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REVIEW

Exploring the Arena of Work Disability Prevention Model for Stay at Work Factors Among Industrial Workers: A Scoping Review

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Abstract

Objective The aging workforce influences employability and health of the working population, with new challenges emerging. The focus has shifted from return to work only, to enhancing ability to stay at work. It is unclear whether factors that influence return to work (RTW) also apply to preserving health and helping workers stay at work (SAW). Study objectives were to identify factors contributing to SAW among industrial workers and map identified factors to the Arena of Work Disability Prevention model (WDP-Arena, a commonly used RTW model) to identify agreements and differences.

Methods Scoping review; eight databases were searched between January 2005-January 2020. Manuscripts with SAW as outcome were included; manuscripts with (early) retirement as outcome were excluded. Factors contributing to SAW were mapped against the components of the WDP-Arena.

Results Thirteen manuscripts were included. Most results aligned with the WDP-Arena. These were most often related to the Workplace and Personal system. Compared to RTW, in industrial workers fewer factors related to the Legislative and Insurance system or Health Care system were relevant for SAW. Societal/cultural/political context was not studied. Multidimensional factors (workability, vitality at work, balanced workstyle, general health, dietary habits) were related to SAW but did not align with components in the WDP-Arena.

Conclusion Most factors that determine SAW in industrial workers could be mapped onto the WDP- Arena model. However, new influencing factors were found that could not be mapped because they are multidimensional. The life-course perspective in SAW is more evident than in RTW. Many elements of the Legislative and Insurance system and the Health Care system have not been studied.

Keywords Aging · Workforce · Prevention · Industrial · Occupational health · Well-being

Extended author information available on the last page of the article

Introduction

Work is increasingly regarded as valuable for sustaining health, even despite the presence of health conditions (Huber et al., 2011; van der Klink et al., 2016). Work provides income, relationships with colleagues, and self-esteem (Pincus et al., 2010; van der Klink et al., 2016). Hence, there are health and social benefits from staying at work. The focus of policymakers and occupational health professionals in western society is also expanding from prevention of sickness absence of workers to preserving and improving workers' health and employability (Sas & Suarez, 2014; Sluiter & Hulshof, 2013). The aging workforce and the financial costs of early pension and sick leave often require individuals to work until old age. In countries with a formal retirement age, retirement age has risen. With this expanding scope, knowledge about the processes and factors that are important for helping workers to stay at work (SAW) is necessary.

Staying at Work

SAW is a complex construct, which may be illustrated by the lack of a unique definition (Brouwer et al., 2012; Fleuren et al., 2016; Klink et al., 2011; Schaufeli & Bakker, 2013; Social-and-Economic-Counsil, 2009; van der Klink et al., 2016; van Vuuren et al., 2018; Williams et al., 2015). SAW has been referred to as (sustainable) employability, workability, vitality, functional capacity, employee performance appraisal, wellness (Brouwer et al., 2012; Klink et al., 2011; Social-and-Economic-Counsil, 2009) and more recently as a construct formed of nine complementary elements (perceived health status, need for recovery, fatigue, workability, job satisfaction, motivation to work, job performance, skill gap and perceived employability) (Fleuren, van Amelsvoort, Zijlstra, et al., 2018; Fleuren et al., 2016). There is agreement that SAW is not only a characteristic of an individual, but must be considered in interaction with their context (Brouwer et al., 2012; Fleuren et al., 2016; van der Klink et al., 2016).

With their capability approach, Klink et al. (van der Klink et al., 2016) stress the goal of making a valuable contribution through work, now and in the future, while safeguarding health and welfare. From a human resource perspective, three overarching dimensions of employability have been identified: capital, career development, and context (Williams et al., 2015). Although there is no consensus about the definition, all recognize the individual capabilities of the worker in their broader context, that different domains are involved in the concept of SAW, and that SAW is about the present and future work situation.

Time is a specific characteristic in the SAW construct. It is challenging to express and predict the future state of a worker at one point in time. This calls for a life course perspective, which examines how natural developments (e.g. biological, social) shape people's lives (Le Blanc et al., 2017; Pransky et al., 2016). These common processes are likely to influence a person's SAW (Fleuren, van Amelsvoort, de Grip, et al., 2018) and any required interventions (Le Blanc et al., 2017). For example, young, healthy, and competent employees may benefit from retaining their status through education or general lifestyle programs. However, the continuously changing context is another aspect to consider.

Arena of Work Disability Prevention Model

To further define and elucidate broader contextual factors in work disability prevention, the Arena of Work Disability Prevention (WDP Arena) was created (Loisel et al., 2001). It was originally developed to identify barriers and facilitators in the process of *returning-to-work* following an episode low back pain, and to understand complexity of the process (Fassier et al., 2015; Loisel et al., 2001; Tamminga et al., 2018). The WDP Arena has been an influential model that helped change the prevailing management paradigm 'from disease prevention and treatment, to disability prevention and management for the management of occupational back pain'(Loisel et al., 2001). It acknowledges return to work as a multifactorial issue that consists of four specific systems (workplace, personal, healthcare, and legislative and insurance) and 2 general systems (overall societal context and culture & politics) that are all important for return to work. The WDP Arena was initially developed for mainly industrial workers with disability due to low back pain (Loisel et al., 2001) then was later adapted for all musculoskeletal disorders (Loisel et al., 2005). It has also been applied to work disability and return to work in other diagnostic groups, such as cancer survivors and workers with occupational injuries in general (Szeto et al., 2011; Tamminga et al., 2018).

Since the WDP Arena was developed, a broader consideration of worker health has gained priority, with a shift from return to work following illness or injury towards SAW, including workers with chronic disorders and functional limitations. With the shifting paradigm from prevention and return to work, to SAW, the WDP Arena has also informed several studies focusing on sustainable employability and SAW (Ammendolia et al., 2016; de Vries et al., 2011; Hjartstrom et al., 2018; Lambeek et al., 2009; Maiwald et al., 2011). However, the aging workforce has influenced employability and health of the working population (Le Blanc et al., 2017; Pransky et al., 2016). Although it seems plausible that the systems and factors that influence RTW also apply to SAW situations, it is unknown whether the WDP Arena covers all aspects relevant to SAW. To our knowledge, no reviews have been conducted about the general contributing factors for SAW as compared to return to work.

Our aim was to apply factors and elements identified in the literature as supporting SAW to the WDP Arena (Brouwer et al., 2012; Fleuren et al., 2016; Klink et al., 2011; Schaufeli & Bakker, 2013; Social-and-Economic-Counsil, 2009; van der Klink et al., 2016; van Vuuren et al., 2018; Williams et al., 2015) to provide insight into the similarities and differences between RTW and SAW. Although SAW is important for all types of workers, we focused on an occupational population at high risk for musculoskeletal disorders through predominantly physical work, which was also the original target population for the WDP Arena. For more than twenty years musculoskeletal disorders have globally been ranked as the main reason for Years Lived with Disabilities and are also highly ranked in Disability Adjusted Life Years (GBD, 2020).

The objectives of this study were to: (1) identify the factors contributing to SAW among industrial workers; (2) map the identified factors to the WDP Arena to identify agreements and differences.

