

Implementing Workplace Health and Wellbeing Practices: A Systematic Review Focused on Psychological Wellbeing

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1 **Abstract**

2 Workplace health and wellbeing practices (WHWPs) often fail to improve psychological
3 health or wellbeing because of implementation failure. In this systematic review, we
4 identified critical success factors for WHWP implementation and gaps in the evidence. We
5 reviewed 74 separate studies that assessed the implementation of WHWPs and their effects on
6 psychological health or psychological wellbeing. Most studies were from advanced industrial
7 Western democracies (71). Intervention types included primary (i.e., work redesign {37
8 studies}, health behavior change {8 studies}), secondary (e.g. mindfulness training, 11
9 studies), tertiary (i.e., focused on rehabilitation, 9 studies) and multifocal (e.g. including
10 components of primary and secondary, 9 studies). Tangible changes preceded improvements
11 in health and wellbeing, indicating intervention success cannot be attributed to non-specific
12 factors. Some interventions had beneficial effects through mechanisms not planned as part of
13 the intervention. Three factors were associated with successful WHWP implementation:
14 continuation, learning, and effective governance. The review indicates future research could
15 focus on how organizations manage conflict between WHWP implementation and existing
16 organizational processes, and the dynamic nature of organizational contexts that affect and are
17 affected by WHWP implementation. This systematic review is registered [PROSPERO: the
18 International Prospective Register of Systematic Reviews ID: CRD42019119656;].

19

20 Keywords: Wellbeing; systematic review; workplace health and wellbeing practices;
21 organizing processes.

22

1 Workplace health and wellbeing practices (WHWPs) are classified (LaMontagne et al., 2007;
2 Richardson & Rothstein, 2008) according to whether their target is preventing ill-
3 health/poor wellbeing (primary prevention, e.g., work redesign, health promotion), providing
4 skills for healthy individuals to manage exposure to risk (secondary prevention, e.g.,
5 resilience training) or rehabilitation (tertiary intervention, e.g., talking therapies). Although
6 WHWPs can be effective (LaMontagne et al., 2007), implementation factors influence their
7 effectiveness (Egan et al., 2009).

8 Implementation is ‘the dynamic process of adapting the program to the context of
9 action while maintaining the intervention’s core principles’ (Herrera-Sánchez et al., 2017:4).
10 No systematic review has yet integrated research on WHWP implementation across all forms
11 of WHWP and related implementation to intervention outcomes. Prior systematic reviews
12 have focused on variables used in research (Havermans et al., 2016; Wierenga et al. 2013), on
13 specific kinds of WHWP (e.g., return to work interventions, Hoefsmith et al., 2012; see also
14 Moran et al., 2014; Murta et al., 2007; Rojatz et al., 2016), a specific implementation issue
15 (managers’ support for interventions, Passey et al., 2018), and the rigor of WHWP
16 intervention studies (Burgess et al., 2020). A scoping review focused on identifying gaps
17 between research and practice (Rasmussen et al., 2018).

18 Conceptual/narrative reviews of WHWP implementation have developed frameworks
19 to guide researchers or practitioners. In Table 1, we propose a typology of these frameworks.
20 We identified five types, which can be divided into frameworks to evaluate factors that
21 influence intervention effectiveness (implementation, appraisal, and realist frameworks) and
22 models of best practice (best practice models, a sub-set focused on regulatory compliance).
23 Implementation frameworks focus on providing guidance on implementation, what should go
24 into a successful intervention, and segmentation of interventions into planned phases.
25 Appraisal frameworks focus on the design of evaluation studies and include checklists of

1 factors that support intervention effectiveness. Realist evaluation, specifically Pawson's
2 notion of Context, Mechanisms and Outcome (CMO) configurations (Pawson & Manzano-
3 Santaella, 2012), represents a methodology for describing how complex interventions work
4 (Greenhalgh, 2014). Best practice and regulatory compliance models prescribe that WHWPs
5 should consist of planned stages of activities.

6 TABLE 1 HERE

7 A limitation in the literature is the lack of theoretical or conceptual bases for research
8 on WHWP implementation (Biron & Karanika-Murray, 2014, 2015; Burgess et al., 2020;
9 Martin et al., 2016; Nielsen, 2013). Without a comprehensive mapping of research on how
10 WHWP implementation affects WHWP outcomes, it is not possible to know the empirical
11 regularities that can provide a basis for theoretical development, unknowns requiring
12 empirical investigation, and ambiguities requiring theoretical resolution. The objectives of
13 this systematic review are to identify critical success factors for WHWP implementation and
14 gaps in the evidence. Doing so provides a platform for future theoretical development.

15 We reviewed studies that assessed components of psychological wellbeing (e.g.,
16 affective wellbeing, eudaimonic wellbeing, Waterman, 1993). The focus on psychological
17 wellbeing reflects that many WHWPs target and have benefits for psychological wellbeing
18 (LaMontage et al., 2007), and that improvements in physical health provide psychological
19 benefits (Steptoe et al., 2015). Focusing on psychological wellbeing enables inclusive and
20 comprehensive coverage of WHWPs, compared to focusing on interventions for specific
21 health conditions. Therefore, our review is focused on studies that report on the
22 implementation and effects on psychological wellbeing of the full range of WHWPs (primary,
23 secondary, tertiary), regardless of the intended focus of the intervention. We included
24 interventions focused on improving health and wellbeing directly (e.g., health promotion) or
25 indirectly through changes to the work environment (e.g., enhancing managerial skills).

