Positive work environments that promote a sustainable working life: The importance of work engagement, job satisfaction, and organizational commitment

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Preface

For a long time, research on work life issues has primally focused on the risks and challenges faced by employees and organizations. While this approach contributes to identifying problems and addressing the root causes of work-related ill-health, such as physical diseases and psychosocial stressors, it has offered limited insight into practical strategies for enhancing employee well-being, flourishing, functioning and productivity.

This literature review adopts a positive work and organisational psychology perspective and provides an overview of Nordic research on three key positive work-related states: job satisfaction, organisational commitment and work engagement. These positive states reflect the experience of positive emotions and attitudes in the workplace, which are seen as important for supporting a healthy and sustainable working life. The review explores the factors that promote job satisfaction, organisational commitment, and work engagement and examines the possible outcomes of these positive work-related states for both employees and organisations.

The co-authors of this literature review are Jari Hakanen, Research Professor at the Finnish Institute of Occupational Health (FIOH) and adjunct Professor at the University of Helsinki and visiting Associate Professor at Keio University Tokyo; Jie Li, researcher at FIOH and PhD candidate at Tampere University. Shiri Rahman, chief researcher at FIOH, participated in the review, screening part of the records and providing overall guidance. The authors have selected their theoretical and methodological starting points and are responsible for the findings and conclusions presented. Librarians Anders Danielsson, Lars Våge and Marie Rönnlund, Mid-Sweden University, contributed to the literature and information searches. Senior Research Specialist Marta Roczniewska and Assistant Professor Aleksandra Sjöström-Bujacz reviewed the quality of the literature review on behalf of the Swedish Agency for Work Environment Expertise. Marta Sousa-Ribeiro Larsson, PhD, analyst at the Swedish Agency for Work Environment Expertise, has managed the process on behalf of the agency. Communications officer Julia Engström oversaw the communications activities within the project.

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Nader Ahmadi, Director-General

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Summary

This review provides an overview of Nordic research focusing on three positive work-related states: job satisfaction, organisational commitment and work engagement. These positive states refer to the experience of positive emotions and attitudes at work, which are important for maintaining a healthy and sustainable working life. The review examines the factors that promote these states and explores their possible outcomes or consequences for employees and organisations.

Background

For many years, the tradition of work-life research has largely focused on risks, symptoms of work-related ill health, and other problems faced by employees and organisations. By adopting this approach, the understanding of practical measures to enhance employee well-being, flourishing, functioning and productivity remained limited, as it primarily aimed at mitigating illness instead of promoting wellness. This review examined Nordic research from a positive work and organisational psychology perspective. The positive perspective focuses on promoting positive states at work, offering a complementary approach to mitigating workplace risk factors such as stress.

This review adopted the Job Demands – Resources Model and Conservation of Resources Theory to identify factors that promote job satisfaction, organisational commitment and engagement at work, as well as to examine the outcomes of experiencing these positive states for both employees and organisations. Furthermore, the review aimed to identify research on gain cycles, which are positive reciprocal relationships (or mutually beneficial co-development) between positive states at work and other factors. Finally, it examined interventions that may potentially promote these positive states. The overall goal of the review is to provide research-based insights for practitioners, policymakers, human resource management experts, occupational health professionals and other stakeholders regarding the potential benefits of promoting positive states at work, focusing on job satisfaction, organisational commitment and work engagement. This review addresses the following questions:

1. What promoting factors has Nordic research identified as being associated with job satisfaction, organisational commitment and work engagement?
2. What outcomes has Nordic research identified as being associated with job satisfaction, organisational commitment and work engagement?
3. What gain cycles (i.e. positive reciprocal relationships) has Nordic research identified among job satisfaction, organisational commitment and work engagement, the factors that promote these positive states, and their associated outcomes?

4. What types of interventions designed to promote job satisfaction, organisational commitment, and work engagement have been investigated in Nordic research?

Method

To address these questions, a review was conducted on peer-reviewed quantitative longitudinal (i.e. with two or more measurement points) observational and intervention studies, published between 2000 and 2023, which examined job satisfaction, organisational commitment and/or work engagement and were conducted among employees in the Nordic countries (Denmark, Finland, Iceland, Norway and Sweden). The inclusion and exclusion criteria for evaluating the studies were formulated according to the SPIDER framework, which specifies the central characteristics of a study according to the sample (S), phenomena of interest (PI), design (D), evaluation (E) and research type (R). For the intervention studies, only those studies that used randomised controlled trials were included. By randomly assigning the participants to either an experimental group (receiving the intervention) or a control group, this type of intervention design mitigates potential bias from non-random participant allocation to treatment and control groups. A total of 2830 empirical articles were screened and evaluated at the title or abstract level, of which 97 full-text articles were included and analysed in this review. Most of the articles (91) were based on longitudinal survey studies, some of which were combined with register-based follow-up outcomes. In addition, six intervention studies with randomised controlled trial designs were included.

Results

Based on the Job Demands-Resources Model, several types of promoting factors of the three positive states at work were identified and categorised as organisational, social, task and personal resources. The identified organisational resources were, for example, supportive leadership, transparent organisational practices, and professional development. Social resources, in turn, included communication, cooperation and social support, whereas task resources included, for example, skill variety, autonomy, job control and role clarity. The final category, personal resources, included health, personality and proactive behaviours, such as job crafting, which refers to the proactive changes employees make to their job.

The outcomes of positive states at work were categorised into individual and job-related outcomes. Individual outcomes included, for example, better physical and mental health, reduced likelihood of early retirement due to disability, lower levels of burnout, fewer work-to-family conflicts and greater work-to-family enrichment. Job-related outcomes encompassed factors such as improved work quality, higher productivity, a greater tendency for job crafting, lower turnover intentions, higher employee retention rates, increased wage and a reduced likelihood of unemployment.

The inclusion of longitudinal studies allowed for the examination of gain cycles over time. Gain cycles were identified between personal initiative and work engagement, as well as between work engagement and work-to-family enrichment experiences.

Only six intervention studies were included in the review. These concerned an open-rota work-rest schedule design, a leadership intervention, promoting the employees' access to updated knowledge related to their work, physical exercise or relaxation programmes. The low number of eligible intervention studies limited the ability to draw comprehensive conclusions. However, their content was discussed and could be used to inspire future intervention studies.

Practical implications

This literature review identified several positive individual and job-related outcomes of job satisfaction, organisational commitment and work engagement. Based on the review, these positive work-related states can be promoted through supportive leadership, a positive work environment (for example, fair organisational practices), increased autonomy and job control (for example, job designs that allow employees to use their skills and have influence over their schedules and how to carry out their work), support to career development (for example, promoting professional skills), as well as encouragement of job crafting, that is, employees making self-initiated changes to their work.

Contents

1. Introduction

Work stress, exhaustion, burnout, absenteeism and sleeping problems. For decades, pathogenic and symptom-focused perspectives have dominated work, organisational and occupational health psychology (1–3). Even today, the treatment and prevention of employee illness remain one of the cornerstones of Nordic policies to foster a healthy workforce. Diagnosing work-related illnesses and establishing practices, for example, to tackle the persistent problem of burnout (4) is key to identifying employees at risk, providing appropriate support and making improvements in working conditions. However, solely focusing on mitigating negative aspects in the workplace does not provide a complete understanding of the factors that create healthy, balanced and meaningful working lives (5).

Work is not only a potential source of strain or suffering; it can also be a place where employees help and support each other, enjoy learning, face challenges, find creative solutions, achieve work goals, share success and promote a positive climate, even during stressful periods. A lack of burnout does not imply that employees are necessarily happily engaged at work. Therefore, greater emphasis should be placed on understanding these positive behaviours to enhance what is beneficial in working life, ultimately supporting sustainable careers and workplaces in the changing world of work.

This review includes Nordic research published between 2000 and 2023 on three positive states at work, namely, job satisfaction, organisational commitment and work engagement. These three states reflect employees' attitudes and positive emotions and therefore have a broad scope to depict the positive states that employees could experience in their work. The review aims to identify the factors that promote these positive states, as well as to examine the outcomes of experiencing them for both employees and organisations. The review also seeks to identify studies on gain cycles, which refer to the mutually beneficial growth between positive states and other factors, as well as interventions that could promote these positive states. The results of this review may be used to provide research-based insights for practitioners, policymakers, human resource management experts, occupational health professionals and other stakeholders regarding the potential benefits of fostering satisfaction, commitment and engagement in the workplace.

Towards a positive perspective in promoting employee well-being

The importance of positive proactive approaches has gradually gained more attention in the Nordic countries. For example, systematic work environment management (6) is a legal requirement for all Swedish workplaces and aims to create a sustainable and well-functioning work environment that promotes

safety and well-being. Another example is the national working-life development strategy with the vision of achieving the best working life in Europe (7) in Finland. Since the beginning of the 21st century, researchers have increasingly focused on adopting a more positive approach to identifying what truly promotes employee well-being (8) and mental health (9). Emphasising positive psychology in the work context (10) challenges the conventional idea that mitigating risks and illness is sufficient to achieve optimal well-being (11, 12).

Following this shift in the scope of employee well-being towards a focus on the positive and on employee potential, new types of positive and proactive employee behaviours such as job crafting, adaptive performance, social courage at work and prosocial behaviour have been identified and studied (13, 14). Job crafting in particular has gained popularity in research in recent years (15) and refers to various self-initiated, voluntary changes that an employee or a group of employees jointly make to change their work tasks (16). Job crafting has also been defined as employee-initiated changes to impact the level of job resources and job demands to better align them with their abilities and preferences (17). These employee-initiated bottom-up approaches, in addition to the traditional top-down approaches (initiated by leaders), have been found to promote employee well-being and job performance, proving to be important for both employees and organisations (18, 19).

In current organisational research, the ratio of studies that focus on malpractices, risk factors and symptoms vs. positive behaviours (such as job crafting), resources at work and well-being (instead of illness, such as stress and burnout) may be more balanced than it was 25 years ago. At the time, Myers (20), based on abstracts from scientific journals in psychology, estimated that studies on negative emotions were 14 times more common than studies on positive emotions. Similarly, a few years later, Schaufeli and Bakker (21) scrutinised articles published in the Journal of Occupational Health Psychology and found that studies focusing on negative job-related outcomes outnumbered studies on positive outcomes by a ratio of 15 to 1. Today, the ratio in the above-mentioned journal is more balanced. Even though it may still be the case that more articles focus on negative outcomes, the difference is no longer as pronounced as it once was, and a significant shift has occurred over the past 20 years.

Work environments can be characterised by both "givens" and "alterables" (22). "Givens", such as excessive time pressure or workload due to labour shortages, are relatively inherent to the context or conditions in which organisations operate and may not easily be changed in the short term, often requiring long-term organisational efforts, such as increased staffing levels. "Alterables", in turn, refer to aspects of the work environment such as positive job resources like supportive leadership, appreciation and skill variety (23) that are more adaptable in the short term and may be promoted through daily interactions at no additional cost.

While the importance of investing in addressing the root causes of work stressors at the organisational level – such as excessive workload and time pressure – should not be overlooked, a complementary approach is to focus on "alterables" or positive aspects of work that can help balance or mitigate the negative impact

of work demands and supporting employees in staying engaged, satisfied and committed at work (24). For example, developing employee-oriented leadership practices (25) could not only promote positive states at work, such as job satisfaction, organisational commitment and work engagement, but also contribute to mitigating negative states, such as burnout. From the perspective of an individual employee, research on job crafting has shown that employees are often capable of increasing job resources to promote positive outcomes, but their efforts to reduce job demands tend to be less effective, potentially leading to greater burnout (26).

It is worth noting that the positive approach to individual health and well-being is not entirely a new concept. For instance, optimal health in terms of both a lack of illness and the presence of wellness has been noted in the early conceptualisation of salutogenesis (27). Similarly, positive states of job satisfaction and organisational commitment have been widely studied for decades. Of note, as early as 1971, Bertil Gardell (28), a Swedish researcher, published a study focusing on the joy of work, "arbetsglädje", and the target group of studying "arbetsglädje" was industrial workers instead of highly educated experts. Work engagement has its roots in the beginning of the 1990s in the seminal theoretical papers by William Kahn (29), although the still-growing empirical research on work engagement only started at the beginning of the 2000s (8, 30).