Methods

Design This study was a scoping review, which is a methodology for rigorously collecting, synthesizing, appraising and presenting broad findings from existing research on a topic (Gross et al., 2016; Levac et al., 2010). A scoping review was conducted because SAW is a concept without a widely agreed-upon definition and it involves a range of disciplines and perspectives (Brouwer et al., 2012; Fleuren et al., 2016; Klink et al., 2011; Schaufeli & Bakker, 2013; Social-and-Economic-Counsil, 2009; van der Klink et al., 2016; van Vuuren et al., 2018; Williams et al., 2015). A scoping review allowed us to case a wide net to examine the diverse SAW concept and explore all factors potentially influential for SAW. A systematic review was considered, but deemed inappropriate since there is no widely accepted definition of SAW and since we did not have a focused question answerable through systematic review methods. The 'mapping process', typical for a scoping review, was used to map the key concepts underpinning the research area against the WDP Arena and identify factors supporting SAW of industrial workers (Grant & Booth, 2009; Levac et al., 2010). This paper adhered to the PRISMA extension for scoping reviews (Tricco et al., 2018).

Five steps typical of scoping review methodology were followed: (1) identifying the research question; (2) identifying relevant studies; (3) study selection; (4) charting the data; and (5) collating, summarizing, and reporting the results (Levac et al., 2010). The sixth step, consultation, will be conducted subsequently in a follow-up study. The scoping process is not linear but iterative, requiring researchers to engage with each stage in a reflexive way and, where necessary, repeat steps to ensure that the literature is covered comprehensively (Levac et al., 2010). To enhance transparency, the changes made during the process are discussed in this Methods section. Unlike systematic reviews, scoping reviews can include a range of publications and study types and require an analytical interpretation and inventory of the literature (Gross et al., 2016; Levac et al., 2010; Peters et al., 2015).

Identifying the Research Question

In our study, we accounted for differences between the RTW and SAW outcomes. In general, RTW applies to workers with health conditions who are off work while SAW applies to all workers with or without health conditions. The WDP Arena was initially developed with a focus on return to work of workers with low back pain. For the current review, we focused on a population at risk for developing work disability due to low back pain and other musculoskeletal disorders: industrial blue-collar workers with or without health conditions.

The research questions and search terms were iteratively adapted and focused, as is common in scoping review methodology (Gross et al., 2016; Levac et al., 2010). We initially attempted to review literature on the general working population, however, after conducting an initial search we identified > 14,000 potentially relevant articles. Many manuscripts addressed return to work with or after health conditions (e.g., cancer) and the occupations studied were very diverse. After discussing these results with the research team, we decided to narrow our population from the general

working population to a healthy working population. We judged factors specific to specific health conditions were too narrow and detailed for this early phase of the research. We also narrowed to industrial workers with high risk for low back pain, as low back pain was the focus of the original WDP Arena. We focused on the industrial blue-collar population with well-identified risks for sickness and early retirement (Andersen et al., 2016; Peters et al., 2015; Robroek et al., 2013; Sewdas et al., 2020) as we were interested in extending these risks to factors that contribute to SAW. Additionally, industrial workers have a high risk for musculoskeletal disorders (Hulshof et al., 2019). Our final research questions were: (1) What factors have been demonstrated to support SAW in industrial workers; and (2) Do these factors align with the components of the WDP Arena?

Identifying Relevant Studies

A search for relevant studies was performed using electronic databases with the assistance of two experienced research librarians at the University of Groningen. The databases PubMed, Embase, CINAHL, Cochrane library, PsycINFO, Business Source Premier, Web of Science and SCOPUS were searched. The WDP Arena is based on literature and the most recent adapted version was presented in 2005. To identify changes since the WDP Arena was updated in 2005, our literature review started January 1, 2005 and we closed the search on January 14, 2020; the starting date of the analyses. We constructed the search in PubMed using four concepts (Population (industrial workers), Predictors/factors (any predictive variables or determinants), Outcome (employability), and Time (sustainability) (See appendix A). The string was adapted for the other databases. Keywords included terms referring to industrial workers, predictors, facilitators, barriers, models, synonyms for employability in combination with synonyms for SAW/sustainability. Relevant references from included studies were included if they matched the inclusion criteria or were deemed to contribute to an understanding of the factors.

Study Selection

While selecting studies, we iteratively refined the inclusion criteria consistent with the objective. The first change we made to the primary selection criteria was that studies with a focus on un-sustainable employment (early retirement, work disability, absenteeism, sickness, decreased workability, turnover) were included for full-text screening. Although a study's outcome measure may be un-sustainable employability, the aim or the results could be interpreted as a contribution to the SAW literature. In that case, the manuscript would be included. The second change made was that when the population was not specified other than the 'working population' in the title or abstract, the full-text manuscripts were searched for specific results related to the industrial, 'blue-collar' population or mainly physically straining industrial work. The third and final change was that we initially did not include cross-sectional studies because the time factor inherent to SAW is not included naturally in the cross-sectional design. However, in the title-abstract screening we identified potentially relevant cross-sectional studies with specific questions about factors that, according

to respondents, enable them to stay at work in the future. We, therefore, decided to screen these documents in full text.

Final Selection Criteria

Outcome Measure We included studies with a focus on factors influencing SAW (follow-up measurement > 1 year or qualitative questions aiming at SAW > 1 year) or sustainable RTW (time since start working > 1 year) for industrial blue-collar workers. The time aspect of SAW or RTW had to have been explicitly reported, ideally with the SAW outcome measured until legislative retirement age (where applicable) in the country of interest. Studies with disability retirement as an outcome were excluded.

Study Design Original, primary quantitative studies were included. To cover the time aspect, observational cohort and intervention studies with a follow up > 1 year were included. Cross-sectional survey studies and original primary qualitative studies were included when facilitators of SAW were a specific topic of interest (e.g., answering the question 'in your opinion, what will enable you to stay at work until retirement age?'). Reviews about influencing factors for SAW and manuscripts that present definitions, models, frameworks or schemes for SAW of industrial workers were included. Peer reviewed full text manuscripts of conference papers were included. Cross-sectional validation studies of instruments (e.g., the Work Ability Index) were excluded.

Population of Interest We included studies of industrial blue-collar workers, which were considered to be workers in primarily physically demanding occupations. More specifically, we included studies of workers, not being in a management or primarily supervising function, who are employed in industries in which products are manufactured, repaired, ornamented, finished, adapted, broken-up or demolished, distributed or in which materials are transformed (including construction workers).

Studies about (re-)entry into the industrial labor market, (e.g., students), were included if the criteria for SAW > 1 year was met. Studies on unpaid workers, children under 15 years of age, or uniquely migrant workers were excluded. Workers with unique emotional, physical and mental stressors in their work (e.g., military and veterans, health care workers) were excluded. Studies with results focused on mixed populations of white and blue collar workers were excluded.

General Criteria To identify changes since the adaptation of the WDP Arena to all musculoskeletal disorders in 2005, literature between 2005 and January 2020 was included. Manuscripts had to be written in English or Dutch.