1 **Methods**

2 The review protocol followed the Preferred Reporting Items for Systematic Review and Meta-
3 Analysis Protocols (PRISMA-P, Shamseer et al., 2015).

4 *Criteria for inclusion and exclusion*

5 The PICOS framework guided the development of search terms and inclusion/exclusion
6 criteria (population, intervention, comparison, outcomes and study design, Shamseer et al.,
7 2015, see protocol for search terms). Figure 1 shows the bibliographic databases searched.

8 *Population.* Studies of working adults or sick-listed workers, including employees and
9 the self-employed. We placed no restrictions on occupational sector or country.

10 *Intervention.* Factors involved in WHWP implementation. We took a broad approach,
11 including interventions that were primary focused on work redesign, primary focused on
12 health behavior, secondary, tertiary, or multifocal interventions combining features of other
13 intervention types.

14 *Comparison.* Studies assessing markers of psychological health and wellbeing,
15 enabling comparisons between interventions that improved indicators, those with no effects,
16 and those with adverse effects. Where studies used other health indicators, these were
17 considered (e.g., health behaviors).

18 *Outcomes.* Primary outcomes were factors influencing WHWP implementation.
19 Formal process evaluations and other studies were included that provided data, for example,
20 on how interventions were adapted and/or stakeholder actions involved implementing or
21 resisting the intervention. Studies that just reported on the effectiveness of an intervention
22 without considering its implementation were excluded. Secondary outcomes were changes in
23 psychological wellbeing indicators (as defined above). Studies needed to include both primary
24 and secondary outcomes.

Study design. Qualitative, quantitative and mixed methods studies with a longitudinal element were included (randomized control trial, non-equivalent control group design, pre-test/post-test only).

4 *Other.* Empirical studies published in peer-reviewed journals. We focused on peer-
5 reviewed research because there is a sufficient data within the peer-reviewed literature to
6 answer the research questions and peer-review provides assurance of quality and rigor. We
7 searched English language databases only, but did include articles published in other
8 languages. We included studies from 2009 onwards, because such studies tend to use more
9 rigorous methodologies and incorporate findings from previous research.

10 Study selection

11 Searches identified 18,011 titles. At least two independent reviewers coded the papers at
12 every stage. At initial title-sifting, a paper moved to abstract sifting if at least one reviewer
13 thought it met the inclusion criteria. Abstracts moved to full text screening and then to data
14 synthesis, if both reviewers thought the paper met the inclusion criteria. Disagreements were
15 resolved through discussion. Average agreement between reviewers exceeded 77% (Cohen's
16 kappa $\geq .30$) at each stage of sifting, figures that justify using two reviewers for each title, the
17 inclusive approach to sifting adopted, and resolving disagreements through discussion.
18 Seventy-four unique interventions were included in the review, represented in 86 separate
19 papers. Figure 1 summarizes the sifting process.

20

21 *Data extraction*
22 Prior to full sifting, we piloted and modified data extraction sheets. Two review team
23 members independently extracted data from each study to ensure comprehensive coverage of
24 relevant data. We undertook additional searches to find papers that contained data on

1 intervention effectiveness if such data were not included in the papers reviewed. We extracted
2 data from 31 additional sources, leading to a total of 117 papers that described the 74 studies.

3 *Synthesis*

4 We developed a coding frame from prior systematic reviews and frameworks that list factors
5 associated with facilitating or impeding the implementation of WHWPs (Table 1 and
6 Introduction provide exemplary citations). We refined the coding frame by reading the papers
7 included in the review and through interviews ($N=42$) with various organizational
8 stakeholders (occupational health and human resources practitioners, senior managers, front
9 line workers). We double-coded a random sample of 10 papers, and modified the coding
10 frame for consistent application prior to interpretation and synthesis. A random sample of a
11 further 10 papers were double-coded with the revised frame, revealing consistency in
12 classifying intervention type ($\kappa = 1$), effectiveness ($\kappa = 0.78$, 90% agreement),
13 making of changes ($\kappa = 1$), and coding of contextual features ($\kappa = .82$, 89%
14 agreement). Discrepancies were discussed, and the first coder's interpretation was deemed
15 credible. To further ensure robustness of data synthesis, all authors checked the synthesis of
16 the data and its interpretation across multiple iterations. Table 2 summarizes the coding
17 frame.

18 TABLE 2 HERE

19 First, data were coded according to intervention type following classifications used in
20 previous reviews (LaMontagne et al., 2007; Richardson & Rothstein, 2008). The
21 classifications were primary work redesign, primary health behavior, secondary, tertiary, and
22 a category for multifocal interventions that combined elements of other types of intervention
23 (e.g., primary work redesign and secondary). We classified intervention effectiveness
24 according the whether the intervention had any benefits (or not). Given the number of
25 variables collected in studies varied, we considered the minimal benefit to be a demonstrable

1 change in at least one health or wellbeing indicator, accompanied by no adverse effects. We
2 differentiated those interventions that had benefits for the entire sample from those
3 interventions where the benefits were contingent on another factor (i.e., moderation) or where
4 indirect effects were transmitted through intervention implementation (i.e., mediation) with
5 inconsistent, but no negative, effects across the sample. Ineffective interventions were
6 classified as those with null or adverse effects (including studies where there was one adverse
7 effect on health/wellbeing indicators, irrespective of other benefits).