Beyond the emergence of novel concepts, the positive psychological approach has introduced a deeper paradigmatic change towards focusing on the potential, strengths and motivations in individuals, groups and organisations. For example, health is increasingly described in terms of separate dimensions, which not only calls for examining the lack of illness in employees but also the presence of wellness (9, 31). Thus, it may be worth focusing on developing strategies to promote positive work-related states as it would complement the strategies of mitigating the negative aspects of work.

Job satisfaction, organisational commitment and work engagement as three positive work-related states

In this review, the core positive states at work are job satisfaction, organisational commitment and work engagement. They were chosen as they are widely studied in academic research in general (32–34) and because they are highly relevant in practice for employees and organisations (35). They are also important concepts because they are subject to change ("alterable"), usually as a result of positive factors, often job and/or personal resources, which can be enhanced in work contexts. They also lead to either more positive or fewer negative consequences for employees, organisations, and/or the interface between work and family.

Job satisfaction is defined as a pleasurable or positive emotional state resulting from an appraisal of one's job or job experiences (36). Research on job

satisfaction in recent decades has focused either on various facets of job satisfaction – such as satisfaction with specific aspects of the job (e.g. leadership, shift work) – or on global job satisfaction, which refers to an employee's overall satisfaction with their job. (37). In the present review, the focus has been on overall satisfaction with one's job, which is also the most often studied and used conceptualisation of job satisfaction. Often, this overall satisfaction with one's job is measured with a single question asking: "How satisfied are you with your present job?".

Affective organisational commitment, in turn, refers to the key and most studied dimension of an employee's commitment to the organisation, with the other dimensions being normative commitment and continuance commitment (38, 39). Affective organisational commitment is defined as an employee's positive emotional attachment to, identification with and involvement in the organisation (39). One commonly used measure of affective organisational commitment has been the eight-item (e.g. "I am very happy being a member of this organisation") scale developed by Allen and Meyer (40). The present review focuses on affective organisational commitment, which is referred to as *organisational commitment* in this review.

Finally, the most recent concept in the group of positive states in the present review, *work engagement,* has been defined as "a positive, fulfilling, work-related state of mind that is characterised by vigor, dedication, and absorption." (8, p. 74). Thus, engaged workers have high levels of energy and are involved, fully focused on, and happily absorbed in their work. Other definitions and approaches to work engagement have also been introduced, such as employee engagement. For example, Harter and colleagues (41) defined and measured employee engagement by assessing positive job characteristics rather than positive feelings and attitudes at work. Work engagement has its origins in William Kahn's (29) qualitative research and theorising on personal engagement. Kahn (29) defined personal engagement as the connection between an organisation's members and their work roles. In engagement, people employ and express themselves physically, cognitively and emotionally during role performance. This means that engaged employees can fully focus on their work tasks and be authentic in their work roles.

All these positive states at work – job satisfaction, organisational commitment and work engagement – have gained wide research interest. There is also robust evidence of the positive consequences or outcomes these states may have for employees and organisations. The findings from meta-analyses show, for example, that job satisfaction relates positively to job performance (32, 42), as well as to health, particularly mental and psychological health (43). Similarly, organisational commitment has been found to be positively associated with job performance (33) and negatively with both the intention to leave the job and actual employee turnover (44). Finally, work engagement has also been found to positively relate to both task and contextual job performance (34), and negatively to sickness absenteeism (45). There are also several meta-analyses suggesting that positive personal and job-related characteristics are important contributors to these positive states (44, 46–48). In addition, these positive states can be promoted through different workplace interventions. For

example, a review and meta-analysis by Knight and colleagues (49) found that interventions focusing on personal resource building, job resource building, leadership training and health promotion had a small but positive effect on work engagement.

A number of reviews have examined the three positive states that are the focus of the present review (44, 50, 51). However, these earlier reviews do not specifically address the Nordic context and some of them are quite old. There is also one Nordic report (52) that provides an overview of international longitudinal research on the relationships between job resources, well-being and job performance. The authors of that report also aimed to include longitudinal Norwegian research (i.e. studies with data from two or more measurement points) but could only identify three cross-sectional studies (i.e. studies analysing data from a single point in time) on the relationships between the aforementioned variables. The present review has a broader scope, as it focuses on job satisfaction, organisational commitment and work engagement, specifically on promoting factors (resources) and various outcomes associated with these three positive work-related states, beyond just performance. It also examines gain cycles among the positive states, the factors that promote them, and their related outcomes. Finally, the review examines interventions designed to foster these positive work-related states.

The Nordic context

The Nordic countries of Denmark, Finland, Iceland, Norway and Sweden are generally considered to share similarities in their quality of life and economic conditions. In comparison to other countries, the Nordic countries are typically characterised by lower power distance (i.e. the perceived degree of inequality among people) and lower uncertainty avoidance (i.e. apparent re-sistance to change, as well as intolerance toward untraditional ways of behaving), shorter working hours and appreciation of leisure, stronger democracy, less corruption and less gender inequality (53). They are also considered less competitive and more cooperative cultures, prioritising consensus in the workplace, harmony, inclusion, work-life balance, tenderness, and shared risk and profits (53). In terms of working life, the Nordic countries have collaborated in shaping policies for a sustainable working life, for example, through the Nordic Council of Ministers.

In addition to their several strengths, the Nordic countries also share many challenges that require solutions. They are ageing societies and face declining fertility rates, which can potentially weaken public welfare services (54) and challenge organisations due to the lack of a qualified labour force. In addition, Nordic working life also faces several other challenges, for example, work intensification and ongoing digitalisation, automation and artificial intelligence, all of which potentially cause increased job insecurity and a threat to the well-being. Moreover, unexpected crises may cause huge challenges and long-term changes in work life, as in the case of the COVID-19 crisis and the subsequent shift to remote work, which has been associated with an increased sense of

loneliness and job insecurity (55). For example, in Finland, an ongoing "How is Finland doing" population survey indicated that several employee well-being indicators such as work engagement, burnout, job boredom, job satisfaction and workability, had not returned to their pre-pandemic levels as of late 2023, compared to three months before the pandemic (56). Considering the similarities between the Nordic countries and their working conditions, this review will focus exclusively on Nordic research, which refers to studies that have been conducted among workers in Denmark, Finland, Iceland, Norway and Sweden, as this may facilitate the generalisability of the findings to the Swedish context.

2. Theoretical framework

This review adopts the Conservation of Resources Theory (57, 58) and the Job Demands-Resources Model (59) to identify factors that promote job satisfaction, organisational commitment and engagement at work, as well as to examine the outcomes of experiencing these positive states for both employees and organisations, and the potential gain cycles between the positive states at work and other factors. The Conservation of Resources Theory provides the foundation for understanding and explaining the development of stress in terms of resource gains and losses (58). The Job Demands-Resources Model focuses on organisational context and applies many of the main principles of the Conservation of Resources Theory by establishing different job-related resources (60). Despite their contextual distinction, they can be regarded as impactful theoretical frameworks that have inspired research in work and organisational psychology in the current millennium (61), focusing on positive (e.g. promoting health) and negative (e.g. mitigating illness) outcomes.

In the work domain, both Conservation of Resources Theory (58) and the Job Demands-Resources Model (21) operate under the main assumption that employees are inherently motivated to improve their work situations, which is achieved by investing in available resources to gain subsequent resources and protect against resource loss. The basic formulation of the Job Demands-Resources Model (21, 59) posits that regardless of the type of job, work characteristics can be categorised into two groups: job resources and job demands. *Job resources* refers to aspects of a job that are functional in achieving work goals, stimulating personal growth and consequently promoting positive states at work. These aspects can be physical (e.g. workstation), psychological (e.g. well-being), social (e.g. coworker relations), task-related (e.g. feedback) or organisational (e.g. leadership). *Job demands,* in turn, refers to those aspects of a job that require sustained physical and/or psychological effort, such as workload, and are therefore associated with certain physiological and/or psychological costs that may lead to stress and burnout. It is important to note that job resources not only serve as a way to mitigate the demanding aspects of work, but are also valuable in their own right as they complement employees' ongoing motivation for growth (62). The current review focuses on resources and resource gains instead of job demands.

Figure 1 illustrates how job satisfaction, organisational commitment and work engagement may be promoted by different categories of resources. For example, Xanthopoulou et al. (63) demonstrated how job resources, such as autonomy, and personal resources, such as self-efficacy, may be used to improve work engagement. Furthermore, a study by Morrow et al. (64) showed how physical resources, such as adequate workspace, may promote employee organisational commitment.

Figure 1. Conceptual model of the current review

However, job satisfaction, organisational commitment and work engagement are not only considered to be positive consequences resulting from various resources, but also as resources in themselves that lead to other positive consequences (Figure 1). Since job satisfaction, organisational commitment and work engagement reflect highly motivated and satisfied employees, these positive motivated states may promote subsequent resource gains, as illustrated by the individual-related and job-related outcomes shown in Figure 1. For example, Hakanen and Schaufeli (65) found that being engaged at work encourages employees to actively utilise their resources at work, which in turn enhances life satisfaction. On the other hand, making use of resources can also serve a protective function by preventing resource loss. For example, employees who are satisfied with their jobs may be less vulnerable to workplace challenges (loss of resources), which, in turn, may reduce the likelihood of them wanting to leave their jobs (66). In this way, positive states at work are promoting factors of positive outcomes and benefit the process of resource gains (Figure 1).

In addition, resources may positively co-develop with each other (reciprocal relationship), which may result in gain cycles (58, 60). Gain cycles refer to the cumulative co-development between two resources that is, how two resources may improve each other over time (58). For example, Hakanen and colleagues (67) demonstrated how work engagement as a positive energy state led to improved work-family enrichment (e.g. how work-related activities helped to deal with personal and practical issues at home). Conversely, work-family enrichment may promote work engagement, creating a resource gain cycle that has potential benefits for both employees and organisations.

In sum, the relationships in Figure 1 represent the process of resource gains. As demonstrated above, "resources" is a term in Conservation of Resources Theory and the Job Demands-Resources Model, which may refer to every aspect shown in Figure 1 (promoting factors, positive states and their outcomes). For this review, though, the term "resources" refers exclusively to the promoting factors of job satisfaction, organisational commitment and work engagement. Furthermore, the Conservation of Resources Theory and the Job Demands-Resources Model also include the perspective of resource loss, which could be used to explain how job demands (e.g. workload) may lead to the loss of resources; this could be indicated, for example, by increased burnout. However, the current review focuses exclusively on the process of resource gains and gain cycles, rather than on resource loss and loss cycles, as this perspective aligns with the positive psychological approach described in the introduction.

3. Purpose

This review provides an overview of Nordic research focusing on three positive work-related states, namely, job satisfaction, organisational commitment and work engagement. It examines the factors that promote these states and explores their possible outcomes (consequences) for both employees and organisations. Additionally, it aims to identify gain cycles and intervention designs in promoting these positive states at work. The following questions are addressed:

1. What promoting factors has Nordic research identified as being associated with job satisfaction, organisational commitment and work engagement?

2. What outcomes has Nordic research identified as being associated with job satisfaction, organisational commitment and work engagement?

3. What gain cycles (i.e. positive reciprocal relationships) has Nordic research identified among job satisfaction, organisational commitment and work engagement, the factors that promote these positive states, and their associated outcomes?

4. What types of interventions designed to promote job satisfaction, organisational commitment and work engagement have been investigated in Nordic research?

4. Method

To address the questions elaborated above, a review was conducted on peer-reviewed longitudinal observational prospective Nordic studies, defined as studies with at least two measurement occasions over time, including register-based observations, as well as intervention studies with randomised controlled trial designs. Reviews as a research tool allow for the scrutiny of a large body of literature and synthesis of information in novel ways (68). Based on Grant and Booth's (69) typologies of the different types of review, the current review can be categorised as a general literature review, as it offers the flexibility to cover a wide range of subjects and themes, as well as adopt a systematic approach in searching and reviewing the included studies. The results of the current review are presented thematically, following the four questions (i.e. promoting factors, outcomes, gain cycles and intervention designs).