Screening

The manuscripts were first screened based on title and abstract, according to the selection criteria. The full texts of potentially relevant manuscripts were then retrieved

and screened. The first three authors performed the screening process independently: 100% - first author, 50% - second and third author. After screening consensus was sought. In cases where no consensus could be reached, the last author screened as a third member and was therefore decisive for in- or exclusion.

Data Analyses: Charting the Data

After identifying relevant studies, the first author performed data extraction. Extraction was verified on 10% of the studies by the second or third author. Relevant information from the selected studies was extracted using an Excel spreadsheet. This spreadsheet included data for authors, year of publication, article title, discipline of the authors, geographic location of the study, brief description of the study, study sample, study design and goals, methods, how SAW was measured, key results, factors influencing SAW, interventions to improve SAW.

Data Analyses: Collating, Summarizing And Reporting the Results

How SAW was measured, important factors influencing SAW, study population and (if applicable) interventions to improve SAW were identified by critically reviewing the results of relevant studies. The factors were then mapped against the WDP Arena to identify where the factors fit into the WDP Arena, or whether the factors were not represented. The description of the WPD Arena (Loisel et al., 2005) was used during this process. The first author performed the initial mapping, then discussed this with all authors until consensus was achieved.

Results

The search resulted in 3,311 unique manuscripts and after all phases of screening, we included 13 relevant studies (see Fig. 1). After adding 10 potentially interesting manuscripts identified in personal collections of the authors to the main search, 3,140 records were excluded based on title and/or abstract. Of the 181 potentially relevant titles, there were several reasons for exclusion and often individual manuscripts had multiple exclusion criteria. However, we asked reviewers to only identify one reason for exclusion. Four of these titles were abstracts in conference proceedings with insufficient information for inclusion and no follow-up full manuscripts could be found. For nine titles, no full text manuscript could be found online, in the library, or after emailing the authors. Next, we excluded for design criteria: follow-up time of the study (n=6), population cannot be identified (n=87), and outcome is other than SAW (for instance risk for leaving work) (n=62). The manuscripts from personal collections were all excluded in the final screening phase. Characteristics of the relevant studies are presented in Table 1 and summarized in the text below. The purposeful results for the aim of this scoping review are presented in Table 2 and described below.

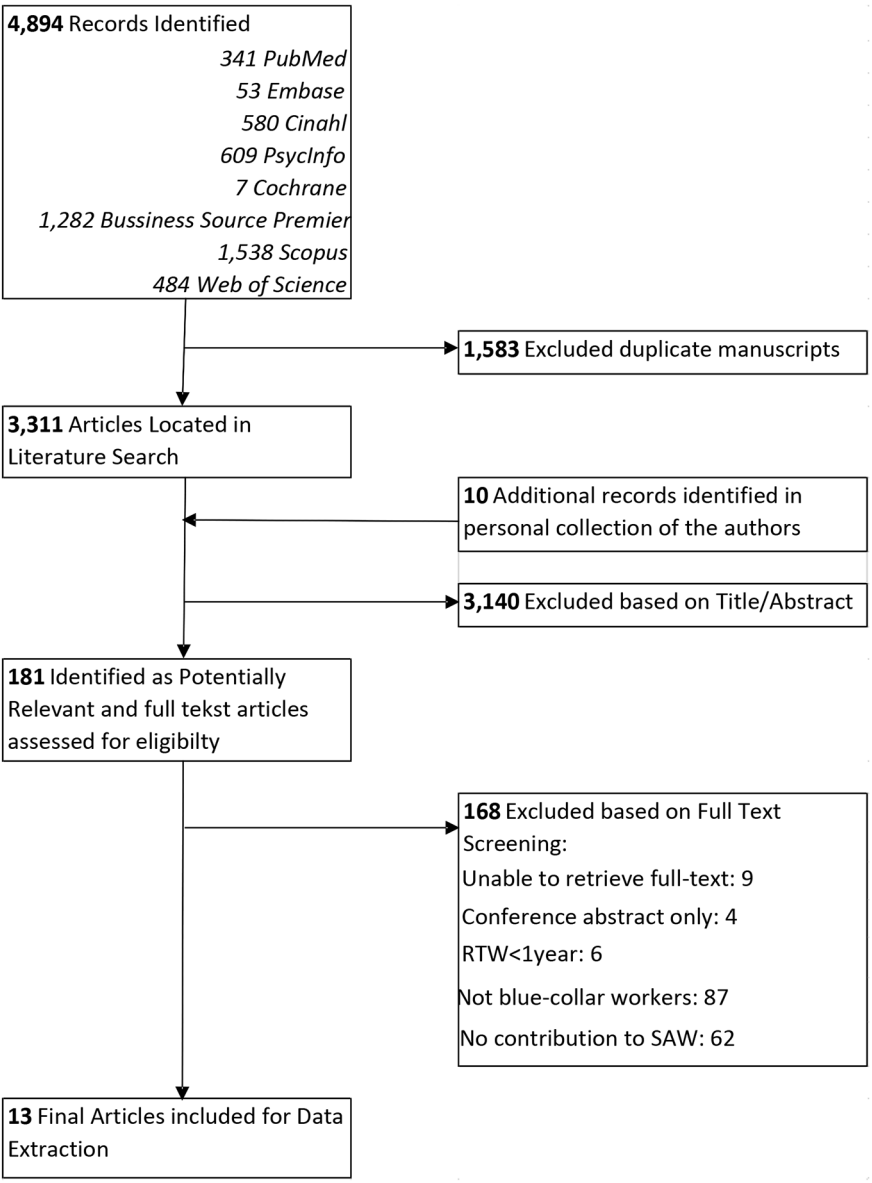

Fig. 1 Flowchart of the study selection process. For some manuscripts more reasons for exclusion could have been provided and only one is presented

General Description of the Studies

Eleven studies were conducted in Europe and two others in Asia. Most studies (n = 10) were published within the timeframe from 2014 to 2018, the other two studies were published between 2005 and 2014. (Table 1). Four studies were observational pro-

spective cohort studies with a follow-up period between 2.3 and 5 years. Sample size varied from n=353 to n=9,530. Five studies had a cross sectional design, two of these were part of a mixed method methodology. One intervention study had a quasi-experimental design, and one cluster randomized trial was combined with an economic evaluation. In one study interviews were conducted in combination with a critical literature review.

A variety of industrial occupations (Table 2) was observed, although construction workers dominated (n=7) (Eaves et al., 2014; Jebens et al., 2014; Oude Hengel et al., 2012; Oude Hengel et al., 2014; Roelen et al., 2014; Tonnon et al., 2018; Tonnon et al., 2017). Four other studies explicitly described the industry: automotive workers (Debroux, 2016; Rose, 2006), technical and maintenance job workers in a steel manufacturing process (van de Ven et al., 2014), blue collar workers at a dairy company(van Scheppingen et al., 2015), and manufacturing companies (Debroux, 2016). One study described blue-collar workers in general terms only (Yamazaki et al., 2007). Two studies described the employer perspective (Debroux, 2016; Tonnon et al., 2017), all others the employee perspective. Table 1 displays more details about the characteristics of included studies.