8 Using the CMO framework for realist evaluation (Pawson & Manzano-Santaella,
9 2012), we coded data for factors related to changes leading to the activation of mechanisms
10 and a range of contextual features. We differentiated context according to whether it referred
11 to the omnibus context of factors in the wider organizational environment (e.g., prevailing
12 labor market conditions) or the discrete context of intervention implementation (i.e.,
13 contextual factors around the intervention, e.g., stakeholders' attitudes to WHWPs) (Johns,
14 2006).

15 We used Snape et al.'s (2019) quality rating scale, which integrates guidance on
16 research quality for quantitative (GRADE, Early Intervention Foundation) and qualitative
17 research (CERQual, CASP). Snape et al. recommend providing a strength of evidence rating
18 for each review finding, summarized as an evidence statement. Snape et al.'s four-point scale
19 ranges from: 'strong evidence', in which there is confidence a finding is robust; 'promising
20 evidence,' which suggests the finding is robust, but requires further investigation; 'initial
21 evidence,' where there is less confidence than for 'promising evidence' and further
22 investigation is required; and 'no evidence/evidence not yet strong enough for conclusions,'
23 where there is insufficient evidence to draw conclusions. We rated the strength of each
24 evidence statement by examining reviewers' judgements of the quality of the studies
25 underpinning each evidence summary and the consistency of the evidence underpinning each

1 evidence statement. Data extraction sheets contained information and a summary statement on
2 the quality of each study. Each strength of evidence grading was accompanied by an explicit
3 rationale. Evidence ratings were developed through consensus within the review team and
4 consultation with three external experts (see acknowledgements).

5 **Results and Discussion**

6 TABLE 3 HERE

7 Table 3 shows the studies reviewed. Numbers signify the studies in the tables because
8 multiple papers sometimes described the same study. The review included data from 16319
9 workers participating in interventions and 6685 workers in control groups. Forty-eight of the
10 74 studies were from Northern Europe, 23 from other advanced Western democracies (e.g.,
11 Canada), one from another advanced democracy (Korea), and one each from Turkey and
12 China. A range of sectors were included, including construction, manufacturing, and utilities.
13 Twenty-seven studies were conducted in health or social care organizations and 15 in public
14 service organizations (e.g., education).

15 Thirty-seven studies were evaluations of primary work redesign interventions (e.g.,
16 psychosocial risk assessment followed by team meetings to develop action plans, 2, Biron et
17 al., 2010); eight were evaluations of preventive health behavior change interventions (e.g.,
18 physical activity promotion through peer encouragement, information provision, subsidized
19 gym membership, and pedometer provision, 37, Edmunds et al., 2013); nine were evaluations
20 of multifocal interventions (e.g., psychosocial risk assessment, team-led changes to work
21 environments, leadership development, stress management training, and health information, 8,
22 Fridrich et al., 2016; Jenny et al., 2011, 2015); eleven were evaluations of secondary
23 interventions (e.g., mindfulness training, 12, Braganza et al., 2018); and nine were evaluations
24 of tertiary interventions (e.g., physician guided problem-solving to support return to work for
25 workers with minor mental health problems, 49, Arends et al., 2014ab).

1 The eight preventive health behavior change interventions were entirely or largely
2 focused on physical health (e.g., physical activity). All except nine of the remaining
3 interventions were focused on psychological wellbeing/health. Of these nine, five had a dual
4 focus on physical and psychological health (20, Lundmark et al., 2017; 21, Jensen, 2013; 63,
5 Mabry et al., 2018; Olson et al., 2016; 64, Lee et al., 2014; 66, Brisson et al., 2006; Oude
6 Hengel et al., 2011, 2013). The others focused on reducing muscular-skeletal problems or
7 ergonomic risk (62, Sorensen et al. 2011, 2016); safety (70, Tregaskis et al., 2013); and
8 sedentary behaviors (50, Hadgraft et al., 2017; Healy et al. 2017; 51, Brakenridge et al., 2016,
9 2018).

10 Twenty-eight interventions were classified as beneficial ($N=6845$ for treatment
11 conditions, $N=4333$ for control conditions), 17 as contingently beneficial ($N=6223$ for
12 treatment conditions, $N=600$ for control conditions) and 29 as conferring no benefits or as
13 harmful ($N=3251$ for treatment conditions, $N=1652$ for control conditions). Randomized
14 controlled or non-equivalent control group designs were used to evaluate 14 of the beneficial
15 interventions, five of the contingently beneficial interventions, and 17 of the non-beneficial
16 interventions. There is therefore no indication that stronger research designs (randomized or
17 non-equivalent control group designs) were associated with intervention effectiveness.

18 **Changes and mechanisms**

19 TABLE 4 HERE
20 Table 4 summarizes the evidence on whether changes were made and/or mechanisms
21 activated, alongside overall sample sizes for intervention and control groups. In all the
22 beneficial interventions, across all intervention types, changes were made and some
23 mechanisms activated. The mechanisms activated were not always those mechanisms
24 intended (e.g., workplace health promotion leading to behavior change). In all cases where
25 unintended mechanisms were activated, intervention effectiveness was attributed to

1 improvements in the social aspects of workplaces brought about by social activities
2 underpinning intervention implementation (e.g., workshops, group exercises). In two cases,
3 the unintended mechanisms were also attributed to changes in aspects of workplace cultures,
4 specifically health behavior norms (37, Edmunds et al., 2013; 50, Hadgraft et al., 2017, Healy
5 et al., 2017). In another, changes in workplace behavioral norms were the intended
6 mechanism of change (48, Byron et al., 2015).

