber et al. (2019). Most of the studies included in the review found significant associations between negative age stereotypes and decreased self-efficacy, job satisfaction and performance as well as learning, development or the increased retirement intentions of older employees.

Studies have also specifically examined disability retirement. Knardahl et al. (2017) conducted a systematic review with meta-analysis on the contribution of psychological, social and organisational work factors to the risk of disability retirement. There was limited evidence for downsizing, organisational change, lack of employee development and supplementary training, repetitive work tasks, effort-reward imbalance to increase risk of disability pension. Very limited evidence was found for job demands, evening or night work and low social support from one's superior. The most robust evidence was found for work control in increasing the risk of disability retirement. In an older study, Dragano and Schneider (2011) analysed 20 longitudinal studies in a systematic review which examined associations between disability retirement and different aspects of the psychosocial work environment. Most studies found elevated disability risks in those exposed to psychosocial factors at work. Important single factors were low control, monotonous work, work stress (job strain, effort-reward imbalance), a lack of social support and problems related to the organisation of work and to leadership behaviours.

In another interesting study, Hovbrandt et al. (2021) investigated the associations between different job types and social participation in a ten-year follow-up of senior workers (aged 55 at baseline). Jobs with a high decision latitude, as in active and relaxed jobs, predicted high social participation even after the cessation of employment. Additionally, high social participation during working life was a predictor of high social participation from a long-term perspective, promoting healthy ageing. Incentives for working longer were strongly related to good working conditions. Therefore, the authors conclude that a supportive work environment with possibilities for employees to participate in decision-making, i.e. high control, is vital for a sustainable working life. This may contribute to an

extended working life and may also support social participation prior to retirement as well as after retirement and thus to healthy aging.

- **Work engagement and performance**

A study by the OECD (Arends et al. 2017) on job quality, health and productivity was based on a systematic review. Strong evidence was found of a negative relationship between job stress, job strain and individual at-work productivity and for a positive relationship between job rewards and productivity. Moderate evidence was found of a negative relationship between work-family conflict and at-work productivity and for a positive relationship between fairness at work and social support from co-workers and productivity. Health influenced the relationship between the quality of the work environment and productivity, with the relationship being stronger for people in good health.

Various other studies have explored specific psychosocial hazards and performance, including job security, social welfare regime, flexible working arrangements and psychological safety. For example, an interesting study by Sverke et al. (2019) carried out a meta-analysis of job insecurity and employee performance. The first aim of this study was to meta-analytically investigate how job insecurity is related to task performance, contextual performance, counterproductive work behaviour, creativity and safety compliance. The second aim was to test two method-related factors (cross-sectional vs. longitudinal associations; and self vs. supervisor ratings of performance) and two macro-level indicators of social protection (social welfare regime and union density) as moderators of these associations. The results showed that job insecurity was generally associated with impaired employee performance. These findings were generally similar both cross-sectionally and longitudinally. Overall, the associations between job insecurity and negative performance outcomes were weaker in welfare regimes characterised by strong social protection, whereas the results were mixed concerning union density.

Another review explored how the introduction of flexible work arrangements were related to employee productivity. A systematic review of the psychological impacts of new ways of working (NWW) was conducted by Kotera and Vione (2020). While NWW was associated with workers' engagement, work-related flow, and connectivity, they were also found to increase blurred work-home boundary, fatigue, and mental demands. Newman, Donohue and Eva's (2017) systematic review identified supportive leadership, supportive interpersonal relationships and organisational support to be related to psychological safety which was, in turn, related to performance. Hodroj et al.'s (2023) systematic review and meta-analysis examined the association between quality of care (QoC) and job characteristics in residential aged care and hospital settings. QoC was negatively correlated with job demands and job strain, and positively correlated with job resources. Counterproductive work behaviours had a positive relationship with job demands and job strain. The association between poor QoC and low job resources was stronger in aged care than in hospital settings. Teoh et al. (2023) carried out a meta-analysis of longitudinal studies to examine doctors' perceived working conditions, psychological health and patient care. The results indicated that job resources predicted work engagement and emotional exhaustion, while job

demands predicted emotional exhaustion. Better clinical care was also associated with higher levels of job resources and lower levels of emotional exhaustion and job demands.

Turning to studies on work engagement, there are numerous that have found a strong link between job resources and work engagement. For example, a meta-analysis of longitudinal studies on the drivers of work engagement (Lesener et al. 2019) identified 55 longitudinal studies that investigated the differential impact of various job resources on work engagement at group level, leader level and organisational level. The findings suggested that job resources at each of these three levels predict work engagement over time. However, organisational level resources (reflecting how work is organised, designed and managed) contribute much more strongly to work engagement than group-level, and leader-level resources.

Another study by Kwon and Kim (2020) conducted an integrative literature review of employee engagement and innovative behaviour with a focus on job demands and resources. The review included 34 empirical studies and indicated that employees perceive a mix of reasonably high demands and high resources to be ideal for their engagement, that innovative behaviour is a consequence of these delicate interactions and that engaged employees are more likely to behave innovatively by activating coping strategies to deal with challenges. This study supports the arguments of the Challenge-Hindrance Stressor theoretical model, specifically that a certain level of job demands may challenge employees and have positive outcomes. However, this has been questioned by another meta-analytical study (Kubicek et al. 2023) which specifically explored workload and cognitive demands on learning. The results showed that workload was negatively related to learning and motivation, and positively related to strain; whereas cognitive demands were positively related to learning and motivation, and negatively related to strain. The detrimental effects of workload were more pronounced for care and social workers and for measures of overload. The authors conclude that their results cast doubt on whether stressors can actually be simultaneously detrimental and beneficial, as neither workload nor cognitive demands were found to have such a pattern.

Mori et al. (2024) systematically reviewed work engagement among older workers, finding that work engagement increases with age and is mainly mediated by increased emotional regulation. In addition, age moderates the relationships between various job-related psychological and work environmental factors and work engagement. Finally, work engagement was found to be associated with working beyond retirement age. In another study, Mauno et al. (2023) examined the impact of work intensification, finding it to be related to various negative outcomes for employees, such as impaired wellbeing and motivation.

Additionally, some studies on psychosocial safety climate (PSC), although not based on systematic review or meta-analysis, have examined PSC in relation to engagement, performance and innovation. Idris et al. (2015) explored the effect of team-level PSC on individual level job resources (i.e. learning opportunities), engagement and performance. Participants were 427 employees from 56 teams (each from a different organisation) in Malaysia. Team-level PSC was positively

related to job engagement, mediated by learning opportunities; PSC was related to performance mediated by job engagement. The authors conclude that, overall, the findings support the role of team-level PSC as an antecedent of positive work conditions and outcomes. Another qualitative study by Zadow et al. (2023) was based on a case study of software engineers and sought to examine PSC as a predictor of work engagement, creativity, innovation and work performance. The findings indicated that, at between-person level, PSC was positively related to average future weekly individual fluctuations in creativity (radical and incremental), work engagement and job performance. Additionally, weekly work engagement was related to future creativity (radical and incremental). Work engagement also mediated the between-person relationship between PSC and future creativity (both radical and incremental). PSC did not predict innovation.

Finally, some studies have focused on safety performance. The systematic review of Kalteh et al. (2021) found that safety culture and safety climate are associated with safety performance. Similarly, Leitao and Greiner's (2016) epidemiology-based systematic review found full or partial support for the association of safety culture with accidents/injuries at work.

- **Job satisfaction and turnover intention**

Job satisfaction has been already addressed in some of the reviews discussed so far. Additionally, Penconek et al.'s (2021) systematic review examined determinants of nurse manager job satisfaction. The findings indicated that autonomy, power to make decisions for change, social support, team cohesion and strategies to reduce job stress may improve the job satisfaction of front-line nursing managers. Job satisfaction has also been studied as an antecedent of turnover intention. Kim and Kim's (2021) systematic review and meta-analysis identified predictors of the turnover intentions of hospital nurses in South Korea (2000-20). Burnout, emotional exhaustion, job stress and career plateauing were positively associated with turnover intention, while organisational commitment, person-organisational fit, career commitment, work engagement, job satisfaction and job embeddedness were negatively associated.

Li and Yao (2022) conducted a meta-analysis on the antecedents of turnover intention among teachers. Trust, professional identification and organisational commitment were the three most important predictors while job satisfaction, climate, justice, support, work engagement and intrinsic motivation were also important. Burnout, workload and stress were positively related to turnover intentions, with burnout the most important predictor. The relationships between most of these antecedents and teachers' turnover intention were stable regardless of age, gender, cultural context and grade level. Burnout and intrinsic motivation showed a stronger relationship with turnover intention among younger teachers; specifically, younger teachers with higher burnout and lower intrinsic motivation tended to show higher intention to quit. Age was negatively related to turnover intention only in the context of collectivist cultures compared with individualist ones. Finally, Ozkan (2023) carried out a meta-analytic review of organisational justice perceptions and turnover intention. All dimensions of organisational

justice, including distributive, interactional, interpersonal, informational and procedural, had a strongly negative relationship with turnover intention.

In summary, the available evidence on organisational outcomes is diverse and builds a picture of several PSR contributing to performance, job satisfaction, work engagement, innovation, absenteeism, presenteeism, turnover, retirement intention and disability retirement. Studies identify the limitations in the available evidence in terms of quality and recognise that the evidence base is not as well-developed as that on the health impact of PSR. It should also be mentioned that, as discussed earlier in this report, most studies have focused on psychosocial hazards and less on the positive dimensions of the psychosocial work environment. However, it is still possible to identify both the positive and the negative impact of PSR on several organisational outcomes and conclude that there is a strong business case for a healthy psychosocial work environment.

11. Interventions on work-related PSR

This section aims to provide an overview of key interventions on work-related PSR at organisational level. Different types of macro level interventions were discussed in Section 6, including hard and soft law interventions. As discussed, earlier, these macro level interventions (e.g. specific legislation on work-related PSR, social partner agreements, the adoption of standards) have an impact on organisational practices. This section first discusses the different types of organisational-level interventions on work-related PSR and how they relate to the hierarchy of control. It then summarises the available evidence in relation to these approaches and draws learning points in terms of their evaluation (see also Table A8). Finally, it presents several examples of interventions that organisations may find useful across the various dimensions of the psychosocial work environment, as depicted in Table 7.

11.1 Types of interventions on work-related PSR and the hierarchy of control

Primary prevention interventions aim at tackling PSR at source. Most often they are designed to deal with aspects of work design, organisation and management that are perceived to be problems by a significant proportion of employees. These are sometimes referred to as organisational-level, job re-design, psychosocial or work environment interventions (Randall and Nielsen 2010) and examples include workload adjustment, improvement of communication processes and job enrichment.

Secondary interventions aim to give employees the skills they need to respond to PSR in a way that reduces the impact that they have on them (Randal and Nielsen 2010). Most of these interventions focus on training employees to respond in a positive way to challenging working conditions (by thinking and/or behaving differently). Examples include stress management training, mindfulness training, and cognitive-behavioural training (CBT).

Tertiary interventions are aimed at employees who are already experiencing significant problems with their wellbeing. Such interventions are designed to help employees who have already been harmed in some way by their working conditions. In many organisations there is often a referral route to allow employees to access specialist help for their condition. Examples include rehabilitation, counselling and return to work programmes (Randall and Nielsen 2010).

As is discussed next, the evidence on these types of interventions is mixed depending on the timeframe, the measures used, the outcomes evaluated and the process of implementation (Leka and Jain 2017).

However, since psychosocial risk management is grounded within occupational safety and health, it is important to mention here also that ISO 45003 makes reference to the hierarchy of controls when addressing PSR (ISO 2021). According to the hierarchy of controls, and in line with the principles of prevention, organisations should, wherever possible, eliminate work-related psychosocial hazards and control the associated risks where elimination is not possible. Psychosocial hazards that could be eliminated include excessive workload, long working hours, and poor workplace conditions like improper lighting and excessive noise. If risks cannot be eliminated, they should be minimised. For PSR, this means changing hazardous ways of working through the design of the work or the system of work. Examples include allowing more time for complex or difficult tasks to be completed appropriately or redesigning work systems to minimise confusion by clearly defining workers' roles, reporting structures, tasks and performance standards. It should be noted that workers can be exposed to multiple psychosocial hazards. Some of these can always be present while others are only occasionally present. Furthermore, organisations should also always consider how hazards (both psychosocial and physical) interact. In most cases, a combination of control measures will most effectively minimise PSR.

NIOSH in the US has outlined how the hierarchy of controls applies to its Total Worker Health approach. The 'Hierarchy of Controls Applied to NIOSH Total Worker Health' emphasises organisational-level interventions to protect workers' safety, health and wellbeing. To apply this model, organisations are advised, quoting directly from the guidelines, to:

- First, eliminate workplace conditions that cause or contribute to worker illness and injury, or otherwise negatively impact well-being. For example, remove harmful supervisory practices throughout the management chain, if applicable
- Second, replace unsafe, unhealthy working conditions or practices with safer, health-enhancing policies, programs, and management practices that improve the culture of safety and health in the workplace
- Third, redesign the work environment, as needed, for improved safety, health, and well-being. Examples could include removing barriers to improving well-being, enhancing access to employer-sponsored benefits, and providing more flexible work schedules
- Fourth, provide safety and health education and resources to enhance individual knowledge for all workers
- Fifth, encourage personal behaviour change to improve safety, health, and well-being. Assist workers with individual risks and challenges, while providing support in making healthier choices (NIOSH 2016).

11.2 Evidence on various types of interventions on work-related PSR

While the literature on interventions is large and includes numerous systematic reviews and meta-analysis, most studies focus on secondary and tertiary interventions. For example, Miguel et al. (2023) conducted an umbrella review of meta-analyses to examine universal, selective and indicated interventions for supporting mental health at the workplace. They included meta-analyses of randomised trials examining psychosocial, physical activity and lifestyle interventions delivered to all workers in general (universal interventions), at-risk workers (selective interventions) and workers already experiencing symptoms of mental disorders (indicated interventions). They also included outcomes from seven domains: symptoms of mental health conditions, positive mental health, quality of life, work-related outcomes, substance use, suicide-related outcomes and potential adverse effects. Sixteen meta-analyses were identified, producing 66 pooled effect sizes of the examined interventions, mostly on symptoms of mental health conditions (n= 43 pooled effect sizes) (e.g. burnout, insomnia, stress) and positive mental health (n= 15) (e.g. wellbeing). Most of the evidence on universal, selective and indicated interventions was focused on psychosocial interventions (such as cognitive-behavioural therapy-based interventions, relaxation or stress management programmes), showing small to moderate effects across the various outcomes.

Ramachandran et al. (2023) examined the effectiveness of mindfulness-based interventions on psychological wellbeing, burnout and PTSD among nurses through a systematic review and meta-analysis. They found that mindfulness-based interventions can effectively reduce psychological distress, stress, depression and some dimensions of burnout. However, evidence remains scarce in the literature. In another systematic review and meta-analysis of randomised control trials on mindfulness and mindfulness-informed interventions, Michaelsen et al. (2023) found small positive effects on mindfulness, wellbeing, mental health, stress, resilience, physical health and work-related factors. These effects were stable in short-term follow-up assessments (1-12 weeks) for most outcomes, but not for long-term ones (13-52 weeks). The review and meta-analysis of Stratton et al. (2022) that e-health interventions have a small positive impact on reducing mental health symptoms in employees.

Nowrouzi-Kia et al. (2023) carried out a systematic review and meta-analysis evaluating the effectiveness of return to work (RTW) interventions for individuals with work-related mental health conditions. No significant differences were found for the meta-analyses examining return to work rates, absenteeism, depression, stress and quality of life. The most effective interventions were found to be a multi-domain one (67% of participants return to work full time) and a health-focused one (with an 85% RTW rate). The systematic review by Lambreghts et al. (2023) examined return to work interventions for sick-listed employees with burnout. Five studies described person-directed interventions, one described a workplace-directed intervention, one described a combination of both intervention types and one study described all three types of intervention. Only the workplace-directed intervention showed a significant improvement in RTW compared with

the comparator group: at 18-month follow-up, 89 per cent of the intervention group had returned to work compared with 73 per cent of the comparator group. Mikkelsen and Rosholm's (2018) systematic review and meta-analysis looked at interventions aimed at enhancing return to work for sick-listed workers with common mental disorders, stress-related disorders, somatoform disorders and personality disorder. The results revealed strong evidence for interventions including contact with the workplace and multicomponent interventions, and moderate evidence for those including a gradual return to work. In addition, the results provided strong evidence for interventions targeting stress compared with those targeting other mental disorders.

Slater et al. (2023) conducted a systematic review and narrative synthesis on work-focused cognitive behavioural therapy (W-CBT) and its effectiveness at facilitating return to work (RTW) for people experiencing mental health conditions. The results indicated that W-CBT is effective at facilitating RTW for mild-to-moderate mental health conditions. For a programme to be labelled W-CBT they recommended that it is a stand-alone intervention; delivered with an understanding RTW is the goal; and the CBT components are always framed by matters, subjects and contexts related to work.

Proper and Oostrom's (2019) systematic review of reviews examined the effectiveness of workplace health promotion interventions in terms of physical and mental health outcomes. For weight-related outcomes, there was strong evidence of favourable effects, especially for interventions targeting physical activity and/or diet. For the remaining metabolic risk factors, there was no evidence of a positive effect of workplace health promotion interventions. There was also strong evidence for a positive, small effect on the prevention of mental health disorders of workplace psychological interventions, especially those that use e-health and cognitive behavioural therapy techniques. Furthermore, strong evidence was found for the prevention of MSDs through workplace interventions, especially resistance exercise training. Carolan et al. (2017) conducted a systematic review and meta-analysis of web-based psychological interventions delivered in the workplace and found them to improve both employee wellbeing and effectiveness.

The systematic review of Sköld et al. (2019) specifically focused on the psychosocial effects of workplace exercise, concluding that workplace exercise interventions seem to have limited effects on mental health and the psychosocial work environment. Grimani et al. (2019) used a systematic review to examine the effectiveness of workplace nutrition and physical activity interventions in improving productivity, work performance and workability. Thirty-nine randomised control trials and non-randomised controlled studies were included. Fourteen workplace nutrition and physical activity intervention studies yielded statistically significant changes on absenteeism (n= 7), work performance (n= 2), workability (n= 3), productivity (n= 1) and on both workability and productivity together (n= 1), while two studies showed effects on absenteeism only between subgroups.

Aeon et al. (2021) carried out a meta-analysis on time management and found it to enhance wellbeing, in particular life satisfaction, to a greater extent than performance.

Gayed et al. (2018) investigated, via a systematic review and meta-analysis, the effectiveness of training workplace managers to understand and support the mental health needs of employees. The findings indicated that training managers in workplace mental health can improve their knowledge, attitudes and self-reported behaviour in supporting employees experiencing mental health problems. However, any findings regarding the impact of manager training on levels of psychological distress among employees remain preliminary as only a very limited amount of research evaluating employee outcomes is available. The review suggests that, in order to understand the effectiveness of manager training on employees, an increase in the collection of data at employee level is required.

A meta-review by Joyce et al. (2016) systematically examined and synthesised the research evidence regarding the effectiveness of primary, secondary and tertiary workplace mental health interventions for anxiety and depression disorders. Twenty review articles were deemed to be of moderate or high quality and were included in the analysis. Moderate evidence was identified for enhancing employee control and promoting physical activity. Stronger evidence was found for CBT-based stress management although less evidence was found for other secondary prevention interventions, such as counselling. Strong evidence was also found against the routine use of debriefing following trauma. Tertiary interventions with a specific focus on work, such as exposure therapy and CBT-based and problem-focused return to work programmes, had a strong evidence base for improving symptomology and a moderate evidence base for improving occupational outcomes. The authors point to the large body of academic literature demonstrating a range of work-related PSR for mental health including job strain, psychological demands, job control, social support, organisational justice, perceived job dissatisfaction, organisational change, job insecurity and employment status (Ndjaboué et al. 2012; Netterstrom et al. 2008; Nieuwenhuijsen et al. 2008; Stansfeld and Candy 2006). Given the range of identified factors, they were surprised that only one work-related factor, job control, had been the subject of multiple, reasonable quality intervention trials.

Joyce and colleagues (2016) further highlight that many workplaces have opted to attempt to enhance workers' resilience rather than modify the risks. However, they did not identify any reviews of sufficient quality examining the effectiveness of workplace resilience training. While some promising results were emerging (Tan et al. 2014), it was concluded that the overall effectiveness of resilience training needs to be examined in more detail before the widescale use of such interventions could be fully supported.

WHO (2022) also found limited evidence for various types of interventions with the exception of manager training – contrary to, for example, Gayed et al. (2018). More specifically, the WHO Guidelines on Mental Health at Work describe only moderate certainty of evidence on manager training as an intervention, while the evidence bases for all other types of intervention are judged to be of low or very low certainty. Together with manager training, only two additional interventions are strongly recommended: reasonable adjustments for people with mental health conditions; and recovery-oriented strategies enhancing vocational and economic inclusion – such as (augmented) supported employment – for people with severe

mental health conditions. Therefore, the WHO Guidelines put more emphasis on secondary and tertiary interventions and not on primary prevention. However, the conclusions reached could be due to the evaluation methodology, which is based on medical models (i.e. randomised controlled trials) rather than other types of evaluation which capture both process and outcomes (Randall et al. 2005; Cox et al. 2007; Karanika-Murray and Biron 2015; van Heijster et al. 2022), and that are more suitable for organisational-level interventions around work organisation and design.

The literature specifically on organisational-level interventions is still growing and there are now lessons to be learned in relation to their success and failure. A recent study by Demerouti and Adaloudis (2024) for the ETUI reviews the evidence on burnout, including interventions. Their scoping review concludes that burnout interventions typically focus on stress-relief and coping strategies to deal with the high level of job demands, but that their effects diminish over time. Research also shows that organisations focus primarily on the consequences of burnout, while more attention should be given to the underlying causes within the job. Evidence from organisational interventions shows that organisations can improve employees' working conditions to reduce burnout risk. They argue for combined interventions to develop a healthy work environment, while supporting individual employees.

In another study, Fox et al. (2022) systematically reviewed organisational and group-level workplace interventions and their effect on multiple domains of worker wellbeing. Interventions were categorised into four types: flexible work and scheduling changes; job and task modifications; relational and team dynamic initiatives; and participatory process interventions. The review found that strategies aiming to change work conditions have the potential to improve wellbeing with demonstrable effects in three particular domains (context-free wellbeing, e.g. psychological distress; work-specific wellbeing, e.g. job satisfaction; and work-family wellbeing, e.g. work-family conflict). Regardless of type, interventions involving increased control and opportunities for workers' voice and participation more reliably improve worker wellbeing, suggesting that these components are critical drivers of wellbeing.

Aust et al. (2023) conducted a systematic review of systematic reviews on the effectiveness of organisational-level interventions in improving the psychosocial work environment, health, and retention of workers. The review aimed to provide a comprehensive and updated overview of reviews, evaluating the effectiveness of organisational-level interventions on both proximal endpoints (changes in the psychosocial work environment) and distal endpoints (changes in workers' health and well-being, and retention) with a focus on primary prevention. 52 reviews of moderate or good quality were included in the final analysis and covered 957 primary studies: 30 focused on specific job groups or occupational sectors, 28 on the healthcare sector, one on schoolteachers and one on male industrial workers. The remaining 22 reviews included intervention studies from various job groups. Only a minority of the included reviews (10 out of 52) conducted a meta-analysis. Of the 52 reviews, 30 studied a specific intervention approach and 22 specific outcomes.

Regarding intervention approaches, the authors found strong quality of evidence for interventions focusing on 'changes in working time arrangements', especially in that those giving employees more influence over the scheduling of their working time (e.g. shifts) generated positive effects on work environment outcomes (especially work-life balance).

Moderate quality of evidence was found for 'influence on work tasks or work organisation', or increased control on positive health effects. There was a tendency that the interventions were more likely to have a positive effect when the interventions were motivated by improving workers' well-being compared to interventions that were motivated by improving the economy of the company. Moderate evidence was also found for 'healthcare approach changes', such as introducing new approaches to dementia care on outcomes related to psychosocial work environment, health, and labour market affiliation of healthcare workers. Similarly, moderate quality evidence was found in relation to 'improvements of the psychosocial work environment'. Positive outcomes were found in studies that introduced workgroup activities focused on better communication and support and those using a participative approach to enhance procedural aspects in the work environment and the core task. There was low quality evidence for the impact of introduction programmes, including mentor programmes, for newly qualified nurses regarding various outcomes. There was also low quality evidence for positive effects regarding the improvement of competencies, but inconsistent results for other outcomes, such as job satisfaction and turnover rates. Low quality evidence also existed for the effects of interventions aimed at preventing violence from patients, which mostly included staff training.

Finally, there was inconclusive evidence due to contradictory results regarding leadership training or development. Three reviews of strong quality and three of moderate quality examined the effects of interventions aimed at leaders (e.g. change in management approach or management development, coaching and training). The evidence across the reviews was different for leaders and for employees, several finding positive effects for leaders, especially regarding their knowledge, but contradictory with regard to employees. One review did not find effects on psychological symptoms for employees, although four found mixed results for employee mental health or wellbeing, moderate effects for organisational aspects (e.g. employee job satisfaction) and varying effects for employee work environment or health outcomes. There was strong quality of evidence for interventions on burnout, specifically that organisational-level interventions, either by themselves or in combination with individual intervention components, can reduce burnout. There was moderate quality evidence for 'various health and wellbeing outcomes', but inconclusive evidence due to contradictory results for stress and due to too few studies on employee retention.

As the authors discuss, the success of organisational-level interventions may depend on certain conditions like sufficient and continuous management support, appropriate problem assessment, so the intervention fits the problems being addressed, and the active involvement of employees. However, unforeseeable contextual changes such as restructuring, downsizing, high turnover among leaders and/or employees, competing projects and similar incidents that disturb

or limit the focus needed to develop and implement workplace improvements may influence the chances of positive outcomes (Nielsen and Randall 2013). These authors conclude that more research is needed, especially about implementation and context, to improve the evidence base.

Two studies by Knight et al. (2017, 2019) were based on a systematic review and meta-analysis which specifically investigated the effectiveness of work engagement interventions while also offering insights into the context and implementation aspects. A systematic search for interventions employing a validated engagement measure revealed 40 studies. Five were personal resource building, twelve job resource building, three leadership training, eighteen health promotion and two job and personal resource building. Twenty (50%) of the studies observed significant positive effects on work engagement, two (5%) had a negative effect and eighteen (45%) had no effect. The overall effect on work engagement was small but positive. Moderator analyses revealed a significant result for intervention style, with a medium to large effect for group interventions, the specific intervention focus and delivery method, employee participation, manager support, and intervention level (top-down vs bottom-up). Bottom-up interventions, and job crafting and mindfulness interventions, in particular, were the most successful. Job and personal resources, job demands and wellbeing were important mediators. Implementation difficulties were common, however, including poor response and attrition rates alongside other adverse factors (e.g. organisational restructuring, redundancy, economic downturn).

Finally, the systematic review by Daniels et al. (2021) provides further insight on contextual issues and why interventions fail. The authors reviewed 74 separate studies that assessed the implementation of workplace health and psychological wellbeing practices and their effects on psychological health or psychological wellbeing. Intervention types, as defined in this study, included primary (e.g. work redesign, 37 studies, and health behaviour change, 8 studies), secondary (e.g. mindfulness training, 11 studies), tertiary (e.g. focused on rehabilitation, 9 studies) and multifocal (e.g. including components of primary and secondary, 9 studies). They found that tangible changes preceded improvements in health and wellbeing, indicating that intervention success cannot be attributed to non-specific factors. Some interventions had beneficial effects through mechanisms not planned as part of the intervention. Three factors were associated with successful implementation: continuation, learning and effective governance. The authors conclude that future research could focus on how organisations manage the conflicts that arise between the implementation of interventions and existing organisational processes, as well as on the dynamic nature of the organisational contexts that affect and are affected by the implementation of workplace health and psychological wellbeing interventions.

Therefore, the evidence base on interventions is mixed and does not allow firm conclusions to be made, especially where evaluation studies have simply applied an evaluation model that does not take the nuances of context and implementation into account. Several studies have provided insights and learning points on the evaluation of interventions that should be considered in this area

before conclusions are drawn, and especially in relation to organisational-level interventions.

However, it is important to note that there are recommendations in relation to specific interventions that have been proposed in key reports and guidance documents such as SLIC (2018), ISO 45003 (ISO 2021) and ILO (2022b). A review of these and other guidance and scientific publications has allowed the development of examples of interventions that organisations may find useful across the various dimensions of the psychosocial work environment.