Operationalization of SAW

SAW was operationalized differently among the studies (Table 2), but we classified them into four main groups. First, there were five studies that defined SAW explicitly as either the preservation of health and wellbeing at work (Eaves et al., 2014; Tonnon et al., 2018), retaining older workers (Debroux, 2016), making a valuable contribution through work now and in the future while safeguarding health and welfare (Tonnon et al., 2017), or the participant's own expectation to continue work over the next 5–10 years when taking health into consideration (van Scheppingen et al., 2015). Second, workability was used as an operationalization measure for SAW two times, using the Work Ability Index (WAI) (Oude Hengel et al., 2014; Sell et al., 2015). Third, work-status was identified as an operationalization for SAW: being at work after five years despite risk for cardiovascular health risks (Rose, 2006), reduced absenteeism (Oude Hengel et al., 2014), demands on working conditions in order to stay employed until 67 years of age (Jebens et al., 2014), ability and/or willingness to continue working until age 65 (Oude Hengel et al., 2012). Fourth, some operationalizations could not be grouped: vitality of workers after four years (Yamazaki et al., 2007), and reducing risks for un-sustainable employability (van de Ven et al., 2014).

Mapping into the WDP Arena

Results of charting the data into factors to improve SAW are presented in Table 2. These factors are mapped into the components of the WDP Arena in Fig. 2, where the studies are allocated according to the components of the WDP Arena. When making decisions regarding where the factors mapped onto the WDP Arena, we compared results to the descriptions of the components in the original WDP manuscripts (Loisel et al., 2005; Loisel et al., 2001). The results for SAW are described per sys-

tem, followed by the factors that could not be allocated specifically because they were multidimensional.

The Workplace system was the most addressed (21 factors in seven studies) of the WDP Arena systems and is described in the following text. For job position, factors contributing to SAW included decreasing overtime work and increasing sedentary work (Yamazaki et al., 2007), accommodating the work environment to be less physically demanding (Tonnon et al., 2017), and lower work pace (Eaves et al., 2014). One study specified for shift workers that lower psychological job demands but also a higher functional level (more managerial and less operational tasks) contribute to SAW (van de Ven et al., 2014). More autonomy contributes to the intention to stay for workers in the dairy industry (van Scheppingen et al., 2015). For workers with health conditions and aging workers, accommodated tasks (i.e., less physical demanding), accommodated workplaces (with less risk for the development of musculoskeletal pain), specific equipment and facilities, adjusting working time standards, providing training, and developing skills to adapt to the changing technological and market environment contribute to SAW (Debroux, 2016; Eaves et al., 2014; Jebens et al., 2014). Oude Hengel et al. (2012) also suggest that physical job demands and psychosocial job characteristics play a role in ability and willingness to continue working, but their study actually shows that willingness and ability decrease with worse circumstances instead of presenting factors that contribute to SAW. Therefore these results are not provided in Fig. 2. On the department and/or organization level, factors that contribute to SAW include direct communication and addressing expectations of both workers and their supervisors/employers (Eaves et al., 2014) as well as a management style with emphasis on health and safety (Eaves et al., 2014).

Compared with older workers, younger workers rated their psychosocial work environment as important in one study (Jebens et al., 2014). On the organization level, we also found that smaller companies (Eaves et al., 2014), promotion of skills and abilities (Debroux, 2016), company culture and vision (Tonnon et al., 2017), economic factors (Tonnon et al., 2017), and organizational measures for alternative jobs (Tonnon et al., 2017) influence SAW. A better economic health of a company is an external-related factor that influences the possibility of implementing SAW interventions (Tonnon et al., 2017).

The Personal system of the WDP Arena was addressed on all levels (five factors; n=4 studies). For the physical elements, lower ratings of musculoskeletal pain in shift workers was positively associated with SAW (van de Ven et al., 2014). Cognitive factors identified as influencing SAW included more personal development (Tonnon et al., 2017) and skill development (Debroux, 2016). For the Affective elements, higher job satisfaction was found as a contribution to SAW for day workers but not for shift workers (van de Ven et al., 2014). In the Social domain, social support was found to be protective of social well-being at work (Rose, 2006).

The Legislative and Insurance system was addressed with 2 factors in n=2 studies. Regulatory policies and laws at the country level and regulatory policies on the company level were addressed as influencing SAW for industrial workers (Debroux, 2016; Tonnon et al., 2017) emphasized that stimulating external rules and regulation (for instance for certificates with clients) can improve SAW policy of employers.

Table 1 Description of study characteristics

Author	Year	Title	Location	Study population	Study design	Study goals	Outcome measures used	Determinants of the study
Debroux et al.	2016	Elderly workers in Japan: The need for a new deal.	Japan	Elderly workers in Japan; 2 out of 5 interviews with line managers of manufacturing companies.*	Mixed methods: narrative literature review and interviews.	Highlight main explicative factors of the peculiarities in terms of how elderly workers continue to be employed in Japan, from an Human Resource Management perspective	The survey focused on: a) current situation of elderly employment (employee and work characteristics, selection process, key issues); b)envisioned changes in policies and practices; c) issues that come to the fore to implement changes; d) development of policies and practices to cope with the issues.	NA
Eaves et al.	2014	Construction workers' views on workplace design and "healthy" aging.	United Kingdom	n=74 construction workers of a small, a medium and a large company.	Mixed methods: qualitative study with in-depth semi structured interviews and quantitative cross sectional survey study.	Exploratory study to investigate construction workers' views of the design of their workplace and health and well-being at work.	Interviews topic list demographics, current job, ideas and current changes to make the workplace safer and easier. Survey: Nordic Musculo-SKeletal Questionnaire for period and point prevalence of musculoskeletal symptoms and the relation with work and the Workability Index,	NA

Table 1 (continued)

Author	Year	Title	Location	Study population	Study design	Study goals	Outcome measures used	Determinants of the study
Jebens et al.	2014	Association between perceived present working conditions and demands versus attitude to early retirement among construction workers.	Norway	n=87 employees of one medium sized construction company.	Cross-sectional survey study,	Compare construction workers present self-reported working conditions with perception of future demands at work to avoid early retirement among different age groups.	Present Psychosocial factors (General Nordic Questionnaire for Psychosocial and Social Factors at Work, shorter version), Mechanical exposure Index (MEI), Physical workload (questionnaire), Health (general questionnaire about health complaints last four weeks), Workability Index (WAI), Demands on future working conditions (questionnaire),	Demographics, work-related (Working overtime, physical job demands, job content and emotional job demands) and health related factors (emotional exhaustion, musculoskeletal symptoms).
Oude Hengel et al.	2012	Do construction companies need to match employees' expectations?	Netherlands	n=5,610 male construction workers.	Cross-sectional survey study.	Explore the associations of demographic, work-related and health-related factors with the ability and willingness to continue working until the age of 65 years in construction workers.	Rating of workability on a 1–10 scale. Productivity for the past month on a 1–10 scale.	Nordic Musculo-Skeletal Questionnaire for musculoskeletal symptoms, work-related factors, Workability Index (2 items) and productivity were measured.