Table 1. The characteristics and eligibility criteria of the current review

	Inclusion	Exclusion
Sample (S)	• Employees in Nordic countries (Denmark, Finland, Iceland, Norway or Sweden)	• Subjects are primarily students, volunteers or patients
Phenomena of Interest (PI)	• Job satisfaction, organisational commitment and work engagement (including suitable synonyms, e.g., employee engagement) • Work engagement consists of vigour, dedication and absorption	• Job satisfaction, organisational commitment and work engagement are contextualised to specific aspects of work (e.g., leadership satisfaction)
Design (D)	• Longitudinal follow-up studies with at least two measurement occasions • Intervention studies with a randomised controlled design (RCT)	• Cross-sectional inferences regarding job satisfaction, organisational commitment and work engagement
Evaluation (E)	• Job satisfaction, organisational commitment and work engagement are evaluated with self-reports	• Job satisfaction, organisational commitment and work engagement are measured with proxies or retrospectively • Job satisfaction, organisational commitment and work engagement variables are recoded inappropriately (e.g., dichotomised)
Research Type (R)	• Quantitative • Peer-reviewed • Published in 2000 or after • Written in English, Danish, Finnish, Icelandic, Norwegian or Swedish	• Mixed methods • Meta-analyses • Methodological • Retrospective • Repeated cross-sectional • Descriptive

In the design phase, the inclusion and exclusion criteria for evaluating studies were formulated according to the SPIDER framework (70), which is presented in Table 1. The SPIDER frame-work specifies the central characteristics of a study according to the sample (S), phenomena of interest (PI), design (D), evaluation (E) and research type (R). For the intervention studies, only randomised controlled trials were included to mitigate potential bias from non-random participant allocation to the treatment and control groups (71).

After defining the inclusion and exclusion criteria, search strings were developed in cooperation with librarians from Mid Sweden University (Appendix A). Multiple keywords were added to ensure sensitivity in capturing relevant studies, for example, including both nationality and country (e.g. Sweden or Swedish) and synonyms for the phenomena of interest (e.g. work engagement or employee engagement). In October 2023, the librarians searched three databases: Scopus, Web of Science and Medline. After removing the duplicates, 2827 articles (titles and abstracts) were delivered to the authors. The authors added three articles they were aware of that were not identified through the search (72–74). Thus, a total of 2830 articles were screened and evaluated.

The flowchart for the search and screening process is presented in Figure 2. The records contained three studies (76–78) that were selected a priori by the authors to assess whether the search strings were sensitive in capturing the relevant studies. Appendix B describes the screening and evaluation process in detail and contains references to the excluded full texts. Taken together, 91 longitudinal and six randomised controlled trial studies were included in the current synthesis. The characteristics of the included longitudinal studies (e.g. participants, follow-up period, measures, analysis type, related concepts and references) and the modified Joanna Briggs Institute's critical appraisal tool for randomised controlled trials (78) are presented in Appendix C.
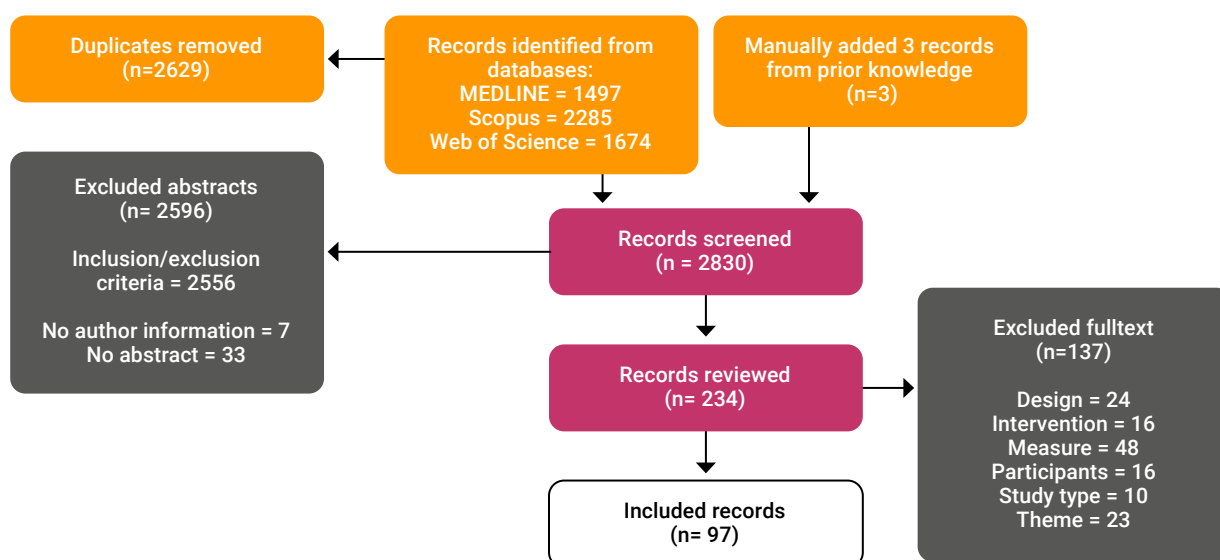
Figure 2: PRISMA flowchart

5. Results

A descriptive overview of the included studies is presented in Table 2. Out of the three positive work-related states, organisational commitment, received less attention (19 studies), while job satisfaction and work engagement were examined in 35 and 31 studies, respectively. Four studies investigated both work engagement and job satisfaction, one study focused on work engagement as an antecedent of organisational commitment, and one study examined both organisational commitment and job satisfaction. In terms of intervention studies, only six randomised controlled trial studies were included, of which five examined job satisfaction and one examined work engagement. The low number of included intervention studies makes it difficult to draw conclusions on their effectiveness, but their contents are described to discuss and inspire future studies.

Table 2. Number of included reports

	Denmark	Finland	Iceland	Norway	Sweden	All
Work engagement		27		3	1	31
Job satisfaction	5	14		10	6	35
Organisational commitment	9	3	1	4	2	19
Work engagement and job satisfaction		2			2	4
Organisational commitment and job satisfaction					1	1
Organisational commitment and work engagement		1				1
Interventions	3	1		2		6

An overview of the results is presented in Figure 3. The included studies provided information about the population – general working population or specific occupations, such as healthcare, metal industry, education and knowledge work – as well as information on multiple promoting factors and/or outcomes of positive states of work (79). The conclusions from the included studies were categorised thematically and are presented below according to four themes (i.e. promoting factors, outcomes, gain cycles and interventions).

Organizational resources
- Supportive leadership (transformational and servant leadership)
- Organisational justice and trust
- Opportunities for professional growth and development
- Employability

Social resources
- Mutual caring
- Cooperation
- Empowerment
- Social support from coworkers and supervisors

Task resources
- Autonomy and job control
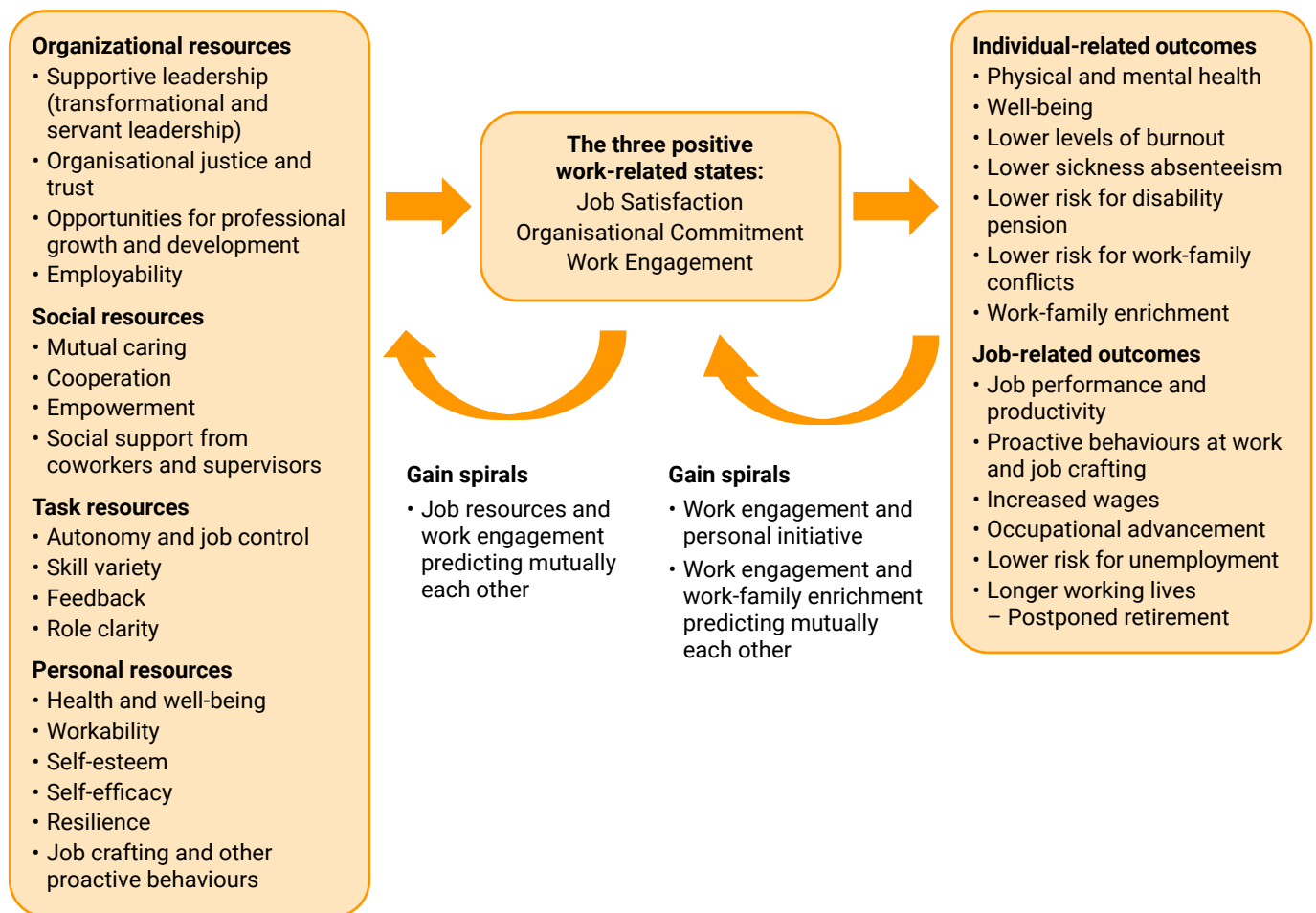- Skill variety
- Feedback
- Role clarity

Personal resources
- Health and well-being
- Workability
- Self-esteem
- Self-efficacy
- Resilience
- Job crafting and other proactive behaviours

The three positive work-related states:
Job Satisfaction
Organisational Commitment
Work Engagement

Gain spirals
- Job resources and work engagement predicting mutually each other

Gain spirals
- Work engagement and personal initiative
- Work engagement and work-family enrichment predicting mutually each other

Individual-related outcomes
- Physical and mental health
- Well-being
- Lower levels of burnout
- Lower sickness absenteeism
- Lower risk for disability pension
- Lower risk for work-family conflicts
- Work-family enrichment

Job-related outcomes
- Job performance and productivity
- Proactive behaviours at work and job crafting
- Increased wages
- Occupational advancement
- Lower risk for unemployment
- Longer working lives
  – Postponed retirement

Figure 3: Examples of the identified promoting factors and outcomes of the positive states at work and reciprocal gain spirals

Promoting factors associated with positive states at work

Based on the Job Demands-Resources Model, promoting factors of the three positive work-related states (job satisfaction, organisational commitment and work engagement) were thematically categorised into organisational, social, task and personal resources.

Organisational resources

Leadership emerged as a key resource that was found to promote all three positive states of work. In particular, supportive leadership (e.g. receiving support and help when needed) was found to promote work engagement in Finnish firefighters (79), organisational commitment in Finnish metal industry workers (81) and job satisfaction among Norwegian teachers (77). Furthermore, studies on Danish healthcare employees demonstrated how leadership quality, such as prioritising employee well-being, is a viable resource in promoting organisational commitment (81, 82).

Specifically, two similar employee-oriented leadership styles were identified: transformational and servant leadership. Transformational leadership means that leaders encourage, inspire and motivate employees (83), whereas the servant leadership approach puts serving others, for example, in succeeding and growing professionally above all other priorities (84). A Danish study found that transformational leadership promoted subsequent job satisfaction among healthcare employees (85). In addition, a diary study on Norwegian naval cadets showed that transformational leadership (e.g. receiving encouragement and recognition during a particular day) may promote work engagement the very next day (86). In a Finnish study comprising employees from three organisations, servant leadership, in turn, was associated with the favourable development of work engagement (87).