Table 7 **Examples of interventions to promote a healthy psychosocial work environment**

Organisational culture & function
• develop a good psychosocial safety climate that demonstrates management prioritisation of, and commitment to addressing PSR and promoting mental health at work, and that values employee participation and consultation to address PSR
• develop organisational policies for PSR reporting, prevention and management
• ensure leaders, managers and workers are trained on PSR and related outcomes
• encourage early reporting of issues by workers by providing a psychologically safe, supportive, respectful work environment
• develop an organisational culture that is fair, just and stigma-free for all workers
• develop and communicate clear organisational objectives and associated processes
• apply ethical and transparent leadership and management practices
• establish effective communication and feedback processes that allow participation and consultation for all workers
• develop the competencies of leaders, managers and workers to work collaboratively in addressing PSR in a preventive manner
• ensure that organisational change is managed in a transparent, consistent and impartial manner and support is provided for all concerned
• consult workers about workplace changes and how these can affect them
• avoid overly bureaucratic processes
Job content
• ensure managers and workers have appropriate skills to meet their task requirements
• design clear and meaningful work tasks
• prioritise tasks and reduce unnecessary tasks and bureaucracy
• design work that reduces high cognitive demands
• design work that promotes interest and engagement, e.g. through task rotation and enrichment
• redesign or rotate difficult tasks allowing sufficient time for recovery
• develop skills and provide appropriate support to deal with high emotional demands and interactions with difficult people
• schedule appropriate breaks in cognitively and emotionally demanding work
• give workers more autonomy in deciding how to carry out their tasks
• promote ethical standards to avoid moral injury

Workload & work pace
• ensure workload and work pace are at an appropriate level and are well-planned to the fullest extent possible • monitor working practices proactively to detect harmful workload and work pace and introduce appropriate adjustments • ensure that work tasks are equally and fairly distributed • set sensible and achievable deadlines in line with available staffing and resources to avoid overload and enhance work quality • in case of work underload or monotonous work, vary or enrich the tasks to prevent boredom and lack of concentration • ensure worker abilities are matched to the demands of their jobs • plan changes in work organisation and the application of new technologies while addressing skills development and support
Work schedule
• introduce well-planned working schedules that safeguard against long working hours and avoid involuntary overtime • allow flexible working practices where possible • adjust breaks and rest time according to workload • design sensible shifts and reasonable working hours to allow time for recovery and maintain work-life balance • set boundaries on the working hours and accessibility of workers (including remote workers) to facilitate work-life balance • adjust working time arrangements to allow workers to fulfil their family and care responsibilities • reduce technology overload and technostress by introducing sensible machine or computer pacing and avoiding over-reliance on algorithmic management • avoid high levels of time pressure and work intensification by managing expectations and setting appropriate boundaries
Control
• establish processes for worker participation and consultation in decision-making, especially when this concerns decisions that directly affect them • give workers more control over their work tasks and methods, and pace of work, where possible • ensure levels of autonomy are matched to workers' abilities • limit algorithmic management and digital surveillance. Where this is not possible, introduce the transparent and balanced use of algorithms and digital surveillance, respecting privacy and data protection • promote worker-in-control design in human-machine interactions
Environment & equipment
• implement good physical working conditions (e.g. noise, lighting, vibration, temperature, chemicals, adequate space) according to good practice guidance • provide appropriate and well-maintained equipment • reduce technostress and technology overload • provide appropriate training for new equipment and technology, for working in unstable environments such as conflict zones and natural disaster zones and for exposure to traumatic events or material • minimise remote and isolated work • minimise exposure to extreme environmental conditions and unstable/traumatic environments • implement safety and security measures to protect workers from specific risks, e.g. the risk of violence, working in unstable environments • provide appropriate support for those working in extreme physical conditions and unstable environments and those exposed to traumatic events and material
Interpersonal relationships at work
• establish a psychologically safe, inclusive, fair and supportive organisational culture through the development and implementation of appropriate policies and processes (e.g. OSH, HR, equality, diversity and inclusion, anti-harassment and violence) and the provision of relevant training for leaders, managers and workers • establish channels to enable workers to express their attitudes, experiences and suggestions, whether directly or through their supervisors and managers

- establish and implement transparent and appropriate procedures to report incidents and deal with conflicts and problem solving, outlining expected behaviours and how unacceptable behaviour will be managed
- establish open, respectful and civil communication systems and processes
- establish procedures for dealing with personal confidential information adhering to ethical standards (including in remote digital work)
- support effective teamwork by developing team cohesion through appropriate planning and training (including for online teams)
- provide opportunities for social interaction, including for isolated workers and temporary agency workers
- limit remote and isolated work where possible and provide additional support for such workers
- provide appropriate support to workers who are experiencing negative impacts from exposure to PSR (e.g. access to occupational health services, employee assistance programmes, confidential counselling, conflict mediation services, return to work programmes, etc.)
- recognise and support vulnerable groups through additional support measures
- design the physical work environment and establish work practices to prevent violence and protect workers
- inform and train all workers about the risks of violence, taking safety precautions and other safety measures in the case of an incident
- provide victims of work-related violence, harassment and bullying (including gender-based violence, sexual harassment and cyberbullying) with access to responsive and safe support services

SLIC (2018) provides further detailed guidance on interventions for third party violence and bullying and harassment at work.

Role in organisation

- provide clear job descriptions with defined roles and responsibilities and performance requirements
- review job descriptions and roles cooperatively on an ongoing basis, and clearly communicate any changes to the employee and those working alongside them
- provide information to workers about their rights and responsibilities
- identify the immediate supervisor and the available support to meet objectives
- develop clear and meaningful professional worker identities
- ensure roles are matched to worker needs, skills, capabilities and experience

Career development

- provide appropriate career prospects and development, matching skills and performance and avoiding under and over-promotion
- implement well-designed evaluation systems not solely based on algorithms
- minimise inappropriate use of rating systems and algorithmic bureaucracy
- establish clear and transparent feedback processes that promote career development
- recognise and reward worker commitment and achievement
- implement transparent, fair and equitable rewards and pay that are appropriate to work performance and that avoid in-work poverty
- ensure career development and pay systems are fair and equitable for all workers and monitor the implementation of these systems to identify and rectify inequalities
- employ sustainable employability practices by providing appropriate training and learning opportunities
- reduce job insecurity by providing more stable work and contracts
- provide support to employees affected by organisational change, restructuring and job insecurity
- promote meaningful work by avoiding meaningless tasks and showcasing the organisational and social value of work

Home-work interface

- implement supportive organisational policies and practices to promote work-life balance
- respect workers' right to disconnect by setting boundaries on working hours and accessibility of workers (including remote workers)
- make reasonable adjustments in working hours and practices to facilitate worker family and care responsibilities where possible
- avoid unreasonable and constant worker mobility that can disrupt personal life
- recognise and support vulnerable groups through appropriate support measures

12. Conclusions and recommendations

This report has discussed definitions, terminology, theories, taxonomies and instruments on the psychosocial work environment. It has reviewed the prevalence of work-related PSR and the policy context in the EU and selected countries, identified the key determinants of the psychosocial work environment at macro level and summarised evidence on the health and organisational impacts. This information was used to develop an updated conceptual framework with the aim of capturing knowledge around sources at macro level, psychosocial factors, psychosocial hazards and impacts. It discussed different types of intervention approaches, drawing learning points on their evaluation, and then developed examples of interventions on the basis of existing guidance, mapped these to psychosocial work environment dimensions at organisational level.

Terminology on work-related PSR can be found in the literature since the 1960s; however, the term 'psychosocial factors' became more widely used in occupational safety and health (OSH) when a definition was provided in a report of the Joint ILO/WHO Committee on Occupational Health, published by the ILO in 1986. Several theoretical models exist on the psychosocial work environment, many of which were developed as models of work-related stress and burnout. Terminology and theoretical domains have evolved over the years with researcher attempts to capture the impact of aspects of the non-physical work environment on health, safety and wellbeing as well as organisational outcomes. Since most of the theoretical models are discussed in the literature as models of work-related stress, a majority of studies have focused on negative outcomes at the individual level. However, there is also some explicit recognition of positive outcomes in some models, although very few capture the macro-level determinants and impacts.

According to these theoretical perspectives, various instruments have been designed to allow data to be collected on work-related PSR with most tools being self-reporting questionnaires. Concepts such as 'job strain' and 'ERI' have been used in numerous studies as risk indicators in relation to various outcomes. While the authors of these theoretical models provide norms for instruments developed to measure job strain and ERI, in empirical studies in various sectors and countries, validation of these and other tools (e.g. COPSOQ) result in different cut-off risk scores, reflecting the nature of work in these contexts. In some countries, for example the UK and Italy, extensive analysis of national level data has provided national level risk cut-off scores that have been used to benchmark organisational practices at national level and in specific sectors.

The evidence indicates that the most prevalent work-related psychosocial risks in the EU are work intensity (such as working to tight deadlines or at high speed), work overload and those which are related to the type of tasks carried out (such as monotonous or complex tasks). Additionally, many workers report being affected by specific working time arrangements such as working irregular schedules and long working hours. Exposure to these risks varies across countries, sectors and occupations, and by organisational size, gender and age. Recent technological developments and the Covid-19 pandemic have resulted in changed working patterns and practices (e.g. telework, hybrid work, algorithmic management, digital surveillance) and employment relationships and contracts (e.g. gig and platform work, zero-hour contracts). Accordingly, several new and emerging PSR are associated with them such as the inability to disconnect, the blurring of work and private life, social isolation and reduced autonomy.

Growing evidence on the prevalence and impact of PSR has resulted in the development of a plethora of hard and soft law initiatives. However, only about 20 per cent of European enterprises inform their employees on psychosocial risks, let alone taking appropriate actions to tackle them with lack of awareness, lack of resources, and lack of technical support, guidance and expertise consistently being identified as key needs in this area, irrespective of enterprise size, sector or country. Although OSH legislation is seen by European employers as a key driver to address health and safety issues, it has been less effective for the management of psychosocial risks and the promotion of mental health in the workplace. In relation to psychosocial risks, there have been several calls to clarify the text of EU legislation further through the inclusion of specific terms (such as work-related stress, psychosocial risks and mental health at work). Other policy approaches (e.g. standards and guidelines) have been found to be more precise and user friendly than legislation in relation to psychosocial risks and mental health at work. However, specific legislation on work-related PSR is now available in the majority of EU Member States and there is evidence to show that, in those countries where specific legislation has been introduced, there is more organisational action. Further work is needed to translate policies into practice and it is important to underline that policies are made and implemented in multi-actor contexts and that context thus has a direct impact both on policy frameworks and on the implementation of policies in practice.

Therefore, the conceptual framework on work-related PSR developed through this work explicitly includes several aspects of the macro context as determinants of the psychosocial work environment at organisational level. These are:

- the political context: governance, political actors, political power relations and the stability of the political system
- the social context: social attitudes, civic engagement, social dialogue, worker representation and workforce demography
- the economic context: globalisation, macroeconomic stability and welfare state model
- the technological context: digitalisation, automation, robotisation and AI
- the ecological context: environmental conditions, including climate change and the safety and security of the environment.

In turn, these have an impact on:

- the policy context: the development and quality of health policies, social protection policies, economic and trade policies, education policies, environmental policies, labour market policies (e.g. labour regulations, anti-discrimination regulations, industrial relations) and OSH policies
- labour market dynamics: the availability of full employment, the prevalence of unemployment, the adequacy of wages and earnings, precarious work and informal employment, child labour, slavery and bonded labour, human-machine interaction, skills development and employability, and the prevalence of the gig economy
- OSH infrastructure: OSH enforcement, the availability, coverage and quality of occupational health services and the quality of the training and competency development of key stakeholders including labour inspectors.

The review of taxonomies on the psychosocial work environment identified several as depicted in theoretical models, measurement instruments and key guidance documents. Some taxonomies list psychosocial factors, others list psychosocial hazards while in other cases, there is a mix of the two, or a mix of factors and outcomes. The most widely used taxonomy is the one by Cox (1993) and Cox and Cox (1993) and its later adapted versions which has been incorporated in several key pieces of guidance, e.g. by EU-OSHA, the European Commission, SLIC, ILO and WHO. The key dimensions of the psychosocial work environment depicted in this taxonomy align well to those of the others and are broad enough to capture developments in terms of the nature of work. These include organisational culture and function, job content, workload and work pace, work schedule, control, environment and equipment, interpersonal relationships at work, role in organisation, career development and home-work interface. Only one taxonomy has incorporated psychosocial safety climate as an indicator of organisational culture. Finally, the existing taxonomies would benefit from updating to include additional examples of both psychosocial factors and psychosocial hazards that capture aspects of the changing nature of work and employment contracts, technological innovations and environmental factors. Therefore, an updated conceptual framework was developed to address these issues.

The review of the impacts of work-related PSR impacts focused both on the health impacts and on organisational outcomes. Although the evidence base can be improved in terms of more high quality studies, it can be concluded that there are now several such studies on the health impacts of work-related PSR. Overall, studies tend to focus on individual level outcomes (mainly cardiovascular disease and mental ill health). The available evidence shows consistently that various PSR can lead to a range of health outcomes and therefore need to be prioritised in a preventive manner within organisations. The available evidence on organisational outcomes is diverse and builds a picture of several PSR contributing to performance, job satisfaction, work engagement, innovation, absenteeism, presenteeism, turnover, retirement intention and disability retirement. Studies identify limitations in the available evidence in terms of quality and recognise that the evidence base is not as well-developed as that on the health impact of PSR. However, it is still possible to identify both the positive and the negative impacts

of PSR on several organisational outcomes and conclude that there is a strong business case for a healthy psychosocial work environment.

Table 8 **Positive psychosocial work environment**

Positive psychosocial work environment	
Organisational culture & function	Good psychosocial safety climate (policies and processes demonstrating leadership prioritisation of, and commitment to, promoting a healthy psychosocial work environment and mental health at work in a preventive way) Ethical and transparent leadership and management practices Organisational culture based on psychological safety, justice and trust Good and inclusive communication processes Employee participation and consultation Clear organisational objectives Value conguence Appropriate support for problem solving Minimisation of unnecessary bureaucracy Well-planned organisational change management
Job content	Clear and meaningful work tasks Appropriate task design reducing cognitive load Appropriate use of skills Work that retains employee interest and engagement Appropriate support to deal with high emotional demands and interactions with difficult people Application of ethical standards to prevent moral injury
Workload & work pace	Appropriate level of workload Well-planned workload Appropriate work pace Sensible and achievable deadlines Well-planned changes in work organisation and application of new technologies Appropriate training in the use of new technologies Human-in-control design Adequate staffing
Work schedule	Sensible shifts Reasonable working hours to maintain work-life balance Flexible working practices to the fullest extent possible Well-planned working schedules Respect for the right to disconnect
Control	Participation in decision-making Control over workload, work tasks and methods, and pace of work Autonomy matched to worker abilities Transparent and balanced use of algorithms and digital surveillance Privacy and data protection
Environment & equipment	Good physical working conditions according to good practice guidance Minimisation of isolated work Minimisation of exposure to extreme environmental conditions and unstable/traumatic environments and material, and provision of security and support measures Appropriate and well-maintained equipment Appropriate training for new equipment and technology

Interpersonal relationships at work	Good relationships at work Teamwork and collaboration Social support from superiors and colleagues Civility and respect Appropriate policies and procedures to deal with conflicts Fair, anti-discriminatory and inclusive policies Zero tolerance of violence, harassment, (cyber)bullying and stigma
Role in organisation	Clear roles and responsibilities Appropriate support to meet objectives Promoting clear and meaningful professional identity
Career development	Appropriate career prospects and development matching skills & performance Constructive feedback mechanisms Training and learning opportunities that support sustainable employability Effort-reward balance Appropriate pay Meaningful and valuable work Job security Work stability Well-designed evaluation systems not solely based on algorithms Minimising algorithmic bureaucracy
Home-work interface	Work-life balance Right to disconnect Supportive organisational policies and practices to achieve 'life balance' Minimisation of unnecessary worker mobility Balanced careers

Revision of Leka et al. (2017) on the basis of conceptual framework.

Finally, the review of evidence on interventions showed that the evidence base is mixed and does not allow firm conclusions to be drawn, especially where evaluation studies have simply applied a model that does not take the nuances of context and implementation into account. More systematic reviews and meta-analyses are now available; however, cost estimation studies are still scarce. Several studies have provided insights and learning points on the evaluation of interventions that should be considered before conclusions are drawn, especially in relation to organisational-level interventions.

While there are knowledge gaps that have been acknowledged and discussed in this report, it is also evident that there is an enormous amount of knowledge which is now developing faster than ever. There is evidence of a greater understanding and appreciation of the importance of the psychosocial work environment among policymakers and the social partners. However, there is more work to be done. There are rapid transformations in the world of work and new realities that are not yet fully understood. Organisations in the EU consistently ask for more support (e.g. EU-OSHA 2010, 2014, 2019). And so do those who undertake the important work of labour inspectorates and occupational health services.

Similarly to other colleagues (e.g. Schulte et al. 2024), it is hoped that this report has highlighted that enough is now known to prioritise the promotion of a healthy psychosocial work environment and the development of healthy work and organisations. Enough is also now known about what a healthy psychosocial work environment looks like. Table 8 presents a revision of the positive psychosocial

work environment characteristics described by Leka et al. (2017) on the basis of the updated conceptual framework presented in this report.

Interestingly, the conclusion that enough knowledge is available was also drawn in the 1986 ILO report. Almost 40 years later, it is imperative that more decisive action now takes place in various areas. The following recommendations aim at highlighting where this action is needed most in research, policy and practice.

Research

- conduct meta-reviews on PSR and design better quality studies on the basis of their findings
- conduct studies on PSR arising from changes in the nature of work, new technologies and practices and their impact
- conduct intervention evaluation studies using appropriate evaluation methods beyond randomised control trials
- in addition to the negative impacts of PSR exposure, evaluate and showcase positive outcomes
- conduct more studies on the impact of the macro context, including addressing inequalities
- conduct policy evaluation studies, including implementation and enforcement.

Policy

- analyse specific pieces of legislation on PSR across countries to assess their content concerning the key dimensions and the taxonomy developed here
- analyse case studies in countries where there has been a long tradition of policy approaches on PSR to evaluate how they have worked out in practice
- analyse how standards have been used in this area and their impact
- engage stakeholders in the discussion of the development of more specific legislation on PSR (e.g. an EU Directive on PSR)
- consider how EU policies can be aligned to promote a preventive approach on PSR at macro level.

Practice

- translate the conceptual framework into tools for stakeholders
- develop stakeholder competencies through appropriate training
- promote labour inspection tools by SLIC and ILO
- establish multi-disciplinary occupational health services with appropriate expertise on PSR prevention
- systematise knowledge on interventions and promote systematic comprehensive multi-modal interventions prioritising prevention.

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All links and references were checked on 06.11.2024.

Annex 1

Table A1 **Directives of relevance to psychosocial risks in the workplace at EU level**

Directive 89/391/EEC the European Framework Directive on Safety and Health at Work
Directive 2003/88/EC concerning certain aspects of the organisation of working time (consolidates and repeals Directive 93/104/EC)
Directive 90/270/EEC on the minimum safety and health requirements for work with display screen equipment (fifth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
Directive 92/85/EC on pregnant workers, women who have recently given birth or are breast-feeding
Directive 94/33/EC on the protection of young people at work
Directive 2002/14/EC establishing a general framework for informing and consulting employees in the European Community
Directive 2002/15/EC on the organisation of working time of persons performing mobile road transport activities
Directive 96/34/EC on the framework agreement on parental leave
Directive 2009/104/EC concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) [replacing Directive 89/655/EEC]
Directive 2008/94/EC on the protection of employees in the event of the insolvency of their employer (repealing Directive 2002/74/EC and Council Directive 80/987/EEC)
Directive 98/59/EC on the approximation of the laws of the Member States relating to collective redundancies
Directive 92/91/EEC - concerning the minimum requirements for improving the safety and health protection of workers in the mineral-extracting industries through drilling (eleventh individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
Directive 92/104/EEC on the minimum requirements for improving the safety and health protection of workers in surface and underground mineral-extracting industries (twelfth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
Directive 89/654/EEC concerning the minimum safety and health requirements for the workplace (first individual directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
Directive 89/656/EEC on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace (third individual directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
Directive 90/269/EEC on the minimum health and safety requirements for the manual handling of loads where there is a risk particularly of back injury to workers (fourth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
Directive 97/81/EC concerning the framework agreement on part-time work
Directive 99/70/EC concerning the framework agreement on fixed-term work
Directive 2000/79/EC concerning the European Agreement on the Organisation of Working Time of Mobile Workers in Civil Aviation.
Council Directive 2001/23/EC on the approximation of the laws of the Member States relating to the safeguarding of employees' rights in the event of transfers of undertakings, businesses or parts of undertakings or businesses
Directive 2009/38/EC on the establishment of a European Works Council or a procedure in Community-scale undertakings and Community-scale groups of undertakings for the purposes of informing and consulting employees (recast)
Directive 93/103/EC concerning the minimum safety and health requirements for work on board fishing vessels (thirteenth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
Directive 92/57/EEC on the implementation of minimum safety and health requirements at temporary or mobile construction sites (eighth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
Directive 91/383/EEC supplementing the measures to encourage improvements in the safety and health at work of workers with a fixed-duration employment relationship or a temporary employment relationship

Table A2 **Results of the implementation of the European framework agreement on work-related stress**

Social partners/ involvement instruments	Substantial joint efforts of social partners	Moderate or unilateral efforts of social partners	Limited social partners initiatives	No social partners initiative so far
National collective agreement or social partner action based on explicit legal framework	Netherlands, Finland Sweden Belgium, Denmark, UK[3] France[4] Iceland, Norway	Italy	Greece, Romania	
National collective agreement or social partner action based on explicit legal framework	Spain (agreement), Luxemburg, Austria (recommendations)	Ireland (recommendations) Czech Republic, Germany[2]		
Mainly legislation	Latvia[1]	Hungary[1], Slovakia[1] (social partner initiated), Portugal[1]		Lithuania[1] Bulgaria Estonia
No action reported or declaration with limited follow-up			Cyprus[5] Poland Slovenia	Malta

Notes: Situation in early 2010. This overview necessarily simplifies differences within categories.
[1] Regulation following European Framework Agreement.
[2] Joint action indirectly through statutory self-governed accident insurance bodies that have a preventive mission.
[3] Recognised as occupational health risk in common law.
[4] National agreement, persistent problems at company level led to government intervention.
[5] Formal, joint recognition of pertinence of the general legal framework.

Source: Adapted from European Commission (2011).

Table A3 **Main implementation actions with a direct link to the autonomous framework agreement on harassment and violence in the workplace**

Country	Implementing actions	Date	Coverage	Binding/ non-binding
AT	Joint guidance	2009	Members of signatory parties (all employers and employees)	Non-binding
BE	Assessment of national legislation led to decision that no further implementation action was needed	2007/8	N/A	N/A
BG	None	N/A	N/A	N/A
CY	Joint translation Tripartite framework agreement on stress with a policy statement on violence and harassment	2008 2009	Whole economy Whole economy	Non-binding Binding
CZ	Joint translation Joint brochure on all 3 autonomous framework agreements Various sectoral collective agreements	2007 2007	Whole economy Members of signatory parties Members of signatory parties	Non-binding Non-binding Binding
DE	Joint dissemination activity around translation of the agreement (including joint events) Various sectoral collective agreements	2008	Whole economy Members of signatory parties	Non-binding Binding

Country	Implementing actions	Date	Coverage	Binding/ non-binding
DK	Assessment of existing legislation and framework collective agreement (private sector) leading to joint declaration that existing provisions are sufficient Collective agreement ('Well-being agreement') Collective agreement on harassment and bullying in the industrial and retail sector in implementation of above-mentioned private sector framework agreement)	2006 (collective agreement) 2010 (joint statement) 2008	Members of signatory parties, private sector Public sector Members of signatory parties, industrial and retail sector	Non-binding Binding Binding
EE	Translation dissemination on ministry and social partner websites	2008	Whole workforce	Non-binding
EL	None	N/A	N/A	N/A
ES	Cross-industry collective agreement requiring inclusion in sectoral collective agreements	2008	Members of signatory parties	Non-binding (but requiring members of signatory parties to take relevant actions)
FI	Joint translation Joint dissemination Drafting of joint leaflet on main messages of agreement, joint work with central government	2010	Whole workforce	Non-binding
FR	Cross-industry national agreement on harassment and violence at work (extended by ministerial decree)	2010	Whole workforce	Binding
HR	None	N/A	N/A	N/A
HU	Joint translation Joint dissemination through circulation of joint information note Consideration of the issue in the revision of the Labour Code (but no changes made)	2009	Members of signatory parties	Non-binding
IE	Joint Charter on Dignity in the workplace	2007	Whole economy	Non-binding
IT	None	N/A	N/A	N/A
LT	None	N/A	N/A	N/A
LU	Joint cross-sectoral agreement on harassment and violence at work; declared generally binding by Grand ducal decree	2009	Whole economy	Binding
LV	Joint declaration, followed by initiatives to support sectoral implementation	2008	Members of signatory organisations	Non-binding
MT	None	N/A	N/A	N/A
NL	Joint Recommendation on harassment and violence in the workplace Various sectoral collective agreements and agreement of 'risk catalogues'	2008	Members of signatory organisations Members of signatory organisations	Non-binding Binding
PL	Joint translation and joint declaration by cross-industry social partners	2009 (joint translation) 2011 (joint declaration)	Members of signatory organisations	Non-binding
PT	Joint translation	2008	Whole economy	Non-binding
RO	None	N/A	N/A	N/A

Country	Implementing actions	Date	Coverage	Binding/ non-binding
SE	Joint translation Joint dissemination	2008	Whole economy	Non-binding
	Publication of joint book on avoiding harassment at work	2008	Whole economy	Non-binding
	Various sectoral collective agreements		Signatory parties	Binding
SI	Amendments to health and safety legislation to include provision in line with framework agreement	2007 and 2013	Whole economy	Binding
SK	None	N/A	N/A	N/A
UK	Joint guidance	2009	Whole workforce	Non-binding
IS	Joint review of national legislation (and conclusion of no further action needed) Joint translation Joint dissemination of agreement	2010	Whole workforce	Non-binding
LI	None	N/A	N/A	N/A
NO	Joint translation and dissemination	2008	Whole economy	Non-binding
	Joint guidelines on bullying and harassment (together with the National Labour Authority)	2010		
	Tripartite agreement on a more inclusive working life (5th IA agreement)	2019 First IA signed in 2001	Whole economy	

Source: Adapted from European Commission (2016).

Annex 2

Table A4 **Included studies – macro context**

Author(s)	Type of review	No. of studies included	Title
Aguirre, D. L., Perez, C., & Burkett, E. K. (2022)	Narrative review	N/A	Stability, security, and the social determinants of health
Antunes, E. D., Bridi, L. R. T., Santos, M., & Fischer, F. M. (2023)	Systematic review	32	Part-time or full-time teleworking? A systematic review of the psychosocial risk factors of telework from home
Bahamondes-Rosado, M. E., Cerdá-Suárez, L. M., Dodero Ortiz de Zevallos, G. F., & Espinosa-Cristia, J. F. (2023)	Systematic review	24	Technostress at work during the COVID-19 lockdown phase (2020–2021): a systematic review of the literature
Bajwa, U., Gastaldo, D., di Ruggiero, E., & Knorr, L. (2018)	Scoping Review	49	The health of workers in the global gig economy (Towards an understanding of workers' experiences in the global gig economy)
Bambra, C. (2011)	Narrative review	N/A	Work, worklessness and the political economy of health inequalities
Bambra, C., Gibson, M., Sowden, A. J., Wright, K., Whitehead, M., & Petticrew, M. (2009)	Umbrella review (Systematic review of systematic reviews)	7	Working for health? Evidence from systematic reviews on the effects on health and health inequalities of organisational changes to the psychosocial work environment
Bankins, S., Ocampo, A. C., Marrone, M., Restubog, S. L. D., & Woo, S. E. (2024)	Systematic review	68	A multilevel review of artificial intelligence in organizations: implications for organizational behavior research and practice
Beaglehole, B., Mulder, R. T., Frampton, C. M., Boden, J. M., Newton-Howes, G., & Bell, C. J. (2018)	Systematic review and meta-analysis	41 (27 in meta-analysis)	Psychological distress and psychiatric disorder after natural disasters: systematic review and meta-analysis
Beer, P., & Mulder, R. H. (2020)	Systematic review	21	The effects of technological developments on work and their implications for continuous vocational education and training: a systematic review
Benach, J., Vives, A., Amable, M., Vanroelen, C., Tarafa, G., & Muntaner, C. (2014)	Narrative review	N/A	Precarious employment: understanding an emerging social determinant of health
Benach, J., Vives, A., Tarafa, G., Delclos, C., & Muntaner, C. (2016)	Integrative narrative review	N/A	What should we know about precarious employment and health in 2025? Framing the agenda for the next decade of research
Benavides, F. G., Serra, C., & Delclos, G. L. (2019)	Narrative review	N/A	What can public health do for the welfare state? Occupational health could be an answer
Biddau, F., Brondi, S., & Cottone, P. F. (2022)	Systematic review	404	Unpacking the psychosocial dimension of decarbonization between change and stability: a systematic review in the social science literature
Biswas, A., Harbin, S., Irvin, E., Johnston, H., Begum, M., Tiong, M., Apedaile, D., Koehoorn, M., & Smith, P. (2021)	Scoping review	58	Sex and gender differences in occupational hazard exposures: a scoping review of the recent literature
Bitzer, T., Wiener, M., & Cram, A. W. (2023)	Scoping review	50	Algorithmic transparency: concepts, antecedents, and consequences – A review and research framework
Bluff, E., Johnstone, R., Walters, D., Limborg, H. J., & Gensby, U. (2022)	Narrative review	N/A	Fitness for purpose of occupational safety and health monitoring and enforcement in the European Union
Bohle, P., Pitts, C., & Quinlan, M. (2010)	Narrative review	N/A	Time to call it quits? The safety and health of older workers