Table 1 (continued)

Author	Year	Title	Location	Study population	Study design	Study goals	Outcome measures used	Determinants of the study
Oude Hengel et al.	2014	Prevention program at construction worksites aimed at improving health and work ability is cost-saving to the employer: Results from an RCT.	Netherlands	n=171 in the intervention group and n=122 in the control group -construction workers of departments of six construction companies.	Economic evaluation and cluster-randomized controlled trial.	Evaluate both the cost-effectiveness and financial return on an intervention program in the construction industry versus usual practice.	Work ability: workability index (first 3 questions), Physical and mental health: Short Form health survey (SF-12), prevalence of musculoskeletal symptoms: Dutch Musculoskeletal Questionnaire. Sick leave data.	6-Month intervention: 2 physical training session by a physical therapist, a rest-break tool for awareness and 2 empowerment training sessions.
Roelen et al.	2014	Work Ability Index as tool to identify workers at risk of premature work exit.	Netherlands	n=9,630 male construction company workers.	Prospective cohort study (2.3 years).	Investigate the discriminative ability of the WAI to assess its usefulness as tool for identifying workers in different age groups at risk of different types of premature work exit.	Work status: employed, unemployed, disability pension, retired.	Workability: Workability Index score - poor, moderate, good and excellent workability.

Table 1 (continued)

Author	Year	Title	Location	Study population	Study design	Study goals	Outcome measures used	Determinants of the study
Rose et al.	2006	Work-related life events, psychological well-being and cardiovascular risk factors in male, Swedish automotive workers.	Sweden	Caucasian automotive workers (men)n=353.	Longitudinal study with 5 year follow up questionnaires and biometry measures.	Analyze the relationship between life events, social support, psychosocial wellbeing and cardiovascular risk factors in blue- and white-collar Swedish automotive workers.	For multivariate linear regressions: the seven variables of the Psychological Well-Being Index (anxiety, depression, positive well-being, self-control, general health, vitality). For multivariate logistic regressions: cardiovascular diseases risk factors (Body Mass Index, hip-to-waist ratio, cholesterol level).	For multivariate linear and the multivariate logistic regressions: the four life event variables. Each model was adjusted for age, work type, and three baseline psychological variables. Demographic and work characteristics were entered if they improved the model significantly. Only significant interactions were entered.
Scheppingen et al.	2015	Vitality at work and its associations with lifestyle, self-determination, organizational culture, and with employees' performance and sustainable employability.	Netherlands	n=629 employees of a dairy company.	Cross-sectional survey study.	(a) The association between lifestyle, basic psychological needs for self-determination, organizational-cultural factors and vitality at work, and (b) the associations between these factors, vitality at work, and perceived effective personal functioning and sustainable employability among employees.	Stay at Work measures that were offered by employers and used by employees. Qualitative study: barriers and facilitators for implementation of Stay at Work measures.	NA

Table 1 (continued)

Author	Year	Title	Location	Study population	Study design	Study goals	Outcome measures used	Determinants of the study
Sell et al.	2016	The effect on work ability of a tailored ergonomic learning program	Denmark	n=249 employees at an industrial worksite	Intervention study with quasi-experimental design (2.5 years),	The paper evaluates the effectiveness of an ergonomic learning program focused on the development of low strain working techniques. The program was evaluated in regard to its capacity to improve and sustain the work ability of industrial workers with high physical work demands,	Rating of workability on a 1–10 scale. Productivity for the past month on a 1–10 scale.	Nordic Musculo-Skeletal Questionnaire for musculoskeletal symptoms, work-related factors, Workability Index (2 items) and productivity were measured.
Tonnon et al.	2017	The Employer Perspective on Sustainable Employability in the Construction Industry	Netherlands	Survey: n=499 employers familiar with the human resources policy of their company working in the construction industry. Interviews: n=17 employers in construction industry	Mixed method: cross sectional survey and interviews.	To determine the measures employers in the construction industry take to promote sustainable employability, the barriers and facilitators that influence implementation and employer needs.	The interviews aimed to retrieve information about the measures employers take to promote sustained employability and the barriers and facilitators that influences implementation.	NA

Table 1 (continued)

Author	Year	Title	Location	Study population	Study design	Study goals	Outcome measures used	Determinants of the study
Tonnon et al.	2018	Strategies of employees in the construction industry to increase their sustainable employability	Netherlands	Survey: n=1,610; n=731 blue collar workers and n=879 white collar workers. Focus-groups: 16 blue collar and 17 white collar workers.*	Mixed methods: cross sectional survey study and focus-group study	investigate to what extent employees in the construction industry use sustained employability measures offered by their employer, which strategies they apply to increase their sustained employability, and which barriers and facilitators influence the implementation of these strategies.	Stay at Work measures that were offered by employers and used by employees. Qualitative study: barriers and facilitators for implementation of Stay at Work measures.	NA

Table 1 (continued)

Author	Year	Title	Location	Study population	Study design	Study goals	Outcome measures used	Determinants of the study
Van de Ven et al.	2014	Individual and work-related predictors of work outcomes related to sustainable employment among male shift and day workers	Netherlands	n=5,640 male workers at a steel manufacturing, processing and distribution company.	Dynamic prospective cohort study (4 year follow-up),	To examine which individual and work-related characteristics predict work outcomes related to sustainable employment among male shift and day workers.	Sustainable Employment, operationalized by:(i) temporarily being placed in less strenuous work (context, employer facilities), (ii) sickness absence of ≥6 weeks (Dutch legislation) or (iii) leaving the organization.	Individual and work related characteristics.

Table 1 (continued)

Author	Year	Title	Location	Study population	Study design	Study goals	Outcome measures used	Determinants of the study
Yamazaki et al.	2007	Lifestyle and work predictors of fatigue in Japanese manufacturing workers	Japan	n=2,875 blue-collar or manual male and female workers from 10 Japanese workplaces included in the longitudinal High-risk and Population Strategy for Occupational Health Promotion (HIPOP-OHP) study.	Prospective observational study (4 year follow-up with questionnaires),	To study the association between changes in lifestyle and fatigue among employees. *(fatigue is operationalized as vitality)*,	Vitality domain score on the SF-36 at 4 year follow-up	4-year changes in lifestyle (for example, with respect to change in smoking status, the three groups were as follows: no change, cessation and new smoker) and vitality domain score at follow up, adjusted for age, sex, workplace, body mass index, number of times a physician was consulted in the preceding year, number of days absent from work in the preceding year, lifestyle in the baseline survey and vitality domain score in the baseline survey.