7 For contingently beneficial interventions, no studies reported the activation of
8 intended mechanisms. In three studies, where changes were implemented at least partially, the
9 interventions' mechanisms were through unintended effects on workplace cultures. In four
10 studies, some participants were exposed to contextual factors that may have affected
11 intervention implementation. In four studies, changes were not implemented for some
12 participants and, in one study (38, Carolan and de Visser, 2017, 2018), some participants had
13 access to a restricted range of intervention components.

14 For non-beneficial interventions, no studies provided evidence that mechanisms were
15 activated. Changes were not implemented at all or as intended, contextual factors may have
16 hindered the implementation of changes or activation of mechanisms, or changes were
17 implemented but no mechanisms activated. In one study where changes were made but
18 mechanisms were not activated (51, Brakenridge et al., 2016, 2018), a secondary intervention
19 was focused on mitigating muscular-skeletal risks from poor sitting positions through
20 supported use of an activity tracker. Although the intervention group improved on movement
21 (step count), there was no improvement in wellbeing outcomes. In this case, it may be the
22 mechanisms activated were insufficient to have an impact on health/wellbeing outcomes, at
23 least during the evaluation period.

24 In summary:

1 **Evidence statement 1:** *To produce benefits for wellbeing, a necessary but not*
2 *sufficient condition is for the WHWP to activate intended mechanisms or mechanisms*
3 *emergent from intervention implementation.* (Rated strong evidence, Table 5).

4 Table 5 summarizes the evidence statements, ranked by the strength of evidence with
5 a rationale for the grade given to each evidence statement.

6 TABLES 5 AND 6 HERE

7 **Omnibus context**

8 Table 6 summarizes the evidence on various aspects of omnibus and discrete intervention
9 contexts, categorized according to intervention outcome (beneficial, contingently beneficial,
10 non-beneficial), overall sample sizes for those exposed to the intervention (treatment group)
11 and whether the contextual feature was considered a negative or positive context for
12 implementation. Examples of negative contextual features include recessionary pressures,
13 negative middle manager attitudes to health/wellbeing initiatives and omitting key
14 stakeholders from intervention governance. Examples of positive contextual features include
15 structures for effectively capturing learning from implementation, problem-solving to
16 overcome barriers to implementation and appropriately resourced professional implementers.

17 Table 6 shows beneficial outcomes tend to be associated with positive, internal
18 omnibus contexts. Adequate financial resources were the most frequently mentioned positive
19 feature of the omnibus context. Positive internal omnibus contexts seemed not to guarantee
20 intervention effectiveness. Moreover, mention was made of lack of resources in studies of two
21 beneficial interventions (study 12, Braganza et al., 2018; study 50, Hadgraft et al., 2017,
22 Healy et al., 2017) and a contingently beneficial intervention (73, Hasson et al., 2014).

23 Negative internal contexts tend to be associated with less beneficial interventions,
24 although is not always the case (Table 6). The most frequently mentioned negative feature
25 was competing priorities (e.g., workload, time constraints, other organizational changes). In

1 one study (48, Byron et al., 2015), the intervention was modified to prevent intervention
2 sessions clashing with work commitments. Other organizational changes appeared to
3 differentiate many contingently and non-beneficial interventions from beneficial
4 interventions. However, two studies (study 6, Abildgaard et al., 2016, 2018, Nielsen et al.,
5 2014, von Thiele Schwarz et al., 2017; study 26, Nielsen & Randall, 2012, Nielsen et al.,
6 2010, 2017, Randall et al., 2009) indicated that concurrent changes may not always affect the
7 implementation and/or effectiveness of an intervention. Study 6 reported a wider cultural shift
8 in the organization, of which the intervention was just one part. Study 26 reported a negative
9 impact on job satisfaction, but positive effects on other wellbeing markers. Both study 6 and
10 26 reported on other factors supporting the intervention (e.g., learning structures) and that
11 initially skeptical workers developed positive attitudes towards the intervention over time.
12 Therefore, features of the discrete context may overcome negative features of the internal
13 omnibus context.

14 **Evidence statement 2:** *Although adverse internal omnibus contexts can affect the*
15 *implementation and effectiveness of WHWPs, overall there is mixed evidence on the*
16 *relationship between the favorability of a range of internal contextual factors and*
17 *WHWP implementation.* (No strength of evidence grading, Table 5).

18 Contextual factors external to the organization were not associated with beneficial
19 interventions. Adverse external environments appear to have detrimental effects on WHWP
20 implementation and effectiveness. In a study of a contingently beneficial intervention (68, van
21 Wingerden et al., 2013), workers were trained to make improvements to their working
22 conditions. Those workers who did not implement the intervention felt external political
23 factors constrained individual choices or resources. Studies 5 (Hoefsmit et al., 2016ab) and 9
24 (Andersen et al., 2014; Martin et al., 2012, 2013, 2015) were work/rehabilitation
25 interventions: Poor labor market conditions were blamed for lack of success due to restricted

1 opportunities to place participants back into work. For study 66 (Brisson et al., 2006, Oude
2 Hengel et al., 2011, 2013), recessionary pressures were blamed for impaired intervention
3 implementation, although it is unclear whether recessionary pressures, for example,
4 constrained resources or influenced internal organizational change (both features of the
5 internal omnibus context). Research is therefore required on how internal contexts change in
6 response to changes in external contexts because properly managed internal responses may
7 not affect WHWPs implementation, as noted above.