Psychologically safe and fair work environment emerged as another important organisational resource for promoting job satisfaction and work engagement. Feeling able to express personal views and being treated with dignity reflects a perception of organizational justice. This was found to promote job satisfaction among Finnish healthcare employees (88), as well as organisational commitment in Swedish employees across various sectors (89). A psychologically safe and trusting work environment (e.g. having a high level of trust in the employer) promoted subsequent work engagement in Finnish university employees (90), as well as job satisfaction in general employees in Sweden (91). Cultivating a fair work environment may be especially important during conditions of change, as a study on Finnish physicians showed that organisational justice may help to mitigate the negative effects of workplace changes on job satisfaction (92).

A handful of studies reflected the importance of accounting for employees' professional development and employability (i.e. the individual's perceived ability to secure employment in the current labour market) in promoting job satisfaction and work engagement. For example, stable improvement in perceived employability was associated with higher job satisfaction among Finnish university employees (93). A Norwegian study on physicians also showed how the perception of having adequate professional skills at graduation was important for their level of job satisfac-tion in their transition to employment (94). Additionally, another Norwegian study showed that opportunities to develop professionally may be derived from challenging tasks, which may foster work engagement (95).

Social resources

Social resources, such as mutual caring among coworkers, were found to promote job satisfaction and work engagement in Swedish hospital employees (96). Similarly, studies on Danish municipal employees (97) and Finnish teachers (98) showed how social resources (e.g. cooperation) promoted job satisfaction. Another study on Swedish hospital employees also showed that informing and cooperating with coworkers promoted job satisfaction and work engagement around seven months after the baseline measurement (99).

A study on Finnish employees showed that feeling welcomed and empowered by team members proved to be a relatively important job resource for work

engagement when compared to other types of job resources, such as autonomy (72). In addition, receiving adequate social support from both coworkers and supervisors was found to promote job satisfaction among Finnish university employees (100). Moreover, team empowerment, consisting of a sense of potency (a "we can" spirit), meaningfulness, autonomy and impact (e.g. the team is seen as doing significant work), was an important promoting factor for work engagement (72). Finally, and especially relevant in the contemporary hybrid work environment, a Finnish study demonstrated the potential of social media, as using social media to communicate and cooperate with coworkers, promoted work engagement (101). Mauno (102) found in turn that work-to-family support, which refers to the supervisor's and coworkers' support of an employee's private life, was not related to work engagement among Finnish healthcare workers.

Task resources

Various task resources were identified as promoting all three positive work-related states. Concepts such as autonomy and job control were used to describe the ability to decide and influence how one's work is conducted and were identified to be important resources in several studies. Job control and autonomy at work were found to promote work engagement in a sample that is representative of the Finnish working-age population (103), as well as among Finnish managers (104). The latter study, which collected longitudinal data at six different time points, found that there were generally positive long-term relationships between work engagement and autonomy. However, among managers who had very low levels of work engagement at baseline, the long-term relationship between autonomy and work engagement was negative (104). Moreover, a diary study on Norwegian naval cadets found that enabling employees to utilise their skills and strengths in their work promoted work engagement the very next day (105).

Regarding job satisfaction, longitudinal studies provided evidence of the importance of job control among Finnish physicians (88, 106) and Swedish white-collar employees (107). Lastly, a positive relationship between job control and organisational commitment was observed in studies on Swedish accountants (89) and white-collar workers (108), as well as among Danish eldercare employees (81, 82).

A three-year follow-up study involving employees from 34 Finnish organisations compared the relative importance of eight job resources at organisational, social and task level for work engagement (72). In that study, the three most important job resources across 11 jobs and over time were skill variety (e.g. possibility for an employee to use their own skills, learn new things and be creative at work), job feedback (i.e. possibility for employee to see the meaning and results of their job), and team empowerment.

Another task resource that was identified in the reviewed studies was role clarity, which refers to how an employee's work is organized and how well they understand what is expected of them. Role clarity was found to promote higher job satisfaction one year later among Swedish process industry workers (109).

In turn, a Norwegian study on healthcare workers showed that work-related sense of coherence (e.g. a clear work structure) led to higher organisational commitment one year later (110).

Personal resources

In the category of personal resources, several factors were shown to promote positive states at work. For example, self-rated health was associated with increased job satisfaction among senior employees in Sweden (111), as well as higher organisational commitment among Finnish employees (80). Studies on workability (i.e. functional capacity to meet the requirements of the job), also demonstrated how health serves as a basis for promoting positive states at work. For example, a Finnish study showed that a 10-year sustained workability was associated with favourable ratings in organisational commitment (112). In terms of health and recovery, activities outside of work are crucial, as shown in another Finnish study, where meaningful activities outside of work were associated with increased work engagement (113).

As for personal attributes, Finnish studies showed that self-esteem and self-efficacy, which generally refer to employee's confidence and belief in their worth and capabilities, promoted work engagement (79, 87). Personality traits, such as openness, conscientiousness and extroversion, characterised as indicators of a resilient personality, were found to promote work engagement among Finnish employees (114, 115). Similarly, a Swedish study on police officers showed that agreeableness, which refers to prioritising others' needs before your own, might play a role in experiencing job satisfaction (116).

Recently, the Job Demands-Resources Model has incorporated the concept of job crafting, which generally refers to an employee making self-initiated changes to their work. This process allows them to proactively increase job resources and decrease harmful job demands, in order to better align these with their abilities and preferences (61). Job crafting can take many forms, such as pursuing professional development, asking a supervisor for performance feedback or support, and seeking new, challenging tasks or roles at work (17). A handful of studies demon-strated how employees may craft their work environment to foster their own positive states at work. Two Finnish studies showed how employees may proactively increase different resources by, for example, learning new tasks at work, which promoted work engagement (73, 117). An-other Finnish study (74) on public sector workers further illustrated that job crafting is im-portant to promote work engagement under conditions of organisational changes (e.g. implementing municipal reforms). A Swedish study on healthcare employees revealed that proactive behaviours are not limited to making self-initiated changes to their own tasks, but also to defending victims of workplace bullying, which was found to promote work engagement (118).

Outcomes associated with positive states at work

The three positive states at work were associated with various outcomes over time. These out-comes were categorised as either individual or job-related outcomes, although many of the out-comes encompassed both employees and workplaces.

Individual-related outcomes

Most studies in the present review that examined the outcomes of the three positive work-related states focused on indicators of physical or mental health. Among studies based on self-reports only, organisational commitment was found to positively predict psychological well-being and reduce sleep disturbances (119) as well as being associated with lower levels of mental distress (120). Organisational commitment was also found to be linked to a reduction in long-term sickness absence (121). Job satisfaction, in turn, negatively predicted persistent sciatic pain (134), as well as multisite musculoskeletal pain (122) and less severe headaches (123). However, a Danish obesity study found no evidence that organisational commitment might lead to changes in body mass index (BMI) (124).

In a study among Finnish cleaners, cardiac autonomic activity was measured over two days, and it was found that work engagement was associated with healthy, adaptable cardiac autonomic activity and particularly increased parasympathetic activity (125). With regards to mental health, work engagement at baseline had a preventive impact on burnout levels three years later in a study among Finnish dentists (126). Work engagement has been shown to positively predict life satisfaction and negatively predict depressive symptoms, even after accounting for the effects of burnout (65). Another longitudinal study among Finnish dentists indicated that work engage-ment may reduce the risk of work-family conflicts, which may occur when an employee is too tired to perform tasks that require attention at home due to work (127).

There is also considerable evidence of register-based research combining self-reports and register data on the importance of positive states at work. Several Nordic studies have found that job satisfaction and organisational commitment may reduce the risk of sickness absenteeism (128-130). Moreover, a large-scale Danish study examining four types of jobs found that organisa-tional commitment reduced the likelihood of receiving a disability pension (131). Similarly, a study based on a representative sample of Finnish working-aged employees showed that work engagement also reduced the likelihood of receiving a disability pension (72).

Job-related outcomes

Job-related outcomes comprised job performance and productivity, proactive behaviours at work, job retention, increased wage and occupational advancement. Organisational commitment was positively related to self-reported quality of care over a two-year follow-up period among Danish

healthcare employees (132). In addition, based on a survey and register-based two-year follow-up study of a representative sample of Finnish employees, work engagement was a posi-tive predictor of individual-level indicators of productivity, such as future wages and occupa-tional advancement, while also reducing the likelihood of future unemployment (133). In addi-tion, another Finnish study using a five-wave design and a general working population dataset revealed that work engagement was related to self-reported social media-enabled productivity (i.e. using social media at work to perform better) over time (134). Job satisfaction, in turn, was found to reduce the risk of stress caused by information systems (e.g. poorly performing IT equipment or software) among physicians (134).

Work engagement also positively promoted job satisfaction, providing evidence for the possibil-ity of one positive state predicting another positive state (126). In the same study, work en-gagement, being an energetic and motivational state at work, also increased the likelihood of various types of proactivity at work. This included employees crafting more structural resources (e.g. through learning new skills to better cope with job demands and increasing motivation), social resources (e.g. through asking for feedback) and challenging demands (e.g. through taking on new, interesting projects). Work engagement also promoted job crafting in terms of dealing with hindering job demands, meaning engaged employees were less likely, for example, to try to avoid making difficult decisions at work.

The three positive states at work were also important determinants of positive attitudes to re-main in the current job (i.e. job retention). An Icelandic study of four organisations found that organisational commitment reduced the risk of the intention to quit work (136). Similar longi-tudinal results were found in two Norwegian studies (137, 138). Furthermore, a study with two measurement points among Finnish dentists found that work engagement at baseline was related to organisational commitment three years later (139). Even stronger evidence of the importance of positive states at work in relation to employee retention was found in a Danish study among eldercare employees showing that organisational commitment negatively predicted actual turno-ver (81).

Two studies suggested that positive states at work may not only predict an employee remaining in their current job but also continue working and postpone retiring. For example, job satisfac-tion could predict the probability of staying in employment despite entitlement to receive an old-age pension, as indicated by a Swedish longitudinal study among older employees (140). Another study conducted in Denmark found that job satisfaction reduced the risk of voluntary early retirement among individuals with or without a chronic disease (141).

Gain cycles (positive reciprocal relationships)

The emergence of positive psychology at work, exemplified by the focus on job resources (61), has inspired longitudinal research into potential gain cycles between two factors over time. This has made it possible to identify

more dynamic relationships between various phenomena, moving beyond the traditional view of unidirectional causal effects from the work environment to well-being and health.

Studies among Finnish dentists included in this review have found gain cycles (positive reciprocal relationships) between different resources and work engagement, as well as between work engagement and proactive behaviour (142). In a study by Hakanen and colleagues (142), resources included, for example, feeling professional pride, while proactive behaviours included actions such as taking the initiative to become more involved at work. Proactive behaviours in particular were found to be related to improved perceptions of team-level innovativeness, which refers to the innovative behaviour and atmosphere in an employee's team or work unit. This includes discussing work tasks, methods and goals, making constant functional improvements, and receiving feedback and suggestions for improvement from clients (142).

Gain cycles were also found between work engagement and work-family enrichment, which refers to the positive impact work can have on family life (67). In other words, work engagement may help employees manage practical issues at home which, in turn, promotes further work engagement. In the same study, improved work-family enrichment also had a positive impact on marital satisfaction (68). Another Finnish study found that work engagement may promote job satisfaction, but failed to find an effect of job satisfaction on work engagement (126). Lastly, a study on Finnish university employees found that a psychological safety climate promoted future work engagement but work engagement did not impact future experiences of a psychological safety climate (90). Thus, the study did not provide evidence of gain cycles between work en-gagement and a psychological safety climate.

Interventions designed to promote positive states at work

Six intervention studies with randomised controlled trial designs were included in the review, which examined job satisfaction or work engagement as outcomes. Four of the included studies examined individual-level interventions, while two of the included studies examined organisa-tional-level interventions. One Danish organisational-level intervention (143) among nurses showed that a 20-month work scheduling intervention can be effective in improving job satis-faction. The study concluded that the intervention group, who participated in an open-rota sys-tem, which refers to collectively designing employees' work-rest schedules, showed an increase in job satisfaction during the intervention period. Another Danish study (144) showed somewhat mixed results from their one-year organisational-level leadership intervention. In their study, leaders were randomised to intervention groups (transformational, transactional and combined) and both the leaders and their employees completed questionnaires. Different leadership programmes had no impact on employees' job satisfaction in the long term. However, evidence was found that employees' experience of an

enhanced transformational leadership style during the intervention period was associated with increased job satisfaction within the same period.