**In case of a mixed population only results for blue collar workers are presented*

Table 2 Outcomes of interest in the included studies

Author	Blue collar workers	Measure of Staying at Work (Quantitative design)/ Definition of Staying at Work (Qualitative design)	Relevant factors of Staying at Work in relation to the Arena of Work Disability Prevention
Debroux et al. (2016)	Workers at a manufacturing company (automotive parts and components, machine tools).	To keep elderly people at work in acceptable social and economic conditions.	Regulatory policies (public and company) can support implementation of Stay at Work measures. For workers with health conditions and aging workers, accommodated tasks (less physical demanding) or accommodated workplace (with less risk for the development of musculoskeletal pain) or specific equipment and facilities, adjusting working time standards, providing training and developing skills to adapt to the changing technological and market environment contribute to Stay at Work. Promotion of skills and abilities by the organization to support Stay at Work of employees.
Eaves et al., (2014)	Construction workers whose work included heavy lifting, twisting, turning and being in awkward and cramped positions for long periods of time.	Preservation of health and well-being at work to enable healthy ageing.	Lower work pace, management style with emphasis on health and safety (which in this study was better in smaller companies), adjusted tasks when aging or when confronted with illness (e.g. less physical demanding tasks in people with diabetes), direct communication and addressing expectations of both workers and their supervisors.
Jebens et al., (2014)	Construction workers, 55% carpenters, 33% concrete workers, bricklayers or painters.	The question about demands on future working conditions in order to stay employed until the age of 67.	All workers, irrespective of age group rated good (self-reported) health and not being exhausted as the most important factors for staying in employment until the normal age of retirement. A reduction in physical demands in future work was rated as being important for continuing working, particularly in those experiencing high mechanical exposure and reduced score on the Workability Index. Younger people rated psychosocial work environment as important.
Oude Hengel et al. (2012)	Construction workers: painters, plumbers, welders, fitters, electricians, assemblers, repairmen, mechanics, bricklayers, carpenters, and other.	Ability and willingness to continue working until the age of 65 was asked with two questions: 'Do you think you are able to continue working in your current profession until the age of 65?' and 'Would you like to work until the age of 65'. The answer 'Yes' was classified as able/willing to continue working; the answers 'No' and 'do not know' were classified as not able/willing.	Only indirect evidence was found for physical job demands, psychosocial job characteristics, absence of musculoskeletal complaints and emotional exhaustion to contribute to ability and willingness to stay at work: odds ratios were calculated compared to hypothetical preferable situations. The explained variances were low.

Table 2 (continued)

Author	Blue collar workers	Measure of Staying at Work (Quantitative design)/ Definition of Staying at Work (Qualitative design)	Relevant factors of Staying at Work in relation to the Arena of Work Disability Prevention
Oude Hengel et al., (2014)	Construction workers of six construction companies.	Workability, measured with two concepts measured by the Workability Index)1) current workability and 2) physical and mental workability in relation to job demands) after 1 year and reduction in sickness absenteeism costs (sickness absenteeism hours multiplied by hourly labor costs).	An intervention by a physical therapist was cost-saving to the employer due to reduced sickness absenteeism costs in the intervention group compared with the control group. However, the intervention cannot be regarded as cost-effective as no significant effects were found for work ability and health.
Roelen et al., (2014)	Male construction company workers with physically demanding work (62%).	Work status after an average of 2.3 years: being employed, as compared to being unemployed, disability pension or retired.	The Workability Index predicted male construction workers who were at risk of future disability pension (2.3 years), but not those at risk of unemployment or early retirement as compared to staying employed. This relation decreased with ageing.
Rose et al. (2006)	Automotive workers who reported themselves as manual workers.	Workers still at work after 5 years and a decrease or continuation of their health risk for cardio vascular diseases and increase in Score in Psychological well-being Index (Index with six subscales: anxiety, depression, positive wellbeing, self-control, general health and vitality. High score is excellent well-being).	More social support and better employee health were found to be protective of psychological well-being.
Scheppingen et al., (2015)	Blue collar workers at a dairy company (personal communication with lead author).	Single question item: 'Taken into consideration your health, do you expect that you are still able to do this work the following five-ten years?'. The answer 'yes', as compared to 'no' or 'maybe' identifies the intention to stay at work.	More autonomy, more balanced workstyle and more vitality contribute to intention to Stay at Work. Lifestyle factors, basic psychological needs for self-determination and organizational-cultural factors made a significant contribution to vitality.
Sell et al. (2016)	Employees at an industrial worksite, except workers from the administrative unit (who were excluded).	Workability, measured with two concepts from the Workability Index (1)current workability and 2) physical workability in relation to job demands).	Ergonomic learning program does not contribute to Stay at Work.

Table 2 (continued)

Author	Blue collar workers	Measure of Staying at Work (Quantitative design)/ Definition of Staying at Work (Qualitative design)	Relevant factors of Staying at Work in relation to the Arena of Work Disability Prevention
Tonnon et al., (2017)	Construction workers.	Sustainable employability, which is defined as making a valuable contribution through one's work, while acquiring capabilities and safeguarding one's health and welfare (van der Klink et al.).	Accommodating the work environment to be less physically demanding will contribute to Stay at Work. Employers use means to stimulate proactive employee behavior to support Sustainable Employability (work environment (95%), employee health (79%), personal development (63%), and organization (65%)). Reduction of sickness absence can be an economic stimulus to invest in Sustainable Employability measures, stimulating rules and regulations can improve Stay at Work policy, a more supportive company culture and vision and time/manpower/expertise create possibilities for implementation of measures. Measures should not interfere with efficiency demands of company clients and including Sustainable Employability in certificates with clients was seen as the most powerful driver for implementation of Sustainable Employability measures.
Tonnon et al., (2018)	Survey: mechanics, plumbers, etc. Focus group: mechanic, plumber, painter, foreman, stock clerk.	Stay at Work is measured as Sustained Employability, which is defined as a worker's ability to make a valuable contribution through his work, while acquiring capabilities and preserving his health and welfare throughout his working life.	Giving worker insight into job prospects in and outside their current company, integrating equipment utilization into daily routines, improving the collaboration between blue and white collar workers contributes to Stay at Work.
Van de Ven et al., (2014)	Shift and day workers in technical and maintenance jobs at a steel manufacturing, processing and distribution company (office workers were excluded).	Reduced risk for (i) temporarily being placed in less strenuous work, (ii) sickness absence≥6 weeks, and (iii) leaving the organization.	A higher functional level (defined as more management tasks and less operational tasks)(i, ii), lower scores on musculoskeletal pain and stiffness (iii) and lower scores on psychological job demands (iii) reduced risk for shift workers. Higher scores on job satisfaction (ii, iii) reduced risk for day workers.
Yamazaki et al., (2007)	Blue collar and manual workers from 10 companies. (Workplaces with mainly white collar workers were excluded)	Vitality domain of the SF-36 after working 4 years.	Decrease of overtime work, increase of sedentary work and decrease of eating between meals contribute to Stay at Work.