Author(s)	Type of review	No. of studies included	Title
Braveman, P., & Gottlieb, L. (2014)	Narrative review	N/A	The social determinants of health: it's time to consider the causes of the causes
Bravo, G., Viviani, C., Lavallière, M., Arezes, P., Martínez, M., Dianat, I., Bragança, S., & Castellucci, H. (2022)	Systematic review	67	Do older workers suffer more workplace injuries? A systematic review
Brooks, S. K., Dunn, R., Sage, C. A. M., Amlôt, R., Greenberg, N., & Rubin, G. J. (2015)	Systematic review	61	Risk and resilience factors affecting the psychological well-being of individuals deployed in humanitarian relief roles after a disaster
Brown, B. S. (1983)	Narrative review	N/A	The impact of political and economic changes upon mental health
Budhwar, P., Malik, A., de Silva, M. T. T., & Thevisuthan, P. (2022)	Systematic review	70	Artificial intelligence – challenges and opportunities for international HRM: a review and research agenda
Busck, O., Knudsen, H., & Lind, J. (2010)	Narrative review	N/A	The transformation of employee participation: consequences for the work environment
Caldbick, S., Labonte, R., Mohindra, K. S., & Ruckert, A. (2014)	Narrative review	N/A	Globalization and the rise of precarious employment: the new frontier for workplace health promotion
Campos-Serna, J., Ronda-Pérez, E., Artazcoz, L., Moen, B. E., & Benavides, F. G. (2013)	Systematic review	30	Gender inequalities in occupational health related to the unequal distribution of working and employment conditions: a systematic review
Castaño, A. M., Fontanil, Y., & García-Izquierdo, A. L. (2019)	Systematic review	61	'Why can't I become a manager?'- A systematic review of gender stereotypes and organizational discrimination
Charlson, F., van Ommeren, M., Flaxman, A., Cornett, J., Whiteford, H., & Saxena, S. (2019)	Systematic review and meta-analysis	129	New WHO prevalence estimates of mental disorders in conflict settings: a systematic review and meta-analysis
Chique, C., Hynds, P., Nyhan, M. M., Lambert, S., Boudou, M., & O'Dwyer, J. (2021)	Systematic review	59	Psychological impairment and extreme weather event (EWE) exposure, 1980-2020: a global pooled analysis integrating mental health and well-being metrics
Clougherty, J. E., Souza, K., & Cullen, M. R. (2010)	Narrative review	N/A	Work and its role in shaping the social gradient in health
Crawford, J. O., Graveling, R. A., Cowie, H. A., & Dixon, K. (2010)	Systematic review	59	The health, safety and health promotion needs of older workers
Cunha, L., Silva, D., & Maggioli, S. (2022)	Systematic review	77	Exploring the status of the human operator in Industry 4.0: a systematic review
Cuthbertson, J., & Penney, G. (2023)	Systematic review	33	Ethical decision making in disaster and emergency management: a systematic review of the literature
da Costa, S., Páez, D., Martí-González, M., Díaz, V., & Bouchat, P. (2023)	Umbrella review (Systematic review of systematic reviews and meta-analysis)	16	Social movements and collective behavior: an integration of meta-analysis and systematic review of social psychology studies
Davies, S. E. (2014)	Narrative review	N/A	Healthy populations, political stability, and regime type: Southeast Asia as a case study
De Silva, M. J., McKenzie, K., Harpham, T., & Huttly, S. R. A. (2005)	Systematic review	50	Social capital and mental illness: a systematic review
Deglon, M., Dalvie, M. A., & Abrams, A. (2023)	Scoping review	12	The impact of extreme weather events on mental health in Africa: a scoping review of the evidence

Author(s)	Type of review	No. of studies included	Title
Dieker, A. C. M., Ijzelenberg, W., Proper, K. I., Burdorf, A., Ket, J. C. F., van der Beek, A. J., & Hulsegge, G. (2019)	Systematic review	27	The contribution of work and lifestyle factors to socioeconomic inequalities in self-rated health – a systematic review
Doki, S., Sasahara, S., & Matsuzaki, I. (2018)	Systematic review	45	Stress of working abroad: a systematic review
Driscoll, T., Rushton, L., Hutchings, S. J., Straif, K., Steenland, K., Abate, D., Abbafati, C., Acharya, D., Adebayo, O. M., Afshari, M., Akinyemiju, T., Alahdab, F., Anjomshoa, M., Antonio, C. A. T., Aremu, O., Ataro, Z., AyalaQuintanilla, B. P., MattarBanoub, J. A., Barker-Collo, S. L., ... Lim, S. S. (2020)	Epidemio-logical analysis	National health databases	Global and regional burden of disease and injury in 2016 arising from occupational exposures: a systematic analysis for the Global Burden of Disease Study 2016
Ebi, K. L., Capon, A., Berry, P., Broderick, C., de Dear, R., Havenith, G., Honda, Y., Kovats, R. S., Ma, W., Malik, A., Morris, N. B., Nybo, L., Seneviratne, S. I., Vanos, J., & Jay, O. (2021)	Narrative review	N/A	Hot weather and heat extremes: health risks
el Khayat, M., Halwani, D. A., Hneiny, L., Alameddine, I., Haidar, M. A., & Habib, R. R. (2022)	Scoping review	92	Impacts of climate change and heat stress on farmworkers' health: a scoping review
MacEachen, E., Kosny, A., Ståhl, C., O'Hagan, F., Redgrift, L., Sanford, S., Carrasco, C., Emile, T., & Mahood, Q. (2016)	Systematic review	18	Systematic review of qualitative literature on occupational health and safety legislation and regulatory enforcement planning and implementation
Ferrara, B., Pansini, M., de Vincenzi, C., Buonomo, I., & Benevene, P. (2022)	Systematic review	20	Investigating the role of remote working on employees' performance and well-being: an evidence-based systematic review
Fida, R., Watson, D., Ghezzi, V., Barbaranelli, C., Ronchetti, M., & di Tecco, C. (2023)	Systematic review	130	Is gender an antecedent to workplace stressors? A systematic review and an empirical study using a person-centred approach
Frank, J., Mustard, C., Smith, P., Siddiqi, A., Cheng, Y., Burdorf, A., & Rugulies, R. (2023)	Narrative review	N/A	Work as a social determinant of health in high-income countries: past, present, and future
Frasquilho, D., Matos, M. G., Salonna, F., Guerreiro, D., Storti, C. C., Gaspar, T., & Caldas-De-Almeida, J. M. (2016)	Systematic review	101	Mental health outcomes in times of economic recession: a systematic literature review
Friel, S., Hattersley, L., & Townsend, R. (2015)	Narrative review	N/A	Trade policy and public health
Garben, S. (2019)	Narrative review	N/A	The regulatory challenge of occupational safety and health in the online platform economy
Garbern, S. C., Ebbeling, L. G., & Bartels, S. A. (2016)	Systematic review	66	A systematic review of health outcomes among disaster and humanitarian responders
Geiling, A., Knaevelsrud, C., Böttche, M., & Stammel, N. (2021)	Systematic review	25	Mental health and work experiences of interpreters in the mental health care of refugees: a systematic review
Gonzales, E., Whetung, C., Lee, Y. J., & Kruchten, R. (2022)	Scoping review	7	Work demands and cognitive health inequities by race and ethnicity: a scoping review
Guan, N., Guariglia, A., Moore, P., Xu, F., & Al-Janabi, H. (2022)	Systematic review	40	Financial stress and depression in adults: a systematic review
Hanvold, T. N., Kines, P., Nykänen, M., Thomée, S., Holte, K. A., Vuori, J., Wærsted, M., & Veiersted, K. B. (2019)	Systematic review	54	Occupational safety and health among young workers in the Nordic countries: a systematic literature review
Hassard, J., Teoh, K. R. H., & Cox, T. (2019)	Systematic review	10	Estimating the economic burden posed by work-related violence to society: a systematic review of cost-of-illness studies

Author(s)	Type of review	No. of studies included	Title
Hassard, J., Teoh, K. R. H., Visockaite, G., Dewe, P., & Cox, T. (2018a)	Systematic review	10	The cost of work-related stress to society: a systematic review
Hassard, J., Teoh, K. R. H., Visockaite, G., Dewe, P., & Cox, T. (2018b)	Systematic review	12	The financial burden of psychosocial workplace aggression: a systematic review of cost-of-illness studies
Hayes, K., Blashki, G., Wiseman, J., Burke, S., & Reifels, L. (2018)	Narrative review	N/A	Climate change and mental health: risks, impacts and priority actions
Hoven, H., & Siegrist, J. (2013)	Systematic review	26	Work characteristics, socioeconomic position and health: a systematic review of mediation and moderation effects in prospective studies
Hu, X., Park, Y., Day, A., & Barber, L. K. (2021)	Narrative review	N/A	Time to disentangle the Information and Communication Technology (ICT) constructs: developing a taxonomy around ICT use for occupational health research
Ioannou, A., Mechili, A., Kolokathi, A., & Diomidous, M. (2013)	Narrative review	N/A	Impacts of globalization in health
Irwin, A., & Scali, E. (2007)	Narrative review	N/A	Action on the social determinants of health: a historical perspective
Jedwab, R. M., Manias, E., Redley, B., Dobroff, N., & Hutchinson, A. M. (2023)	Systematic review	10	Impacts of technology implementation on nurses' work motivation, engagement, satisfaction and well-being: a realist review
Jetha, A., Shamaee, A., Bonaccio, S., Gignac, M. A. M., Tucker, L. B., Tompa, E., Bültmann, U., Norman, C. D., Banks, C. G., & Smith, P. M. (2021)	Systematic review	342	Fragmentation in the future of work: a horizon scan examining the impact of the changing nature of work on workers experiencing vulnerability
Kameg, B. N. (2020)	Narrative review	N/A	Climate change and mental health implications for nurses
Kaplan, G., & Schulhofer-Wohl, S. (2018)	Narrative review	N/A	The changing (dis-)utility of work
Karasek, R. (1989)	Narrative review	N/A	The political implications of psychosocial work redesign: a model of the psychosocial class structure
Kawachi, I. (2008)	Narrative review	N/A	Globalization and workers' health
Kigozi, J., Jowett, S., Lewis, M., Barton, P., & Coast, J. (2017)	Systematic review	28	The estimation and inclusion of presenteeism costs in applied economic evaluation: a systematic review
Kobal Grum, D., & Babnik, K. (2022)	Systematic review	67	The psychological concept of social sustainability in the workplace from the perspective of sustainable goals: a systematic review
Köchling, A., & Wehner, M. C. (2020)	Systematic review	36	Discriminated by an algorithm: a systematic review of discrimination and fairness by algorithmic decision-making in the context of HR recruitment and HR development
Kozar, Ł. J., & Sulich, A. (2023)	Bibliometric review	2480	Green jobs: bibliometric review
Kreshpaj, B., Orellana, C., Burström, B., Davis, L., Hemmingsson, T., Johansson, G., Kjellberg, K., Jonsson, J., Wegman, D. H., & Bodin, T. (2020)	Systematic review	63	What is precarious employment? A systematic review of definitions and operationalizations from quantitative and qualitative studies
Kyung, M. J., Lee, S. J., Dancu, C., & Hong, O. S. (2023)	Systematic review	20	Underreporting of workers' injuries or illnesses and contributing factors: a systematic review
Landsbergis, P. A., Grzywacz, J. G., & Lamontagne, A. D. (2014)	Systematic review	103	Work organization, job insecurity, and occupational health disparities

Author(s)	Type of review	No. of studies included	Title
Law, P. C. F., Too, L. S., Butterworth, P., Witt, K., Reavley, N., & Milner, A. J. (2020)	Systematic review	9	A systematic review on the effect of work-related stressors on mental health of young workers
Leka, S., Jain, A., Iavicoli, S., & di Tecco, C. (2015)	Policy review	94 policy documents	An evaluation of the policy context on psychosocial risks and mental health in the workplace in the European Union: achievements, challenges, and the future
Lindert, J., Ehrenstein, O. S. von, Priebe, S., Mielck, A., & Brähler, E. (2009)	Systematic review and meta-analysis	37 (35 in meta-analysis)	Depression and anxiety in labor migrants and refugees - a systematic review and meta-analysis
Lippel, K., Johnstone, R., & Baril-Gingras, G. (2017)	Narrative review	N/A	Regulation, change and the work environment
Lund, C., Brooke-Sumner, C., Baingana, F., Baron, E. C., Breuer, E., Chandra, P., Haushofer, J., Herrman, H., Jordans, M., Kieling, C., Medina-Mora, M. E., Morgan, E., Omigbodun, O., Tol, W., Patel, V., & Saxena, S. (2018)	Umbrella review (Systematic review of systematic reviews)	289	Social determinants of mental disorders and the Sustainable Development Goals: a systematic review of reviews
Lundgren, K., Kuklane, K., Gao, C., & Holmér, I. (2013)	Narrative review	N/A	Effects of heat stress on working populations when facing climate change
MacEachen, E., Kosny, A., Scott-Dixon, K., Facey, M., Chambers, L., Breslin, C., Kyle, N., Irvin, E., & Mahood, Q. (2010)	Systematic review	14	Workplace health understandings and processes in small businesses: a systematic review of the qualitative literature
Marmot, M. (2005)	Narrative review	N/A	Social determinants of health inequalities
Marmot, M. (2007)	Narrative review	N/A	Achieving health equity: from root causes to fair outcomes
Martelli, M., Zingaretti, L., Salvio, G., Bracci, M., & Santarelli, L. (2021)	Systematic review	26	Influence of work on andropause and menopause: a systematic review
Mas, A., & Pallais, A. (2020)	Narrative review	N/A	Alternative work arrangements
McKee-Ryan, F. M., Song, Z., Wanberg, C. R., & Kinicki, A. J. (2005)	Meta-analysis	104	Psychological and physical well-being during unemployment: a meta-analytic study
Messing, K. (1997)	Narrative review	N/A	Women's occupational health: a critical review and discussion of current issues
Mucci, N., Giorgi, G., Roncaioli, M., Perez, J. F., & Arcangeli, G. (2016)	Systematic review	19	The correlation between stress and economic crisis: a systematic review
Muntaner, C., & O'Campo, P. J. (1993)	Narrative review	N/A	A critical appraisal of the demand/control model of the psychosocial work environment: epistemological, social, behavioral and class considerations
Nagarajan, N. R., Wada, M., Fang, M. L., & Sixsmith, A. (2019)	Bibliometric review	122	Defining organizational contributions to sustaining an ageing workforce: a bibliometric review
Ng, K. H., Agius, M., & Zaman, R. (2013)	Narrative review	N/A	The global economic crisis: effects on mental health and what can be done
Ornek, O. K., Waibel, J., Wullinger, P., & Weinmann, T. (2022)	Systematic review	65	Precarious employment and migrant workers' mental health: a systematic review of quantitative and qualitative studies
Pansini, M., Buonomo, I., de Vincenzi, C., Ferrara, B., & Benevene, P. (2023)	Systematic review	51	Positioning technostress in the JD-R model perspective: a systematic literature review
Patel, V., Burns, J. K., Dhingra, M., Tarver, L., Kohrt, B. A., & Lund, C. (2018)	Systematic review	12	Income inequality and depression: a systematic review and meta- analysis of the association and a scoping review of mechanisms

Author(s)	Type of review	No. of studies included	Title
Patwary, M. M., Bardhan, M., Haque, M. A., Moniruzzaman, S., Gustavsson, J., Khan, M. M. H., Koivisto, J., Salwa, M., Mashreky, S. R., Rahman, A. K. M. F., Tasnim, A., Islam, M. R., Alam, M. A., Hasan, M., Harun, M. A. Y. al, Nyberg, L., & Atikul Islam, M. (2024)	Systematic review	70	Impact of extreme weather events on mental health in South and Southeast Asia: two decades of systematic review of observational studies
Porru, S., Elmetti, S., & Arici, C. (2014)	Non-systematic literature review	20 case series	Psychosocial risk among migrant workers: what we can learn from literature and field experiences
Rantanen, J., Muchiri, F., & Lehtinen, S. (2020)	Narrative review	N/A	Decent work, ILO's response to the globalization of working life: basic concepts and global implementation with special reference to occupational health
Rasanathan, K. (2018)	Narrative review	N/A	10 years after the Commission on Social Determinants of Health: social injustice is still killing on a grand scale
Rauschenbach, C., Krumm, S., Thielgen, M., & Hertel, G. (2013)	Systematic review and meta-analysis	48 articles (66 samples in meta-analysis)	Age and work-related stress: a review and meta-analysis
Riches, S., Taylor, L., Jeyarajaguru, P., Veling, W., & Valmaggia, L. (2023)	Systematic review	17	Virtual reality and immersive technologies to promote workplace well-being: a systematic review
Roche, A. M., Pidd, K., Fischer, J. A., Lee, N., Scarfe, A., & Kostadinov, V. (2016)	Systematic review	20	Men, work, and mental health: a systematic review of depression in male-dominated industries and occupations
Ross, D. (2010)	Narrative review	N/A	Ageing and work: an overview
Rugulies, R. (2012)	Narrative review	N/A	Invited commentary: structure and context matters – the need to emphasize 'social' in 'psychosocial epidemiology'
Rydström, K., Jackson, J., Johansson, K., & Mathiassen, S. E. (2023)	Systematic review	20	A systematic review of work organization, work environment, and employment conditions in warehousing in relation to gender and race/ethnicity
Scheepers, D., & Ellemers, N. (2018)	Systematic review	6	Stress and the stability of social systems: a review of neurophysiological research
Schilgen, B., Nienhaus, A., Handtke, O., Schulz, H., & Moèsko, M. (2017)	Systematic review	14	Health situation of migrant and minority nurses: a systematic review
Scholze, A., & Hecker, A. (2023)	Systematic review and expert interviews	27 studies reviewed and 15 expert interviews	Digital job demands and resources: digitization in the context of the job demands-resources model
Schulte, P. A., Delclos, G., Felknor, S. A., & Chosewood, L. C. (2019)	Narrative review	N/A	Toward an expanded focus for occupational safety and health: a commentary
Schulte, P. A., Iavicoli, I., Fontana, L., Leka, S., Dollard, M. F., Salmen-Navarro, A., Salles, F. J., Olympio, K. P. K., Lucchini, R., Fingerhut, M., Violante, F. S., Seneviratne, M., Oakman, J., Lo, O., Alfredo, C. H., Bandini, M., Silva-Junior, J. S., Martinez, M. C., Cotrim, T., ... Fischer, F. M. (2022)	Narrative review	N/A	Occupational safety and health staging framework for decent work
Schulte, P. A., Streit, J. M. K., Sheriff, F., Delclos, G., Felknor, S. A., Tamers, S. L., Fendinger, S., Grosch, J., & Sala, R. (2020)	Systematic review	36	Potential scenarios and hazards in the work of the future: a systematic review of the peer-reviewed and gray literatures
Shifrin, N. V., & Michel, J. S. (2022)	Meta-analysis	33	Flexible work arrangements and employee health: a meta-analytic review

Author(s)	Type of review	No. of studies included	Title
Sinclair, R. R., & Cheung, J. H. (2016)	Narrative review	N/A	Money matters: recommendations for financial stress research in occupational health psychology
Skogstad, M., Skorstad, M., Lie, A., Conradi, H. S., Heir, T., & Weisæth, L. (2013)	Systematic review	140	Work-related post-traumatic stress disorder
Smith, E. C., Holmes, L., & Burkle, F. M. (2019)	Systematic review	156	The physical and mental health challenges experienced by 9/11 first responders and recovery workers: a review of the literature
Sorensen, G., Dennerlein, J. T., Peters, S. E., Sabbath, E. L., Kelly, E. L., & Wagner, G. R. (2021)	Narrative review	N/A	The future of research on work, safety, health and well-being: a guiding conceptual framework
Stanef-Puic- , M. R., Badea, L., - erban-Oprescu, G. L., - erban-Oprescu, A. T., Frâncu, L. G., & Cre- u, A. (2022)	Systematic review	25	Green jobs - a literature review
Sterud, T., Tynes, T., Mehlum, I. S., Veiersted, K. B., Bergbom, B., Airila, A., Johansson, B., Brendler-Lindqvist, M., Hviid, K., & Flyvholm, M. A. (2018)	Systematic review	82	A systematic review of working conditions and occupational health among immigrants in Europe and Canada
Stevanin, S., Palese, A., Bressan, V., Vehviläinen-Julkunen, K., & Kvist, T. (2018)	Systematic review	33	Workplace-related generational characteristics of nurses: a mixed-method systematic review
Sulich, A., & Sołoducho-Pelc, L. (2022)	Narrative review	N/A	The circular economy and the Green Jobs creation
Sumner, R. C., & Gallagher, S. (2017)	Systematic review	10	Unemployment as a chronic stressor: a systematic review of cortisol studies
Swarup, S. S., P, A. K., Padhi, B. K., Satapathy, P., Shabil, M., Bushi, G., Gandhi, A. P., Khatib, M. N., Gaidhane, S., Zahiruddin, Q. S., Rustagi, S., Barboza, J. J., & Sah, R. (2024)	Systematic review	7	Cardiovascular consequences of financial stress: a systematic review and meta-analysis
Taylor, L. A., Tan, A. X., Coyle, C. E., Ndumele, C., Rogan, E., Canavan, M., Curry, L. A., & Bradley, E. H. (2016)	Systematic review	39	Leveraging the social determinants of health: what works?
Torre, G. la, Esposito, A., Sciarra, I., & Chiappetta, M. (2019)	Systematic review	105	Definition, symptoms and risk of techno-stress: a systematic review
Valenti, A., Gagliardi, D., Fortuna, G., & Iavicoli, S. (2016)	Narrative review	N/A	Towards a greener labour market: occupational health and safety implications
vander Weerdt, C., Stoddard-Dare, P., & DeRigne, L. A. (2023)	Systematic review	43	Is paid sick leave bad for business? A systematic review
Vignola, E. F., Baron, S., Abreu Plasencia, E., Hussein, M., & Cohen, N. (2023)	Narrative review	N/A	Workers' health under algorithmic management: emerging findings and urgent research questions
Virone, C., Kremer, L., & Breil, B. (2021)	Systematic review	29	Which factors of digitisation bias the work-related stress of healthcare employees? A systematic review
Vitória, B. de A., Ribeiro, M. T., & Carvalho, V. S. (2022)	Systematic review	32	The work-family interface and the COVID-19 pandemic: a systematic review
Vleeshouwers, J., Fløvik, L., Christensen, J. O., Johannessen, H. A., Bakke Finne, L., Mohr, B., Jørgensen, I. L., & Lunde, L. K. (2022)	Systematic review	43	The relationship between telework from home and the psychosocial work environment: a systematic review
Volkos, P., & Symvoulakis, E. K. (2021)	Systematic review	35	Impact of financial crisis on mental health: a literature review 'puzzling' findings from several countries
Vrontis, D., Christofi, M., Pereira, V., Tarba, S., Makrides, A., & Trichina, E. (2022)	Systematic review	45	Artificial intelligence, robotics, advanced technologies and human resource management: a systematic review

Author(s)	Type of review	No. of studies included	Title
Walters, D. (2006)	Narrative review	N/A	One step forward, two steps back: worker representation and health and safety in the United Kingdom
Weber, J., Angerer, P., & Müller, A. (2019)	Systematic review	25	Individual consequences of age stereotypes on older workers: a systematic review
Wirth, T., Mette, J., Prill, J., Harth, V., & Nienhaus, A. (2019)	Scoping review	25	Working conditions, mental health and coping of staff in social work with refugees and homeless individuals: a scoping review
Woodward, D., Drager, N., Beaglehole, R., & Lipson, D. (2001)	Narrative review	N/A	Globalization and health: a framework for analysis and action
Zacher, H., & Schmitt, A. (2016)	Literature review	16	Work characteristics and occupational well-being: the role of age
Zhou, Y., Wang, L., & Chen, W. (2023)	Systematic review	126	The dark side of AI-enabled HRM on employees based on AI algorithmic features

Table A5 **Included studies – psychosocial work environment taxonomies**

Author(s)	Type of review	No. of studies included	Title
Fransson, E. I., Nyberg, S. T., Heikkilä, K., Alfredsson, L., Bacquer, D. D., Batty, G. D., Bonenfant, S., Casini, A., Clays, E., Goldberg, M., Kittel, F., Koskenvuo, M., Knutsson, A., Leineweber, C., Magnusson Hanson, L. L., Nordin, M., Singh-Manoux, A., Suominen, S., Vahtera, J., … Kivimäki, M. (2012)	Meta-analysis	17	Comparison of alternative versions of the job demand-control scales in 17 European cohort studies: the IPD-Work consortium
Kop, J. L., Althaus, V., Formet-Robert, N., & Grosjean, V. (2016)	Systematic review	17 measures	Systematic comparative content analysis of 17 psychosocial work environment questionnaires using a new taxonomy
Lindberg, P., & Vingård, E. (2012)	Systematic review	24	Indicators of healthy work environments – a systematic review
Oakman, J., Weale, V., Kinsman, N., Nguyen, H., & Stuckey, R. (2022)	Systematic review	26 measures	Workplace physical and psychosocial hazards: a systematic review of evidence informed hazard identification tools.
Wiegand, D. M., Chen, P. Y., Hurrell, J. J., Jex, S., Nakata, A., Nigam, J. A., Robertson, M., & Tetrick, L. E. (2012)	Semi-systematic and qualitative review	24 measures	A consensus method for updating psychosocial measures used in NIOSH health hazard evaluations

Table A6 **Included studies – health outcomes**

Author(s)	Type of review	No. of studies included	Title
Adriaenssens, J., de Gucht, V., & Maes, S. (2015)	Systematic review	17	Determinants and prevalence of burnout in emergency nurses: a systematic review of 25 years of research
Agyapong, B., Obuobi-Donkor, G., Burback, L., & Wei, Y. (2022)	Scoping review	70	Stress, burnout, anxiety and depression among teachers: a scoping review
Ajith, M. M., Ghosh, A. K., & Jansz, J. (2022)	Systematic review	24	Contributing effects of individual characteristics, behavioural and job-related factors on occurrence of mining-related injuries: a systematic review

Author(s)	Type of review	No. of studies included	Title
Albendín-García, L., Suleiman-Martos, N., Cañadas-De la Fuente, G. A., Ramírez-Baena, L., Gómez-Urquiza, J. L., & de la Fuente-Solana, E. I. (2021)	Systematic review	27	Prevalence, related factors, and levels of burnout among midwives: a systematic review
Albertsen, K., Borg, V., & Oldenburg, B. (2006)	Systematic review	22	A systematic review of the impact of work environment on smoking cessation, relapse and amount smoked
Alilyyani, B., Wong, C. A., & Cummings, G. (2018)	Systematic review	136	Antecedents, mediators, and outcomes of authentic leadership in healthcare: a systematic review
Amiri, S., & Behnezhad, S. (2020b)	Systematic review	21	Is job strain a risk factor for musculoskeletal pain? A systematic review and meta-analysis of 21 longitudinal studies
Amiri, S., & Behnezhad, S. (2020c)	Systematic review and meta-analysis	17	Job strain and mortality ratio: a systematic review and meta-analysis of cohort studies
Amoadu, M., Ansah, E. W., & Sarfo, J. O. (2023)	Scoping review	93	Influence of psychosocial safety climate on occupational health and safety: a scoping review
Anderson, S. P., & Oakman, J. (2016)	Systematic review	27	Allied health professionals and work-related musculoskeletal disorders: a systematic review
Antunes, E. D., Bridi, L. R. T., Santos, M., & Fischer, F. M. (2023)	Systematic review	32	Part-time or full-time teleworking? A systematic review of the psychosocial risk factors of telework from home
Aranha, R. L. D. B., Martins, R. D. C., de Aguilar, D. R., Moreno-Drada, J. A., Sohn, W., Martins, C. D. C., & de Abreu, M. H. N. G. (2021)	Systematic review	12	Association between stress at work and temporomandibular disorders: a systematic review
Aronsson, G., Theorell, T., Grape, T., Hammarström, A., Hogstedt, C., Marteinsdottir, I., Skoog, I., Träskman-Bendz, L., & Hall, C. (2017)	Systematic review and meta-analysis	25	A systematic review including meta-analysis of work environment and burnout symptoms
Asare, B. Y. A., Kwasnicka, D., Powell, D., & Robinson, S. (2021)	Systematic review	90	Health and well-being of rotation workers in the mining, offshore oil and gas, and construction industry: a systematic review
Babu, G. R., Jotheeswaran, A. T., Mahapatra, T., Mahapatra, S., Kumar, A., Detels, R., & Pearce, N. (2014)	Meta-analysis	9	Is hypertension associated with job strain? A meta-analysis of observational studies
Backé, E. M., Seidler, A., Latza, U., Rossnagel, K., & Schumann, B. (2012)	Systematic review	26	The role of psychosocial stress at work for the development of cardiovascular diseases: a systematic review
Bambra, C. L., Whitehead, M. M., Sowden, A. J., Akers, J., & Petticrew, M. P. (2008)	Systematic review	26	Shifting schedules. The health effects of reorganizing shift work
Bambra, C., Egan, M., Thomas, S., Petticrew, M., & Whitehead, M. (2007)	Systematic review	19	The psychosocial and health effects of workplace reorganisation – a systematic review of task restructuring interventions
Bannai, A., & Tamakoshi, A. (2014)	Systematic review	19 in 17 articles	The association between long working hours and health: a systematic review of epidemiological evidence
Basu, S., Qayyum, H., & Mason, S. (2017)	Systematic review	25	Occupational stress in the ED: a systematic literature review
Beckel, J. L. O., & Fisher, G. G. (2022)	Narrative review	N/A	Telework and worker health and well-being: a review and recommendations for research and practice