8 **Evidence statement 3:** *Adverse external environments affect detrimentally the WHWP*
9 *implementation and effectiveness.* (Initial evidence, Table 5).

10 **Discrete context**

11 *Organizational cultural and political factors and their role in delivery of WHWPs*
12 The favorability of internal organizational political and cultural factors tends to be associated
13 with more beneficial interventions (Table 6). It is possible to differentiate between situations
14 where cultural or political factors were used to aid the intervention and situations where
15 cultural and political factors hindered implementation.

16 There were examples of cultural and political factors aiding implementation from
17 beneficial interventions, contingently beneficial and a non-beneficial intervention. Examples
18 include union involvement in the intervention to build trust with workers (political, 70,
19 Tregaskis et al., 2013), using elements of the intervention to create shared understandings
20 about the intervention (cultural, 3, Augustsson et al., 2015; Tafvelin, et al., 2018; von Thiele
21 Schwarz et al., 2015, 2017), taking into account existing social norms when developing
22 interventions (cultural, 74, Sørensen & Holman, 2014), senior managers signaling strategic
23 support for the intervention (cultural, symbolic, 12, Braganza et al., 2018; 66, Brisson et al.,
24 2006, Oude Hengel et al., 2011, 2013; 48, Byron et al., 2015; 74, Sørensen & Holman, 2014),

1 and mandating participation in the intervention (political, 8, Fridrich et al., 2016, Jenny et al.,
2 2011, 2015).

3 There appears to be an increased probability of intervention effectiveness from power
4 associated with formal positions of authority or representation (e.g., unions) and/or
5 organizational cultural norms that enable stakeholder sense-making. However, the presence of
6 one non-beneficial intervention (66, Brisson et al., 2006, Oude Hengel et al., 2011, 2013)
7 suggests engaging with political and cultural factors does not guarantee success. Moreover,
8 there are some questions over how political and cultural factors have effects, either through
9 aiding implementation (e.g., taking existing norms into account, 74, Sørensen & Holman,
10 2014) or by activating mechanisms (70, Tregaskis et al., 2013, where union involvement may
11 have increased trust in management; 3, Augustsson et al., 2015; Tafvelin, et al., 2018; von
12 Thiele Schwarz et al., 2015, 2017, where the intervention created shared understandings).

13 For interventions where political/cultural factors hindered implementation, adverse
14 cultural and political factors manifested themselves usually as passive resistance to
15 implementation or up-take (e.g., ingrained habits 50, Hadgraft et al., 2017, Healy et al., 2017;
16 67, Clay-Williams & Braithwaite, 2015, Clay-Williams et al., 2013) and senior managers not
17 providing symbolic legitimacy (73, Hasson et al., 2014). In one study, managers actively
18 exerted their positional power to undermine the intervention (44, Albertsen et al., 2014, Garde
19 et al., 2012). Study 34 (Zhang et al., 2015, 2016) was an unusual case, in which the
20 implementation team exercised its expert power by withdrawing the intervention from an
21 unreceptive context. The presence of a beneficial intervention amongst cases of negative
22 adverse political and cultural contexts suggests adverse cultural and political contexts can be
23 overcome (50, Hadgraft et al., 2017, Healy et al., 2017).

1 **Evidence statement 4:** *Overt use of power and/or cultural aids WHWP effectiveness,*
2 *and adverse political and/or cultural factors hinder WHWP effectiveness.* (Initial
3 evidence, Table 5).

4 *Governance/delivery structures*

5 Table 6 indicates that (dys)functional governance and delivery structures tend to be associated
6 with intervention (in)effectiveness. Examples of functional governance structures from
7 beneficial interventions include: involvement of stakeholders in meetings (e.g., worker
8 representatives and human resources professionals, Study 17, Busch et al., 2017); regular
9 project group meetings (16, Menzel et al., 2015); and designated implementer roles (37,
10 Edmunds et al., 2013). Examples of dysfunctional governance/delivery structures from non-
11 beneficial interventions include: weak involvement of specialist professionals (31, Andersen
12 & Westgaard, 2013) or other key stakeholders (i.e. worker representatives, 71, Greasley &
13 Edwards, 2015, Greasley et al., 2012); lack of clarity in intervention planning or strategy (73,
14 Hasson et al., 2014); and abandonment of governance structures (e.g., project steering groups,
15 55, Havermans et al., 2018ab).

16 **Evidence statement 5:** *Effective governance and clear delivery structures appear to*
17 *be a necessary but not sufficient condition to facilitate WHWP implementation.*

18 (Promising evidence, Table 5).

19 *Planned sequencing of activities*

20 A planned sequence of activities is not clearly related to intervention effectiveness (Table 6).
21 Examples of sequencing from beneficial interventions include a staged sequence of
22 intervention workshops or modules (23, Goldberg et al., 2015), staged approach to design,
23 development and implementation (16, Menzel et al., 2015), and forward planning of activities
24 (24, Edwards & Higuchi, 2018).