Forsetlund and colleagues (145) conducted an individual-level intervention among Norwegian physicians in which the intervention group gained access to databases, received newsletters and participated in workshops regarding the use of recent scientific evidence in their practice. The rationale of the intervention was that the intervention group would gain knowledge and enhance their self-efficacy, which they would apply in their practice, ultimately leading to improved job satisfaction. However, the 1.5-year intervention study found no impact on physicians' job satis-faction.

Three studies examined individual-level interventions based on relaxation or physical exercise (146–148). De Bloom and colleagues (146) conducted two identical intervention studies to examine the day-level impact of relaxation exercises on job satisfaction and different recovery out-comes among Finnish knowledge workers. In their study, the intervention groups participated in either a 15-minute walk or relaxation (e.g. muscle relaxation and breathing) exercises during their lunch break, twice a week. The intervention effects were mixed as the first intervention, which was conducted during the spring, did not show any long-term impact on job satisfaction. However, the second intervention, which was conducted during the autumn, showed improvements in job satisfaction during the intervention period. De Bloom and colleagues (146) concluded that the effects on job satisfaction seemed to be short-lived and dependent on the season.

Similarly, Barene and colleagues (147) also showed mixed results in their exercise-based intervention among Norwegian female hospital employees. In their study, the intervention groups participated in either football or Zumba sessions in their free time for 40 weeks. The intervention groups managed to show improvements in other health-related outcomes (e.g. sickness absence) compared to the control group. The football group showed weak improvement in job satisfaction, while the Zumba group did not show any effects on job satisfaction. Lastly, Klatt and colleagues (148) conducted a mindfulness intervention (e.g. yoga, meditation, relaxing music) among Danish bank employees for eight weeks. While the intervention was effective in reducing work-related stress, no effects were found regarding work engagement.

6. Discussion

The present review examined three key positive states at work, namely, job satisfaction, organisational commitment and work engagement. Based on the Job Demands-Resources Model (59) and Conservation of Resources Theory (58), the aim of the review was to create a synthesis that would address four questions regarding these positive states at work, which focused on identifying promoting factors, outcomes, gain cycles and intervention designs. Various Nordic longitudinal studies (from Denmark, Finland, Iceland, Norway and Sweden) published between 2000 and 2023 were systematically retrieved, evaluated and synthesised to address the review's questions. The broader aim was to provide practical insights for workplaces and policymakers to promote positive states of work.

A summary of the results is shown in Figure 3. The studies included in this review highlight the benefits of a positive, resource-focused approach to improving working conditions. Most of the included studies have focused on factors that promote job satisfaction, organisational commitment and work engagement. It has also been shown that these positive attitudes can lead to var-ious beneficial outcomes and positive gain cycles. The results of this review contribute to the existing knowledge on promoting positive states at work as a complementary approach to mitigating workplace stress. This review provides valuable insights due to its wide scope in terms of including three indicators representing positive states at work, as well as examining their promoting factors, outcomes, gain cycles and intervention designs. Thus, the review provides a comprehensive overview with far-reaching practical implications. Despite the low number of included intervention studies, which limits the conclusions that can be drawn about the effectiveness of such designs, the six studies included were described to promote reflection on potential future interventions.

Overall, the present review provides support for the importance of the three positive states at work for creating other valuable positive individual and job-related outcomes, such as better health and productivity. These findings support the concept and model of sustainable careers (149), which suggests that the joint indicators of sustainable careers are health (mental and physical), happiness (engagement, satisfaction) and productivity (performance).

Organisational, social, task and personal resources as promoting factors

Most of the promoting factors reflect well-known and vital aspects of promoting positive states at work. For example, servant leadership is a crucial part of organisational resources that can provide employees with other resources, such as skill variety, recognition and support, which, in turn, may enhance work engagement and commitment (150). In addition, social and interpersonal

resources such as collaboration and support strengthen a sense of belongingness, which is known to be one of the basic psychological needs of humans (151).

In this review, some studies reflected the importance of employability and professional development in promoting job satisfaction and work engagement, which may become increasingly important for organisations to acknowledge in promoting positive work-related states. Rapid shifts in skill requirements and non-permanent employment contracts are becoming increasingly commonplace in contemporary labour markets (152, 153). Research suggests that individuals are burdened with more responsibility for managing their own careers which may lead to higher expectations for professional development (149). Considering that traditional paths for career growth in organisations are becoming less commonplace, addressing employees' expectations for career advancement beyond their current organisation may have a greater impact on positive work-related states in the future. Helping employees develop sustainable long-term careers so that they can continue working even after leaving their current organization, can become an important organizational resource. Therefore, this review would have benefited from more longitudinal studies addressing professional development and/or opportunities for career advancement as relevant organisational resources.

Early motivational theories (154, 155) have emphasised the importance of task resources as one of the essential aspects of employee motivation. This review has identified skill variety, feedback from the supervisor, autonomy and job control as important resources at the task level that are drivers of the three positive states at work. The results highlight that the freedom to decide how, when and where to conduct work tasks can create a sense of ownership over one's job and provide opportunities to use personal strengths and learn new skills that are key factors for well-being and motivation at work. In line with the Job Demands-Resources Model and Conservation of Resources Theory, task resources may be especially important in boosting the motivation to accumulate additional resources, rather than just helping employees deal with demanding aspects of their job (62). In other words, task resources not only help employees complete their work tasks but also drive their motivation for learning and growth.

Even though job crafting has been a widely studied topic in Western countries since the 2010s, thus far, a surprisingly limited number of longitudinal studies have been conducted in the Nordic countries. Job crafting refers to a bottom-up approach in which employees are enabled to make self-initiated changes to their work and create positive job challenges to better align their work to their needs (16, 156). There is robust evidence, including a few studies also from the Nordic countries, of the various benefits related to job crafting, for example, employee well-being and attitudes, such as job satisfaction, organisational commitment and work engagement, as well as different types of job performance (26). Despite the limited research in the Nordic countries on the benefits of job crafting, the findings of this literature review suggest that greater attention should be given to job crafting and other bottom-up, proactive approaches in shaping a more innovative and productive Nordic working life.

A few studies have shown that personality and personal attributes are viable resources for promoting positive states at work. While certain personality traits can be useful to a some extent, for example, in the recruitment process (116), it is important to note that personality is a set of rather stable characteristics that are not easily modified (157), whereas certain personal resources such as self-esteem and self-efficacy are more alterable. While the studies included in this review suggest that certain personality types are more likely to be associated with positive states at work than others, the most practical approach for employees and organisations should be to focus on strengthening resources in the work environment (e.g. leadership, social support), rather than aiming to change the personal attributes of employees.

Individual and job-related outcomes of positive states at work

The present review has also identified many studies indicating that job satisfaction, organisational commitment and work engagement can lead to different types of valuable outcomes. These outcomes were categorised as either individual or job-related, although in many cases these categories are closely connected. For example, the finding that feeling engaged helps prevent burnout applies to both the job context (e.g. engaged employees continue to work efficiently) and to employees themselves (e.g. engaged employees stay healthy and still have energy left for home and leisure activities).

In this review, the importance of the three positive states at work were strongly supported by register-based Nordic studies demonstrating, for example, less sickness absenteeism, fewer periods of unemployment and reduced likelihood of an employee leaving their job or receiving a disability pension. In addition, the included longitudinal survey studies showed that feeling well and having a positive attitude towards the workplace can improve general well-being and both physical and mental health, as well as reduce burnout and work-family conflicts (i.e. when work negatively affects the family/home situation). Furthermore, the included studies showed that job crafting can increase work engagement. In turn, feeling engaged gives employees extra energy, making them more proactive and more likely to craft their own jobs (158).

The three positive states at work may also be related to each other over time. The included studies indicate that work engagement can promote both job satisfaction and organisational commitment. These findings suggest that work engagement could be the more proximal indicator among the three positive states at work, meaning that resources might have a direct impact on work engagement. In contrast, job satisfaction and organisational commitment might be more distal indicators that may be promoted, for example, through sustained levels of work engagement. In addition, work engagement represents a highly activated and energised positive state at work, which has also been labelled as proactive engagement (159). From a practical perspective, boosting engagement at work might lead to more satisfied and committed employees.

Gain cycles

One of the breakthrough findings in positive work psychology has been finding support for gain cycles, which refers to the positive co-development between two phenomena (58). The notion of gain cycles adds a novel understanding of the potential impact in promoting positive states at work. For example, one of the included studies showed that promoting job resources such as professional pride leads to improved work engagement which, in turn, reinforces that sense of pride (142). Similarly, one study found gain cycles between work engagement and enriching family life (125). These studies illustrate the dynamic development between work engagement and other outcomes over time. Based on the results of this review, more focus should be placed on examining gain cycles related to job satisfaction and organisational commitment. No studies were found in the literature that examine gain cycles related to these two positive work-related states. The evidence presented in this review may serve as a foundation for future research in this area. For example, in one study, employee health was found to promote job satisfaction (111) and in another study, job satisfaction was found to promote employee health (122). Taken together, these findings highlight the importance of exploring gain cycles—particularly those involving job satisfaction and organisational commitment—to inform strategies that benefit both employees and organisations.

Interventions

This review aimed to identify randomised controlled interventions to illustrate the potential practical value of promoting positive states at work. However, only six intervention studies ful-filled the criteria to be included in the review, which limited the opportunity to draw comprehensive conclusions, especially regarding their effectiveness. As shown in Appendix C, the quality of the studies varied considerably, according to the assessment made using the Joanna Briggs Institute's modified critical appraisal tool (78). However, their inclusion may inspire future studies. Four of the included studies focused on individual-level interventions and aimed to enhance personal resources, for example, physical health (146), and only two studies focused on interventions at the organisational-level. While increasing individual resources is an important aspect of interventions, highlighting organisational-level interventions might be more feasible in addressing occupational stress (160). For example, organisational-level interventions that target ergonomics and workloads might result in more sustainable health effects for employees (161). Adopting such broad, organisational-level interventions could highlight a more systematic approach to improving the work environment, instead of solely focusing on enhancing employees' personal resources, for example, to cope with stress.

Practical implications

Based on the beneficial outcomes of job satisfaction, organisational commitment and work engagement identified in this literature review (Figure 3), a number

of practical implications can be highlighted. These are not based on the intervention studies, as they were so few that they limited the ability to draw conclusions about the effectiveness of the intervention designs investigated. It is important to note that optimal working conditions are likely achieved by promoting several different types of resources, rather than focusing on a single resource (162). However, based on this review, it should be noted that improving one resource in the workplace may lead to improvements in others.

Employee-oriented leadership philosophy

According to the results of this literature review, an employee-oriented leadership philosophy that refers to prioritising employees' needs is an important promoting factor of the three positive states at work (job satisfaction, organisational commitment and work engagement). Specifically, transformational and servant leadership might be viable approaches as they commonly involve aspects of empowering employees. An employee-oriented leadership philosophy may involve aspects such as being authentic around employees (e.g. showing true emotions), encouraging employees to conduct their work tasks in a way that allows them to utilise their skills to the fullest potential, finding ways to provide learning opportunities, helping employees develop professionally, trusting an employee's potential to handle certain tasks, offer consistent feedback and provide social support.

Promoting a positive work environment

Based on this review, organisational justice, trust and social resources have been shown to be important aspects of a work environment that promote positive states at work. A positive work environment may give employees the opportunity to express concerns and criticism without fear of repercussion. There are transparent organisational practices that promote fairness and trust, involving everyone in decision-making processes with the aim of fostering teamwork. Efforts are made to ensure that everyone feels welcome, for example, by highlighting kindness at all levels of social interaction (e.g. coffee breaks, performance reviews and meetings). Furthermore, different social media platforms may help to foster both formal and informal social interaction at work.

Autonomy and Job Control

In the literature, the terms autonomy and job control are used to describe a work design in which employees have a high degree of freedom regarding scheduling and decisions about how to perform their work. These job characteristics of a more flexible work design may support employees' freedom to engage in proactive behaviours, such as learning new tasks, using their available skills as they choose, and seeking inspiring challenges in the workplace. However, the results indicate that despite giving employees autonomy and control over their work, they should not be left unattended. As social support is another important resource, consistently checking and supporting employees' situations would help to ensure that they have the available resources to exercise their autonomy and control over their work (e.g. guidance and clear responsibilities).