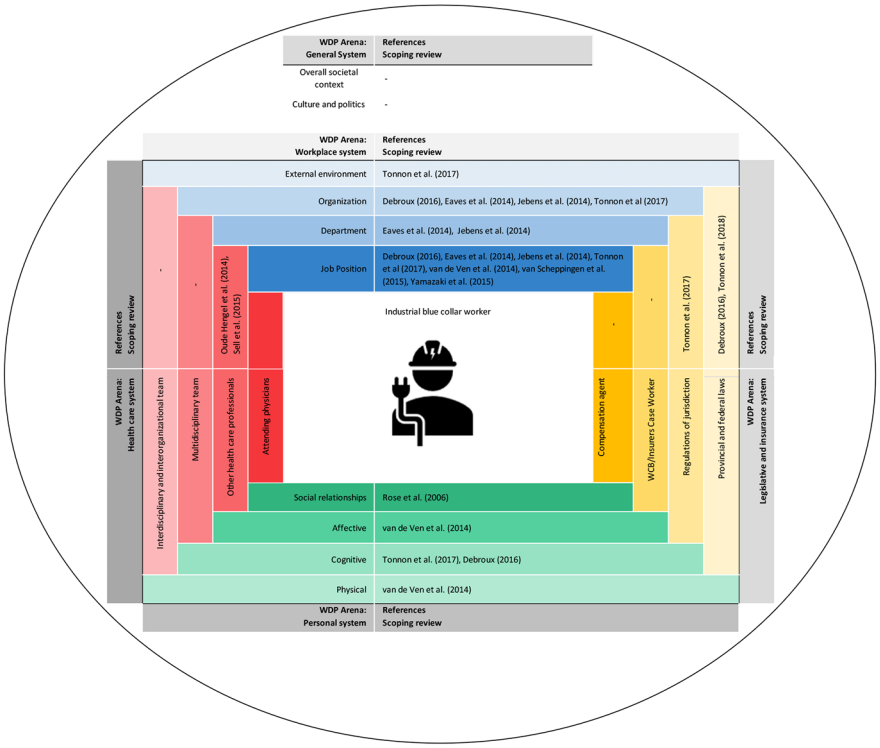

Fig. 2 Mapping of the scoping review results to the WDP Arena. The left or lower columns show the components of the WDP Arena and the right or upper columns show the references for included studies examining these components. The blue-collar industrial worker is in the center of the WDP Arena. The general factors of SAW are around the WDP Arena.

Workers' Compensation/Insurers' Case Workers and Compensation Agents were not addressed as important factors for SAW in the studies identified.

The Health Care system was addressed with one factor by n = 2 studies. Absenteeism was reduced after implementing activities of a physical therapist combined with a rest/break tool and empowerment training sessions (Oude Hengel et al., 2014). Sell et al. (2016) implemented an ergonomic learning program by a physiotherapist for workers with musculoskeletal complaints, which did not contribute to SAW expressed as WAI, but productivity increased (Sell et al., 2015). We allocated this to the WDP component 'other health care professionals'. These interventions however did not increase workability or health-related outcomes. The other Health Care system components (multidisciplinary team and interdisciplinary and interorganizational team) in the WDP Arena were not addressed.

Elements for the General System of the WDP Arena were described as the general circumstances where the study took place (national legislation, demographics) in the introduction section, but not as part of the study results (Debroux, 2016; Eaves et al., 2014; Oude Hengel et al., 2014; Roelen et al., 2014), which might be explained by the complexity of studying these overarching elements.

Table 3 Multifactorial factors that influence Stay at Work but could not be allocated within the WDP Arena

	Multifactorial results of the scoping review:
Personal factors	Decreasing eating between meals (Yamazaki et al., 2007) Better general employee health (Jebens et al., 2014; Rose, 2006; Tonnon et al., 2017) More vitality (as measured with Utrecht Work Engagement Scale) (van Scheppingen et al., 2015);
Work-related factors	Higher scores on the Work Ability Index (Alavinia et al., 2009; Roelen et al., 2014) More balanced workstyle (van Scheppingen et al., 2015)

There were also multidimensional factors that could not be mapped to specific components of the WDP Arena (Table 3). To map eating habits (Yamazaki et al., 2007), self-reported general health (Jebens et al., 2014) and vitality at work (van Scheppingen et al., 2015) we consulted the elaboration of the contextual factors of the International Classification for Functioning, Disability and Health (Heerkens et al., 2017), that classifies these as personal factors. But in the WDP Arena, these could not be aligned with a unique component because there are not only physical and mental components in dietary habits, self-reported general health, and vitality at work. These also depend on the work and private societal context of workers as well as their financial situation. Health measures (e.g. periodic medical exams) are also reported by employers as a measure to support sustained employability, implying they see general health as important to support SAW (Tonnon et al., 2017). One study used general biometry (e.g. blood pressure, cholesterol, BMI) to measure health (Rose, 2006) and found better health indicators were related to SAW. In one cross sectional study, the multidimensional concept 'a balanced workstyle' contributed to SAW (van Scheppingen et al., 2015). The balanced workstyle was measured with six items on use of breaks, physical complaints, making high demands on one's own performance at work and having energy after work. Workability as a construct was a predictor for SAW in two included studies (Alavinia et al., 2009; Roelen et al., 2014). Workability is created of elements from the Work system and the Personal system (Alavinia et al., 2009; Roelen et al., 2014).

Discussion

We identified 13 studies examining SAW among industrial blue-collar workers. We identified several factors that aligned with components of the WDP Arena, but also additional factors that did not. We also found that seven components of the WDP Arena were not studied. When comparing results of the included studies to the WDP Arena, we found that components of the Personal system and Workplace System were well represented and thus align well with SAW. Most identified factors mapped onto the Workplace system, especially at the organization and job position level. The empty spaces in Fig. 2 clearly show that two components of the Legislative and Insurance system (WCB/Insurance Case Worker and Compensation Agent) and three components of the Health Care system (Attending Physicians, Multidisciplinary Team and Interdisciplinary and Interorganizational Team) are not represented with

factors for SAW in the included studies. They were not found as barriers or insignificant factors either, they were simply not addressed in any studies. The absence of these Legislative and Insurance factors may reflect the inherent difficulty of studying these factors for promoting SAW in this specific context. SAW is often a long-term issue that might need resources allocated long before problems become evident. The two components of the General System (Overall Societal Context and Culture and Politics) were not identified as factors for SAW, but were addressed as general circumstances for the studies. These factors are also extremely difficult to study due to the complexity of studying general circumstances. We identified multifactorial factors that could not be mapped to a unique WDP Arena component: dietary habits, general health, vitality, workability (WAI) and workstyle balance. This implies that some factors contributing to SAW of industrial blue-collar workers are distinctly different from RTW when the WDP Arena is used. Although the need for enhancing SAW of industrial blue-collar workers is globally recognized, the fact we identified only 13 studies highlights the need for more SAW research focused on all domains of the WDP Arena. Additional research is also needed on the factors identified that do not map to the WDP Arena. Perhaps an update or revision of the WDP Arena model is needed.

The challenge in defining SAW that we described in the introduction, was also illustrated by the differences in the way SAW was addressed in the selected studies (e.g., retaining older workers, preserving health and wellbeing, workability, vitality or work-status after some time). The changing paradigm from prevention of risks to enhancing of SAW is also reflected in many studies with promising titles that we excluded after full text screening, because they appeared to study factors for un-sustainable employability (Boot et al., 2016; Burdorf et al., 2005; de Jong et al., 2015; Leijten et al., 2015; Main & Shaw, 2016; Nielsen et al., 2018; Oakman et al., 2019; Robroek et al., 2013; Stattin & Jarvholm, 2005), such as decreased workability or disability retirement. To our knowledge, reducing a risk for leaving work early does not automatically implicate that SAW is enhanced (Chen & Gardiner, 2019; Fleuren, van Amelsvoort, Zijlstra, et al., 2018; Fleuren et al., 2020; van Scheppingen et al., 2015).