Author(s)	Type of review	No. of studies included	Title
Berg-Beckhoff, G., Nielsen, G., & Larsen, E. L. (2018)	Systematic review	42	Use of information communication technology and stress, burnout, and mental health in older, middle-aged, and younger workers – results from a systematic review
Bergmann, N., Gyntelberg, F., & Faber, J. (2014)	Systematic review	39	The appraisal of chronic stress and the development of the metabolic syndrome: a systematic review of prospective cohort studies
Bernal, D., Campos-Serna, J., Tobias, A., Vargas-Prada, S., Benavides, F. G., & Serra, C. (2015)	Systematic review and meta-analysis	24 (17 in the meta-analysis)	Work-related psychosocial risk factors and musculoskeletal disorders in hospital nurses and nursing aides: a systematic review and meta-analysis
Bevan, M. P., Priest, S. J., Plume, R. C., & Wilson, E. E. (2022)	Systematic review	5	Emergency first responders and professional well-being: a qualitative systematic review
Bezzina, A., Austin, E., Nguyen, H., & James, C. (2023)	Systematic review	47	Workplace psychosocial factors and their association with musculoskeletal disorders: a systematic review of longitudinal studies
Biswas, A., Harbin, S., Irvin, E., Johnston, H., Begum, M., Tiong, M., Apedaile, D., Koehoorn, M., & Smith, P. (2022)	Systematic review	33	Differences between men and women in their risk of work injury and disability: a systematic review
Boini, S., Bourgkard, E., Ferrières, J., & Esquirol, Y. (2022)	Umbrella review (Systematic review of systematic reviews)	33	What do we know about the effect of night-shift work on cardiovascular risk factors? An umbrella review
Bolm-Audorff, U., Hegewald, J., Pretzsch, A., Freiberg, A., Nienhaus, A., & Seidler, A. (2020)	Systematic review and meta-analysis	24 (23 in the meta-analysis)	Occupational noise and hypertension risk: a systematic review and meta-analysis
Bonde, J. P. E. (2008)	Systematic review	16	Psychosocial factors at work and risk of depression: a systematic review of the epidemiological evidence
Bonde, J. P., Jørgensen, K. T., Bonzini, M., & Palmer, K. T. (2013)	Systematic review	30	Miscarriage and occupational activity: a systematic review and meta-analysis regarding shift work, working hours, lifting, standing, and physical workload
Bongers, P. M., Kremer, A. M., & Laak, J. ter. (2002)	Systematic review	26	Are psychosocial factors, risk factors for symptoms and signs of the shoulder, elbow, or hand/wrist? A review of the epidemiological literature
Bonzini, M., Coggon, D., & Palmer, K. T. (2007)	Systematic review	53	Risk of prematurity, low birthweight and pre-eclampsia in relation to working hours and physical activities: a systematic review
Bonzini, M., Palmer, K. T., Coggon, D., Carugno, M., Cromi, A., & Ferrario, M. M. (2011)	Systematic review	23	Shift work and pregnancy outcomes: a systematic review with meta-analysis of currently available epidemiological studies
Booth, J., Connelly, L., Lawrence, M., Chalmers, C., Joice, S., Becker, C., & Dougall, N. (2015)	Meta-analysis	14	Evidence of perceived psychosocial stress as a risk factor for stroke in adults: a meta-analysis
Borrelli, I., Rossi, M. F., Melcore, G., Perrotta, A., Santoro, P. E., Gualano, M. R., & Moscato, U. (2023)	Systematic review	13	Workplace ethical climate and workers' burnout: a systematic review
Boschman, J. S., van der Molen, H. F., Sluiter, J. K., & Frings-Dresen, M. H. W. (2011)	Systematic review	60	Occupational demands and health effects for bricklayers and construction supervisors: a systematic review
Bravo, G., Viviani, C., Lavallière, M., Arezes, P., Martínez, M., Dianat, I., Bragança, S., & Castellucci, H. (2022)	Systematic review	62	Do older workers suffer more workplace injuries? A systematic review

Author(s)	Type of review	No. of studies included	Title
Briggs, A. M., Bragge, P., Smith, A. J., Govil, D., & Straker, L. M. (2009)	Literature review	52	Prevalence and associated factors for thoracic spine pain in the adult working population: a literature review
Bronkhorst, B., Tummers, L., Steijn, B., & Vijverberg, D. (2015)	Systematic review	21	Organizational climate and employee mental health outcomes: a systematic review of studies in health care organizations
Brooks, S. K., & Greenberg, N. (2022)	Scoping review	13	Mental health and well-being of border security personnel: scoping review
Brooks, S. K., Dunn, R., Sage, C. A. M., Amlôt, R., Greenberg, N., & Rubin, G. J. (2015)	Systematic review	61	Risk and resilience factors affecting the psychological well-being of individuals deployed in humanitarian relief roles after a disaster
Brscic, M., Contiero, B., Schianchi, A., & Marogna, C. (2021)	Systematic review	211	Challenging suicide, burnout, and depression among veterinary practitioners and students: text mining and topics modelling analysis of the scientific literature
Buruck, G., Tomaschek, A., Wendsche, J., Ochsmann, E., & Dörfel, D. (2019)	Systematic review and meta-analysis	18	Psychosocial areas of worklife and chronic low back pain: a systematic review and meta-analysis
Cai, C., Vandermeer, B., Khurana, R., Nerenberg, K., Featherstone, R., Sebastianski, M., & Davenport, M. H. (2019)	Systematic review and meta-analysis	62 (59 in the meta-analysis)	The impact of occupational shift work and working hours during pregnancy on health outcomes: a systematic review and meta-analysis
Caponecchia, C., Coman, R. L., Gopaldasani, V., Mayland, E. C., & Campbell, L. (2020)	Systematic review	92	Musculoskeletal disorders in aged care workers: a systematic review of contributing factors and interventions
Charlson, F., van Ommeren, M., Flaxman, A., Cornett, J., Whiteford, H., & Saxena, S. (2019)	Systematic review and meta-analysis	129	New WHO prevalence estimates of mental disorders in conflict settings: a systematic review and meta-analysis
Chiarotto, A., Gerger, H., van Rijn, R. M., Elbers, R. G., Søgaard, K., Macri, E. M., Jackson, J. A., Burdorf, A., & Koes, B. W. (2023)	Systematic review	17	Physical and psychosocial work-related exposures and the occurrence of disorders of the elbow: a systematic review
Chida, Y., & Steptoe, A. (2009)	Systematic review	147 in 62 articles	Cortisol awakening response and psychosocial factors: a systematic review and meta-analysis
Chuang, C. H., Tseng, P. C., Lin, C. Y., Lin, K. H., & Chen, Y. Y. (2016)	Systematic review	25	Burnout in the intensive care unit professionals: a systematic review
Clarner, A., Graessel, E., Scholz, J., Niedermeier, A., Uter, W., & Drexler, H. (2015)	Systematic review	7	Work-related posttraumatic stress disorder (PTSD) and other emotional diseases as consequence of traumatic events in public transportation: a systematic review
Clayton, M., & Marczak, M. (2023)	Systematic review	18	Palliative care nurses' experiences of stress, anxiety, and burnout: a thematic synthesis
Copanitsanou, P., Fotos, N., & Brokalaki, H. (2017)	Systematic review	10	Effects of work environment on patient and nurse outcomes
Corchero-Falcón, M. del R., Gómez-Salgado, J., García-Iglesias, J. J., Camacho-Vega, J. C., Fagundo-Rivera, J., & Carrasco-González, A. M. (2023)	Systematic review	38	Risk factors for working pregnant women and potential adverse consequences of exposure: a systematic review
Cosgrove, M. P., Sargeant, L. A., Caleyachetty, R., & Griffin, S. J. (2012)	Systematic review and meta-analysis	9	Work-related stress and Type 2 diabetes: systematic review and meta-analysis
Costello, H., Walsh, S., Cooper, C., & Livingston, G. (2019)	Systematic review and meta-analysis	17	A systematic review and meta-analysis of the prevalence and associations of stress and burnout among staff in long-term care facilities for people with dementia
Crawford, J. O., MacCalman, L., & Jackson, C. A. (2011)	Systematic review	11	The health and well-being of remote and mobile workers

Author(s)	Type of review	No. of studies included	Title
Cuenca-Lozano, M. F., & Ramírez-García, C. O. (2023)	Systematic review	15	Occupational hazards in firefighting: systematic literature review
da Costa, B. R., & Vieira, E. R. (2010)	Systematic review	63	Risk factors for work-related musculoskeletal disorders: a systematic review of recent longitudinal studies
da Luz, J. G., Pessa, S. L. R., da Luz, R. P., & Schenatto, F. J. A. (2019)	Systematic review	29	Implications of the environment, conditions and organization of work on teacher health: a systematic review
Dall'Ora, C., Ball, J., Reinius, M., & Griffiths, P. (2020)	Systematic review	91	Burnout in nursing: a theoretical review
de Jong, T., Wiezer, N., de Weerd, M., Nielsen, K., Mattila-Holappa, P., & Mockałło, Z. (2016)	Systematic review	39	The impact of restructuring on employee well-being: a systematic review of longitudinal studies
Debela, M. B., Azage, M., Begosaw, A. M., & Kabeta, N. D. (2022)	Systematic review	36	Factors contributing to occupational injuries among workers in the construction, manufacturing, and mining industries in Africa: a systematic review and meta-analysis
Debelu, D., Mengistu, D. A., Tolera, S. T., Aschalew, A., & Deriba, W. (2023)	Systematic review	36	Occupational-related injuries and associated risk factors among healthcare workers working in developing countries: a systematic review
Dee, J., Dhuhaibawi, N., & Hayden, J. C. (2023)	Systematic review	19	A systematic review and pooled prevalence of burnout in pharmacists
Demerouti, E., & Adaloudis, N. (2024)	Literature review	30	Addressing burnout in organisations - a literature review
Derdowski, L. A., & Mathisen, G. E. (2023)	Literature review	40	Psychosocial factors and safety in high-risk industries: a systematic literature review
Descatha, A., Sembajwe, G., Pega, F., Ujita, Y., Baer, M., Boccuni, F., di Tecco, C., Duret, C., Evanoff, B. A., Gagliardi, D., Godderis, L., Kang, S. K., Kim, B. J., Li, J., Magnusson Hanson, L. L., Marinaccio, A., Ozguler, A., Pachito, D., Pell, J., … Iavicoli, S. (2020)	Systematic review and meta-analysis	22	The effect of exposure to long working hours on stroke: a systematic review and meta-analysis from the WHO/ILO joint estimates of the work-related burden of disease and injury
Dimsdale, J. E. (2008)	Narrative review	N/A	Psychological stress and cardiovascular disease
Dohrmann, S. B., & Leppin, A. (2017)	Systematic review	19	Determinants of seafarers' fatigue: a systematic review and quality assessment
Dragano, N., Siegrist, J., Nyberg, S. T., Lunau, T., Fransson, E. I., Alfredsson, L., Bjorner, J. B., Borritz, M., Burr, H., Erbel, R., Fahlén, G., Goldberg, M., Hamer, M., Heikkilä, K., Jöckel, K. H., Knutsson, A., Madsen, I. E. H., Nielsen, M. L., Nordin, M., … Kivimäki, M. (2017)	Systematic review	11	Effort-reward imbalance at work and incident coronary heart disease: a multicohort study of 90,164 individuals
Dzhambov, A., & Dimitrova, D. (2017)	Systematic review and meta-analysis	21 (19 in meta-analysis)	Occupational noise exposure and the risk for work-related injury: a systematic review and meta-analysis
Eddy, P., Heckenberg, R., Wertheim, E. H., Kent, S., & Wright, B. J. (2016)	Systematic review and meta-analysis	7	A systematic review and meta-analysis of the effort-reward imbalance model of workplace stress with indicators of immune function
Eddy, P., Wertheim, E. H., Hale, M. W., & Wright, B. J. (2023)	Systematic review and meta-analysis	14	A systematic review and revised meta-analysis of the effort-reward imbalance model of workplace stress and hypothalamic-pituitary-adrenal axis measures of stress
Eddy, P., Wertheim, E. H., Kingsley, M., & Wright, B. J. (2017)	Systematic review and meta-analysis	22	Associations between the effort-reward imbalance model of workplace stress and indices of cardiovascular health: a systematic review and meta-analysis

Author(s)	Type of review	No. of studies included	Title
Edward, K. L., Hercelinskyj, G., & Giandinoto, J. A. (2017)	Systematic review and meta-analysis	20	Emotional labour in mental health nursing: an integrative systematic review
Efimov, I., Rohwer, E., Harth, V., & Mache, S. (2022)	Scoping review	19	Virtual leadership in relation to employees' mental health, job satisfaction and perceptions of isolation: a scoping review
Eguchi, H., Watanabe, K., Kawakami, N., Ando, E., Imamura, K., Sakuraya, A., Sasaki, N., Inoue, A., Tsuno, K., Otsuka, Y., Inoue, R., Nishida, N., Iwanaga, M., Hino, A., Shimazu, A., & Tsutsumi, A. (2023)	Systematic review and meta-analysis	11	Work-related psychosocial factors and inflammatory markers: a systematic review and meta-analysis
Eller, N. H., Netterstrøm, B., Gyntelberg, F., Kristensen, T. S., Nielsen, F., Steptoe, A., & Theorell, T. (2009)	Systematic review	23	Work-related psychosocial factors and the development of ischemic heart disease: a systematic review
Feijó, F. R., Gräf, D. D., Pearce, N., & Fassa, A. G. (2019)	Systematic review	51	Risk factors for workplace bullying: a systematic review
Fernandes, C., & Pereira, A. (2016)	Systematic review	22	Exposure to psychosocial risk factors in the context of work: a systematic review
Ferrie, J. E., Virtanen, M., Jokela, M., Madsen, I. E. H., Heikkilä, K., Alfredsson, L., Batty, G. D., Bjorner, J. B., Borritz, M., Burr, H., Dragano, N., Elovainio, M., Fransson, E. I., Knutsson, A., Koskenvuo, M., Koskinen, A., Kouvonen, A., Kumari, M., Nielsen, M. L., … Kivimäki, M. (2016)	Meta-analysis	19	Job insecurity and risk of diabetes: a meta-analysis of individual participant data
Finney, C., Stergiopoulos, E., Hensel, J., Bonato, S., & Dewa, C. S. (2013)	Systematic review	8	Organizational stressors associated with job stress and burnout in correctional officers: a systematic review
Fisher, G. G., Chaffee, D. S., Tetrick, L. E., Davalos, D. B., & Potter, G. G. (2017)	Narrative review	N/A	Cognitive functioning, aging, and work: a review and recommendations for research and practice
Fishta, A., & Backé, E. M. (2015)	Umbrella review (Systematic review of systematic reviews)	6 systematic reviews (81 studies)	Psychosocial stress at work and cardiovascular diseases: an overview of systematic reviews
Flouris, A. D., Dinas, P. C., Ioannou, L. G., Nybo, L., Havenith, G., Kenny, G. P., & Kjellstrom, T. (2018)	Systematic review and meta-analysis	111 (64 in meta-analysis)	Workers' health and productivity under occupational heat strain: a systematic review and meta-analysis
Forman-Dolan, J., Caggiano, C., Anillo, I., & Kennedy, T. D. (2022)	Systematic review	5	Burnout among professionals working in corrections: a two stage review
Fossum, I. N., Bjorvatn, B., Waage, S., & Pallesen, S. (2013)	Systematic review	29	Effects of shift and night work in the offshore petroleum industry: a systematic review
Franklin, P., & Gkiouleka, A. (2021)	Scoping review	20	A scoping review of psychosocial risks to health workers during the Covid-19 pandemic
Fransson, E. I., Heikkilä, K., Nyberg, S. T., Zins, M., Westerlund, H., Westerholm, P., Väänänen, A., Virtanen, M., Vahtera, J., Theorell, T., Suominen, S., Singh-Manoux, A., Siegrist, J., Sabia, S., Rugulies, R., Pentti, J., Oksanen, T., Nordin, M., Nielsen, M. L., … Kivimäki, M. (2012)	Meta-analysis	14	Job strain as a risk factor for leisure-time physical inactivity: an individual-participant meta-analysis of up to 170,000 men and women: the IPD-Work Consortium

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Fransson, E. I., Nyberg, S. T., Heikkilä, K., Alfredsson, L., Bjorner, J. B., Borritz, M., Burr, H., Dragano, N., Geuskens, G. A., Goldberg, M., Hamer, M., Hooftman, W. E., Houtman, I. L., Joensuu, M., Jokela, M., Knutsson, A., Koskenvuo, M., Koskinen, A., Kumari, M., ... Kivimäki, M. (2015)	Meta-analysis	14	Job strain and the risk of stroke: an individual-participant data meta-analysis
Fujino, Y., Horie, S., Hoshuyama, T., Tsutsui, T., & Tanaka, Y. (2006)	Systematic review	17	A systematic review of working hours and mental health burden
Furuya, Y., Nakazawa, S., Fukai, K., & Tatemichi, M. (2022)	Scoping review	29	Health impacts with telework on workers: a scoping review before the COVID-19 pandemic
Galaiya, R., Kinross, J., & Arulampalam, T. (2020)	Systematic review	62	Factors associated with burnout syndrome in surgeons: a systematic review
Ganster, D. C., & Rosen, C. C. (2013)	Narrative review	N/A	Work stress and employee health: a multidisciplinary review
Garbern, S. C., Ebbeling, L. G., & Bartels, S. A. (2016)	Systematic review	66	A systematic review of health outcomes among disaster and humanitarian responders
Geiling, A., Knaevelsrud, C., Böttche, M., & Stammel, N. (2021)	Systematic review	25	Mental health and work experiences of interpreters in the mental health care of refugees: a systematic review
Gerger, H., Macri, E. M., Jackson, J. A., Elbers, R. G., van Rijn, R., Søgaard, K., Burdorf, A., Koes, B., & Chiarotto, A. (2024)	Systematic review	14	Physical and psychosocial work-related exposures and the incidence of carpal tunnel syndrome: a systematic review of prospective studies
Gerhardt, C., Semmer, N. K., Sauter, S., Walker, A., de Wijn, N., Kälin, W., Kottwitz, M. U., Kersten, B., Ulrich, B., & Elfering, A. (2021)	Systematic review and meta-analysis	25	How are social stressors at work related to well-being and health? A systematic review and meta-analysis
Gilbert-Ouimet, M., Trudel, X., Brisson, C., Milot, A., & Vézina, M. (2014)	Systematic review	79	Adverse effects of psychosocial work factors on blood pressure: systematic review of studies on demand-control-support and effort-reward imbalance models
Giménez Lozano, J. M., Martínez Ramón, J. P., & Morales Rodríguez, F. M. (2021)	Systematic review	59	Doctors and nurses: a systematic review of the risk and protective factors in workplace violence and burnout
Giorgi, G., Arcangeli, G., Perminiene, M., Lorini, C., Ariza-Montes, A., Fiz-Perez, J., di Fabio, A., & Mucci, N. (2017)	Systematic review	20	Work-related stress in the banking sector: a review of incidence, correlated factors, and major consequences
Glozier, N., Tofler, G. H., Colquhoun, D. M., Bunker, S. J., Clarke, D. M., Hare, D. L., Hickie, I. B., Tatoulis, J., Thompson, D. R., Wilson, A., & Branagan, M. G. (2013)	Narrative review	N/A	Psychosocial risk factors for coronary heart disease
Golding, S. E., Horsfield, C., Davies, A., Egan, B., Jones, M., Raleigh, M., Schofield, P., Squires, A., Start, K., Quinn, T., & Cropley, M. (2017)	Systematic review	25	Exploring the psychological health of emergency dispatch centre operatives: a systematic review and narrative synthesis
Golzad, H., Teimoory, A., Mousavi, S. J., Bayramova, A., & Edwards, D. J. (2023)	Systematic review	305	Mental health causation in the construction industry: a systematic review employing a psychological safety climate model
Gómez-Salgado, C., Camacho-Vega, J. C., Gómez-Salgado, J., García-Iglesias, J. J., Fagundo-Rivera, J., Allande-Cussó, R., Martín-Pereira, J., & Ruiz-Frutos, C. (2023)	Systematic review	35	Stress, fear, and anxiety among construction workers: a systematic review
González-Siles, P., Martí-Vilar, M., González-Sala, F., Merino-Soto, C., & Toledano-Toledano, F. (2022)	Systematic review	41	Sense of coherence and work stress or well-being in care professionals: a systematic review
Gribben, L., & Semple, C. J. (2021)	Integrative review	20	Factors contributing to burnout and work-life balance in adult oncology nursing: an integrative review

Author(s)	Type of review	No. of studies included	Title
Guerra, G., Júarez-García, A., Burton-Jeangros, C., Flahault, A., Quezada-Sánchez, A. D., & Salgado-De-snyder, N. (2022)	Systematic review	10	Non-migrant paid domestic workers and depressive symptoms: a mixed-methods systematic review
Hall, C. E., Davidson, L., Brooks, S. K., Greenberg, N., & Weston, D. (2023)	Systematic review	27 in 25 articles	The relationship between homeworking during COVID-19 and both, mental health, and productivity: a systematic review
Hall, N. A., Everson, A. T., Billingsley, M. R., & Miller, M. B. (2022)	Systematic review	57	Moral injury, mental health and behavioural health outcomes: a systematic review of the literature
Hargreaves, S., Rustage, K., Nellums, L. B., McAlpine, A., Pocock, N., Devakumar, D., Aldridge, R. W., Abubakar, I., Kristensen, K. L., Himmels, J. W., Friedland, J. S., & Zimmerman, C. (2019)	Systematic review and meta-analysis	36 (18 in meta-analysis)	Occupational health outcomes among international migrant workers: a systematic review and meta-analysis
Harvey, S. B., Modini, M., Joyce, S., Milligan-Saville, J. S., Tan, L., Mykletun, A., Bryant, R. A., Christensen, H., & Mitchell, P. B. (2017)	Umbrella review (Systematic review of systematic reviews)	37	Can work make you mentally ill? A systematic meta-review of work-related risk factors for common mental health problems
Hauke, A., Flintrop, J., Brun, E., & Rugulies, R. (2011)	Systematic review and meta-analysis	54	The impact of work-related psychosocial stressors on the onset of musculoskeletal disorders in specific body regions: a review and meta-analysis of 54 longitudinal studies
Heikkilä, K., Fransson, E. I., Nyberg, S. T., Zins, M., Westerlund, H., Westerholm, P., Virtanen, M., Vahtera, J., Suominen, S., Steptoe, A., Salo, P., Pentti, J., Oksanen, T., Nordin, M., Marmot, M. G., Lunau, T., Ladwig, K. H., Koskenvuo, M., Knutsson, A., … Kivimäki, M. (2013)	Meta-analysis	11	Job strain and health-related lifestyle: findings from an individual-participant meta-analysis of 118,000 working adults
Heikkilä, K., Madsen, I. E. H., Nyberg, S. T., Fransson, E. I., Ahola, K., Alfredsson, L., Bjorner, J. B., Borritz, M., Burr, H., Dragano, N., Ferrie, J. E., Knutsson, A., Koskenvuo, M., Koskinen, A., Nielsen, M. L., Nordin, M., Pejtersen, J. H., Pentti, J., Rugulies, R., … Kivimak- i, M. (2014)	Meta-analysis	11	Job strain and the risk of inflammatory bowel diseases: individual-participant meta-analysis of 95,000 men and women
Heikkilä, K., Madsen, I. E. H., Nyberg, S. T., Fransson, E. I., Ahola, K., Alfredsson, L., Bjorner, J. B., Borritz, M., Burr, H., Knutsson, A., Koskenvuo, M., Koskinen, A., Nielsen, M. L., Nordin, M., Pahkin, K., Pentti, J., Rugulies, R., Salo, P., Shipley, M. J., … Kivimäki, M. (2014)	Meta-analysis	10	Job strain and COPD exacerbations: an individual-participant meta-analysis
Heikkilä, K., Madsen, I. E. H., Nyberg, S. T., Fransson, E. I., Westerlund, H., Westerholm, P. J. M., Virtanen, M., Vahtera, J., Väänänen, A., Theorell, T., Suominen, S. B., Shipley, M. J., Salo, P., Rugulies, R., Pentti, J., Pejtersen, J. H., Oksanen, T., Nordin, M., Nielsen, M. L., … Kivimäki, M. (2014)	Meta-analysis	11	Job strain and the risk of severe asthma exacerbations: a meta-analysis of individual-participant data from 100,000 European men and women
Heikkilä, K., Nyberg, S. T., Fransson, E. I., Alfredsson, L., de Bacquer, D., Bjorner, J. B., Bonenfant, S., Borritz, M., Burr, H., Clays, E., Casini, A., Dragano, N., Erbel, R., Geuskens, G. A., Goldberg, M., Hooftman, W. E., Houtman, I. L., Joensuu, M., Jöckel, K. H., … Kivimäki, M. (2012a)	Meta-analysis	12	Job strain and alcohol intake: a collaborative meta-analysis of individual-participant data from 140,000 men and women

Author(s)	Type of review	No. of studies included	Title
Heikkilä, K., Nyberg, S. T., Fransson, E. I., Alfredsson, L., de Bacquer, D., Bjorner, J. B., Bonenfant, S., Borritz, M., Burr, H., Clays, E., Casini, A., Dragano, N., Erbel, R., Geuskens, G. A., Goldberg, M., Hooftman, W. E., Houtman, I. L., Joensuu, M., Jöckel, K. H., ... for the IPD-Work Consortium. (2012b)	Meta-analysis	15	Job strain and tobacco smoking: an individual-participant data meta-analysis of 166,130 adults in 15 European studies
Heikkilä, K., Nyberg, S. T., Madsen, I. E. H., de Vroome, E., Alfredsson, L., Bjorner, J. J., Borritz, M., Burr, H., Erbel, R., Ferrie, J. E., Fransson, E. I., Geuskens, G. A., Hooftman, W. E., Houtman, I. L., Jöckel, K. H., Knutsson, A., Koskenvuo, M., Lunau, T., Nielsen, M. L., ... Kivimäki, M. (2016)	Multicohort study	12	Long working hours and cancer risk: a multi-cohort study
Heikkilä, K., Nyberg, S. T., Theorell, T., Fransson, E. I., Alfredsson, L., Bjorner, J. B., Bonenfant, S., Borritz, M., Bouillon, K., Burr, H., Dragano, N., Geuskens, G. A., Goldberg, M., Hamer, M., Hooftman, W. E., Houtman, I. L., Joensuu, M., Knutsson, A., Koskenvuo, M., ... Kivimaki, M. (2013).	Meta-analysis	12	Work stress and risk of cancer: meta-analysis of 5700 incident cancer events in 116,000 European men and women
Heikkilä, K., Pentti, J., Madsen, I. E. H., Lallukka, T., Virtanen, M., Alfredsson, L., Bjorner, J., Borritz, M., Brunner, E., Burr, H., Ferrie, J. E., Knutsson, A., Koskinen, A., Leineweber, C., Hanson, L. L. M., Nielsen, M. L., Nyberg, S. T., Oksanen, T., Pejtersen, J. H., ... Kivimäki, M. (2020)	Meta-analysis	11	Job strain as a risk factor for peripheral artery disease: a multi-cohort study
Hilton, N. Z., Addison, S., Ham, E., C. Rodrigues, N., & Seto, M. C. (2022)	Systematic review	19	Workplace violence and risk factors for PTSD among psychiatric nurses: systematic review and directions for future research and practice
Hodroj, B., Way, K. A., Scott, T. L., Wright, A. L., & Manchha, A. (2023)	Systematic review and meta-analysis	6	Does context count? The association between quality of care and job characteristics in residential aged care and hospital settings: a systematic review and meta-analysis
Hoff, T., & Lee, D. R. (2021)	Systematic review	43	Burnout and physician gender: what do we know?
Hooftman, W. E., van Poppel, M. N. M., van der Beek, A. J., Bongers, P. M., & van Mechelen, W. (2004)	Systematic review	31	Gender differences in the relations between work-related physical and psychosocial risk factors and musculoskeletal complaints
Hoogendoorn, W. E., van Poppel, M. N. M., Bongers, P. M., Koes, B. W., Bouter, L. M., & Hoogendoorn, L. (2000)	Systematic review	13	Systematic review of psychosocial factors at work and private life as risk factors for back pain
Hoshuyama, T., Horie, S., Tsutsui, T., Fujino, Y., Tanaka, Y., Nagano, C., & Takahashi, K. (2005)	Systematic review	12	Long working hours and cardiovascular diseases: a systematic review
Hosseini, M., Soltanian, M., Torabizadeh, C., & Shirazi, Z. H. (2022)	Systematic review	11	Prevalence of burnout and related factors in nursing faculty members: a systematic review
Huang, L. Y., Hu, H. Y., Wang, Z. T., Ma, Y. H., Dong, Q., Tan, L., Yu, J. T., & Zhu, L. Q. (2020)	Systematic review and meta-analysis	43	Association of occupational factors and dementia or cognitive impairment: a systematic review and meta-analysis
Huang, Y., Xu, S., Hua, J., Zhu, D., Liu, C., Hu, Y., Liu, T., & Xu, D. (2015)	Meta-analysis	6	Association between job strain and risk of incident stroke: a meta-analysis
Hwang, W. J., & Hong, O. (2012)	Systematic review	44	Work-related cardiovascular disease risk factors using a socioecological approach: implications for practice and research
Igboanugo, S., Bigelow, P. L., & Mielke, J. G. (2021)	Systematic review	29	Health outcomes of psychosocial stress within firefighters: a systematic review of the research landscape

Author(s)	Type of review	No. of studies included	Title
Jacukowicz, A. (2016)	Systematic review	9	Psychosocial work aspects, stress and musculoskeletal pain among musicians. A systematic review in search of correlates and predictors of playing-related pain
Jamieson, N., Carey, L. B., Jamieson, A., & Maple, M. (2023)	Systematic review	12	Examining the association between moral injury and suicidal behavior in military populations: a systematic review
Janwantanakul, P., Sitthipornvorakul, E., & Paksaichol, A. (2012)	Systematic review	18	Risk factors for the onset of nonspecific low back pain in office workers: a systematic review of prospective cohort studies
Jarczok, M. N., Jarczok, M., Mauss, D., Koenig, J., Li, J., Herr, R. M., & Thayer, J. F. (2013)	Systematic review	19	Autonomic nervous system activity and workplace stressors - a systematic review
Järvelin-Pasanen, S., Sinikallio, S., & Tarvainen, M. P. (2019)	Systematic review	10	Heart rate variability and occupational stress - systematic review
Jayakumar, P., Overbeek, C. L., Lamb, S., Williams, M., Funes, C., Gwilym, S., Ring, D., & Vranceanu, A.-M. (2018)	Systematic review	41	What factors are associated with disability after upper extremity injuries? A systematic review
Jelmini, J. D., Ross, J., Whitehurst, L. N., & Heebner, N. R. (2023)	Systematic review and meta-analysis	12	The effect of extended shift work on autonomic function in occupational settings: a systematic review and meta-analysis
Jooss, S., McDonnell, A., & Conroy, K. (2021)	Integrative review	100	Flexible global working arrangements: an integrative review and future research agenda
Joseph, L., Vasanthan, L., Standen, M., Kuisma, R., Paungmali, A., Pirunsan, U., & Sitilertpisan, P. (2023)	Systematic review	54	Causal relationship between the risk factors and work-related musculoskeletal disorders among professional drivers: a systematic review
Joyce, K., Pabayo, R., Critchley, J. A., & Bambra, C. (2010)	Systematic review	10	Flexible working conditions and their effects on employee health and well-being
Kang, M. Y., Park, H., Seo, J. C., Kim, D., Lim, Y. H., Lim, S., Cho, S. H., & Hong, Y. C. (2012)	Meta-analysis	11	Long working hours and cardiovascular disease: a meta-analysis of epidemiologic studies
Karlsson, M. L., Björklund, C., & Jensen, I. (2012)	Systematic review	17	The relationship between psychosocial work factors, employee health and organisational production: a systematic review
Kearney, J., Muir, C., & Smith, K. (2022)	Systematic review	12	Occupational injury among paramedics: a systematic review
Khamisa, N., Peltzer, K., & Oldenburg, B. (2013)	Systematic review	70	Burnout in relation to specific contributing factors and health outcomes among nurses: a systematic review
Khan, S., Malik, B. H., Gupta, D., & Rutkofsky, I. (2020)	Systematic review	18	The role of circadian misalignment due to insomnia, lack of sleep, and shift work in increasing the risk of cardiac diseases: a systematic review
Kim, E. J., & Dimsdale, J. E. (2007)	Systematic review	63	The effect of psychosocial stress on sleep: a review of polysomnographic evidence
Kim, T. J., & von dem Knesebeck, O. (2016)	Systematic review and meta-analysis	15	Perceived job insecurity, unemployment and depressive symptoms: a systematic review and meta-analysis of prospective observational studies
Kishi, R., Kitahara, T., Masuchi, A., & Kasai, S. (2002)	Narrative review	N/A	Work-related reproductive, musculoskeletal and mental disorders among working women – history, current issues and future research directions
Kivimäki, M., & Kawachi, I. (2015)	Systematic review	27	Work stress as a risk factor for cardiovascular disease