1 Needs/risk assessment is specified as an early activity in many best practice models
2 and regulatory compliance guidelines (Table 1). Where needs/risk assessment was mentioned
3 as an early activity, it was associated with three beneficial, three contingently beneficial and
4 six non-beneficial interventions. In non-beneficial interventions, reasons for problems with
5 needs/risk assessment include: Managers reacted badly to the results of assessments leading to
6 implementation problems (25, Coffey et al., 2009; 45, Schelvis et al., 2016, 2017); issues with
7 decision-makers' understanding of results from assessments (2, Biron et al., 2010; 5,
8 Andersen et al., 2014; Martin et al., 2012, 2013, 2015); and assessments causing participants
9 to experience psychological discomfort (5, Andersen et al., 2014; Martin et al., 2012, 2013,
10 2015). The presentation of evidence from needs/risk assessments may be an important factor.
11 For example, a contingently beneficial intervention included a risk/needs assessment that was
12 tailored to a specific context (6, Abildgaard et al., 2016, 2018; Nielsen et al., 2014; von Thiele
13 Schwarz et al., 2017).

14 **Evidence statement 6:** *The relationship between the sequencing of specific activities
15 and WHWP implementation is unclear.* (No strength of evidence grading, Table 5).

16 *Continuity*

17 For beneficial interventions, 10 studies indicated efforts at continuity in terms of
18 implementing, adapting, or sustaining the intervention. Examples include problem-solving
19 and modifying interventions to overcome implementation barriers (12, Braganza et al., 2018;
20 48, Byron et al., 2015). An eleventh study (65, Gilbert-Ouimet et al., 2011) reported on a
21 nuanced picture of continuity, with participants feeling that some aspects of the intervention
22 were geared towards providing short-term solutions to problems (e.g., using temporary staff
23 to ease workload), but there were also longer term changes to jobs.

24 Six contingently beneficial interventions mentioned continuity issues. These include:
25 infrequent communications about initiatives (6, Abildgaard et al. 2016, 2018, Nielsen et al.,

1 2014, von Thiele Schwarz et al., 2017; 57, Mikkelsen et al., 2011); uneven implementation
2 across workplaces (8, Fridrich et al., 2016, Jenny et al., 2011, 2015; 40, Jia et al., 2018; 61,
3 Csiernik et al., 2012ab); and time limits on the intervention (28, Chapleau et al., 2011). In the
4 last example, specialist expert support conferred benefits after adaptations to address initial
5 problems, but there was a decline in wellbeing after the support was withdrawn.

6 Two non-beneficial interventions evidenced attempts at continuity. In one (25, Coffey
7 et al., 2009), although there were no improvements in health/wellbeing markers, there were
8 improvements in health literacy, changes in organizational policies and practices, and staff
9 empowerment. In the other (62, Sorensen et al., 2011, 2016), coherent communication about
10 the intervention appeared to be lacking. Eight non-beneficial interventions reported on why
11 no attempts were made at continuity in implementing, adapting or sustaining the intervention.
12 The reasons include the time limited nature of the intervention (e.g., 27, McGilton et al.,
13 2013), abandonment of the governance structure (53, Anderson & Sice, 2016), and minimal
14 or no participant engagement with the intervention (e.g., 51, Brakenridge et al., 2016, 2018).

15 In summary, WHWP effectiveness appears to be associated with effort in ensuring
16 continuity of implementation, including adaptation. There is a qualifying condition that such
17 efforts at continuity require regular communication about WHWPs (6, Abildgaard et al. 2016,
18 2018, Nielsen et al., 2014, von Thiele Schwarz et al., 2017; 57, Mikkelsen et al., 2011; 62,
19 Sorensen et al., 2011, 2016).

20 **Evidence statement 7a:** *A critical success factor for WHWPs is continuity in efforts*
21 *at implementing, adapting, or otherwise sustaining the intervention.* (Strong evidence,
22 Table 5).

23 **Evidence statement 7b:** *Frequent communication about the intervention assists*
24 *continuity of efforts.* (Initial evidence, Table 5).

25

1 *Learning structures*

2 We focused on studies of interventions in which learning structures supported intervention
3 implementation, rather than studies in which learning was the planned mechanism.

4 Two beneficial interventions and three contingently beneficial interventions reported
5 on learning structures to support implementation. Examples of learning structures from
6 beneficial interventions include use of Kaizen principles, coaching, problem-solving
7 approaches, workshops (all from 3, Augustsson et al., 2015, Tafvelin, et al., 2018, von Thiele
8 Schwarz et al., 2015, 2017) and training (Mejías Herrera & Huaccho Huatuco, 2011).

9 Learning structures may build continuity, as continuity in efforts at implementing or
10 adapting the intervention co-occurred with learning structures in three cases (3, Augustsson et
11 al., 2015, Tafvelin, et al., 2018, von Thiele Schwarz et al., 2015, 2017; 6, Abildgaard et al.,
12 2016, 2018, Nielsen et al., 2014, von Thiele Schwarz et al., 2017; 8, Fridrich et al., 2016,
13 Jenny et al., 2011, 2015) and dysfunctional learning structures co-occurred with lack of
14 continuity in one non-beneficial intervention (2, Biron et al., 2010). Where functional learning
15 structures were present in both beneficial interventions and two contingently beneficial
16 interventions (6, Abildgaard et al., 2016, 2018, Nielsen et al., 2014, von Thiele Schwarz et
17 al., 2017; 8, Fridrich et al., 2016, Jenny et al., 2011, 2015), governance structures were
18 present. Where functional learning structures were reported in one contingently beneficial
19 intervention (74, Sørensen & Holman, 2014) and all non-beneficial interventions, no evidence
20 of governance structures was provided. Dysfunctional governance and dysfunctional learning
21 structures were present in the non-beneficial intervention (2, Biron et al., 2010). Therefore,
22 functional governance structures may promote functional learning structures, in turn
23 facilitating adaptation of interventions during implementation (von Thiele Schwarz et al.,
24 2016).