Interestingly, the only factor of the Healthcare system of the WPD Arena that was addressed for blue-collar industrial workers was ‘other Health professionals’. The other factors of the Healthcare system were not studied in relation to SAW of blue-collar workers. However, we did find health as a topic for SAW in three studies for a life-course perspective, namely that workers benefit from the possibilities of balancing their working conditions to their health conditions or other work limitations due to the aging process (Debroux, 2016; Eaves et al., 2014; Jebens et al., 2014). Apparently, the studies did not focus on managing the health conditions from the Healthcare system perspective. The typical aspect of SAW as compared to RTW is the life-course perspective in relation to health and managing this. For example, time and the life-course perspective have previously been discussed as an important aspect of SAW for health conditions with divergent prevalence across the lifespan (e.g., workers with cancer or mental disorders) (Pransky et al., 2016; Stapelfeldt et al., 2019). Another study that did not focus specifically on the industrial population also shows that workers with chronic health conditions that often come with aging, such

as arthritis or diabetes type II, can be in good health for considerable periods, but then experience debilitating symptoms for bouts of uncertain duration which requires good timing of introducing work accommodations (Gignac et al., 2018). The results were, however, limited to workers who were already at risk for reduced employability. Recently, results from the SeniorWorkingLIfe study acknowledged that barriers and facilitators for prolonging working life are different among workers with sedentary and physical demanding work (Andersen et al., 2020). It would be interesting to study how factors of the Healthcare system align with support of the industrial blue-collar workers who are confronted with life-course perspective challenges to SAW. It would also be interesting to compare this with RTW, because it might require more pro-active skills and because SAW might require a more dynamic modelling as compared to RTW due to inherent changes over time (Fleuren et al., 2020).

Strengths and Limitations

A strength of this study is that we consulted with two librarians to develop the complex search string. Another strength is that we searched for evidence in a broad field of interest, according to the presumed interests of stakeholders and professionals, by searching multiple databases from health care, business and psychology. We adapted our screening process to also study full-text manuscripts about un-sustainable employability in-depth to search for articles about enhancing SAW in an effort to have more meaningful results. However, this did not result in more included studies.

A limitation of our study was that we focused on one occupational subgroup instead of a general population. This was necessary because including all occupations and possible health conditions would have resulted in an unwieldy number of relevant citations. We expected more studies to be identified because industrial blue-collar workers are a well-studied population for RTW and for risks of leaving work. We did not track in detail why studies were excluded (e.g., we excluded based on not being industrial blue-collar workers, but we did not register the other population that was studied). Because there were only 13 relevant studies identified, it would have been interesting to analyze in-depth why there were thousands of studies excluded. It could be relevant to study whether the evidence for elements that influence SAW is different for other occupational groups (e.g., health sector or white-collar workers). As a result of our choice, we missed important information from other working populations and chronically ill populations without specification of occupation (Gignac et al., 2018; Hursh et al., 2006; Leijten et al., 2014; Main & Shaw, 2016; Robroek et al., 2013; Stapelfeldt et al., 2019) that might apply to industrial workers as well.

Another limitation might be the languages that we excluded. It is possible that manuscripts addressing the Legislative and Insurance system in relation to SAW are published in the language of the country of interest, because of the specific context and situation. We would have missed these publications. However, in line with Chen et al. (2019) in their review about supporting older workers to SAW in a general population, the majority of our identified studies originate from Europe, especially the Netherlands. Chen et al. (2019) suggest that nation-wide policies to retain and support older workers are of specific scientific interest in Europe and the Netherlands. We included the Dutch language and manuscripts from personal archives of the

Dutch authors, who are specialists in the field. However, this did not result in more Dutch language inclusions. Despite the increasing interest for SAW, well-designed studies on the issue are still scarce.

Conclusion

This study provides an overview of factors that contribute to SAW of industrial workers, mapped to the WDP Arena. Because few relevant studies were identified, additional research is needed on factors influencing SAW of industrial workers. Most identified factors align with the WDP Arena, however, some multidimensional factors and the life-course perspective appear unique to SAW and could not be mapped onto the WDP Arena. Many elements of the Legislative and Insurance system and the Health Care system were not studied and require additional attention through high-quality research.

Appendix A

PubMed Search strategy.

1.Population	2.Predictors/factors	3.Outcome	4.Time
		Employability	**Sustainability**
(employe*[tiab] OR worker*[tiab] OR occupation*[tiab] OR workforce[tiab]) AND ((“Industry“[Mesh]) OR blue collar *[tiab] OR industr*[tiab] OR manufact*[tiab])	predict*[tiab] OR identif*[tiab] OR barrier*[tiab] OR facilitat*[tiab] OR indicat*[tiab] OR determinant*[tiab] OR motivator*[tiab] OR factor*[tiab] OR associat*[ti] OR influenc*[ti] OR relationship*[ti] OR related[ti] OR “Age Factors“[Mesh:NoExp] OR employment outcome*[tiab] OR job outcome*[tiab] OR model[ti] OR definition[ti]	“Employment”[MeSH] OR workability[tiab] OR work ability[tiab] OR employability[tiab] OR work participation*[tiab] OR labour market participat*[tiab] OR labour force participat*[tiab] OR working liv*[ti] OR working lif*[ti] OR work lif*[ti] OR work liv*[ti] OR work functioning[tiab] OR vitalit*[tiab] OR “return to work”[tiab]	Sustain*[tiab] OR life course[tiab] OR lifecourse[tiab] OR life span[tiab] OR lifespan[tiab] OR working liv*[tiab] OR working lif*[tiab] OR work life[tiab] OR stay at work[tiab] OR staying at work[tiab] OR maintain*[tiab] OR prolong*[tiab] OR retain*[tiab] OR intention to leave[tiab] OR turnover*[tiab] OR intention[ti] OR intend*[ti] OR (quit*[tiab] AND job*[tiab]) OR “Aging“[Mesh:NoExp] OR retir*[tiab] OR aging[ti] OR ageing[ti] OR recurrence[tiab] OR endurable[tiab] OR “work transition”[tiab] OR older worker*[tiab] OR bridge worker[tiab]

1.Population	2.Predictors/factors	3.Outcome	4.Time
66,026	10,424,297	104,946	2,077,724
#1 AND #2 AND #3 AND #4			509
Limited to 2005–2020 dd jan 14, 2020			341

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Author's contribution All authors contributed to the study conception and design. Marianne Six Dijkstra (MSD) performed the literature search with support of librarians; screening of manuscripts was performed by MSD (100%), Hendrik Bieleman (HB) (50%) and Remko Soer (RS) (50%); analysis was performed by MSD, HB and RS. The first draft of the manuscript was written by MSD and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Availability of data and material Results are filed in the Saxion Institutional Repository and can be provided on reasonable request. Availability of material is not applicable

Code Availability Search strings are filed in the Saxion Institutional Repository and can be provided on reasonable request.

Declarations

Conflict of interest The authors declare that they have no relevant financial or non-financial conflict of interest to the content of this article.

Ethical approval Not applicable.

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