Career Development Opportunities

Investing in an employee's career development may help them feel that they possess the qualities and relevant skills to gain employment in the current labour market. The included studies indicate that career longevity may be nurtured by offering opportunities (e.g. courses, networking events) and time for employees to enhance their professional skills (e.g. updating skills to a new occupational standard) and more general skills (e.g. communication, project management, public speaking, CV workshops). The aforementioned career development opportunities may be beneficial to the perception of employability, which was found to promote positive work-related states in this review.

Job crafting

Promoting job crafting behaviours may be particularly relevant to job designs that aim to promote employee autonomy and job control. Job crafting may be promoted by encouraging employees to occasionally appraise their work and make minor changes and improvements. Employees may be encouraged to think about what can be done differently to make their work more suitable for them, what kind of changes they can make to add variety to their workday, what kind of changes they can they make to learn something new from their work, how can they find ways to seek inspiring challenges, and what changes they can make to improve communication and social relationships at work. Utilising existing skills and learning new ones is one of the most important sources of engagement at work and a task-related resource that can be enhanced through job crafting.

Knowledge gaps to fill

Future studies should adopt longitudinal research designs to expand the understanding of various promoting factors, outcomes, gain cycles and intervention designs regarding job satisfaction, organisational commitment and work engagement. Longitudinal studies provide more rigorous and reliable conclusions compared to cross-sectional designs (163). This is beneficial to identifying effective strategies for promoting positive states at work. Important resource categories were identified in this review that could be expanded in future longitudinal studies. For example, various leadership styles, the use of work-related social media and career advancement opportunities. In particular, more longitudinal studies on gain cycles and intervention designs are required. A change in work arrangements took place during and after the pandemic as many employees switched to working remotely, and this tendency is expected to continue (164). This means that more Nordic studies are needed that focus on the challenges in contemporary hybrid work environments for work, work communities, shared learning and collaborations, job performance and well-being.

Long-term remote working entails new considerations regarding the relative importance of different resources, which practises may promote these resources, and identifying the threats to well-being. For example, a meta-analysis showed that both autonomy, a job resource, and feelings of isolation and loneliness were associated with the intensity of remote work (i.e., number of days per week

worked remotely)(165). The lack of face-to-face interaction in remote work may especially challenge social resources and the use of tacit knowledge to learn new skills, particularly for young employees and newcomers in general. Future studies should also examine and develop suggestions for leadership practices in terms of how to lead and support employees who are working from home. Furthermore, given the evidence on autonomy and job control in this review, future studies could examine self-leadership, which refers to employees leading them-selves (166). Interestingly, a few of the included reports illustrated the potential of social media in promoting positive states at work (101, 115), which could be further explored in more detail in future studies.

In addition, more randomised controlled trials are needed to explore ways to promote positive states at work among Nordic employees. Several intervention studies were excluded from this review due to a lack of rigorous methodology, such as non-randomised designs or the absence of a control group, making it unclear whether the reported positive changes were actually caused by the interventions. Some intervention studies included in this review provided a promising basis for developing future intervention programmes, for example, focusing on exercises or collective work scheduling. However, due to the limited number of eligible intervention studies, the present review could not provide a meaningful synthesis of effective interventions for promoting positive states at work. Therefore, more targeted intervention studies are needed to address this gap. While both individual- and organisational-level interventions are important, focusing on organisational-level interventions might be more effective (160). Overall, the findings of this review can serve as an inspiration for designing interventions that focus on one or multiple resources that are known to promote positive states at work among Nordic employees (Figure 3).

Lastly, although this was not the focus of this review, future studies could more commonly adopt perspectives that highlight the demographic differences in promoting positive states at work. Some of the included studies explored demographic factors (e.g. age and gender) in predicting the development of work engagement in the Finnish population (167). However, most studies only controlled for demographic differences, such as gender and age, in their analyses. Given that the included studies showed mixed gender associations, for example, in correlation tables, a more refined research focus is needed to examine the gender differences in promoting positive states at work.

It is worth exploring gender differences since the evidence outside of this review is also mixed. For example, some studies suggest that there does not seem to be gender differences in terms of burnout (168) and that women report slightly higher levels of work engagement than men (169). The notion of a gender equality paradox has been used to describe the apparent contradiction that women report higher job satisfaction than men, despite, for example, lower pay and lack of opportunities for promotion (170). Thus, the gender equality paradox suggests that promoting positive states at work may in part be affected by differences in gender, which calls for a more refined focus on examining gender inequalities that may occur in Nordic working life. It is suggested that early exposure to gender equality might shape the future expectations of women

to have higher standards in work life, thereby reducing the paradox of being more satisfied, despite the discrimination that they may face in their work life (171). The gender-segregated labour markets could result in different working conditions (172), which could impact the strategies on how to promote positive states at work.

In addition to gender, age may play a significant role in the relative importance of resources in promoting positive states at work. For example, a study among over 35,000 employees from 30 European countries found that older employees tend to report higher levels of work engagement compared to younger employees (169). Younger employees are typically in need of more support as they are more likely to be in the beginning stages of their careers and might need more specific job resources, such as autonomy or social support (173).

Although the Nordic countries are generally perceived to have a relatively high degree of equality, it can still be relevant to examine how issues of inequality may affect efforts to promote posi-tive states at work. For example, examining themes such as pension gaps across genders (174), career development among immigrant workers (175), division of paid and unpaid housework across genders (176), and prejudiced hiring practices towards senior employees (177), could pro-vide contextual settings to be further examined in terms of job resources. Similarly, social inequalities in health are a persistent problem and should also be addressed more often in this field of research.

Limitations

The first limitation in the present review is that the literature search may not have captured all relevant studies. An indication of this is that the authors, based on their prior knowledge, have included three studies that were not found in the search. However, the search strings were de-veloped to be highly sensitive by, for example, not including terms such as "quantitative" or "longitudinal" (See Appendix A). Furthermore, the search resulted in a large number of records, including many irrelevant studies from unrelated disciplines (e.g. environmental biology, history, organic agriculture, energy policy), indicating that the search strings were sensitive at the cost of precision. More precise search strings could have reduced the number of irrelevant studies from these disciplines, but this would have risked excluding some relevant studies due to, for example, database indexing. The authors of this review therefore consider that the sensitivity of the search strings was appropriate, a conviction reinforced by the fact that the search included three studies that had been pre-selected as relevant to be identified through the search strings.

Second, this review adopted a broad scope, which limits the ability to critically assess the specific effects of the identified promoting factors, outcomes and gain cycles. The information retrieved from the included studies is biased in terms of participant characteristics, follow-up periods, and analysis methods, as well as the focus on identifying promoting factors rather than negative aspects. However, the present review aimed to identify potential promoting factors,

instead of, for example, making clinical recommendations. Moreover, the strong theoretical foundation provided by the Conservation of Resources Theory (58) and Job Demands-Resources Model (59) guided the interpretation of the studies, with nearly all of them aligned with the theory. The critical appraisal of the prevalence of specific effects or effect sizes is outside of the scope of this re-view, as its purpose was to provide an overview of factors related to the three positive states at work.

Third, the studies included in this review were uneven in terms of contributions across the Nordic countries (Table 2). This is largely due to the inclusion of only longitudinal follow-up studies and the exclusion of patient populations, which has resulted in the exclusion of many studies that would otherwise have been included in this review. As shown in Appendix B, another common reason for excluding studies was how the three positive work-related states were opera-tionalised (e.g. through dichotomised variables). It may, however, be assumed that the results of this review represent the state of Nordic longitudinal studies and may be applied to the practice in Nordic workplaces. Besides the commonalities between the Nordic countries that were de-scribed in the introduction, the main results are based on well-known and globally accepted the-ories of the Job Demands-Resources Model and Conservation of Resources Theory, whose rationales may be applied to most working conditions present in Nordic workplaces.

Lastly, the current review included randomised controlled intervention studies, with the aim of increasing its practical value. However, only six studies were eligible, which made it difficult to draw meaningful conclusions about the effectiveness of the interventions. Therefore, the results of this review are primarily based on findings from the longitudinal non-intervention studies. Nonetheless, the inclusion of the intervention studies may serve as inspiration for future research.

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Appendix A.
Search Documentations

MEDLINE

MEDLINE via Web of Science interface 230928

Söktermer	Antal poster
Positiva arbetsrelaterade attityder	
1. TS=(((job OR work OR "work-place" OR workplace OR organisation* OR organization* OR occupation*) NEAR/6 commitment) OR ((job OR work OR "work-place" OR workplace OR "work-life") NEAR/6 (satisf* OR dissatisf* OR "dis-satisf*")) OR "work engagement" OR "employee engagement" OR "work related flow" OR "job related flow") OR MHX=("work engagement" OR "job satisfaction")	45 198
Norden	
TS=(Sweden OR swedish OR swede OR swedes OR norway OR norwegian* OR finland OR finnish OR finn OR finns OR denmark OR danish OR dane OR danes OR iceland* OR faroese*)	317 522
Kombinerade sökningar	
3. 1 AND 2	1 853
Applicerade begränsningar	
4. Årsintervall 2000-2024	1 516
5. Språk: eng, nor, swe, fin, ice, dan	1 508
6. Publikationstyp: articles	1 497
Slutresultat	
7.	**1 497**

[TS] = Topic. Includes terms from the title, abstract, Author keywords and Keywords Plus; **[" "] =** Citation Marks; searches for an exact phrase; **[*] =** Truncation; **[NEAR/n] =** The terms in the search must be within a specified number of terms (n) in any order; **[MHX] =** Mesh terms

Scopus

Scopus 230928

Söktermer	Antal poster
Positiva arbetsrelaterade attityder	
1. TITLE-ABS-KEY(((work OR job) PRE/0 (related PRE/0 flow))) OR (TITLE-ABS-KEY ((work OR ”work-place” OR workplace OR job OR organization* OR organisation* OR occupation*) W/6 (commitment OR committed))) OR (TITLE-ABS-KEY ((work OR employee) PRE/0 engagement)) OR (TITLE-ABS-KEY ((job OR work OR ”work-place” OR workplace OR ”work-life”) W/6 (satisf* OR dissatisf* OR ”dis-satisf*”)))	116 980
Norden	
TITLE-ABS-KEY(sweden OR swedish OR swede OR swedes OR norway OR norwegian* OR finland OR finnish OR finn OR finns OR denmark OR danish OR dane OR danes OR iceland* OR faro-es*)	669 772
Kombinerade sökningar	
3. 1 AND 2	3 043
Applicerade begränsningar	
4. Årsintervall 2000-2024	2 579
5. Språk: eng, nor, swe, fin, ice, dan	2 566
6. Publikationstyp: articles	2 285
Slutresultat	
7.	**2 285**

[TITLE-ABS-KEY] = A combined field that searches abstracts, keywords, and document titles; **[” ”] =** Citation Marks; searches for an exact phrase; **[*] =** Truncation; **[?] =** Wild card; **[W/n] =** "Within". The terms in the search must be within a specified number of terms (n) in any order; **[PRE/n] =** The terms in the search must be within a specified number of terms (n) in a specific order.

Web of Science

Web of Science Core Collection 230928

Söktermer	Antal poster
Positiva arbetsrelaterade attityder	
1. (TS=((((job OR work OR "work-place" OR workplace OR "work-life" OR organisation* OR organization* OR occupation*) NEAR/6 (commitment OR committed)) OR ((job OR work OR "work-place" OR workplace) NEAR/6 (satisf* OR dissatisf* OR "dissatisf*")) OR "work engagement" OR "employee engagement" OR "work related flow" OR "job related flow")))	77 361
Norden	
(TS=(sweden OR swedish OR swede OR swedes OR norway OR norwegian* OR finland OR finnish OR finn OR finns OR denmark OR danish OR dane OR danes OR iceland* OR faroes*))	464 434
Kombinerade sökningar	
3. 1 AND 2	1 889
Applicerade begränsningar	
4. Årsintervall 2000-2024	1 791
5. Språk: eng, nor, swe, fin, ice, dan	1 785
6. Publikationstyp: articles	1 674
Slutresultat	
7.	**1 674**

[TS] = Topic. Includes terms from the title, abstract, Author keywords and Keywords Plus; **[" "] =** Citation Marks; searches for an exact phrase; **[*] =** Truncation; **[NEAR/n] =** The terms in the search must be within a specified number of terms (n) in any order.