Author(s)	Type of review	No. of studies included	Title
Kivimäki, M., Jokela, M., Nyberg, S. T., Singh-Manoux, A., Fransson, E. I., Alfredsson, L., Bjorner, J. B., Borritz, M., Burr, H., Casini, A., Clays, E., de Bacquer, D., Dragano, N., Erbel, R., Geuskens, G. A., Hamer, M., Hooftman, W. E., Houtman, I. L., Jöckel, K. H., ... Virtanen, M. (2015)	Systematic review	25	Long working hours and risk of coronary heart disease and stroke: a systematic review and meta-analysis of published and unpublished data for 603,838 individuals
Kivimäki, M., Nyberg, S. T., Batty, G. D., Fransson, E. I., Heikkilä, K., Alfredsson, L., Bjorner, J. B., Borritz, M., Burr, H., Casini, A., Clays, E., de Bacquer, D., Dragano, N., Ferrie, J. E., Geuskens, G. A., Goldberg, M., Hamer, M., Hooftman, W. E., Houtman, I. L., ... Theorell, T. (2012)	Meta-analysis	13	Job strain as a risk factor for coronary heart disease: a collaborative meta-analysis of individual participant data
Kivimäki, M., Nyberg, S. T., Fransson, E. I., Heikkilä, K., Alfredsson, L., Casini, A., Clays, E., de Bacquer, D., Dragano, N., Ferrie, J. E., Goldberg, M., Hamer, M., Jokela, M., Karasek, R., Kittel, F., Knutsson, A., Koskenvuo, M., Nordin, M., Oksanen, T., ... Batty, G. D. (2013)	Meta-analysis	7	Associations of job strain and lifestyle risk factors with risk of coronary artery disease: a meta-analysis of individual participant data
Kivimäki, M., Pentti, J., Ferrie, J. E., Batty, G. D., Nyberg, S. T., Jokela, M., Virtanen, M., Alfredsson, L., Dragano, N., Fransson, E. I., Goldberg, M., Knutsson, A., Koskenvuo, M., Koskinen, A., Kouvonen, A., Luukkonen, R., Oksanen, T., Rugulies, R., Siegrist, J., ... Deanfield, J. (2018)	Multicohort study	7	Work stress and risk of death in men and women with and without cardiometabolic disease: a multicohort study
Kivimäki, M., Singh-Manoux, A., Nyberg, S., Jokela, M., & Virtanen, M. (2015)	Meta-analysis	8	Job strain and risk of obesity: systematic review and meta-analysis of cohort studies
Kivimäki, M., Virtanen, M., Elovainio, M., Kouvonen, A., Väänänen, A., & Vahtera, J. (2006)	Meta-analysis	14	Work stress in the etiology of coronary heart disease – a meta-analysis
Koch, P., Schablon, A., Latza, U., & Nienhaus, A. (2014)	Systematic review	19	Musculoskeletal pain and effort-reward imbalance – a systematic review
Koranyi, I., Jonsson, J., Rönnblad, T., Stockfelt, L., & Bodin, T. (2018)	Systematic review	59	Precarious employment and occupational accidents and injuries – a systematic review
Kraatz, S., Lang, J., Kraus, T., Münster, E., & Ochsmann, E. (2013)	Systematic review	18	The incremental effect of psychosocial workplace factors on the development of neck and shoulder disorders: a systematic review of longitudinal studies
Kuper, H., Marmot, M., & Hemingway, H. (2002)	Systematic review	71	Systematic review of prospective cohort studies of psychosocial factors in the etiology and prognosis of coronary heart disease
Lagerveld, S. E., Bültmann, U., Franche, R. L., van Dijk, F. J. H., Vlasveld, M. C., van der Feltz-Cornelis, C. M., Bruinvels, D. J., Huijs, J. J. J. M., Blonk, R. W. B., van der Klink, J. J. L., & Nieuwenhuijsen, K. (2010)	Systematic review	30	Factors associated with work participation and work functioning in depressed workers: a systematic review
Lamiani, G., Borghi, L., & Argentero, P. (2017)	Systematic review	17	When healthcare professionals cannot do the right thing: a systematic review of moral distress and its correlates
Landsbergis, P. A., Dobson, M., Koutsouras, G., & Schnall, P. (2013)	Meta-analysis and systematic review	22 in the meta-analysis and 7 in the systematic review	Job strain and ambulatory blood pressure: a meta-analysis and systematic review

Author(s)	Type of review	No. of studies included	Title
Lang, J., Ochsmann, E., Kraus, T., & Lang, J. W. B. (2012)	Systematic review and meta-analysis	50	Psychosocial work stressors as antecedents of musculoskeletal problems: a systematic review and meta-analysis of stability-adjusted longitudinal studies
Lawn, S., Roberts, L., Willis, E., Couzner, L., Mohammadi, L., & Goble, E. (2020)	Meta-analysis	14	The effects of emergency medical service work on the psychological, physical, and social well-being of ambulance personnel: a systematic review of qualitative research
le Huu, P., Bellagamba, G., Bouhadfane, M., Villa, A., & Lehucher, M. P. (2022)	Meta-analysis	41	Meta-analysis of effort-reward imbalance prevalence among physicians
Lee, E. W. J., Zheng, H., Aung, H. H., Seidmann, V., Li, C., Aroor, M. R., Lwin, M. O., Ho, S. S., & Theng, Y. L. (2021)	Systematic review	51	Examining organizational, cultural, and individual-level factors related to workplace safety and health: a systematic review and metric analysis
Lesener, T., Gusy, B., & Wolter, C. (2019)	Meta-analysis	74	The job demands-resources model: a meta-analytic review of longitudinal studies
Leso, V., Caturano, A., Vetrani, I., & Iavicoli, I. (2021)	Systematic review	7	Shift or night shift work and dementia risk: a systematic review
Li, J., Pega, F., Ujita, Y., Brisson, C., Clays, E., Descatha, A., Ferrario, M. M., Godderis, L., Iavicoli, S., Landsbergis, P. A., Metzendorf, M. I., Morgan, R. L., Pachito, D. v., Pikhart, H., Richter, B., Roncaioli, M., Rugulies, R., Schnall, P. L., Sembajwe, G., … Siegrist, J. (2020)	Systematic review and meta-analysis	37	The effect of exposure to long working hours on ischaemic heart disease: a systematic review and meta-analysis from the WHO/ILO joint estimates of the work-related burden of disease and injury
Li, J., Zhang, M., Loerbroks, A., Angerer, P., & Siegrist, J. (2015)	Systematic review and meta-analysis	5	Work stress and the risk of recurrent coronary heart disease events: a systematic review and meta-analysis
Li, Q., Du, H., & Chi, P. (2021)	Systematic review and meta-analysis	21	Job stress and well-being among internal migrant workers in China: a review and meta-analysis
Lightbody, C. E., Clegg, A., Patel, K., Lucas, J. C., Storey, H., Hackett, M. L., & Watkins, D. C. L. (2017)	Systematic review and meta-analysis	46	Systematic review and meta-analysis of psychosocial risk factors for stroke
Lim, J. Y., Kim, G. M., & Kim, E. J. (2022)	Systematic review and meta-analysis	154	Factors associated with job stress among hospital nurses: a meta-correlation analysis
Lim, J., Bogossian, F., & Ahern, K. (2010)	Systematic review	15	Stress and coping in Australian nurses: a systematic review
Lindmark, T., Engström, M., & Trygged, S. (2023)	Systematic review	17	Psychosocial work environment and well-being of direct-care staff under different nursing home ownership types: a systematic review
Linton, S. J. (2001)	Systematic review	21	Occupational psychological factors increase the risk for back pain: a systematic review
Linton, S. J., Kecklund, G., Franklin, K. A., Leissner, L. C., Sivertsen, B., Lindberg, E., Svensson, A. C., Hansson, S. O., Sundin, Ö., Hetta, J., Björkelund, C., & Hall, C. (2015)	Systematic review	24	The effect of the work environment on future sleep disturbances: a systematic review
Listopad, I. W., Michaelsen, M. M., Werdecker, L., & Esch, T. (2021)	Systematic review	122	Bio-psycho-socio-spirito-cultural factors of burnout: a systematic narrative review of the literature
Liu, M. Y., Li, N., Li, W. A., & Khan, H. (2017)	Systematic review and meta-analysis	11	Association between psychosocial stress and hypertension: a systematic review and meta-analysis
Loh, M. Y., Idris, M. A., Dormann, C., & Muhamad, H. (2019)	Systematic review	56	Organisational climate and employee health outcomes: a systematic review

Author(s)	Type of review	No. of studies included	Title
Long, M. H., Johnston, V., & Bogossian, F. (2012)	Systematic review	18	Work-related upper quadrant musculoskeletal disorders in midwives, nurses and physicians: a systematic review of risk factors and functional consequences
Lunde, L. K., Fløvik, L., Christensen, J. O., Johannessen, H. A., Finne, L. B., Jørgensen, I. L., Mohr, B., & Vleeshouwers, J. (2022)	Systematic review	14	The relationship between telework from home and employee health: a systematic review
Lytsy, P., & Friberg, E. (2020)	Systematic review	42	Psychosocial work environmental factors and workplace health, a systematic literature review
MacDonald, J. B., Hodgins, G., Saliba, A. J., & Metcalf, D. A. (2023)	Systematic review	13	Journalists and depressive symptoms: a systematic literature review
Madsen, I. E. H., Nyberg, S. T., Magnusson Hanson, L. L., Ferrie, J. E., Ahola, K., Alfredsson, L., Batty, G. D., Bjorner, J. B., Borritz, M., Burr, H., Chastang, J. F., de Graaf, R., Dragano, N., Hamer, M., Jokela, M., Knutsson, A., Koskenvuo, M., Koskinen, A., Leineweber, C., ... Kivimäki, M. (2017)	Systematic review and meta-analysis	13	Job strain as a risk factor for clinical depression: systematic review and meta-analysis with additional individual participant data
Magnavita, N., di Stasio, E., Capitanelli, I., Lops, E. A., Chirico, F., & Garbarino, S. (2019)	Systematic review and meta-analysis	34 (7 in meta-analysis)	Sleep problems and workplace violence: a systematic review and meta-analysis
Mäkikangas, A., Kinnunen, U., Feldt, T., & Schaufeli, W. (2016)	Systematic review	40	The longitudinal development of employee well-being: a systematic review
Martín-Romo, L., Sanmartín, F. J., & Velasco, J. (2023)	Systematic review	30	Invisible and stigmatized: a systematic review of mental health and risk factors among sex workers
Masanotti, G. M., Paolucci, S., Abbafati, E., Serratore, C., & Caricato, M. (2020)	Systematic review	39	Sense of coherence in nurses: a systematic review
Matre, D., Skogstad, M., Sterud, T., Nordby, K. C., Knardahl, S., Christensen, J. O., & Lie, J. A. S. (2021)	Systematic review and meta-analysis	22	Safety incidents associated with extended working hours. a systematic review and meta-analysis
Mauno, S., Herttalampi, M., Minkkinen, J., Feldt, T., & Kubicek, B. (2023)	Systematic review	39	Is work intensification bad for employees? A review of outcomes for employees over the last two decades
McCormack, H. M., MacIntyre, T. E., O'Shea, D., Herring, M. P., & Campbell, M. J. (2018)	Systematic review	29	The prevalence and cause(s) of burnout among applied psychologists: a systematic review
Medisauskaite, A., & Kamau, C. (2017)	Systematic review and meta-analysis	43 (28 in meta-analysis)	Prevalence of oncologists in distress: systematic review and meta-analysis
Meredith, L. S., Bouskill, K., Chang, J., Larkin, J., Motala, A., & Hempel, S. (2022)	Systematic review	141	Predictors of burnout among US healthcare providers: a systematic review
Michie, S., & Williams, S. (2003)	Systematic review	40	Reducing work related psychological ill health and sickness absence: a systematic literature review
Mikkelsen, S., Coggon, D., Andersen, J. H., Casey, P., Flachs, E. M., Kolstad, H. A., Mors, O., & Bonde, J. P. (2021)	Systematic review and meta-analysis	54	Are depressive disorders caused by psychosocial stressors at work? A systematic review with metaanalysis
Milner, A., Scovelle, A. J., King, T. L., & Madsen, I. (2019)	Systematic review and meta-analysis	18	Exposure to work stress and use of psychotropic medications: a systematic review and meta-analysis
Milner, A., Witt, K., LaMontagne, A. D., & Niedhammer, I. (2018)	Systematic review and meta-analysis	25 (22 in meta-analysis)	Psychosocial job stressors and suicidality: a meta-analysis and systematic review
Miraglia, M., & Johns, G. (2016)	Meta-analysis	109 samples	Going to work ill: a meta-analysis of the correlates of presenteeism and a dual-path model

Author(s)	Type of review	No. of studies included	Title
Mona, G. G., Chimbari, M. J., & Hongoro, C. (2019)	Systematic review	36	A systematic review on occupational hazards, injuries and diseases among police officers worldwide: policy implications for the South African police service
Montero-Tejero, D. J., Jiménez-Picón, N., Gómez-Salgado, J., Vidal-Tejero, E., & Fagundo-Rivera, J. (2024)	Systematic review	14	Factors influencing occupational stress perceived by emergency nurses during prehospital care: a systematic review
Moretti Anfossi, C., Ahumada Muñoz, M., Tobar Fredes, C., Pérez Rojas, F., Ross, J., Head, J., & Britton, A. (2022)	Systematic review	86	Work exposures and development of cardiovascular diseases: a systematic review
Morgan, R., Tan, H. L., Oveisi, N., Memmott, C., Korzuchowski, A., Hawkins, K., & Smith, J. (2022)	Scoping review	76	Women healthcare workers' experiences during COVID-19 and other crises: a scoping review
Morris, S. E., Tarquini, S. J., Yusufov, M., Adolf, E., Amonoo, H. L., Bain, P. A., Borstelmann, N. A., Braun, I. M., Hughes, T., Muriel, A. C., Northman, L. M., Peteet, J. R., Poort, H., Russ-Carbin, A., & Pirl, W. F. (2021)	Systematic review	38	Burnout in psychosocial oncology clinicians: a systematic review
Murray, R. M., Davis, A. L., Shepler, L. J., Moore-Merrell, L., Troup, W. J., Allen, J. A., & Taylor, J. A. (2020)	Systematic review	21	A systematic review of workplace violence against emergency medical services responders
Nakata, A. (2012)	Narrative review	N/A	Psychosocial job stress and immunity: a systematic review
Ndjaboué, R., Brisson, C., & Vézina, M. (2012)	Systematic review	11	Organisational justice and mental health: a systematic review of prospective studies
Nexø, M. A., Meng, A., & Borg, V. (2016)	Systematic review	11	Can psychosocial work conditions protect against age-related cognitive decline? Results from a systematic review
Niazi, A., Memon, M. A., Sarwar, N., Obaid, A., Mirza, M. Z., & Amjad, K. (2024)	Systematic review	74	Work intensification: a systematic review of studies from 1989 to 2022
Nicholls, R., Perry, L., Duffield, C., Gallagher, R., & Pierce, H. (2017)	Integrative review	26	Barriers and facilitators to healthy eating for nurses in the workplace: an integrative review
Niedhammer, I., Bertrais, S., & Witt, K. (2021)	Meta review (Systematic review of literature reviews and meta-analysis)	72	Psychosocial work exposures and health outcomes: a meta-review of 72 literature reviews with meta-analysis
Nielsen, M. B., Harris, A., Pallesen, S., & Einarsen, S. v. (2020)	Systematic review and meta-analysis	26 (16 in meta-analysis)	Workplace bullying and sleep – a systematic review and meta-analysis of the research literature
Nieuwenhuijsen, K., Bruinvels, D., & Frings-Dresen, M. (2010)	Systematic review	7	Psychosocial work environment and stress-related disorders, a systematic review
Niinihuhta, M., & Häggman-Laitila, A. (2022)	Systematic review	17	A systematic review of the relationships between nurse leaders' leadership styles and nurses' work-related well-being
Nowrouzi-Kia, B., Nadesar, N., & Casole, J. (2019)	Systematic review	10	Systematic review: factors related to injuries in small- and medium-sized enterprises
Nowrouzi-Kia, B., Sithamparanathan, G., Nadesar, N., Gohar, B., & Ott, M. (2022)	Systematic review and meta-analysis	9	Factors associated with work performance and mental health of healthcare workers during pandemics: a systematic review and meta-analysis
Nyberg, A., Kecklund, G., Hanson, L. M., & Rajaleid, K. (2021)	Systematic review	28	Workplace violence and health in human service industries: a systematic review of prospective and longitudinal studies

Author(s)	Type of review	No. of studies included	Title
Nyberg, A., Rajaleid, K., & Demmelmaier, I. (2022)	Systematic review	95	The work environment during coronavirus epidemics and pandemics: a systematic review of studies using quantitative, qualitative, and mixed-methods designs
Nyberg, S. T., Fransson, E. I., Heikkilä, K., Ahola, K., Alfredsson, L., Bjorner, J. B., Borritz, M., Burr, H., Dragano, N., Goldberg, M., Hamer, M., Jokela, M., Knutsson, A., Koskenvuo, M., Koskinen, A., Kouvonen, A., Leineweber, C., Madsen, I. E. H., Hanson, L. L. M., ... Kivimäki, M. (2014)	Meta-analysis	13	Job strain as a risk factor for type 2 diabetes: a pooled analysis of 124,808 men and women
Nyberg, S. T., Fransson, E. I., Heikkilä, K., Alfredsson, L., Casini, A., Clays, E., de Bacquer, D., Dragano, N., Erbel, R., Ferrie, J. E., Hamer, M., Jöckel, K. H., Kittel, F., Knutsson, A., Ladwig, K. H., Lunau, T., Marmot, M. G., Nordin, M., Rugulies, R., ... Kivimäki, M. (2013)	Meta-analysis	8	Job strain and cardiovascular disease risk factors: meta-analysis of individual-participant data from 47,000 men and women
Nyberg, S. T., Heikkilä, K., Fransson, E. I., Alfredsson, L., de Bacquer, D., Bjorner, J. B., Bonenfant, S., Borritz, M., Burr, H., Casini, A., Clays, E., Dragano, N., Erbel, R., Geuskens, G. A., Goldberg, M., Hooftman, W. E., Houtman, I. L., Jöckel, K. H., Kittel, F., ... Kivimäki, M. (2012)	Meta-analysis	13	Job strain in relation to body mass index: pooled analysis of 160 000 adults from 13 cohort studies
O'Connor, K., Muller Neff, D., & Pitman, S. (2018)	Systematic review and meta-analysis	33	Burnout in mental health professionals: a systematic review and meta-analysis of prevalence and determinants
Oglesby, L. W., Gallucci, A. R., & Wynveen, C. J. (2020)	Systematic review	59	Athletic trainer burnout: a systematic review of the literature
Ong, J., Swift, C., Bath, M., Ong, S., Lim, W., Al-Naeeb, Y., Shankar, A., & Dan, Y. Y. (2021)	Systematic review	11	The prevalence of burnout, risk factors, and job-related stressors in gastroenterologists: a systematic review
Overgaard, D., Gyntelberg, F., & Heitman, B. L. (2004)	Literature review	10	Psychological workload and body weight: is there an association? A review of the literature
Pacheco, E. C. R. L., Bártolo, A., Rodrigues, F., Pereira, A., Duarte, J. C., & Silva, C. F. (2021)	Systematic review	30	Impact of psychological aggression at the workplace on employees' health: a systematic review of personal outcomes and prevention strategies
Pachito, D. v., Pega, F., Bakusic, J., Boonen, E., Clays, E., Descartha, A., Delvaux, E., de Bacquer, D., Koskenvuo, K., Kröger, H., Lambrechts, M. C., Latorraca, C. O. C., Li, J., Cabrera Martimbianco, A. L., Riera, R., Rugulies, R., Sembajwe, G., Siegrist, J., Sillanmäki Statistician, L., ... Godderis, L. (2021)	Systematic review and meta-analysis	14	The effect of exposure to long working hours on alcohol consumption, risky drinking and alcohol use disorder: a systematic review and meta-analysis from the WHO/ILO joint estimates of the work-related burden of disease and injury
Padula, R. S., Comper, M. L. C., Sparer, E. H., & Dennerlein, J. T. (2017)	Systematic review	14	Job rotation designed to prevent musculoskeletal disorders and control risk in manufacturing industries: a systematic review
Page, J., & Robertson, N. (2022)	Systematic review	19	Extent and predictors of work-related distress in community correction officers: a systematic review
Paksaichol, A., Janwantanakul, P., Purepong, N., Pensri, P., & van der Beek, A. J. (2012)	Systematic review	7	Office workers' risk factors for the development of non-specific neck pain: a systematic review of prospective cohort studies
Palma, A., Ansoleaga, E., & Ahumada, M. (2018)	Systematic review	23	Workplace violence among health care workers
Palmer, K. T., & Smedley, J. (2007)	Systematic review	30	Work relatedness of chronic neck pain with physical findings - a systematic review

Author(s)	Type of review	No. of studies included	Title
Palmer, K. T., Bonzini, M., Harris, E. C., Linaker, C., & Bonde, J. P. (2013)	Systematic review and meta-analysis	86	Work activities and risk of prematurity, low birth weight and pre-eclampsia: an updated review with meta-analysis
Pejtersen, J. H., Burr, H., Hannerz, H., Fishta, A., & Eller, N. H. (2015)	Systematic review	2	Update on work-related psychosocial factors and the development of ischemic heart disease: a systematic review
Pena-Gralle, A. P. B., Talbot, D., Duchaine, C. S., Lavigne-Robichaud, M., Trudel, X., Aubé, K., Gralle, M., Gilbert-Ouimet, M., Milot, A., & Brisson, C. (2022)	Systematic review	18	Job strain and effort-reward imbalance as risk factors for type 2 diabetes mellitus: a systematic review and meta-analysis of prospective studies
Perdikaris, P., Kletsiou, E., Gymnopoulou, E., & Matziou, V. (2010)	Literature review	10	The relationship between workplace, job stress and nurses' tobacco use: a review of the literature
Pereira, S. M., Fonseca, A. M., & Carvalho, A. S. (2011)	Systematic review	13	Burnout in palliative care: a systematic review
Peter, R., & Siegrist, J. (2000)	Narrative review	N/A	Psychosocial work environment and the risk of coronary heart disease
Petereit-Haack, G., Bolm-Audorff, U., Starke, K. R., & Seidler, A. (2020)	Systematic review and meta-analysis	31	Occupational risk for post-traumatic stress disorder and trauma-related depression: a systematic review with meta-analysis
Platt, B., Hawton, K., Simkin, S., & Mellanby, R. J. (2012)	Systematic review	52	Suicidal behaviour and psychosocial problems in veterinary surgeons: a systematic review
Pousa, P. C. P., & de Lucca, S. R. (2021)	Systematic review	15	Psychosocial factors in nursing work and occupational risks: a systematic review
Prang, K. H., Newnam, S., & Berecki-Gisolf, J. (2015)	Systematic review	14	The impact of family and work-related social support on musculoskeletal injury outcomes: a systematic review
Pretzsch, A., Seidler, A., & Hegewald, J. (2021)	Narrative review	N/A	Health effects of occupational noise
Rauschenbach, C., Krumm, S., Thielgen, M., & Hertel, G. (2013)	Literature review and meta-analysis	66 samples in 48 studies	Age and work-related stress: a review and meta-analysis
Richter, K., Peter, L., Rodenbeck, A., Weess, H. G., Riedel-Heller, S. G., & Hillemacher, T. (2021)	Systematic review	14	Shiftwork and alcohol consumption: a systematic review of the literature
Riedl, R. (2012)	Literature review	9	On the biology of technostress: literature review and research agenda
Rohleder, N. (2019)	Narrative review	N/A	Stress and inflammation – the need to address the gap in the transition between acute and chronic stress effects
Rönnblad, T., Grönholm, E., Jonsson, J., Koranyi, I., Orellana, C., Kreshpaj, B., Chen, L., Stockfelt, L., & Bodin, T. (2019)	Systematic review and meta-analysis	16	Precarious employment and mental health: a systematic review and meta-analysis of longitudinal studies
Rosa, D., Terzoni, S., Dellafiore, F., & Destrebecq, A. (2019)	Systematic review	24	Systematic review of shift work and nurses' health
Rosário, S., Fonseca, J. A., Nienhaus, A., & da Costa, J. T. (2016)	Systematic review	10	Standardized assessment of psychosocial factors and their influence on medically confirmed health outcomes in workers: a systematic review
Rotenstein, L. S., Torre, M., Ramos, M. A., Rosales, R. C., Guille, C., Sen, S., & Mata, D. A. (2018)	Systematic review	45	Prevalence of burnout among physicians: a systematic review
Rothenberger, D. A. (2017)	Systematic review	N/A	Physician burnout and well-being: a systematic review and framework for action

Author(s)	Type of review	No. of studies included	Title
Rudkjoebing, L. A., Bungum, A. B., Flachs, E. M., Eller, N. H., Borritz, M., Aust, B., Rugulies, R., Rod, N. H., Biering, K., & Bonde, J. P. (2020)	Systematic review and meta-analysis	17	Work-related exposure to violence or threats and risk of mental disorders and symptoms: a systematic review and meta-analysis
Rugulies, R., Aust, B., & Madsen, I. E. H. (2017)	Systematic review and meta-analysis	8	Effort-reward imbalance at work and risk of depressive disorders. A systematic review and meta-analysis of prospective cohort studies
Rugulies, R., Sørensen, K., di Tecco, C., Bonafede, M., Rondinone, B. M., Ahn, S., Ando, E., Ayuso-Mateos, J. L., Cabello, M., Descatha, A., Dragano, N., Durand-Moreau, Q., Eguchi, H., Gao, J., Godderis, L., Kim, J., Li, J., Madsen, I. E. H., Pachito, D. v., … Pega, F. (2021)	Systematic review and meta-analysis	22	The effect of exposure to long working hours on depression: a systematic review and meta-analysis from the WHO/ILO joint estimates of the work-related burden of disease and injury
Saade, S., Parent-Lamarche, A., Bazarbachi, Z., Ezzeddine, R., & Ariss, R. (2022)	Systematic review	107	Depressive symptoms in helping professions: a systematic review of prevalence rates and work-related risk factors
Salmond, E., Salmond, S., Ames, M., Kamienski, M., & Holly, C. (2019)	Systematic review	23	Experiences of compassion fatigue in direct care nurses: a qualitative systematic review
Salvagioni, D. A. J., Melanda, F. N., Mesas, A. E., González, A. D., Gabani, F. L., & de Andrade, S. M. (2017)	Systematic review	36	Physical, psychological and occupational consequences of job burnout: a systematic review of prospective studies
Schilgen, B., Nienhaus, A., Handtke, O., Schulz, H., & Moèsko, M. (2017)	Systematic review	14	Health situation of migrant and minority nurses: a systematic review
Schneider, A., & Weigl, M. (2018)	Systematic review	39	Associations between psychosocial work factors and provider mental well-being in emergency departments: a systematic review
Schneider, J., Talamonti, D., Gibson, B., & Forshaw, M. (2022)	Systematic review	39	Factors mediating the psychological well-being of healthcare workers responding to global pandemics: a systematic review
Schoellbauer, J., Hartner-Tiefenthaler, M., & Kelliher, C. (2023)	Systematic review	78	Strain, loss of time, or even gain? A systematic review of technology-based work extending and its ambiguous impact on well-being, considering its frequency and duration
Schreibauer, E. C., Hippler, M., Burgess, S., Rieger, M. A., & Rind, E. (2020)	Integrative review	45	Work-related psychosocial stress in small and medium-sized enterprises: an integrative review
Schwatka, N. v., Butler, L. M., & Rosecrance, J. R. (2012)	Systematic review	20	An aging workforce and injury in the construction industry
Seidler, A., Thinschmidt, M., Deckert, S., Then, F., Hegewald, J., Nieuwenhuijsen, K., & Riedel-Heller, S. G. (2014)	Systematic review	23	The role of psychosocial working conditions on burnout and its core component emotional exhaustion – a systematic review
Sherwood, L., Hegarty, S., Vallières, F., Hyland, P., Murphy, J., Fitzgerald, G., & Reid, T. (2019)	Systematic review	20	Identifying the key risk factors for adverse psychological outcomes among police officers: a systematic literature review
Shields, M., Dimov, S., Kavanagh, A., Milner, A., Spittal, M. J., & King, T. L. (2021)	Systematic review	9	How do employment conditions and psychosocial workplace exposures impact the mental health of young workers? A systematic review
Shriane, A. E., Ferguson, S. A., Jay, S. M., & Vincent, G. E. (2020)	Systematic review	16	Sleep hygiene in shift workers: a systematic literature review
Siegrist, J. (1996)	Systematic review	2	Adverse health effects of high-effort/low-reward conditions
Siegrist, J., & Li, J. (2016)	Systematic review	51	Associations of extrinsic and intrinsic components of work stress with health: a systematic review of evidence on the effort-reward imbalance model