1 **Evidence statement 8:** *Learning structures, coupled with effective governance*
2 *structures, help adaptation and continuity in WHWP implementation.* (Initial
3 evidence, Table 5).

4 *Service or service delivery characteristics*

5 Thirty-seven studies reported on the service or service delivery. Examples of positive features
6 of interventions include fit with participants and/or context (e.g., 56, Moll et al., 2018ab);
7 similarity of service delivery professionals to participants (e.g., 48, Byron et al., 2015); and
8 novelty (e.g., 29, Kinser et al., 2016). Examples of negative features include incompatibility
9 with working patterns/spaces (e.g., 55, Havermans et al., 2018ab); negative evaluations of
10 intervention content (e.g., 19, Russell et al., 2016); lack of clarity/communication about the
11 intervention (e.g., 1, Pålsson et al., 2018); negative evaluations of service delivery
12 professionals (e.g., 43, van Oostrom, 2009, 2010); and problems with supporting technologies
13 (e.g., 32, Foureur et al., 2013).

14 Table 6 indicates a trend for beneficial interventions to have positive service/service
15 delivery features relative to less beneficial interventions. However, seven beneficial
16 interventions and seven contingently beneficial interventions had negative service delivery
17 features. There is a trend for non-beneficial interventions to have more negative features
18 relative to beneficial interventions, although removing preventive work redesign studies from
19 consideration removes this trend. Therefore, although positive service/service delivery
20 features may enhance implementation of effective interventions, negative features do not
21 necessarily undermine implementation or WHWP effectiveness. Overcoming negative
22 features may be especially problematic for primary work redesign interventions.

23 **Evidence statement 9:** *Positive service/service delivery features enhance WHWP*
24 *implementation; negative service/service delivery features can be overcome.*
25 (Promising evidence, Table 5).

1 *Key stakeholders: Workers, managers and professional implementers.*

2 Examples of worker dispositions to WHWPs include: levels of mistrust or confidence
3 in management (e.g., 27, McGilton et al., 2013); worker skepticism about the intervention
4 (24, Edwards & Higuchi, 2018); and fear of, readiness or capability to change (e.g., Chau et
5 al., 2014, 2016; including health as a barrier in tertiary interventions, e.g., 38, Carolan & de
6 Visser, 2017, 2018).

7 Table 6 indicates that positive/negative worker dispositions tend to be associated with
8 more/less beneficial interventions. Nevertheless, some interventions conferred benefits in the
9 presence of negative worker dispositions. Worker attitudes improved over time in four
10 studies. Union involvement overcame mistrust in a beneficial intervention (70, Tregaskis et
11 al., 2013). In a contingently beneficial intervention (28, Chapleau et al., 2011), adaptations
12 were made to the intervention in response to negative worker attitudes, after which attitudes
13 changed and wellbeing improved. One intervention was labelled non-beneficial because of an
14 adverse effect on job satisfaction, although there were positive effects on other wellbeing
15 markers (26, Nielsen & Randall, 2012, Nielsen et al., 2010, 2017, Randall et al., 2009). In
16 another non-beneficial intervention (53, Anderson & Sice, 2016), although worker attitudes
17 were changing, senior managers abandoned the intervention.

18 **Evidence statement 10:** *Positive worker dispositions towards WHWPs and WHWP
19 implementation are associated with beneficial outcomes; negative dispositions can be
20 overcome.* (Promising evidence, Table 5).

21 Twenty-eight studies reported on line/middle manager dispositions towards the
22 interventions. Examples include levels of support (e.g., monitoring progress and regular
23 communications about the intervention, 6, Abildgaard et al., 2016, 2018, Nielsen et al., 2014,
24 von Thiele Schwarz et al., 2017); stability/instability of line/middle management staffing
25 (e.g., 31, Andersen & Westgaard, 2013); mistrust of workers (e.g., 27, McGilton et al., 2013);

1 ability/inability to make changes (e.g., 19, Russell et al., 2016); and, active/passive
2 engagement with the intervention (e.g., Busch et al., 2017).