Appendix B.
Screening and evaluation

The 2830 records (titles and abstracts) resulting from the literature search were unevenly divided among three researchers (J.L., J.H. and S.R.) to eligibility screening. Eligible records were marked in green, excluded records in red, and uncertain cases in yellow for joint evaluation (by J.L. and J.H). The main reasons for exclusion were related to study type (e.g., qualitative or cross-sectional), irrelevant subjects (e.g., studies conducted outside of Nordic countries or focusing on patients), and the absence of the three positive work-related states due to an irrelevant field of study (e.g., environmental biology). Common reasons for uncertain cases involved ambiguity about whether the study was conducted in the Nordic countries or whether the participants were eligible. For example, some records examined school-to-work or work-to-retirement transitions and were eventually included in the next screening phase (to the full texts). However, studies following patients, such as those tracking diagnosed conditions and their return to work, were excluded. Another common reason for uncertainty was records involving longitudinal follow-up settings, which were discussed and resolved individually. After reviewing all records and jointly assessing uncertain cases, 234 records were deemed eligible for full-text retrieval.

All 234 full texts were retrieved and jointly screened based on the inclusion criteria (by J.L. and J.H.). The aim of the current review was to identify and provide an overview of promoting factors, outcomes, and reciprocal relationships related to the three positive work-related states. Furthermore, the included studies varied in their subjects (e.g., population, organisation sample), follow-up periods (e.g., daily, weekly, monthly, yearly), exposures, outcomes and analysis methods (e.g., latent analysis, observed, person-centred). Therefore, assessing the risk of bias for non-intervention studies was considered irrelevant for the purposes of this review. In contrast, if the review had aimed to draw conclusions about specific effect sizes or clinical recommendations, the heterogeneity of the included studies would pose a significant risk to the validity of such conclusions.

The primary reasons for excluding full text are presented in the table below. Regarding non-intervention studies, common reasons for exclusion related to irrelevant study design, themes, and measurement of the three positive work-related states. For intervention studies, common reasons for exclusion involved non-equivalent control groups (e.g., non-randomised) and lack of relevance (e.g., patients). Taken together, 91 non-intervention and 6 intervention studies were included in the synthesis. References for excluded reports and the main reasons for exclusion are provided in the table on the next page.

Excluded articles

JS = Job Satisfaction, OC = Organisational Commitment, WE = Work Engagement

The primary motivation for exclusion:

- Design (e.g., cross-sectional, repeated cross-sectional, cross-sectional inferences regarding the three positive work-related states).
- Participants (e.g., patients, anonymous follow-up, non-Nordic).
- Measure (e.g., unsuitable synonym, dichotomised operationalisation, retrospective measure).
- Study type (e.g., methodological focus, scale development, retrospective study, mixed methods).
- Intervention (e.g., non-randomised control group, lack of control group).
- Theme (e.g., studying the effects of a total smoke ban on restaurant workers).

Reference	First author and year	The primary motivation for exclusion
1	Aasland 2010	Study type
2	Ahlstrom 2013	Measure (JS)
3	Airiala 2012	Design
4	Amanak 2023	Participants
5	Andersen 2007	Measure (JS)
6	Andersson 2008	Measure (JS)
7	Arendt 2008	Measure (JS)
8	Arnetz 2007	Intervention
9	Beck 2015	Intervention
10	Berthelsen 2018	Design
11	Berthelsen 2021	Design
12	Bjorner 2010	Study type
13	Bockerman 2012	Participants
14	Claes 2011	Design
15	D'Addio 2007	Study type
16	Daehlen 2008	Measure (JS)
17	de Bloom 2015	Measure (WE)
18	Degl' Innocenti 2020	Theme
19	Eib 2022	Design
20	Engström 2009	Design
21	Eriksen 2001	Theme
22	Ertesvåg 2021	Theme

Reference	First author and year	The primary motivation for exclusion
23	Ervasti 2023	Theme
24	Evertsson 2013	Measure (OC)
25	Forsgarde 2000	Intervention
26	Gregson 2023	Intervention
27	Grönroos 2009	Measure (OC)
28	Grønstad 2020	Participants
29	Gudex 2010	Measure (JS)
30	Gulbrandsen 2002	Design
31	Hadju 2018	Measure (OC)
32	Hansen 2011	Theme
33	Harty 2016	Intervention
34	Haukka 2010	Measure (JS)
35	Hellevik 2020	Measure (JS)
36	Heponiemi 2014	Theme
37	Hetland 2008	Theme
38	Himberg-Sundet 2019	Theme
39	Hinkka 2002	Theme
40	Hoff 2021	Theme
41	Holmgren 2013	Measure (OC)
42	Holten 2018	Measure (JS)
43	Holten 2015	Theme
44	Huhtala 2016	Measure (WE)
45	Hyggen 2008	Measure (OC)
46	Hyggen 2012	Measure (OC)
47	Håkansson 2019	Theme
48	Innstrand 2004	Intervention
49	Irehill 2023	Measure (WE)
50	Isaksson 2000	Measure (JS)
51	Jalonen 2006	Measure (OC)
52	Jensen 2010	Participants
53	Johnsen 2019	Intervention
54	Jönsson 2012	Design
55	Kankaanranta 2007	Design
56	Kanste 2010	Intervention
57	Kerkkänen 2004	Measure (JS)
58	Kiema-Junes 2022	Design
59	Kiema-Junes 2020	Design
60	Kinnunen 2004	Theme
61	Kosenkranius 2023	Measure (WE)
62	Kukkurainen 2012	Measure (JS)
63	Larsson 2019	Measure (WE)

Reference	First author and year	The primary motivation for exclusion
64	Linnansaari-Rajalin 2015	Measure (OC)
65	Lundgren 2005	Participants
66	Ly 2014	Theme
67	Lydiksen 2023	Participants
68	Lämås 2021	Intervention
69	Løset 2023	Measure (JS)
70	Lövgren 2002	Participants
71	Makikangas 2016	Measure (JS)
72	Malmberg-Ceder 2020	Participants
73	Mantynen 2014	Theme
74	Marhold 2002	Study type
75	Martinussen 2012	Design
76	Martinussen 2017	Design
77	Mauno 2007	Measure (WE)
78	Meng 2020	Intervention
79	Mikkelsen 2000	Theme
80	Mortimer 2003	Measure (JS)
81	Mäkikangas 2012	Measure (WE)
82	Netterstrøm 2010	Measure (JS)
83	Nielsen 2021	Measure (JS)
84	Nielsen 2021	Intervention
85	Nielsen 2009	Measure (JS/WE)
86	Nielsen 2009	Design
87	Nielsen 2012	Design
88	Nielsen 2007	Study type
89	Nielsen 2008	Measure (JS/WE)
90	Nislin 2016	Theme
91	Nislin 2016	Theme
92	Nortomaa 2016	Measure (OC)
93	Numminen 2017	Study type
94	Nurminen 2002	Measure (JS)
95	Nyberg 2015	Design
96	Nørøxe 2019	Participants
97	Nørøxe 2019	Participants
98	Ojala 2018	Intervention
99	Oksa 2021	Design
100	Pagan 2016	Measure (JS)
101	Pedersen 2020	Theme
102	Pedersen 2021	Measure (JS)
103	Penttilä 2021	Design
104	Penttinen 2020	Design

Reference	First author and year	The primary motivation for exclusion
105	Petterson 2005	Participants
106	Platts 2023	Participants
107	Prakash 2019	Measure (JS)
108	Putus 2021	Measure (JS)
109	Pyöriä 2017	Design
110	Ragnarsdóttir 2014	Participants
111	Randall 2009	Study type
112	Reigo 2001	Measure (JS)
113	Reijula 2018	Design
114	Roelen 2015	Theme
115	Rosta 2013	Theme
116	Runeson 2005	Measure (JS)
117	Räsänen 2020	Study type
118	Saarinen 2023	Participants
119	Saksvik 2000	Design
120	Sand 2003	Participants
121	Sandvik 2003	Design
122	Sellgren 2007	Design
123	Seppälä 2020	Intervention
124	Sjöberg 2000	Measure (OC)
125	Sortheix 2013	Measure (WE)
126	Stapelfeld 2011	Intervention
127	Sveinsdóttir 2018	Study type
128	Tafvelin 2019	Intervention
129	Vaag 2013	Measure (WE)
130	Vassbø 2020	Participants
131	Virtanen 2002	Measure (JS)
132	von Bonsdorff 2010	Measure (JS)
133	von Thiele Schwartz 2017	Intervention
134	Wallin 2006	Measure (OC)
135	Wang 2007	Theme
136	Westover 2010	Theme
137	Wijk 2020	Study type

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Appendix C. Included articles

Tabulation of included non-intervention reports

The table below describes the general and approximate characteristics of the given study. General reference for the measures of job satisfaction, organisational commitment and work engagement is reported.

- Den = Denmark, Fin = Finland, Ice = Iceland, Nor = Norway, Swe = Sweden
- JS = Job Satisfaction, OC = Organisational Commitment, WE = Work Engagement
- SEM = Structural Equation Modelling
- Regression = e.g., linear, logistic, Cox, Poisson
- Person-centred = e.g., latent transition, latent profile, growth mixture modelling
- General employees = e.g., a population sample or a sample from multiple organisations
- Related concepts = e.g., relevant antecedents, outcomes or reciprocal factors.

Reference	First author (year)	Country	Positive state (measure; items)	Sample characteristics	Approximate follow-up time	Primary analysis type	Related concepts
1	Airila (2014)	Fin	WE (UWES; 9)	Firefighters (n = 403)	10 years	SEM	• Job resources (supervisor, interpersonal, task) • Self-esteem • Workability
2	Annell (2018)	Swe	JS (Hellgren et al., 1997; 3)	Police officers (n = 508)	3,5 years	Regression	• Agreeableness
3	Bakker (2022)	Nor	WE (UWES; 9)	Naval cadets (n = 57)	30 days (diary study)	Multilevel	• Transformational leadership
4	Bakker (2019)	Nor	WE (UWES; 9)	Naval cadets (n = 87)	30 days (diary study)	Multilevel	• Using strengths at work (talents, personal qualities)
5	Berglund (2017)	Swe	JS (Global; 1)	Senior employees (n = 580)	8 years	Regression	• Retention
6	Bernstrom (2022)	Nor	OC (QPS; 3)	Healthcare employees (n = 11842)	3 years	SEM	• Sickness absence
7	Celuch (2022)	Fin	WE (UWES; 9)	General employees (n = 768)	2,5 years	Multilevel	• Openness • Conscientiousness • Extroversion
8	Cheng (2014)	Fin	JS (Global; 1)	University employees (n = 926)	3 years	Regression	• Social support • Optimism • Job control • Job insecurity x social support
9	Christensen (2017)	Nor	JS (Global; 1)	General employees (n = 2989)	2 years	Regression	• Pain sites
10	Christensen (2012)	Nor	JS (Global; 1)	General employees (n = 3574)	2 years	Regression, SEM	• Headache

Reference	First author (year)	Country	Positive state (measure; items)	Sample characteristics	Approximate follow-up time	Primary analysis type	Related concepts
11	Clausen (2010)	Den	OC (COPSOQ; 4)	Eldercare employees (n = 5992)	1 year	Regression	• Turnover
12	Clausen (2010)	Den	OC (COPSOQ; 4)	Eldercare employees (n = 6299)	1 year	Multilevel	• Leadership • Leadership • Influence at work
13	Clausen (2014)	Den	OC (COPSOQ; 4)	General employees (n = 61302)	1,5 years	Regression	• Long-term sickness absence
14	Clausen (2014)	Den	OC (COPSOQ; 4)	General employees (n = 40554)	6 years	Regression	• Disability pension
15	Clausen (2010)	Den	OC (COPSOQ; 4)	Eldercare employees (n = 9560)	1 year	Regression	• Long-term sickness absence
16	Clausen (2015)	Den	OC (COPSOQ; 4)	Eldercare employees (n = 5085)	1 year	Multilevel	• Psychological well-being • Sickness absence • Sleep disturbances
17	Dellve (2007)	Swe	OC (SCSI; 1) JS (SCSI; 1)	Human service (n = 3804)	3 years	Multilevel	• Work Attendance
18	Eib (2015)	Swe	OC (ACS; 3)	Accountants (n = 429)	1 year	Regression	• Organisational justice
19	Ek (2021)	Fin	WE (UWES; 9) JS (Global; 1)	General employees (n = 6496)	29 years	Person-centred	• Employment trajectories
20	Elovainio (2015)	Fin	JS (JDS; 3)	Physicians (n = 1524)	4 years	Regression, SEM	• Organisational justice • Job control
21	Feldt (2013)	Fin	WE (UWES; 9)	Managers (n = 298)	4 years	Person-centred	• Effort-reward imbalance
22	Feldt (2009)	Fin	OC (Cook & Wall, 1980; 4)	Managers (n = 1033)	10 years	Person-centred	• Workability
23	Finne (2016)	Nor	OC (QPS Nordic; 3-5)	General employees (n = 4158)	2 years	Multilevel	• Mental distress • Positive affect
24	Finset (2005)	Nor	JS (JSC; 10)	Physicians (n = 210)	10 years	Regression	• Perceived skills
25	Framke (2019)	Den	JS (Global; 1)	Pre-school employees (n = 606)	2 years	Generalised linear model	• Social capital
26	Gram Quist (2013)	Den	OC (COPSOQ; 5)	Eldercare employees (n = 4135)	3 years	Regression	• Body mass index
27	Grødal (2019)	Nor	OC (COPSOQ; 4)	Nursing home employees (n = 166)	1 year	SEM	• Coherent work
28	Hagen (2006)	Nor	JS (Global; 1)	General employees (n = 38426)	7 years	Regression	• Disability retirement
29	Hakanen (2015)	Fin	WE (UWES; 17)	Dentists (n = 1580)	7 years	SEM	• Work-family enrichment • Work-family conflict
30	Hakanen (2021)	Fin	WE (UWES; 9)	General employees (n = 2334)	3 years	Dominance	• Autonomy • Skill discretion Feedback • Role clarity • Friendliness • Team empowerment