Author(s)	Type of review	No. of studies included	Title
Siegrist, J., & Li, J. (2017)	Systematic review and meta-analysis	6	Work stress and altered biomarkers: a synthesis of findings based on the effort-reward imbalance model
Siegrist, J., & Wege, N. (2020)	Narrative review	N/A	Adverse psychosocial work environments and depression – a narrative review of selected theoretical models
Singh, C., Cross, W., Munro, I., & Jackson, D. (2020)	Systematic review	16	Occupational stress facing nurse academics – a mixed-methods systematic review
Singh, J., Karanika-Murray, M., Baguley, T., & Hudson, J. (2020)	Systematic review	15	A systematic review of job demands and resources associated with compassion fatigue in mental health professionals
Singh, P., Aulak, D. S., Mangat, S. S., & Aulak, M. S. (2016)	Systematic review	33	Systematic review: factors contributing to burnout in dentistry
Skakon, J., Nielsen, K., Borg, V., & Guzman, J. (2010)	Systematic review	49	Are leaders' well-being, behaviours and style associated with the affective well-being of their employees? A systematic review of three decades of research
Skogstad, M., Skorstad, M., Lie, A., Conradi, H. S., Heir, T., & Weisæth, L. (2013)	Systematic review	140	Work-related post-traumatic stress disorder
Sluiter, J. K. (2006)	Narrative review	N/A	High-demand jobs: age-related diversity in work ability?
Smith, E. C., Holmes, L., & Burkle, F. M. (2019a)	Literature review	25	Exploring the physical and mental health challenges associated with emergency service call-taking and dispatching: a review of the literature
Smith, E. C., Holmes, L., & Burkle, F. M. (2019b)	Systematic review	156	The physical and mental health challenges experienced by 9/11 first responders and recovery workers: a review of the literature
Solovieva, S., Lallukka, T., Virtanen, M., & Viikari-Juntura, E. (2013)	Systematic review	39	Psychosocial factors at work, long work hours, and obesity: a systematic review
Sommovigo, V., Setti, I., Argentero, P., & O'Shea, D. (2019)	Systematic review	53	The impact of customer incivility and verbal aggression on service providers: a systematic review
Somville, F., Van Bogaert, P., Wellens, B., De Cauwer, H., & Franck, E. (2023)	Systematic review	35	Work stress and burnout among emergency physicians: a systematic review of last 10 years of research
Spann, A., Vicente, J., Allard, C., Hawley, M., Spreeuwenberg, M., & de Witte, L. (2020)	Scoping review	92	Challenges of combining work and unpaid care, and solutions: a scoping review
Sparrenberger, F., Cichelero, F. T., Ascoli, A. M., Fonseca, F. P., Weiss, G., Berwanger, O., Fuchs, S. C., Moreira, L. B., & Fuchs, F. D. (2009)	Systematic review	14	Does psychosocial stress cause hypertension? A systematic review of observational studies
Sriharan, A., Ratnapalan, S., Tricco, A. C., Lupea, D., Ayala, A. P., Pang, H., & Lee, D. D. (2020)	Scoping review	28	Occupational stress, burnout, and depression in women in healthcare during COVID-19 pandemic: rapid scoping review
Stansfeld, S., & Candy, B. (2006)	Meta-analysis	11	Psychosocial work environment and mental health – a meta-analytic review
Stewart, A. L., Kathawalla, U.-K., Wolfe, A. G., & Everson-Rose, S. A. (2018)	Systematic review	37	Women's heart health at mid-life: what is the role of psychosocial stress?
Strohmeier, H., & Scholte, W. F. (2015)	Systematic review	14	Trauma-related mental health problems among national humanitarian staff: a systematic review of the literature
Stults-Kolehmainen, M. A., & Sinha, R. (2014)	Systematic review	168	The effects of stress on physical activity and exercise

Author(s)	Type of review	No. of studies included	Title
Sui, H., Sun, N., Zhan, L., Lu, X., Chen, T., & Mao, X. (2016)	Systematic review and meta-analysis	7	Association between work-related stress and risk for type 2 diabetes: a systematic review and meta-analysis of prospective cohort studies
Suleiman-Martos, N., Albendín-García, L., Gómez-Urquiza, J. L., Vargas-Román, K., Ramirez-Baena, L., Ortega-Campos, E., & de La Fuente-Solana, E. I. (2020)	Systematic review and meta-analysis	10	Prevalence and predictors of burnout in midwives: a systematic review and meta-analysis
Szerencsi, K., van Amelsvoort, L. G. P. M., Viechtbauer, W., Mohren, D. C. L., Prins, M. H., & Kant, I. J. (2012)	Systematic review and meta-regression analysis	71	The association between study characteristics and outcome in the relation between job stress and cardiovascular disease – a multilevel meta-regression analysis
Taibi, Y., Metzler, Y. A., Bellingrath, S., & Müller, A. (2021)	Systematic review	30	A systematic overview on the risk effects of psychosocial work characteristics on musculoskeletal disorders, absenteeism, and workplace accidents
Tang, K. (2014)	Systematic review	23	A reciprocal interplay between psychosocial job stressors and worker well-being? A systematic review of the 'reversed' effect
Taouk, Y., Spittal, M. J., LaMontagne, A. D., & Milner, A. J. (2020)	Systematic review and meta-regression analysis	32	Psychosocial work stressors and risk of all-cause and coronary heart disease mortality: a systematic review and meta-analysis
Tavares, A. I. (2017)	Narrative review	N/A	Telework and health effects review
Taylor, C., Mattick, K., Carrieri, D., Cox, A., & Maben, J. (2022)	Literature review	N/A	'The WOW factors': comparing workforce organization and well-being for doctors, nurses, midwives and paramedics in England
Teoh, K., Singh, J., Medisauskaite, A., & Hassard, J. (2023)	Meta-analysis	23 samples	Doctors' perceived working conditions, psychological health and patient care: a meta-analysis of longitudinal studies
Then, F. S., Luck, T., Luppa, M., Thinschmidt, M., Deckert, S., Nieuwenhuijsen, K., Seidler, A., & Riedel-Heller, S. G. (2014)	Systematic review	17	Systematic review of the effect of the psychosocial working environment on cognition and dementia
Theorell, T., Hammarström, A., Aronsson, G., Träskman Bendz, L., Grape, T., Hogstedt, C., Marteinsdottir, I., Skoog, I., & Hall, C. (2015)	Systematic review and meta-regression analysis	59	A systematic review including meta-analysis of work environment and depressive symptoms
Theorell, T., Jood, K., Järvholm, L. S., Vingård, E., Perk, J., Östergren, P. O., & Hall, C. (2016)	Systematic review	54	A systematic review of studies in the contributions of the work environment to ischaemic heart disease development
Thibodeau, P. S., Nash, A., Greenfield, J. C., & Bellamy, J. L. (2023)	Systematic review	15	The association of moral injury and healthcare clinicians' well-being: a systematic review
Thielmann, B., Hartung, J., & Böckelmann, I. (2022)	Systematic review	5	Objective assessment of mental stress in individuals with different levels of effort reward imbalance or overcommitment using heart rate variability: a systematic review
Thompson, L., & Rose, J. (2011)	Systematic review	21	Does organizational climate impact upon burnout in staff who work with people with intellectual disabilities? A systematic review of the literature
Torquati, L., Mielke, G. I., Brown, W. J., Burton, N. W., & Kolbe-Alexander, T. L. (2019)	Meta-analysis	7	Shift work and poor mental health: a meta-analysis of longitudinal studies

Author(s)	Type of review	No. of studies included	Title
Trudel-Fitzgerald, C., Chen, Y., Singh, A., Okereke, O. I., & Kubzansky, L. D. (2016)	Narrative review	N/A	Psychiatric, psychological, and social determinants of health in the nurses' health study cohorts
Urbina-Garcia, A. (2020)	Systematic review	28	What do we know about university academics' mental health? A systematic literature review
van der Molen, H. F., Foresti, C., Daams, J. G., Frings-Dresen, M. H. W., & Kuijer, P. P. F. M. (2017)	Systematic review	27	Work-related risk factors for specific shoulder disorders: a systematic review and meta-analysis
van der Molen, H. F., Nieuwenhuijsen, K., Frings-Dresen, M. H. W., & de Groene, G. (2020)	Systematic review and meta-analysis	17	Work-related psychosocial risk factors for stress-related mental disorders: an updated systematic review and meta-analysis
van der Windt, D. A. W. M., Thomas, E., Pope, D. P., de Winter, A. F., Macfarlane, G. J., Bouter, L. M., & Silman, A. J. (2000)	Systematic review	29	Occupational risk factors for shoulder pain: a systematic review
van Duijnhoven, J., Aarts, M. P. J., Aries, M. B. C., Rosemann, A. L. P., & Kort, H. S. M. (2019)	Systematic review	20	Systematic review on the interaction between office light conditions and occupational health: elucidating gaps and methodological issues
van Laethem, M., Beckers, D. G., Kompier, M. A., Dijksterhuis, A., & Geurts, S. A. (2013)	Systematic review	20	Psychosocial work characteristics and sleep quality: a systematic review of longitudinal and intervention research
van Melick, M. J. G. J., van Beukering, M. D. M., Mol, B. W., Frings-Dresen, M. H. W., & Hulshof, C. T. J. (2014)	Systematic review and meta-analysis	16	Shift work, long working hours and preterm birth: a systematic review and meta-analysis
van Rijn, R. M., Huisstede, B. M. A., Koes, B. W., & Burdorf, A. (2009a)	Systematic review	13	Associations between work-related factors and specific disorders at the elbow: a systematic literature review
van Rijn, R. M., Huisstede, B. M. A., Koes, B. W., & Burdorf, A. (2009b)	Systematic review	44	Associations between work-related factors and the carpal tunnel syndrome – a systematic review
van Rijn, R. M., Huisstede, B. M., Koes, B. W., & Burdorf, A. (2010)	Systematic review	17	Associations between work-related factors and specific disorders of the shoulder – a systematic review of the literature
van Veen, M., Oude Hengel, K. M., Schelvis, R. M. C., Bongers, P. M., Ket, J. C. F., van der Beek, A. J., & Boot, C. R. L. (2023)	Systematic review	17	Psychosocial work factors affecting mental health of young workers: a systematic review
Vedaa, Ø., Harris, A., Bjorvatn, B., Waage, S., Sivertsen, B., Tucker, P., & Pallesen, S. (2016)	Systematic review	22	Systematic review of the relationship between quick returns in rotating shift work and health-related outcomes
Verkuil, B., Atasayi, S., & Molendijk, M. L. (2015)	Systematic review and meta-analysis	63	Workplace bullying and mental health: a meta-analysis on cross-sectional and longitudinal data
Virtanen, M., & Kivimäki, M. (2018)	Narrative review	N/A	Long working hours and risk of cardiovascular disease
Virtanen, M., Heikkilä, K., Jokela, M., Ferrie, J. E., Batty, G. D., Vahtera, J., & Kivimäki, M. (2012)	Systematic review and meta-analysis	12	Long working hours and coronary heart disease: a systematic review and meta-analysis
Virtanen, M., Jokela, M., Lallukka, T., Magnusson Hanson, L., Pentti, J., Nyberg, S. T., Alfredsson, L., Batty, G. D., Casini, A., Clays, E., DeBacquer, D., Ervasti, J., Fransson, E., Halonen, J. I., Head, J., Kittel, F., Knutsson, A., Leineweber, C., Nordin, M., ... Kivimäki, M. (2020)	Meta-analysis	19	Long working hours and change in body weight: analysis of individual-participant data from 19 cohort studies

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Virtanen, M., Jokela, M., Madsen, I. E. H., Magnusson Hanson, L. L., Lallukka, T., Nyberg, S. T., Alfredsson, L., Batty, G. D., Bjorner, J. B., Borritz, M., Burr, H., Dragano, N., Erbel, R., Ferrie, J. E., Heikkilä, K., Knutsson, A., Koskenvuo, M., Lahelma, E., Nielsen, M. L., … Kivimäki, M. (2018)	Systematic review and meta-analysis	18	Long working hours and depressive symptoms: systematic review and meta-analysis of published studies and unpublished individual participant data
Virtanen, M., Jokela, M., Nyberg, S. T., Madsen, I. E. H., Lallukka, T., Ahola, K., Alfredsson, L., Batty, G. D., Bjorner, J. B., Borritz, M., Burr, H., Casini, A., Clays, E., de Bacquer, D., Dragano, N., Erbel, R., Ferrie, J. E., Fransson, E. I., Hamer, M., … Kivimäki, M. (2015)	Systematic review and meta-analysis	61	Long working hours and alcohol use: systematic review and meta-analysis of published studies and unpublished individual participant data
Virtanen, M., Kivimäki, M., Joensuu, M., Virtanen, P., Elovainio, M., & Vahtera, J. (2005)	Systematic review	27	Temporary employment and health: a review
Virtanen, M., Nyberg, S. T., Batty, G. D., Jokela, M., Heikkilä, K., Fransson, E. I., Alfredsson, L., Bjorner, J. B., Borritz, M., Burr, H., Casini, A., Clays, E., de Bacquer, D., Dragano, N., Elovainio, M., Erbel, R., Ferrie, J. E., Hamer, M., Jöckel, K.-H., … IPD-Work Consortium. (2013)	Systematic review and meta-analysis	13	Perceived job insecurity as a risk factor for incident coronary heart disease: systematic review and meta-analysis
Wagner, S. L., White, N., Fyfe, T., Matthews, L. R., Randall, C., Regehr, C., White, M., Alden, L. E., Buys, N., Carey, M. G., Corneil, W., Fraess-Phillips, A., Krutop, E., & Fleischmann, M. H. (2020)	Systematic review	222	Systematic review of posttraumatic stress disorder in police officers following routine work-related critical incident exposure
Wagstaff, A. S., & Lie, J. A. S. (2011)	Systematic review	14	Shift and night work and long working hours – a systematic review of safety implications
Watanabe, K., Imamura, K., & Kawakami, N. (2016)	Systematic review and meta-analysis	7	Working hours and the onset of depressive disorder: a systematic review and meta-analysis
Watanabe, K., Sakuraya, A., Kawakami, N., Imamura, K., Ando, E., Asai, Y., Eguchi, H., Kobayashi, Y., Nishida, N., Arima, H., Shimazu, A., & Tsutsumi, A. (2018)	Systematic review and meta-analysis	8	Work-related psychosocial factors and metabolic syndrome onset among workers: a systematic review and meta-analysis
Williamson, V., Stevelink, S. A. M., & Greenberg Background, N. (2018)	Systematic review and meta-analysis	13	Occupational moral injury and mental health: systematic review and meta-analysis
Wilson, M. D., Conroy, L. M., & Dorevitch, S. (2014)	Systematic review	10	Occupational stress and subclinical atherosclerosis: a systematic review
Wirth, T., Mette, J., Prill, J., Harth, V., & Nienhaus, A. (2019)	Scoping review	25	Working conditions, mental health and coping of staff in social work with refugees and homeless individuals: a scoping review
Wischlitzki, E., Amler, N., Hiller, J., & Drexler, H. (2020)	Systematic review	4	Psychosocial risk management in the teaching profession: a systematic review
Wong, K., Chan, A. H. S., & Ngan, S. C. (2019)	Meta-analysis	243	The effect of long working hours and overtime on occupational health: a meta-analysis of evidence from 1998 to 2018
Xie, W., Wang, J., Zhang, Y., Zuo, M., Kang, H., Tang, P., Zeng, L., Jin, M., Ni, W., & Ma, C. (2021)	Systematic review and meta-analysis	21	The levels, prevalence and related factors of compassion fatigue among oncology nurses: a systematic review and meta-analysis
Xu, S., Huang, Y., Xiao, J., Zhu, W., Wang, L., Tang, H., Hu, Y., & Liu, T. (2015)	Meta-analysis	14	The association between job strain and coronary heart disease: a meta-analysis of prospective cohort studies
Xue, Y., Lopes, J., Ritchie, K., D'Alessandro, A. M., Banfield, L., McCabe, R. E., Heber, A., Lanius, R. A., & McKinnon, M. C. (2022)	Scoping review	57	Potential circumstances associated with moral injury and moral distress in healthcare workers and public safety personnel across the globe during COVID-19: a scoping review

Author(s)	Type of review	No. of studies included	Title
Yang, B., Wang, Y., Cui, F., Huang, T., Sheng, P., Shi, T., Huang, C., Lan, Y., & Huang, Y. N. (2018)	Meta-analysis	17	Association between insomnia and job stress: a meta-analysis
Yang, T., Qiao, Y., Xiang, S., Li, W., Gan, Y., & Chen, Y. (2019)	Meta-analysis	9	Work stress and the risk of cancer: a meta-analysis of observational studies
Yazd, S. D., Wheeler, S. A., & Zuo, A. (2019)	Systematic review	167	Key risk factors affecting farmers' mental health: a systematic review
Zare, A., Choobineh, A., Hassanipour, S., & Malakoutikhah, M. (2021)	Systematic review and meta-analysis	66	Investigation of psychosocial factors on upper limb musculoskeletal disorders and the prevalence of its musculoskeletal disorders among nurses: a systematic review and meta-analysis
Zhao, Y., Richardson, A., Poyser, C., Butterworth, P., Strazdins, L., & Leach, L. S. (2019)	Systematic review and meta-analysis	33	Shift work and mental health: a systematic review and meta-analysis
Zhu, Y., Liu, J., Jiang, H., Brown, T. J., Tian, Q., Yang, Y., Wang, C., Xu, H., Liu, J., Gan, Y., & Lu, Z. (2020)	Meta-analysis	19	Are long working hours associated with weight-related outcomes? A meta-analysis of observational studies
Zsoldos, E., Mahmood, A., & Ebmeier, K. P. (2014)	Narrative review	N/A	Occupational stress, bullying and resilience in old age

Table A7 **Included studies – organisational outcomes**

Author(s)	Type of review	No. of studies included	Title
Alilyyani, B., Wong, C. A., & Cummings, G. (2018)	Systematic review	21	Antecedents, mediators, and outcomes of authentic leadership in healthcare: a systematic review
Aloisio, L. D., Coughlin, M., & Squires, J. E. (2021)	Systematic review	28	Individual and organizational factors of nurses' job satisfaction in long-term care: a systematic review
Amiri, S., & Behnezhad, S. (2020a)	Systematic review and meta-analysis	19	Association between job strain and sick leave: a systematic review and meta-analysis of prospective cohort studies
Amoadu, M., Ansah, E. W., & Sarfo, J. O. (2023)	Scoping review	93	Influence of psychosocial safety climate on occupational health and safety: a scoping review
Angerer, P., & Weigl, M. (2015)	Systematic review	12	Physicians' psychosocial work conditions and quality of care: a literature review
Attridge, M. (2009)	Narrative review	N/A	Measuring and managing employee work engagement: a review of the research and business literature
Bae, S. H., & Fabry, D. (2014)	Systematic review	21	Assessing the relationships between nurse work hours/overtime and nurse and patient outcomes: systematic literature review
Berguig, O., & Abdelbaki, N. (2021)	Systematic review	30	Impact of quality of work life's dimensions on turnover intention: a systematic literature review
Bernuzzi, C., Sommovigo, V., & Setti, I. (2022)	Systematic review	26	The role of resilience in the work-life interface: a systematic review
Bernstrøm, V. H., & Houkes, I. (2017)	Systematic review	70	A systematic literature review of the relationship between work hours and sickness absence
Bolt, E. E. T., Winterton, J., & Cafferkey, K. (2022)	Systematic review	1375	A century of labour turnover research: a systematic literature review

Author(s)	Type of review	No. of studies included	Title
Borrelli, I., Rossi, M. F., Melcore, G., Perrotta, A., Santoro, P. E., Gualano, M. R., & Moscato, U. (2023)	Systematic review	13	Workplace ethical climate and workers' burnout: a systematic review
Brborovi- , H., Daka, Q., Dakaj, K., & Brborovi- , O. (2017)	Systematic review	12	Antecedents and associations of sickness presenteeism and sickness absenteeism in nurses: a systematic review
Browne, P., Carr, E., Fleischmann, M., Xue, B., & Stansfeld, S. A. (2019)	Systematic review	46	The relationship between workplace psychosocial environment and retirement intentions and actual retirement: a systematic review
Carolina, N., Gunnar, B., Pia, T., & Peter, Ö. (2024)	Systematic review	6	Individual, family, job, and organizational factors associated with retirement intentions among older long-term care workers: a systematic review
Cicolini, G., Comparcini, D., & Simonetti, V. (2014)	Systematic review	12	Workplace empowerment and nurses' job satisfaction: a systematic literature review
Cohen, A. (1993)	Meta-analysis	34	Organizational commitment and turnover: a meta-analysis
Copanitsanou, P., Fotos, N., & Brokalaki, H. (2017)	Systematic review	10	Effects of work environment on patient and nurse outcomes
Cotton, P., & Hart, P. M. (2003)	Narrative review	N/A	Occupational well-being and performance: a review of organisational health research
Cummings, G. G., MacGregor, T., Davey, M., Lee, H., Wong, C. A., Lo, E., Muise, M., & Stafford, E. (2010)	Systematic review	53	Leadership styles and outcome patterns for the nursing workforce and work environment: a systematic review
Davey, M. M., Cummings, G., Newburn-Cook, C. v., & Lo, E. A. (2009)	Systematic review	14	Predictors of nurse absenteeism in hospitals: a systematic review
de Cordova, P. B., Bradford, M. A., & Stone, P. W. (2016)	Systematic review	13	Increased errors and decreased performance at night: a systematic review of the evidence concerning shift work and quality
de Croon, E. M., Sluiter, J. K., Nijssen, T. F., Dijkmans, B. A. C., Lankhorst, G. J., & Frings-Dresen, M. H. W. (2004)	Systematic review	19	Predictive factors of work disability in rheumatoid arthritis: a systematic literature review
de las Heras-Rosas, C., Herrera, J., & Rodríguez-Fernández, M. (2021)	Bibliometric review	448	Organisational commitment in healthcare systems: a bibliometric analysis
de Vries, H., Fishta, A., Weikert, B., Rodriguez Sanchez, A., & Wegewitz, U. (2018)	Scoping review	71	Determinants of sickness absence and return to work among employees with common mental disorders: a scoping review
Deligkaris, P., Panagopoulou, E., Montgomery, A. J., & Masoura, E. (2014)	Systematic review	15	Job burnout and cognitive functioning: a systematic review
Demerouti, E., Peeters, M. C. W., & van der Heijden, B. I. J. M. (2012)	Narrative review	N/A	Work-family interface from a life and career stage perspective: the role of demands and resources
Demerouti, E., & Adaloudis, N. (2024)	Literature review	30	Addressing burnout in organisations: a literature review
Dewa, C. S., Loong, D., Bonato, S., Thanh, N. X., & Jacobs, P. (2014)	Systematic review	5	How does burnout affect physician productivity? A systematic literature review
di Muzio, M., Dionisi, S., di Simone, E., Cianfrocca, C., Muzio, F. D. I., Fabbian, F., Barbiero, G., Tartaglini, D., & Giannetta, N. (2019)	Systematic review	19	Can nurses' shift work jeopardize the patient safety? A systematic review
Ding, M., & Wang, C. (2023)	Meta-analysis	31 samples	Can public service motivation increase work engagement? A meta-analysis across cultures.
Doyle Fosco, S. L. (2022)	Systematic review	27	Educational leader well-being: a systematic review

Author(s)	Type of review	No. of studies included	Title
Dragano, N., & Schneider, L. (2011)	Systematic review	20	Work related psychosocial factors and the risk of early disability pensioning: a contribution to assessing the need for rehabilitation
Duchaine, C. S., Aubé, K., Gilbert-Ouimet, M., Vézina, M., Ndjaboué, R., Massamba, V., Talbot, D., Lavigne-Robichaud, M., Trudel, X., Bruno Pena-Gralle, A.-P., Lesage, A., Moore, L., Milot, A., Laurin, D., & Brisson, C. (2020)	Systematic review and meta-analysis	23 (13 in meta-analysis)	Psychosocial stressors at work and the risk of sickness absence due to a diagnosed mental disorder – a systematic review and meta-analysis supplemental content
Dupont, F., Léger, P. M., Begon, M., Lecot, F., Sénécal, S., Labonté-Lemoyne, E., & Mathieu, M. E. (2019)	Systematic review	12	Health and productivity at work: which active workstation for which benefits: a systematic review
Efimov, I., Rohwer, E., Harth, V., & Mache, S. (2022)	Scoping review	19	Virtual leadership in relation to employees' mental health, job satisfaction and perceptions of isolation: a scoping review
Faragher, E. B., Cass, M., & Cooper, C. L. (2005)	Systematic review and meta-analysis	485	The relationship between job satisfaction and health: a meta-analysis
Fernandes, C., & Pereira, A. (2016)	Systematic review	22	Exposure to psychosocial risk factors in the context of work: a systematic review
Flouris, A. D., Dinas, P. C., Ioannou, L. G., Nybo, L., Havenith, G., Kenny, G. P., & Kjellstrom, T. (2018)	Systematic review and meta-analysis	111 (64 in meta-analysis)	Workers' health and productivity under occupational heat strain: a systematic review and meta-analysis
Galanakis, M. D., & Tsitouri, E. (2022)	Systematic review	20	Positive psychology in the working environment. Job demands-resources theory, work engagement and burnout: a systematic literature review
Galanis, P., Moisoglou, I., Papathanasiou, I. v., Malliarou, M., Katsiroumpa, A., Vraka, I., Siskou, O., Konstantakopoulou, O., & Kaitelidou, D. (2024)	Systematic review and meta-analysis	8	Association between organizational support and turnover intention in nurses: a systematic review and meta-analysis
García-Buades, M. E., Peiró, J. M., Montañez-Juan, M. I., Kozusznik, M. W., & Ortiz-Bonnín, S. (2020)	Systematic review	30	Happy-productive teams and work units: a systematic review of the 'happy-productive worker thesis'
Gärtner, F. R., Nieuwenhuijsen, K., van Dijk, F. J. H., & Sluiter, J. K. (2010)	Systematic review	16	The impact of common mental disorders on the work functioning of nurses and allied health professionals: a systematic review
Gómez-Salgado, C., Camacho-Vega, J. C., Gómez-Salgado, J., García-Iglesias, J. J., Fagundo-Rivera, J., Allande-Cussó, R., Martín-Pereira, J., & Ruiz-Frutos, C. (2023)	Systematic review	35	Stress, fear, and anxiety among construction workers: a systematic review
Gonçalves, G., Sousa, C., Fernandes, M. J., Almeida, N., & Sousa, A. (2023)	Systematic review	16	Restorative effects of biophilic workplace and nature exposure during working time: a systematic review
González-Siles, P., Martí-Vilar, M., González-Sala, F., Merino-Soto, C., & Toledano-Toledano, F. (2022)	Systematic review	47	Sense of coherence and work stress or well-being in care professionals: a systematic review
Grailey, K. E., Murray, E., Reader, T., & Brett, S. J. (2021)	Systematic review	62	The presence and potential impact of psychological safety in the healthcare setting: an evidence synthesis
Gutiérrez, O. I., Polo, J. D., Zambrano, M. J., & Molina, D. C. (2020)	Meta-analysis	43 (45 samples)	Meta-analysis and scientific mapping of well-being and job performance
Guzeller, C. O., & Celiker, N. (2020)	Meta-analysis	13	Examining the relationship between organizational commitment and turnover intention via a meta-analysis
Hall, C. E., Davidson, L., Brooks, S. K., Greenberg, N., & Weston, D. (2023)	Systematic review	25	The relationship between homeworking during COVID-19 and both, mental health, and productivity: a systematic review

Author(s)	Type of review	No. of studies included	Title
Halter, M., Boiko, O., Pelone, F., Beighton, C., Harris, R., Gale, J., Gourlay, S., & Drennan, V. (2017)	Umbrella review (Systematic review of systematic reviews)	9	The determinants and consequences of adult nursing staff turnover: a systematic review of systematic reviews
Hassard, J., Teoh, K. R. H., & Cox, T. (2019)	Systematic review	10	Estimating the economic burden posed by work-related violence to society: a systematic review of cost-of-illness studies
Hassard, J., Teoh, K. R. H., Visockaite, G., Dewe, P., & Cox, T. (2018a)	Systematic review	10	The cost of work-related stress to society: a systematic review
Hassard, J., Teoh, K. R. H., Visockaite, G., Dewe, P., & Cox, T. (2018b)	Systematic review	12	The financial burden of psychosocial workplace aggression: a systematic review of cost-of-illness studies
Heinrichs, K., Angerer, P., & Loerbroks, A. (2018)	Systematic review	7	Psychosocial working conditions as determinants of asthma self-management at work: a systematic review
Henrotin, J. B., & Gulisano, F. (2022)	Systematic review	21	Sick leave during pregnancy and occupational factors: a systematic review
Hodkinson, A., Zhou, A., Johnson, J., Geraghty, K., Riley, R., Zhou, A., Panagopoulou, E., Chew-Graham, C. A., Peters, D., Esmail, A., & Panagioti, M. (2022)	Systematic review and meta-analysis	170	Associations of physician burnout with career engagement and quality of patient care: systematic review and meta-analysis
Hoff, T., Carabetta, S., & Collinson, G. E. (2019)	Systematic review	32	Satisfaction, burnout, and turnover among nurse practitioners and physician assistants: a review of the empirical literature
Homaie Rad, E., Rashidian, A., Arab, M., & Souri, A. (2017)	Systematic review and meta-analysis	17	Comparison the effects of poor health and low income on early retirement: a systematic review and meta-analysis
Huu, P. T. (2023)	Systematic review	12	Impact of employee digital competence on the relationship between digital autonomy and innovative work behavior: a systematic review
Ibrahim, N. F., Mohamad Sharif, S., Saleh, H., Mat Hasan, N. H., & Jayiddin, N. F. (2023)	Systematic review	37	PERMA well-being and innovative work behaviour: a systematic literature review
Johnson, A. H., & Benham-Hutchins, M. (2020)	Systematic review	14	The influence of bullying on nursing practice errors: a systematic review
Jonsson, S. (2012)	Re-test study	709 participants	Psychosocial work environment and prediction of job satisfaction among Swedish registered nurses and physicians – a follow-up study
Jun, J., Ojemeni, M. M., Kalamani, R., Tong, J., & Crecelius, M. L. (2021)	Systematic review	20	Relationship between nurse burnout, patient and organizational outcomes: systematic review
Kalteh, H. O., Mortazavi, S. B., Mohammadi, E., & Salesi, M. (2021)	Systematic review	31	The relationship between safety culture and safety climate and safety performance: a systematic review
Karlsson, M. L., Björklund, C., & Jensen, I. (2012)	Systematic review	17	The relationship between psychosocial work factors, employee health and organisational production: a systematic review
Keers, R. N., Williams, S. D., Cooke, J., & Ashcroft, D. M. (2013)	Systematic review	54	Causes of medication administration errors in hospitals: a systematic review of quantitative and qualitative evidence
Kerry, M. J. (2018)	Systematic review	39	Psychological antecedents of retirement planning: a systematic review
Keyko, K., Cummings, G. G., Yonge, O., & Wong, C. A. (2016)	Systematic review	18	Work engagement in professional nursing practice: a systematic review