Reference	First author (year)	Country	Positive state (measure; items)	Sample characteristics	Approximate follow-up time	Primary analysis type	Related concepts
31	Hakanen (2011)	Fin	WE (UWES; 17)	Dentists (n = 1632)	3 years	SEM	• Job resources (craftsmanship, pride, results) • Work-family enrichment • Marital satisfaction
32	Hakanen (2018)	Fin	WE (UWES; 9) JS (Hakanen et al., 2018; 2)	Dentists (n = 1877)	4 years	SEM	• Job satisfaction • Job crafting • Burnout
33	Hakanen (2008)	Fin	WE (UWES; 17)	Dentists (n = 2555)	3 years	SEM	• Job resources (craftsmanship, pride, results) • Personal initiative
34	Hakanen (2021)	Fin	WE (UWES; 3)	General employees (n = 4876)	2 years	Instrumental variable	• Occupational rankings • Wages • Disability pensions • Unemployment
35	Hakanen (2012)	Fin	WE (UWES; 17)	Dentists (n = 1964)	7 years	SEM	• Life satisfaction • Depression symptoms
36	Hakanen (2008)	Fin	OC (Lindström et al., 2000; 2)	Dentists (n = 2555)	3 years	SEM	• Vigor • Dedication
37	Harju (2016)	Fin	WE (UWES; 9)	Highly educated employees (n = 1630)	3 years	SEM	• Job crafting
38	Harju (2021)	Fin	WE (UWES; 9)	General employees (n = 2453)	1,5 years	SEM	• Job crafting
39	Heponiemi (2018)	Fin	JS (JDS; 3)	Physicians (n = 1109)	9 years	Regression	• Stress from information systems
40	Heponiemi (2014)	Fin	JS (JDS; 3)	Physicians (n = 1515)	4 years	Variance	• Job control
41	Heponiemi (2013)	Fin	JS (JDS; 3)	Physicians (n = 1581)	4 years	Regression	• Organisational justice x job changes
42	Hogh (2018)	Den	OC (COPSOQ-II; 4)	Eldercare service employees (n = 4000)	1 year	Multilevel	• Quality of care
43	Holm (2023)	Swe	WE (UWES; 3)	Healthcare employees (n = 1144)	6 months	SEM	• Defender role
44	Jacobsen (2020)	Nor	OC (Meyer & Allen, 1997; 4)	Hospital employees (n = 1864)	1 year	Regression	• Sickness absence
45	Jutengren (2020)	Swe	WE (SWEBO; 10) JS (COPSOQ; 6)	Healthcare employees (n = 250)	7 months	SEM	• Social capital
46	Juutinen (2023)	Fin	WE (UWES; 3)	University employees (n = 442)	1 year	SEM	• Psychological safety climate
47	Kaltiainen (2022)	Fin	WE (UWES; 3)	General employees (n = 532)	1 year	SEM	• Age • Gender • Living alone • Telework
48	Kaltiainen (2023)	Fin	WE (UWES; 3)	General employees (n = 996)	6 months	SEM	• Job control

Reference	First author (year)	Country	Positive state (measure; items)	Sample characteristics	Approximate follow-up time	Primary analysis type	Related concepts
49	Kinnunen (2013)	Fin	WE (UWES; 9)	General employees (n = 274)	1 year	SEM	• Job demands • Job resources • Recovery
50	Kirves (2014)	Fin	JS (Global; 1)	University employees (n = 926)	2 years	Person-centred	• Employability trajectories
51	Kopperud (2023)	Nor	WE (UWES; 9)	Financial sector employees (n = 838)	3 weeks	Regression	• Mastery goal orientation
52	Kuoppala (2011)	Fin	JS (Global; 1)	Civil servants (n = 967)	7 years	Regression	• Sick leave • Disability pension
53	Lamminpää (2012)	Fin	JS (Global; 1)	Civil servants (n = 967)	7 years	Regression	• Entering rehabilitation
54	Lundmark (2022)	Swe	JS (COPSOQ-II; 4)	Process industry employees (n = 601)	2 years	SEM	• Role clarity
55	Malinen (2016)	Fin	JS (Malinen & Savolainen, 2016; 4)	Teachers (n = 365)	1,5 years	SEM	• General social climate
56	Mathisen (2021)	Den	JS (Mathisen et al., 2021; 4)	Hospital employees (n = 24 385)	1 year	parametric g-formula	• Turnover
57	Mauno (2010)	Fin	WE (UWES; 9)	Healthcare employees (n = 409)	2 years	Regression	• Work-family support • Work-family barriers
58	Miranda (2002)	Fin	JS (Global; 1)	Forest industry (n = 2404)	1 year	Regression	• Sciatic pain
59	Munir (2012)	Den	JS (Munir et al., 2012; 5)	Eldercare service employees (n = 188)	1,5 years	Regression	• Transformational leadership
60	Mäkikangas (2018)	Fin	WE (UWES; 9)	Rehabilitation employees (n = 131)	1 week	Person-centred	• Job crafting
61	Mäkikangas (2013)	Fin	WE (UWES; 9)	Managers (n = 463)	2 years	Person-centred	• Job change
62	Neupane (2022)	Fin	JS (Global; 1)	Senior employees (n = 1262)	2 years	General linear model	• Age groups
63	Neupane (2013)	Fin	JS (Global; 1)	Food industry employees (n = 734)	4 years	Regression	• Multi-site pain
64	Näswall (2014)	Swe	JS (Hellgren et al., 1997; 3) OC (Allen & Meyer, 1990; 3)	White-collar employees (n = 292)	3 years	Regression	• Job control
65	Oakman (2016)	Fin	JS (Global; 1)	Food industry employees (n = 734)	4 years	Regression	• Musculoskeletal disorder
66	Oksa (2021)	Fin	WE (UWES; 9)	General employees (n = 965)	2 years	Hybrid	• Social media communication • Social support • Task resources

Reference	First author (year)	Country	Positive state (measure; items)	Sample characteristics	Approximate follow-up time	Primary analysis type	Related concepts
67	Oksa (2023)	Fin	WE (UWES; 9)	General employees (n = 733)	2 years	Person-centred	• Personality traits
68	Oksa (2022)	Fin	WE (UWES; 9)	General employees (n = 733)	2 years	Hybrid	• Social media-enabled productivity
69	Olsen (2019)	Nor	JS (Global; 1)	General employees (n = 455)	2,5 years	Regression	• Turnover
70	Richter (2019)	Swe	JS (Hellgren et al., 1999; 3)	Employees (n = 906)	1 year	SEM	• Organisational trust
71	Roelen (2013)	Nor	JS (JSI; 5)	Nurses (n = 1582)	1 year	Regression	• Sickness absence
72	Sacco (2022)	Swe	JS (Global; 1)	Senior employees (n = 2655)	9 years	Regression	• Self-rated health
73	Salin (2023)	Fin	WE (UWES; 5)	Psychologists (n = 213)	3 months	Regression	• High-performance work practices
74	Sejbaek (2013)	Den	OC (COPSOQ; 4)	Senior employees (n = 2444)	2 years	Regression	• Early retirement
75	Seppala (2020)	Fin	WE (UWES; 9)	General employees (n = 891)	1,5 years	SEM	• Job crafting
76	Seppälä (2015)	Fin	WE (UWES; 9)	Dentists (n = 1964)	7 years	SEM	• Job resources
77	Seppälä (2012)	Fin	WE (UWES; 9)	General employees (n = 120)	2 days (objective measure)	Regression	• Cardiac autonomic activity
78	Seppälä (2020)	Fin	WE (UWES; 9)	Managers (n = 329)	6 years	Multilevel	• Autonomy
79	Sewdas (2020)	Den	JS (Global; 1)	Senior employees (n = 1861)	4 years	Regression	• Voluntary retirement
80	Siltaloppi (2011)	Fin	WE (UWES; 9)	General employees (n = 274)	1 year	Person-centred	• Recovery experiences
81	Skaalvik (2020)	Nor	JS (Skaalvik & Skaalvik, 2017; 4)	Teachers (n = 262)	7 months	SEM	• Supervisory support
82	Solberg (2012)	Nor	JS (Warr et al., 1979; 10)	Physicians (n = 255)	5 years	Regression	• Job position change • Work-home stress
83	Sterud (2011)	Nor	JS (Sterud et al., 2011; 10)	Ambulance personnel (n = 298)	1 year	Regression	• Extroversion • Lack of leadership support
84	Strömgren (2016)	Swe	WE (SWEBO; 10) JS (COPSOQ-II; 6)	Healthcare employees (n = 477)	1 year	Regression	• Social capital
85	Sturges (2008)	Ice	OC (Meyer et al., 1993; 6)	General employees (n = 153)	1 year	Regression	• Intention to quit
86	Søbstad (2021)	Nor	JS (JSI; 5)	Nurses (n = 1147)	3 years	Regression	• Turnover intention

Reference	First author (year)	Country	Positive state (measure; items)	Sample characteristics	Approximate follow-up time	Primary analysis type	Related concepts
87	Thorsen (2016)	Den	JS (Global; 1)	Senior employees (n = 1876)	4 years	Regression	• Early retirement
88	Tuomi (2004)	Fin	OC (Porter et al., 1974; 4)	Metal industry workers (n = 1389)	2 years	Variance	• Development opportunities • Promotion of well-being • Supervisory support
89	Upadyaya (2020)	Fin	WE (UWES; 9)	General employees (n = 766)	1 year	Person-centred	• Servant leadership • Resilience • Self-efficacy
90	Vander Elst (2014)	Swe	OC (ACS; 3)	White-collar employees (n = 722)	1 year	SEM	• Job control
91	Virtanen (2003)	Fin	JS (JDS; 14)	Healthcare employees (n = 4851)	4 years	Regression	• Changes in employment

Risk of bias for RCT reports

Y = Yes, N = No, U = Unclear, N/A = Not applicable

Reference	First author and year	Was true randomisation used for the assignment of participants to treatment groups?	Was allocation to treatment groups concealed?	Were treatment groups similar at the baseline?	Were participants blind to treatment assignment?	Were those delivering the treatment blind to treatment assignment?	Were treatment groups treated identically other than the intervention of interest?	Were outcome assessors blind to treatment assignment?	Were outcomes measured in the same way for treatment groups?	Were outcomes measured in a reliable way?	Was follow-up complete and if not, were differences between groups in terms of their follow-up adequately described and analysed?	Was appropriate statistical analysis used?
200	An (2020)	Y	U	Y	Y	N/A	Y	N/A	Y	Y	Y	Y
201	Barene (2023)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
202	de Bloom (2017)	Y	U	Y	U	N/A	Y	N/A	Y	Y	Y	Y
203	Forset-lund (2003)	Y	Y	N	Y	N/A	U	N/A	Y	U	U	Y
204	Klatt (2017)	Y	Y	Y	N	N/A	Y	N/A	Y	Y	Y	Y
205	Pryce (2006)	Y	U	U	U	N/A	U	N/A	Y	Y	Y	Y

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