Author(s)	Type of review	No. of studies included	Title
Kigozi, J., Jowett, S., Lewis, M., Barton, P., & Coast, J. (2017)	Systematic review	28	The estimation and inclusion of presenteeism costs in applied economic evaluation: a systematic review
Kim, H., & Kim, E. G. (2021)	Meta-analysis	417	A meta-analysis on predictors of turnover intention of hospital nurses in South Korea (2000-2020)
Knardahl, S., Johannessen, H. A., Sterud, T., Härmä, M., Rugulies, R., Seitsamo, J., & Borg, V. (2017)	Systematic review and meta-analysis	39	The contribution from psychological, social, and organizational work factors to risk of disability retirement: a systematic review with meta-analyses
Kossyva, D., Theriou, G., Aggelidis, V., & Sarigiannidis, L. (2023)	Systematic review	50	Outcomes of engagement: a systematic literature review and future research directions
Kotera, Y., & Vione, K. C. (2020)	Systematic review	7	Psychological impacts of the New Ways of Working (NWW): a systematic review
Kubicek, B., Uhlig, L., Hülsheger, U. R., Korunka, C., & Prem, R. (2023)	Meta-analysis	417 samples	Are all challenge stressors beneficial for learning? A meta-analytical assessment of differential effects of workload and cognitive demands
Kuoppala, J., Lamminpää, A., & Husman, P. (2008)	Systematic review and meta-analysis	46	Work health promotion, job well-being, and sickness absences – a systematic review and meta-analysis
Kwon, K., & Kim, T. (2020)	Systematic review	34	An integrative literature review of employee engagement and innovative behavior: revisiting the JD-R model
Lamiani, G., Borghi, L., & Argentero, P. (2017)	Systematic review	17	When healthcare professionals cannot do the right thing: a systematic review of moral distress and its correlates
Langster, H. J., & Cutrer, S. (2021)	Systematic review	20	A scoping review of the impact of downsizing on survivors
Laserna Jiménez, C., Casado Montañés, I., Carol, M., Guix- Comellas, E. M., & Fabrellas, N. (2022)	Systematic review	10	Quality of professional life of primary healthcare nurses: a systematic review
Lavander, P., Meriläinen, M., & Turkki, L. (2016)	Systematic review	18	Working time use and division of labour among nurses and health-care workers in hospitals – a systematic review
le Floch, B., Bastiaens, H., le Reste, J. Y., Lingner, H., Hoffman, R. D., Czachowski, S., Assenova, R., Koskela, T. H., Klemenc-Ketis, Z., Nabbe, P., Sowinska, A., Montier, T., & Peremans, L. (2016)	Systematic review	17	Which positive factors determine the GP satisfaction in clinical practice? A systematic literature review
Lee, H., & Cummings, G. G. (2008)	Systematic review	14	Factors influencing job satisfaction of front-line nurse managers: a systematic review
Lee, J. (2022)	Systematic review	6	Nursing home nurses' turnover intention: a systematic review
Leitão, S., & Greiner, B. A. (2016)	Systematic review	17	Organisational safety climate and occupational accidents and injuries: an epidemiology-based systematic review
Lesener, T., Gusy, B., Jochmann, A., & Wolter, C. (2020)	Systematic review and meta-analysis	63 (57 samples in meta-analysis)	The drivers of work engagement: a meta-analytic review of longitudinal evidence
Levine, A. C., Adusumilli, J., & Landrigan, C. P. (2010)	Systematic review	15	Effects of reducing or eliminating resident work shifts over 16 hours: a systematic review
Li, H., Yuan, B., Wang, D., & Meng, Q. (2019)	Systematic review	36	Motivating factors on performance of primary care workers in China: a systematic review and meta-analysis

Author(s)	Type of review	No. of studies included	Title
Li, R., & Yao, M. (2022)	Meta-analysis	94 (99 samples)	What promotes teachers' turnover intention? Evidence from a meta-analysis
Liu, M., Wang, J., Lou, J., Zhao, R., Deng, J., & Liu, Z. (2023)	Systematic review	29	What is the impact of integrated care on the job satisfaction of primary healthcare providers: a systematic review
Lu, H., Zhao, Y., & While, A. (2019)	Literature review	59	Job satisfaction among hospital nurses: a literature review
Lui, J. N. M., Andres, E. B., & Johnston, J. M. (2018)	Systematic review	38	Presenteeism exposures and outcomes amongst hospital doctors and nurses: a systematic review
Margheritti, S., Negrini, A., & Miglioretti, M. (2022)	Systematic review	20	Can psychological capital promote safety behaviours? A systematic review
Michie, S., & Williams, S. (2003)	Systematic review	40	Reducing work related psychological ill health and sickness absence: a systematic literature review
Midje, H. H., Nyborg, V. N., Nordsteien, A., Øvergård, K. I., Brembo, E. A., & Torp, S. (2024)	Systematic review	16	Antecedents and outcomes of work engagement among nursing staff in long-term care facilities – a systematic review
Miller, K. I., & Monge, P. R. (1986)	Meta-analysis	34 (40 samples)	Participation, satisfaction, and productivity: a meta-analytic review
Mlekus, L., & Maier, G. W. (2021)	Meta-analysis	56	More hype than substance? A meta-analysis on job and task rotation
Modini, M., Joyce, S., Mykletun, A., Christensen, H., Bryant, R. A., Mitchell, P. B., & Harvey, S. B. (2016)	Meta review (Systematic review of systematic reviews)	11	The mental health benefits of employment: results of a systematic meta-review
Mori, K., Nagata, M., & Nagata, T. (2021)	Systematic review	30	Work-related factors affecting the occurrence of presenteeism — recent research trends and future directions
Mori, K., Odagami, K., Inagaki, M., Moriya, K., Fujiwara, H., & Eguchi, H. (2024)	Systematic review	50	Work engagement among older workers: a systematic review
Nielsen, M. B., Indregard, A. M. R., & Øverland, S. (2016)	Systematic review and meta-analysis	26 (16 in meta-analysis)	Workplace bullying and sickness absence: a systematic review and meta-analysis of the research literature
Newman, A., Donohue, R., & Eva, N. (2017)	Systematic review	83	Psychological safety: a systematic review of the literature
Newman, A., Round, H., Wang, S., & Mount, M. (2020)	Systematic review	78	Innovation climate: a systematic review of the literature and agenda for future research
Nielsen, K., Nielsen, M. B., Ogbonnaya, C., Känsälä, M., Saari, E., & Isaksson, K. (2017)	Systematic review and meta-analysis	84	Workplace resources to improve both employee well-being and performance: a systematic review and meta-analysis
Nowrouzi-Kia, B., Sithamparanathan, G., Nadesar, N., Gohar, B., & Ott, M. (2022)	Systematic review and meta-analysis	9	Factors associated with work performance and mental health of healthcare workers during pandemics: a systematic review and meta-analysis
Nwoko, J. C., Emeto, T. I., Malau-Aduli, A. E. O., & Malau-Aduli, B. S. (2023)	Systematic review	38	A systematic review of the factors that influence teachers' occupational well-being
O'Donovan, R., & McAuliffe, E. (2020a)	Systematic review	36	A systematic review of factors that enable psychological safety in healthcare teams
Özkan, A. H. (2023)	Meta-analysis	5818	Organizational justice perceptions and turnover intention: a meta-analytic review
Padula, R. S., Comper, M. L. C., Sparer, E. H., & Dennerlein, J. T. (2017)	Systematic review	14	Job rotation designed to prevent musculoskeletal disorders and control risk in manufacturing industries: a systematic review

Author(s)	Type of review	No. of studies included	Title
Parent-Lamarche, A., & Biron, C. (2022)	Intervention study	105 managers	When bosses are burned out: psychosocial safety climate and its effect on managerial quality
Parker, C. P., Baltes, B. B., Young, S. A., Huff, J. W., Altmann, R. A., Lacost, H. A., & Roberts, J. E. (2003)	Meta-analysis	121 samples	Relationships between psychological climate perceptions and work outcomes: a meta-analytic review
Penconek, T., Tate, K., Bernardes, A., Lee, S., Micaroni, S. P. M., Balsanelli, A. P., de Moura, A. A., & Cummings, G. G. (2021)	Systematic review	38	Determinants of nurse manager job satisfaction: a systematic review
Roczniewska, M., Smoktunowicz, E., Calcagni, C. C., von Thiele Schwarz, U., Hasson, H., & Richter, A. (2022)	Systematic review	202	Beyond the individual: a systematic review of the effects of unit-level demands and resources on employee productivity, health, and well-being
Rusbadrol, N., & Mahmud, N. (2018)	Systematic review	46	A systematic review on the relationship between organizational justice and turnover intention
Scharn, M., Sewdas, R., Boot, C. R. L., Huisman, M., Lindeboom, M., & van der Beek, A. J. (2018)	Systematic review	20	Domains and determinants of retirement timing: a systematic review of longitudinal studies
Scheurer, D., McKean, S., Miller, J., & Wetterneck, T. (2009)	Systematic review	97	U.S. physician satisfaction: a systematic review
Schultz, A. B., & Edington, D. W. (2007)	Systematic review	37	Employee health and presenteeism: a systematic review
Shen, X., Jiang, H., Xu, H., Ye, J., Lv, C., Lu, Z., & Gan, Y. (2020)	Systematic review and meta-analysis	25	The global prevalence of turnover intention among general practitioners: a systematic review and meta-analysis
Silva, J. A. M., Mininel, V. A., Fernandes Agreli, H., Peduzzi, M., Harrison, R., & Xyrichis, A. (2022)	Systematic review	3	Collective leadership to improve professional practice, healthcare outcomes and staff well-being
Simpson, M. R. (2009)	Literature review	20	Engagement at work: a review of the literature
Siqueira, V. de B., Rocha, A. de S. L., Schwingel, P. A., & Carvalho, F. M. (2023)	Systematic review	2	Prevalence of presenteeism in agricultural workers: systematic review
Skagen, K., & Collins, A. M. (2016)	Systematic review	12	The consequences of sickness presenteeism on health and well-being over time: a systematic review
Soleas, E. (2021)	Systematic review	74	Environmental factors impacting the motivation to innovate: a systematic review
Srirahayu, D. P., Ekowati, D., & Sridadi, A. R. (2023)	Systematic review	57	Innovative work behavior in public organizations: a systematic literature review
Steil, A. V., Floriani, E. V., & Bello, J. D. S. A. (2019)	Systematic review	31	Antecedents of intention to leave the organization: a systematic review
Su, X., & Chan, K. L. (2023)	Meta-analysis	46	The associations of decent work with well-being and career capabilities: a meta-analysis
Sui, W., Smith, S. T., Fagan, M. J., Rollo, S., & Prapavessis, H. (2019)	Systematic review	63	The effects of sedentary behaviour interventions on work-related productivity and performance outcomes in real and simulated office work: a systematic review
Sverke, M., Låstad, L., Hellgren, J., Richter, A., & Näswall, K. (2019)	Meta-analysis	106 (119 samples)	A meta-analysis of job insecurity and employee performance: testing temporal aspects, rating source, welfare regime, and union density as moderators
Teoh, K., Hassard, J., & Cox, T. (2019)	Systematic review	21	Doctors' perceived working conditions and the quality of patient care: a systematic review
Teoh, K., Singh, J., Medisauskaite, A., & Hassard, J. (2023)	Meta-analysis	23 samples	Doctors' perceived working conditions, psychological health and patient care: a meta-analysis of longitudinal studies

Author(s)	Type of review	No. of studies included	Title
Then, F. S., Luck, T., Luppa, M., Thinschmidt, M., Deckert, S., Nieuwenhuijsen, K., Seidler, A., & Riedel-Heller, S. G. (2014)	Systematic review	17	Systematic review of the effect of the psychosocial working environment on cognition and dementia
Thielmann, B., Schnell, J., Böckelmann, I., & Schumann, H. (2022)	Systematic review	37	Analysis of work-related factors, behavior, well-being outcome, and job satisfaction of workers of emergency medical service: a systematic review
Thielmann, B., Schwarze, R., & Böckelmann, I. (2023)	Systematic review	10	A systematic review of associations and predictors for job satisfaction and work engagement in prehospital emergency medical services – challenges for the future
Thin, S. M., Chongmelaxme, B., Watcharadamrongkun, S., Kanjanarach, T., Sorofman, B. A., & Kittisopee, T. (2022)	Systematic review	28	A systematic review on pharmacists' turnover and turnover intention
Thompson, L., & Rose, J. (2011)	Systematic review	21	Does organizational climate impact upon burnout in staff who work with people with intellectual disabilities? A systematic review of the literature
Topa, G., Depolo, M., & Alcover, C. M. (2018)	Meta-analysis	151 (171 samples)	Early retirement: a meta-analysis of its antecedent and subsequent correlates
Trus, M., Razbadauskas, A., Doran, D., & Suominen, T. (2012)	Systematic review	9	Work-related empowerment of nurse managers: a systematic review
Tully, M. P., Ashcroft, D. M., Dornan, T., Lewis, P. J., Taylor, D., & Wass, V. (2009)	Systematic review	16	The causes of and factors associated with prescribing errors in hospital inpatients: a systematic review
van den Berg, T. I. J., Elders, L. A. M., & Burdorf, A. (2010)	Systematic review and focus groups	8 studies and 7 focus groups	Influence of health and work on early retirement
van Rijn, R. M., Robroek, S. J. W., Brouwer, S., & Burdorf, A. (2014)	Systematic review	29	Influence of poor health on exit from paid employment: a systematic review
vander Weerdt, C., Stoddard-Dare, P., & DeRigne, L. A. (2023)	Systematic review	43	Is paid sick leave bad for business? A systematic review
Vargas-Benítez, M. Á., Izquierdo-Espín, F. J., Castro-Martínez, N., Gómez-Urquiza, J. L., Albendín-García, L., Velando-Soriano, A., & Cañadas-De la Fuente, G. A. (2023)	Systematic review and meta-analysis	7 (5 in meta-analysis)	Burnout syndrome and work engagement in nursing staff: a systematic review and meta-analysis
Viviani, C. A., Bravo, G., Lavallière, M., Arezes, P. M., Martínez, M., Dianat, I., Bragança, S., & Castellucci, H. I. (2021)	Systematic review	73	Productivity in older versus younger workers: a systematic literature review
Wagner, J. I. J., Cummings, G., Smith, D. L., Olson, J., Anderson, L., & Warren, S. (2010)	Systematic review	6	The relationship between structural empowerment and psychological empowerment for nurses: a systematic review
Webster, R. K., Liu, R., Karimullina, K., Hall, I., Amlôt, R., & Rubin, G. J. (2019)	Systematic review	9	A systematic review of infectious illness presenteeism: prevalence, reasons and risk factors
Wee, K. Z., & Lai, A. Y. (2022)	Systematic review and meta-analysis	25	Work engagement and patient quality of care: a meta-analysis and systematic review
Wendsche, J., & Lohmann-Haislah, A. (2017)	Meta-analysis	86 (91 samples)	A meta-analysis on antecedents and outcomes of detachment from work
White, M., Wagner, S., Schultz, I. Z., Murray, E., Bradley, S. M., Hsu, V., McGuire, L., & Schulz, W. (2013)	Systematic review	142	Modifiable workplace risk factors contributing to workplace absence across health conditions: a stakeholder-centered best-evidence synthesis of systematic reviews
Wiktorowicz, J., Warwas, I., Turek, D., & Kuchciak, I. (2022)	Meta-analysis	65 samples	Does generativity matter? A meta-analysis on individual work outcomes

Author(s)	Type of review	No. of studies included	Title
Wynendaele, H., Gemmel, P., Pattyn, E., Myny, D., & Trybou, J. (2021)	Systematic review	23	Systematic review: what is the impact of self-scheduling on the patient, nurse and organization?
Yildiz, B., & Yildiz, T. (2022)	Systematic review and meta-analysis	15	A systematic review and meta-analytical synthesis of the relationship between work engagement and job satisfaction in nurses
Yildiz, B., Yildiz, T., Ozbilgin, M., & Yildiz, H. (2022)	Meta-analysis	36 samples	Counterintuitive consequences of COVID-19 on healthcare workers: a meta-analysis of the relationship between work engagement and job satisfaction
Yu, F., Raphael, D., Mackay, L., Smith, M., & King, A. (2019)	Systematic review	38	Personal and work-related factors associated with nurse resilience: a systematic review
Zabin, L. M., Zaitoun, R. S. A., Sweity, E. M., & de Tantillo, L. (2023)	Systematic review	7	The relationship between job stress and patient safety culture among nurses: a systematic review
Zahari, N., & Kaliannan, M. (2023)	Systematic review	48	Antecedents of work engagement in the public sector: a systematic literature review
Zhang, W., Tocher, P., L'Heureux, J., Sou, J., & Sun, H. (2023)	Scoping review	155	Measuring, analyzing, and presenting work productivity loss in randomized controlled trials: a scoping review

Table A8 **Included studies – interventions**

Author(s)	Type of review	No. of studies included	Title
Aburumman, M., Newnam, S., & Fildes, B. (2019)	Systematic review	23	Evaluating the effectiveness of workplace interventions in improving safety culture: a systematic review
Aeon, B., Faber, A., & Panaccio, A. (2021)	Meta-analysis	48	Does time management work? A meta-analysis
Alkhawaldeh, J. M. A., Soh, K. L., Mukhtar, F. B. M., & Ooi, C. P. (2020)	Systematic review	10	Effectiveness of stress management interventional programme on occupational stress for nurses: a systematic review
Andersen, M. F., Nielsen, K. M., & Brinkmann, S. (2012)	Systematic review	8	Meta-synthesis of qualitative research on return to work among employees with common mental disorders
Anderson, L., FitzGerald, M., & Luck, L. (2010)	Systematic review	10	An integrative literature review of interventions to reduce violence against emergency department nurses
Ansoleaga, E., Garrido, P., Domínguez, C., Castillo, S., Lucero, C., Tomicic, A., & Martínez, C. (2015)	Systematic review	30	Return to work enablers for workers with work-related mental illness
Attoe, C., Matei, R., Thompson, L., Teoh, K., Cross, S., & Cox, T. (2022)	Systematic review	24	Returning to clinical work and doctors' personal, social and organisational needs: a systematic review
Aust, B., & Ducki, A. (2004)	Systematic review	11	Comprehensive health promotion interventions at the workplace: experiences with health circles in Germany
Aust, B., Møller, J. L., Nordentoft, M., Frydendall, K. B., Bengtsen, E., Jensen, A. B., Garde, A. H., Kompier, M., Semmer, N., Rugulies, R., & Jaspers, S. Ø. (2023)	Umbrella review (Systematic review of systematic reviews)	957 primary studies in 52 systematic reviews	How effective are organizational-level interventions in improving the psychosocial work environment, health, and retention of workers? A systematic overview of systematic reviews

Author(s)	Type of review	No. of studies included	Title
Avolio, B. J., Reichard, R. J., Hannah, S. T., Walumbwa, F. O., & Chan, A. (2009)	Meta-analysis	200 samples	A meta-analytic review of leadership impact research: experimental and quasi-experimental studies
Awa, W. L., Plaumann, M., & Walter, U. (2010)	Systematic review	25	Burnout prevention: a review of intervention programs
Axén, I., Björk Brämberg, E., Vaez, M., Lundin, A., & Bergström, G. (2020)	Systematic review	33	Interventions for common mental disorders in the occupational health service: a systematic review with a narrative synthesis
Bambra, C. L., Whitehead, M. M., Sowden, A. J., Akers, J., & Petticrew, M. P. (2008)	Systematic review	26	Shifting schedules. The health effects of reorganizing shift work
Bartlett, L., Martin, A., Neil, A. L., Memish, K., Otahal, P., Kilpatrick, M., & Sanderson, K. (2019)	Systematic review and meta-analysis	23	A systematic review and meta-analysis of workplace mindfulness training randomized controlled trials
Basu, S., Qayyum, H., & Mason, S. (2017)	Systematic review	25	Occupational stress in the ED: a systematic literature review
Bentley, T., Onnis, L. ann, Vassiley, A., Farr-Wharton, B., Caponecchia, C., Andrew, C., O'Neill, S., de Almeida Neto, A., Huron, V., & Green, N. (2023)	Systematic review	39	A systematic review of literature on occupational health and safety interventions for older workers
Bhui, K. S., Dinos, S., Stansfeld, S. A., & White, P. D. (2012)	Systematic review	23	A synthesis of the evidence for managing stress at work: a review of the reviews reporting on anxiety, depression, and absenteeism
Björk, J. M., Bolander, P., & Forsman, A. K. (2021)	Systematic review and meta-analysis	31 (24 in meta-analysis)	Bottom-up interventions effective in promoting work engagement: a systematic review and meta-analysis
Blank, L., Peters, J., Pickvance, S., Wilford, J., & MacDonald, E. (2008)	Systematic review	14	A systematic review of the factors which predict return to work for people suffering episodes of poor mental health
Cannon-Bowers, J. A., Bowers, C. A., Carlson, C. E., Doherty, S. L., Evans, J., & Hall, J. (2023)	Meta-analysis	11	Workplace coaching: a meta-analysis and recommendations for advancing the science of coaching
Caponecchia, C., Coman, R. L., Gopaldasani, V., Mayland, E. C., & Campbell, L. (2020)	Systematic review	92	Musculoskeletal disorders in aged care workers: a systematic review of contributing factors and interventions
Carolan, S., Harris, P. R., & Cavanagh, K. (2017)	Systematic review and meta-analysis	21	Improving employee well-being and effectiveness: systematic review and meta-analysis of web-based psychological interventions delivered in the workplace
Catapano, P., Cipolla, S., Sampogna, G., Perris, F., Luciano, M., Catapano, F., & Fiorillo, A. (2023)	Systematic review	18	Organizational and individual interventions for managing work-related stress in healthcare professionals: a systematic review
Clayton, S., Barr, B., Nylen, L., Burström, B., Thielen, K., Diderichsen, F., Dahl, E., & Whitehead, M. (2012)	Meta-analysis	86	Effectiveness of return-to-work interventions for disabled people: a systematic review of government initiatives focused on changing the behaviour of employers
Cloostermans, L., Bekkers, M. B., Uiters, E., & Proper, K. I. (2015)	Systematic review	4	The effectiveness of interventions for ageing workers on (early) retirement, work ability and productivity: a systematic review
Clough, B. A., March, S., Chan, R. J., Casey, L. M., Phillips, R., & Ireland, M. J. (2017)	Systematic review	23	Psychosocial interventions for managing occupational stress and burnout among medical doctors: a systematic review
Cohen, C., Pignata, S., Bezak, E., Tie, M., & Childs, J. (2023)	Systematic review	33	Workplace interventions to improve well-being and reduce burnout for nurses, physicians and allied healthcare professionals: a systematic review

Author(s)	Type of review	No. of studies included	Title
Collins, D. B., & Holton, E. F. (2004)	Meta-analysis	83	The effectiveness of managerial leadership development programs: a meta-analysis of studies from 1982 to 2001
Cooklin, A., Joss, N., Husser, E., & Oldenburg, B. (2017).	Systematic review	31	Integrated approaches to occupational health and safety: a systematic review
Corbière, M., Shen, J., Rouleau, M., & Dewa, C. S. (2009)	Systematic review	24	A systematic review of preventive interventions regarding mental health issues in organizations
Covell, C. L., Sands, S. R., Ingraham, K., Lavoie-Tremblay, M., Price, S. L., Reichert, C., & Bourgeault, I. L. (2020)	Scoping review	6	Mapping the peer-reviewed literature on accommodating nurses' return to work after leaves of absence for mental health issues: a scoping review
Daniels, K., Gedikli, C., Watson, D., Semkina, A., & Vaughn, O. (2017)	Systematic review	33	Job design, employment practices and well-being: a systematic review of intervention studies
Daniels, K., Watson, D., Nayani, R., Tregaskis, O., Hogg, M., Etuknwa, A., & Semkina, A. (2021)	Systematic review	74	Implementing practices focused on workplace health and psychological well-being: a systematic review
de Jong, T., Wiezer, N., de Weerd, M., Nielsen, K., Mattila-Holappa, P., & Mockałło, Z. (2016)	Systematic review	39	The impact of restructuring on employee well-being: a systematic review of longitudinal studies
de Oliveira, C., Cho, E., Kavelaars, R. A., Jamieson, M., Bao, B., & Rehm, J. (2020)	Literature review	56	Economic analyses of mental health and substance use interventions in the workplace: a systematic literature review and narrative synthesis
de Sio, S., Buomprisco, G., Perri, R., Bruno, G., Mucci, N., Nieto, H. A., Battagliola, E. T., & Cedrone, F. (2020)	Umbrella review (Systematic review of systematic reviews)	13 reviews and 23 other original papers	Work-related stress risk and preventive measures of mental disorders in the medical environment: an umbrella review
de Vries, H. J., Reneman, M. F., Groothoff, J. W., Geertzen, J. H. B., & Brouwer, S. (2011)	Systematic review	7	Factors promoting staying at work in people with chronic nonspecific musculoskeletal pain: a systematic review
DeChant, P. F., Acs, A., Rhee, K. B., Boulanger, T. S., Snowdon, J. L., Tutty, M. A., Sinsky, C. A., & Thomas Craig, K. J. (2019)	Systematic review	50	Effect of organization-directed workplace interventions on physician burnout: a systematic review
Demerouti, E., & Adaloudis, N. (2024)	Systematic review	8	Addressing burnout in organisations: a literature review
Dreison, K. C., Luther, L., Bonfils, K. A., Sliter, M. T., McGrew, J. H., & Salyers, M. P. (2018)	Meta-analysis	27	Job burnout in mental health providers: A meta-analysis of 35 years of intervention research
Duhoux, A., Menear, M., Charron, M., Lavoie-Tremblay, M., & Alderson, M. (2017)	Systematic review	8	Interventions to promote or improve the mental health of primary care nurses: a systematic review
Dutheil, F., Bessonnat, B., Pereira, B., Baker, J. S., Moustafa, F., Fantini, M. L., Mermillod, M., & Navel, V. (2020)	Systematic review and meta-analysis	18	Napping and cognitive performance during night shifts: a systematic review and meta-analysis
Dyreborg, J., Lipscomb, H. J., Nielsen, K., Törner, M., Rasmussen, K., Frydendall, K. B., Bay, H., Gensby, U., Bengtsen, E., Guldenmund, F., & Kines, P. (2022)	Systematic review	100	Safety interventions for the prevention of accidents at work: a systematic review
Edwards, D., Burnard, P., Owen, M., Hannigan, B., Fothergill, A., & Coyle, D. (2003)	Systematic review	70	A systematic review of the effectiveness of stress- management interventions for mental health professionals
Egan, M., Bambra, C., Thomas, S., Petticrew, M., Whitehead, M., & Thomson, H. (2007)	Systematic review	18	The psychosocial and health effects of workplace reorganisation – a systematic review of organisational-level interventions that aim to increase employee control

Author(s)	Type of review	No. of studies included	Title
Ernawati, E., Mawardi, F., Roswiyani, R., Melissa, M., Wiwaha, G., Tiatri, S., & Hilmanto, D. (2022)	Systematic review	8	Workplace wellness programs for working mothers: a systematic review
Erschens, R., Adam, S. H., Schröpel, C., Diebig, M., Rieger, M. A., Gündel, H., Zipfel, S., & Junne, F. (2024)	Systematic review	6	Improving well-being and fostering health-oriented leadership among leaders in small and medium-sized enterprises (SMEs): a systematic review
Ervasti, J., Joensuu, M., Pentti, J., Oksanen, T., Ahola, K., Vahtera, J., Kivimäki, M., & Virtanen, M. (2017)	Systematic review and meta-analysis	15 (11 in meta-analysis)	Prognostic factors for return to work after depression-related work disability: a systematic review and meta-analysis
Etuknwa, A., Daniels, K., & Eib, C. (2019)	Systematic review	79	Sustainable return to work: a systematic review focusing on personal and social factors
Feltner, C., Peterson, K., Weber, R. P., Cluff, L., Coker-Schwimmer, E., Viswanathan, M., & Lohr, K. N. (2016)	Systematic review	15	The effectiveness of total worker health interventions: a systematic review for a National Institutes of Health Pathways to Prevention workshop
Fibbins, H., Ward, P. B., Watkins, A., Curtis, J., & Rosenbaum, S. (2018)	Systematic review	5	Improving the health of mental health staff through exercise interventions: a systematic review
Figueredo, J. M., García-Ael, C., Gragnano, A., & Topa, G. (2020)	Systematic review	20	Well-being at work after return to work (RTW): a systematic review
Fothergill, A., Edwards, D., & Burnard, P. (2004)	Systematic review	23	Stress, burnout, coping and stress management in psychiatrists: findings from a systematic review
Fox, K. E., Johnson, S. T., Berkman, L. F., Sianoja, M., Soh, Y., Kubzansky, L. D., & Kelly, E. L. (2022)	Systematic review	83	Organisational- and group-level workplace interventions and their effect on multiple domains of worker well-being: a systematic review
Furlan, A. D., Gnam, W. H., Carnide, N., Irvin, E., Amick, B. C., DeRango, K., McMaster, R., Cullen, K., Slack, T., Brouwer, S., & Bültmann, U. (2012)	Systematic review	21	Systematic review of intervention practices for depression in the workplace
Gayed, A., Milligan-Saville, J. S., Nicholas, J., Bryan, B. T., LaMontagne, A. D., Milner, A., Madan, I., Calvo, R. A., Christensen, H., Mykletun, A., Glozier, N., & Harvey, S. B. (2018)	Systematic review and meta-analysis	9	Effectiveness of training workplace managers to understand and support the mental health needs of employees: a systematic review and meta-analysis
Giga, S. I., Noblet, A. J., Faragher, B., & Cooper, C. L. (2003)	Systematic review	16	The UK perspective: a review of research on organisational stress management interventions
Gilbody, S., Cahill, J., Barkham, M., Richards, D., Bee, P., & Glanville, J. (2006)	Systematic review	8	Can we improve the morale of staff working in psychiatric units? A systematic review
Gillen, P. A., Sinclair, M., Kernohan, W. G., Begley, C. M., & Luyben, A. G. (2017)	Meta-analysis	5	Interventions for prevention of bullying in the workplace
Gragnano, A., Negrini, A., Miglioretti, M., & Corbière, M. (2018)	Umbrella review (Systematic review of systematic reviews)	27 reviews and 75 other original papers	Common psychosocial factors predicting return to work after common mental disorders, cardiovascular diseases, and cancers: a review of reviews supporting a cross-disease approach
Greiner, B. A., Leduc, C., O'Brien, C., Cresswell-Smith, J., Rugulies, R., Wahlbeck, K., Abdulla, K., Amann, B. L., Pashoja, A. C., Coppens, E., Corcoran, P., Maxwell, M., Ross, V., de Winter, L., Arensman, E., & Aust, B. (2022)	Systematic review	5	The effectiveness of organisational-level workplace mental health interventions on mental health and well-being in construction workers: a systematic review and recommended research agenda
Griffiths, A. (2000)	Narrative review	N/A	Designing and managing healthy work for older workers

Author(s)	Type of review	No. of studies included	Title
Grima, D., la Torre, G., & Sernia, S. (2023)	Narrative review	N/A	What to remove from the work environment: the sick worker or the cause of his sickness? Workplace bullying, a form of violence that causes sickness
Grimani, A., Aboagye, E., & Kwak, L. (2019)	Systematic review	39	The effectiveness of workplace nutrition and physical activity interventions in improving productivity, work performance and workability: a systematic review
Grover, S., & Furnham, A. (2016)	Systematic review	52	Coaching as a developmental intervention in organisations: a systematic review of its effectiveness and the mechanisms underlying it
Häggman-Laitila, A., & Romppanen, J. (2018)	Systematic review	5	Outcomes of interventions for nurse leaders' well-being at work: a quantitative systematic review
Heckenberg, R. A., Eddy, P., Kent, S., & Wright, B. J. (2018)	Systematic review and meta-analysis	9	Do workplace-based mindfulness meditation programs improve physiological indices of stress? A systematic review and meta-analysis
Hijdra, R., Hijdra, R., Oude Groeniger, J., Burdorf, A., & Schuring, M. (2023)	Systematic review and interviews	N/A and 20 interviews	Work participation of elderly construction workers. A systematic review and qualitative analysis
Hill, R. C., Dempster, M., Donnelly, M., & McCorry, N. K. (2016)	Systematic review	9	Improving the well-being of staff who work in palliative care settings: a systematic review of psychosocial interventions
Hogg, B., Medina, J. C., Gardoki-Souto, I., Serbanescu, I., Moreno-Alcázar, A., Cerga-Pashoja, A., Coppens, E., Tóth, M. D., Fanaj, N., Greiner, B. A., Holland, C., Kõlves, K., Maxwell, M., Qirjako, G., de Winter, L., Hegerl, U., Pérez-Sola, V., Arensman, E., & Amann, B. L. (2021)	Systematic review	70	Workplace interventions to reduce depression and anxiety in small and medium-sized enterprises: a systematic review
Jack, G., Riach, K., Bariola, E., Pitts, M., Schapper, J., & Sarrel, P. (2016)	Systematic review	75	Menopause in the workplace: what employers should be doing
Jones, C., Verstappen, S. M. M., & Payne, K. (2019)	Systematic review	21	A systematic review of productivity in economic evaluations of workplace interventions: a need for reporting criteria?
Joyce, S., Modini, M., Christensen, H., Mykletun, A., Bryant, R., Mitchell, P. B., & Harvey, S. B. (2016)	Systematic review	20	Workplace interventions for common mental disorders: a systematic meta-review
Kalani, S., Azadfallah, P., Oreyzi, H., & Adibi, P. (2018)	Systematic review	3	Interventions for physician burnout: a systematic review of systematic reviews
Kaltenegger, H. C., Becker, L., Rohleder, N., Nowak, D., & Weigl, M. (2021)	Systematic review and meta-analysis	23 (5 in meta-analysis)	Associations of working conditions and chronic low-grade inflammation among employees: a systematic review and meta-analysis
Karabinski, T., Haun, V. C., Nübold, A., Wendsche, J., & Wegge, J. (2021)	Meta-analysis	30	Interventions for improving psychological detachment from work: a meta-analysis
Karjalainen, K., Malmivaara, A., van Tulder, M., Roine, R., Jauhiainen, M., Hurri, H., & Koes, B. (2001)	Systematic review	2	Multidisciplinary biopsychosocial rehabilitation for subacute low back pain in working-age adults
Kärkkäinen, R., Saaranen, T., Hiltunen, S., Ryynänen, O. P., & Räsänen, K. (2017)	Systematic review	10	Systematic review: factors associated with return to work in burnout
Karlsen, I. L., Svendsen, P. A., & Abildgaard, J. S. (2022)	Review of smartphone applications	57	A review of free smartphone applications designed to improve occupational health, safety, and well-being at workplaces
Kelloway, E. K., & Barling, J. (2010)	Narrative review	N/A	Leadership development as an intervention in occupational health psychology

Author(s)	Type of review	No. of studies included	Title
Knight, C., Patterson, M., & Dawson, J. (2017)	Systematic review and meta-analysis	20	Building work engagement: a systematic review and meta-analysis investigating the effectiveness of work engagement interventions
Knight, C., Patterson, M., & Dawson, J. (2019)	Systematic review	40	Work engagement interventions can be effective: a systematic review
Kuehnl, A., Seubert, C., Rehfuess, E., von Elm, E., Nowak, D., & Glaser, J. (2019)	Systematic review	21	Human resource management training of supervisors for improving health and well- being of employees
Kunzler, A. M., Chmitorz, A., Röthke, N., Staginnus, M., Schäfer, S. K., Stoffers-Winterling, J., & Lieb, K. (2022)	Systematic review and meta-analysis	24 (17 in meta-analysis)	Interventions to foster resilience in nursing staff: a systematic review and meta-analyses of pre-pandemic evidence
Kunzler, A. M., Helmreich, I., Chmitorz, A., König, J., Binder, H., Wessa, M., & Lieb, K. (2020)	Systematic review	44	Psychological interventions to foster resilience in healthcare professionals
Kuoppala, J., & Lamminpää, A. (2008)	Systematic review	41	Rehabilitation and work ability: a systematic literature review
Kynoch, K., Wu, C. J., & Chang, A. M. (2011)	Systematic review	10	Interventions for preventing and managing aggressive patients admitted to an acute hospital setting: a systematic review
Lambreghts, C., Vandenbroeck, S., Goorts, K., & Godderis, L. (2023)	Systematic review	8	Return-to-work interventions for sick-listed employees with burnout: a systematic review
LaMontagne, A. D., Keegel, T., Louie, A. M., Ostry, A., & Landsbergis, P. A. (2007)	Systematic review	90	A systematic review of the job-stress intervention evaluation literature, 1990-2005
Lartey, S., Cummings, G., & Profetto-Mcgrath, J. (2014)	Systematic review	12	Interventions that promote retention of experienced registered nurses in health care settings: a systematic review
Lee, J., Huang, Y. H., Cheung, J. H., Chen, Z., & Shaw, W. S. (2019)	Systematic review	19	A systematic review of the safety climate intervention literature: past trends and future directions
Lee, N. K., Roche, A., Duraisingam, V., Fischer, J. A., & Cameron, J. (2014)	Systematic review	5	Effective interventions for mental health in male-dominated workplaces
Lovejoy, M., Kelly, E. L., Kubzansky, L. D., & Berkman, L. F. (2021)	Narrative review	N/A	Work redesign for the 21st century: promising strategies for enhancing worker well-being
Lui, J. N. M., Andres, E. B., & Johnston, J. M. (2018)	Systematic review	38	Presenteeism exposures and outcomes amongst hospital doctors and nurses: a systematic review
MacEwen, B. T., MacDonald, D. J., & Burr, J. F. (2015)	Systematic review	23	A systematic review of standing and treadmill desks in the workplace
Maresca, G., Corallo, F., Catanese, G., Formica, C., & lo Buono, V. (2022)	Systematic review	7	Coping strategies of healthcare professionals with burnout syndrome: a systematic review
Michaelsen, M. M., Graser, J., Onescheit, M., Tuma, M. P., Werdecker, L., Pieper, D., & Esch, T. (2023).	Systematic review and meta-analysis	91	Mindfulness-based and mindfulness-informed interventions at the workplace: a systematic review and meta-regression analysis of RCTs
Michie, S., & Williams, S. (2003)	Systematic review	7	Reducing work related psychological ill health and sickness absence: a systematic literature review
Miguel, C., Amarnath, A., Akhtar, A., Malik, A., Baranyi, G., Barbui, C., Karyotaki, E., & Cuijpers, P. (2023)	Umbrella review (Systematic review of meta-analyses)	16	Universal, selective and indicated interventions for supporting mental health at the workplace: an umbrella review of meta-analyses
Mikkelsen, M. B., & Rosholm, M. (2018)	Systematic review and meta-analysis	42 (32 in meta-analysis)	Systematic review and meta-analysis of interventions aimed at enhancing return to work for sick-listed workers with common mental disorders, stress-related disorders, somatoform disorders and personality disorders

Author(s)	Type of review	No. of studies included	Title
Mimura, C., & Griffiths, P. (2003)	Literature review	5	The effectiveness of current approaches to workplace stress management in the nursing profession: an evidence-based literature review
Mlekus, L., & Maier, G. W. (2021)	Meta-analysis	56	More hype than substance? A meta-analysis on job and task rotation
Montano, D., Hoven, H., & Siegrist, J. (2014)	Systematic review	39	Effects of organisational-level interventions at work on employees' health: a systematic review
Naghieh, A., Montgomery, P., Bonell, C. P., Thompson, M., & Aber, J. L. (2015)	Systematic review	4	Organisational interventions for improving well-being and reducing work-related stress in teachers
Naidu, V. v., Giblin, E., Burke, K. M., & Madan, I. (2016)	Systematic review	6	Delivery of cognitive behavioural therapy to workers: a systematic review
Nayani, R. J., Nielsen, K., Daniels, K., Donaldson-Feilder, E. J., & Lewis, R. C. (2018)	Literature review	23	Out of sight and out of mind? A literature review of occupational safety and health leadership and management of distributed workers
Nicolakakis, N., Lafantaisie, M., Letellier, M. C., Biron, C., Vézina, M., Jauvin, N., Vivion, M., & Pelletier, M. (2022)	Systematic review	7	Are organizational interventions effective in protecting healthcare worker mental health during epidemics/pandemics? A systematic literature review
Nielsen, K. (2013)	Narrative review	N/A	How can we make organizational interventions work? Employees and line managers as actively crafting interventions
Nielsen, K., Nielsen, M. B., Ogbonnaya, C., Känsälä, M., Saari, E., & Isaksson, K. (2017)	Systematic review and meta-analysis	84	Workplace resources to improve both employee well-being and performance: a systematic review and meta-analysis
Nieuwenhuijsen, K., Bültmann, U., Neumeyer-Gromen, A., Verhoeven, A. C., Verbeek, J. H., & van der Feltz-Cornelis, C. M. (2008)	Systematic review	11	Interventions to improve occupational health in depressed people
Nieuwenhuijsen, K., Faber, B., Verbeek, J. H., Neumeyer-Gromen, A., Hees, H. L., Verhoeven, A. C., van der Feltz-Cornelis, C. M., & Bültmann, U. (2014)	Systematic review	23	Interventions to improve return to work in depressed people
Nieuwenhuijsen, K., Verbeek, J. H., Neumeyer-Gromen, A., Verhoeven, A. C., Bültmann, U., & Faber, B. (2020)	Systematic review	45	Interventions to improve return to work in depressed people
Nigatu, Y. T., Huang, J., Rao, S., Gillis, K., Merali, Z., & Wang, J. L. (2019)	Systematic review and meta-analysis	16	Indicated prevention interventions in the workplace for depressive symptoms: a systematic review and meta-analysis
Nigatu, Y. T., Liu, Y., Uppal, M., McKinney, S., Gillis, K., Rao, S., & Wang, J. L. (2017)	Meta-analysis	18	Prognostic factors for return to work of employees with common mental disorders: a meta-analysis of cohort studies
Nijp, H. H., Beckers, D. G. J., Geurts, S. A. E., Tucker, P., & Kompier, M. A. J. (2012)	Systematic review	63	Systematic review on the association between employee worktime control and work-non-work balance, health and well-being, and job-related outcomes
Nowrouzi-Kia, B., Garrido, P., Gohar, B., Yazdani, A., Chattu, V. K., Bani-Fatemi, A., Howe, A., Duncan, A., Riquelme, M. P., Abdullah, F., Jaswal, S., Lo, J., Fayyaz, Y., & Alam, B. (2023)	Systematic review and meta-analysis	28	Evaluating the effectiveness of return-to-work interventions for individuals with work-related mental health conditions: a systematic review and meta-analysis
O'Brien, L., Wallace, S., & Romero, L. (2018)	Systematic review	18	Effect of psychosocial and vocational interventions on return-to-work rates post–acute myocardial infarction

Author(s)	Type of review	No. of studies included	Title
O'Donovan, R., & McAuliffe, E. (2020b)	Systematic review	14	A systematic review exploring the content and outcomes of interventions to improve psychological safety, speaking up and voice behaviour
Oakman, J., Neupane, S., Proper, K. I., Kinsman, N., & Nygård, C. H. (2018)	Systematic review and meta-analysis	22 (17 in meta-analysis)	Workplace interventions to improve work ability: a systematic review and meta-analysis of their effectiveness
Odeen, M., Magnussen, L. H., Maeland, S., Larun, L., Eriksen, H. R., & Tveito, T. H. (2013)	Systematic review	93	Systematic review of active workplace interventions to reduce sickness absence
Oesch, P., Kool, J., Hagen, K. B., & Bachmann, S. (2010)	Systematic review and meta-analysis	23 (20 in meta-analysis)	Effectiveness of exercise on work disability in patients with non-acute non-specific low back pain: systematic review and meta-analysis of randomized controlled trials
Ohadomere, O., & Ogamba, I. K. (2021)	Systematic review	22	Management-led interventions for workplace stress and mental health of academic staff in higher education: a systematic review
Paguio, J. T., Yu, D. S. F., & Su, J. J. (2020)	Systematic review	14	Systematic review of interventions to improve nurses' work environments
Panagioti, M., Panagopoulou, E., Bower, P., Lewith, G., Kontopantelis, E., Chew-Graham, C., Dawson, S., van Marwijk, H., Geraghty, K., & Esmail, A. (2017)	Systematic review and meta-analysis	19 (20 samples used in meta-analysis)	Controlled interventions to reduce burnout in physicians: a systematic review and meta-analysis
Park, S., & Jang, M. K. (2019)	Systematic review	8	Associations between workplace exercise interventions and job stress reduction: a systematic review
Patterson, P. D., Ghen, J. D., Antoon, S. F., Martin-Gill, C., Guyette, F. X., Weiss, P. M., Turner, R. L., & Buysse, D. J. (2019)	Systematic review	5	Does evidence support 'banking/extending sleep' by shift workers to mitigate fatigue, and/or to improve health, safety, or performance? A systematic review
Peiró, J. M., Nielsen, K., Latorre, F., Shepherd, R., & Vignoli, M. (2020)	Systematic review	18	Safety training for migrant workers in the construction industry: a systematic review and future research agenda
Peters, M., Klein, T., Stuber, F., Kösters, M., Mulfinger, N., Stiawa, M., & Puschner, B. (2023)	Systematic review	15	Moderators and mediators of effects of interventions to reduce stress in hospital employees: a systematic review
Peters, S., Johnston, V., Hines, S., Ross, M., & Coppieters, M. (2016)	Systematic review	11	Prognostic factors for return-to-work following surgery for carpal tunnel syndrome: a systematic review
Phillips, E. A., Gordeev, V. S., & Schreyögg, J. (2019)	Systematic review and meta-analysis	50 (30 in meta-analysis)	Effectiveness of occupational e-mental health interventions: a systematic review and meta-analysis of randomized controlled trials
Pieper, C., Schröer, S., & Eilerts, A. L. (2019)	Systematic review	74	Evidence of workplace interventions – a systematic review of systematic reviews
Pijpker, R., Vaandrager, L., Veen, E. J., & Koelen, M. A. (2020)	Systematic review	10	Combined interventions to reduce burnout complaints and promote return to work: a systematic review of effectiveness and mediators of change
Price, O., Baker, J., Bee, P., & Lovell, K. (2015)	Systematic review	38	Learning and performance outcomes of mental health staff training in de-escalation techniques for the management of violence and aggression
Proper, K. I., & van Oostrom, S. H. (2019)	Umbrella review (Systematic review of meta-analyses)	9	The effectiveness of workplace health promotion interventions on physical and mental health outcomes – a systematic review of reviews

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Ramachandran, H. J., bin Mahmud, M. S., Rajendran, P., Jiang, Y., Cheng, L., & Wang, W. (2023)	Systematic review and meta-analysis	14 (11 in meta-analysis	Effectiveness of mindfulness-based interventions on psychological well-being, burnout and post-traumatic stress disorder among nurses: a systematic review and meta-analysis
Restrepo, J., & Lemos, M. (2021)	Systematic review	29	Addressing psychosocial work-related stress interventions: a systematic review
Richardson, K. M. (2017)	Narrative review	N/A	Managing employee stress and wellness in the new millennium
Richardson, K. M., & Rothstein, H. R. (2008)	Meta-analysis	36	Effects of occupational stress management intervention programs: a meta-analysis
Robertson, I. T., Cooper, C. L., Sarkar, M., & Curran, T. (2015)	Systematic review	14	Resilience training in the workplace from 2003 to 2014: a systematic review
Romppanen, J., & Häggman-Laitila, A. (2017)	Systematic review	10	Interventions for nurses' well-being at work: a quantitative systematic review
Rugulies, R., Aust, B., Greiner, B. A., Arensman, E., Kawakami, N., LaMontagne, A. D., & Madsen, I. E. H. (2023)	Narrative review	N/A	Work-related causes of mental health conditions and interventions for their improvement in workplaces
Salomonsson, S., Hedman-Lagerlöf, E., & Öst, L. G. (2018)	Systematic review and meta-analysis	45	Sickness absence: a systematic review and meta-analysis of psychological treatments for individuals on sick leave due to common mental disorders
Schalk, D. M. J., Bijl, M. L. P., Halfens, R. J. G., Hollands, L., & Cummings, G. G. (2010)	Systematic review	11	Interventions aimed at improving the nursing work environment: a systematic review
Scheepers, R. A., Emke, H., Epstein, R. M., & Lombarts, K. M. J. M. H. (2020)	Systematic review	24	The impact of mindfulness-based interventions on doctors' well-being and performance: a systematic review
Selič-Zupančič, P., Klemenc-Ketiš, Z., & Tement, S. O. (2023)	Systematic review	15	The impact of psychological interventions with elements of mindfulness on burnout and well-being in healthcare professionals: a systematic review
Silva, J. A. M., Mininel, V. A., Fernandes Agreli, H., Peduzzi, M., Harrison, R., & Xyrichis, A. (2022)	Systematic review	3	Collective leadership to improve professional practice, healthcare outcomes and staff well-being
Sköld, M. B., Bayattork, M., Andersen, L. L., & Schlünssen, V. (2019)	Systematic review	7	Psychosocial effects of workplace exercise – a systematic review
Slater, D., Venning, A., Matthews, L., Iles, R., & Redpath, P. (2023)	Systematic review	25	Defining work-focused cognitive behavioural therapy (W-CBT) and whether it is effective at facilitating return to work for people experiencing mental health conditions: a systematic review and narrative synthesis
Sousa, A. D., Baixinho, C. L., Presado, M. H., & Henriques, M. A. (2023)	Systematic review	13	The effect of interventions on preventing musculoskeletal injuries related to nurses work: systematic review
Sriharan, A., Ratnapalan, S., Tricco, A. C., Lupea, D., Ayala, A. P., Pang, H., & Lee, D. D. (2020)	Scoping review	28	Occupational stress, burnout, and depression in women in healthcare during Covid-19 pandemic: rapid scoping review
Steenstra, I. A., Munhall, C., Irvin, E., Oranye, N., Passmore, S., van Eerd, D., Mahood, Q., & Hogg-Johnson, S. (2017)	Systematic review	22	Systematic review of prognostic factors for return to work in workers with sub acute and chronic low back pain
Steenstra, I. A., Verbeek, J. H., Heymans, M. W., & Bongers, P. M. (2005)	Systematic review	18	Prognostic factors for duration of sick leave in patients sick listed with acute low back pain: a systematic review of the literature
Stratton, E., Lampit, A., Choi, I., Gavelin, H. M., Aji, M., Taylor, J., Calvo, R. A., Harvey, S. B., & Glozier, N. (2022)	Systematic review and meta-analysis	40	Trends in effectiveness of organizational eHealth interventions in addressing employee mental health: systematic review and meta-analysis

Author(s)	Type of review	No. of studies included	Title
Street, T. D., & Lacey, S. J. (2015)	Systematic review	9	A systematic review of studies identifying predictors of poor return to work outcomes following workplace injury
Stuber, F., Seifried-Dübon, T., Rieger, M. A., Gündel, H., Ruhle, S., Zipfel, S., & Junne, F. (2021)	Systematic review	7	The effectiveness of health-oriented leadership interventions for the improvement of mental health of employees in the health care sector: a systematic review
Subel, D., Blane, D., & Sheringham, J. (2022)	Systematic review	10	Workplace interventions to reduce occupational stress for older workers: a systematic review
Sui, W., Smith, S. T., Fagan, M. J., Rollo, S., & Prapavessis, H. (2019)	Systematic review	63	The effects of sedentary behaviour interventions on work-related productivity and performance outcomes in real and simulated office work: a systematic review
Tamminga, S. J., Emal, L. M., Boschman, J. S., Levasseur, A., Thota, A., Ruotsalainen, J. H., Schelvis, R. M. C., Nieuwenhuijsen, K., & van der Molen, H. F. (2023)	Systematic review	117	Individual-level interventions for reducing occupational stress in healthcare workers
Tan, L., Wang, M. J., Modini, M., Joyce, S., Mykletun, A., Christensen, H., & Harvey, S. B. (2014)	Systematic review and meta-analysis	17 (12 in meta-analysis	Preventing the development of depression at work: a systematic review and meta-analysis of universal interventions in the workplace
Tarro, L., Llauradó, E., Ulldemolins, G., Hermoso, P., & Solà, R. (2020)	Systematic review and meta-analysis	47 (19 in meta-analysis	Effectiveness of workplace interventions for improving absenteeism, productivity, and work ability of employees: a systematic review and meta-analysis of randomized controlled trials
Thomas Craig, K. J., Willis, V. C., Gruen, D., Rhee, K., & Jackson, G. P. (2021)	Systematic review	81	The burden of the digital environment: a systematic review on organization-directed workplace interventions to mitigate physician burnout
Thonon, F., Godon-Rensonnet, A. S., Perozziello, A., Garsi, J. P., Dab, W., & Emsalem, P. (2023)	Systematic review	141	Return on investment of workplace-based prevention interventions: a systematic review
Tingulstad, A., Meneses-Echavez, J., Evensen, L. H., Bjerk, M., & Berg, R. C. (2022)	Systematic review and meta-analysis	25 (20 samples used in meta-analysis	Effectiveness of work-related interventions for return to work in people on sick leave: a systematic review and meta-analysis of randomized controlled trials
Tölli, S., Partanen, P., Kontio, R., & Häggman-Laitila, A. (2017)	Systematic review	33 (17 studies and 16 training intervention reports)	A quantitative systematic review of the effects of training interventions on enhancing the competence of nursing staff in managing challenging patient behaviour
Torchalla, I., & Strehlau, V. (2018)	Systematic review	11	The evidence base for interventions targeting individuals with work-related PTSD: a systematic review and recommendations
Trowbridge, K., & Mische Lawson, L. (2016)	Systematic review	10	Mindfulness-based interventions with social workers and the potential for enhanced patient-centered care: a systematic review of the literature
van der Hulst, M., Vollenbroek-Hutten, M. M. R., & Ijzerman, M. J. (2005)	Systematic review	10	A systematic review of sociodemographic, physical, and psychological predictors of multidisciplinary rehabilitation – or, back school treatment outcome in patients with chronic low back pain
van der Klink, J. J. L., Blonk, R. W. B., Schene, A. H., & van Dijk, F. J. H. (2001)	Systematic review	48	The benefits of interventions for work-related stress
van Eerd, D., Munhall, C., Irvin, E., Rempel, D., Brewer, S., van der Beek, A. J., Dennerlein, J. T., Tullar, J., Skivington, K., Pinion, C., & Amick, B. (2016)	Systematic review	61	Effectiveness of workplace interventions in the prevention of upper extremity musculoskeletal disorders and symptoms: an update of the evidence

Author(s)	Type of review	No. of studies included	Title
van Laethem, M., Beckers, D. G., Kompier, M. A., Dijksterhuis, A., & Geurts, S. A. (2013)	Systematic review	20 (3 intervention studies)	Psychosocial work characteristics and sleep quality: a systematic review of longitudinal and intervention research
van Oostrom, S. H., Driessen, M. T., de Vet, H. C. W., Franche, R. L., Schonstein, E., Loisel, P., van Mechelen, W., & Anema, J. R. (2009)	Systematic review	6	Workplace interventions for preventing work disability
van Vilsteren, M., van Oostrom, S. H., de Vet, H. C. W., Franche, R. L., Boot, C. R. L., & Anema, J. R. (2015)	Systematic review	14	Workplace interventions to prevent work disability in workers on sick leave
Velana, M., & Rinkenauer, G. (2021)	Systematic review	27	Individual-level interventions for decreasing job-related stress and enhancing coping strategies among nurses: a systematic review
Wan Mohd Yunus, W. M. A., Musiat, P., & Brown, J. S. L. (2018)	Systematic review	22	Systematic review of universal and targeted workplace interventions for depression
Weaver, B., Kirk-Brown, A., Goodwin, D., & Oxley, J. (2023)	Scoping review	20	Psychosocial safety behavior: a scoping review of behavior-based approaches to workplace psychosocial safety
West, C. P., Dyrbye, L. N., Erwin, P. J., & Shanafelt, T. D. (2016)	Systematic review and meta-analysis	52	Interventions to prevent and reduce physician burnout: a systematic review and meta-analysis
Westermann, C., Kozak, A., Harling, M., & Nienhaus, A. (2014)	Systematic review	16	Burnout intervention studies for inpatient elderly care nursing staff: systematic literature review
White, C., Green, R. A., Ferguson, S., Anderson, S. L., Howe, C., Sun, J., & Buys, N. (2019)	Systematic review	37	The influence of social support and social integration factors on return to work outcomes for individuals with work-related injuries: a systematic review
Williams-Whitt, K., White, M. I., Wagner, S. L., Koehn, C., Dionne, C. E., Koehoorn, M., Harder, H., Pasca, R., Warje, O., Hsu, V., McGuire, L., Schulz, W., Kube, D., Hook, A., & Wright, M. D. (2015)	Systematic review	11	Job demand and control interventions: a stakeholder-centered best-evidence synthesis of systematic reviews on workplace disability
Wilson, D. M., Errasti-Ibarrondo, B., Low, G., O'Reilly, P., Murphy, F., Fahy, A., & Murphy, J. (2020)	Scoping review	54	Identifying contemporary early retirement factors and strategies to encourage and enable longer working lives: a scoping review
Wissemann, A. K., Pit, S. W., Serafin, P., & Gebhardt, H. (2022)	Systematic review	13	Strategic guidance and technological solutions for human resources management to sustain an aging workforce: review of international standards, research, and use cases
Worley, V., Fraser, P., Allender, S., & Bolton, K. A. (2022)	Systematic review	18	Describing workplace interventions aimed to improve health of staff in hospital settings – a systematic review
Xu, H., Kynoch, K., Tuckett, A., & Eley, R. (2020)	Systematic review	14	Effectiveness of interventions to reduce emergency department staff occupational stress and/or burnout: a systematic review
Zhang, X., Song, Y., Jiang, T., Ding, N., & Shi, T. (2020)	Systematic review	22	Interventions to reduce burnout of physicians and nurses

European
Trade Union Institute
Bd du Jardin Botanique, 20
1000 Brussels
Belgium
etui@etui.org
www.etui.org

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