3 Manager positivity is not clearly related to intervention effectiveness (Table 6).

4 Manager negativity is associated with less beneficial interventions, although if primary work
5 redesign studies are not considered, the evidence is ambiguous. Moreover, manager negativity
6 is not always associated with intervention ineffectiveness (beneficial intervention, 17, Busch
7 et al., 2017). In this case, although managers had a negative attitude to the intervention, they
8 did not actively block the intervention, suggesting a differentiation of cases where line/middle
9 managers are passive and cases where managers are actively engaged in resisting changes.
10 Indeed, in 14 cases where (negative) positive manager dispositions were present, changes
11 were (not) made or mechanisms (not) activated (2, Biron et al., 2010; 3, Augustsson et al.,
12 Tafvelin, et al., 2018, von Thiele Schwarz et al., 2015, 2017; 6, Abildgaard et al., 2016,
13 Nielsen et al., 2014, von Thiele Schwarz et al., 2017; 11, Aust et al., 2010; 20,
14 Lundmark et al., 2017; 24, Edwards & Higuchi, 2018; 27, McGilton et al., 2013; 31,
15 Andersen & Westgaard, 2013; 32, Foureur et al., 2013; 45, Schelvis et al., 2016, 2017; 48,
16 Byron et al., 2015; 49, Arends et al., 2014ab; 50, Hadgraft et al., 2017, Healy et al., 2017; 74,
17 Sørensen & Holman, 2014). In six cases of non-beneficial interventions, changes were made,
18 notwithstanding negative line/middle manager dispositions, which suggests line/middle
19 manager dispositions can undermine the effectiveness of changes that are made (i.e., inhibit
20 mechanisms) (1, Pålsson et al., 2018; 5, Andersen et al., 2014, Martin et al., 2012, 2013,
21 2015; 26, Nielsen & Randall, 2012, Nielsen et al., 2010, 2017, Randall et al., 2009; 51,
22 Brakenridge et al., 2016, 2018; 71, Greasley & Edwards, 2015, Greasley et al., 2012; 73,
23 Hasson et al., 2014).

1 **Evidence statement 11:** *Line managers can block or hinder implementation of*
2 *changes, or undermine the effectiveness of any changes made.* (Promising evidence,
3 Table 5).

4 Twenty-nine studies reported on senior managers' dispositions towards the
5 interventions. Examples of dispositions include: Levels of engagement and visibility with the
6 intervention (e.g., 57, Mikkelsen et al., 2011); indications of support/commitment (e.g., 14,
7 Larsson et al., 2015, Rigotti et al., 2014); lack of communications (e.g., 54, Saksvik et al.,
8 2015, 2018, Undebakke et al., 2015); and imposing constraints or actively working against or
9 terminating the intervention (e.g., 25, Coffey et al., 2009).

10 Beneficial interventions tend to be associated with senior manager positivity and less
11 beneficial interventions with senior manager negativity (Table 6). senior management support
12 was present but not seen as critical to implementation (3Augustsson et al., 2015, Tafvelin et
13 al., 2018, von Thiele Schwarz et al., 2015, 2017). These instances indicate there may be some
14 circumstances where senior manager dispositions are not critical to WHWP implementation
15 or effectiveness. In most other cases, it seems to be that senior managers prevent or hinder
16 implementation rather than hinder the activation of mechanisms, because there were only two
17 cases of non-beneficial interventions where changes were made despite of negative senior
18 manager dispositions (60, Cummings et al., 2013; 71, Greasley & Edwards, 2015, Greasley et
19 al., 2012).

20 **Evidence statement 12:** *The relationship between senior manager dispositions*
21 *towards WHWPs and WHWP implementation is unclear, although senior managers*
22 *can block or hinder implementation of changes, or less frequently, undermine the*
23 *effectiveness of changes that are made.* (Promising evidence, Table 5).

24 Examples of dispositions of expert and strategic implementers include: Active versus
25 limited engagement in implementation (e.g., 2, Biron et al., 2010); divergence of expectations

1 between expert implementers and other stakeholders (71, Greasley & Edwards, 2015,
2 Greasley et al., 2012); and the level of resourcing available to expert implementers (73,
3 Hasson et al., 2014). Table 6 indicates expert implementer positivity is associated with
4 beneficial outcomes, and negativity with contingently beneficial or non-beneficial outcomes.
5 In five cases, expert implementer negativity was associated with no or limited changes being
6 made (2, Biron et al., 2010; 3, Augustsson et al., 2015, Tafvelin et al., 2018, von Thiele
7 Schwarz et al., 2015, 2017; 17, Busch et al., 2017; 71, Greasley & Edwards, 2015, Greasley et
8 al., 2012; 73, Hasson et al., 2014), indicating the effects of expert, strategic implementers are
9 on making changes rather than activating mechanisms.

10 **Evidence statement 13:** *Expert and strategic implementers' dispositions to WHWPs*
11 *influence WHWP implementation.* (Initial evidence, Table 5).

12 **Strengths and Limitations**

13 One strength of this review is its inclusivity compared to previous reviews, synthesizing
14 evidence from a wide range of intervention types and engaging with complex features of
15 organizational contexts. One question is whether the implementation factors associated with
16 effective interventions varies by intervention type. In initial syntheses of data, we did separate
17 analyses for each intervention type, and found no appreciable differences between
18 intervention types, except where noted above. Consistency of findings across intervention
19 types mitigates against concerns over the number of work redesign interventions in the review
20 (35). Notwithstanding, future research could redress the balance of interventions studied.

21 A limitation concerns the locations and sectors where studies were conducted. Forty-
22 eight of studies were from Northern Europe and 71 from advanced Western democracies.
23 Twenty-seven studies were conducted in health or social care organizations, and a further 15
24 in public service organizations (e.g., education). The geographical and sectoral spread of the
25 studies does indicate a need for research from a wider range of contexts.

1 The present review complies with many features of good practice guidelines for
2 systematic reviews (Johnson & Hennessy, 2019). However, although two reviewers
3 independently extracted data for each study, coding and synthesis was conducted by one
4 reviewer (lead author). This was to accommodate the qualitative and nuanced nature of the
5 data, as well as the breadth of the codes in the coding frame. Notwithstanding, data synthesis
6 was checked by review team members and double-coding a sample of papers indicated the
7 credibility of the coding. In comprehensively reviewing the literature on WHWP
8 implementation, we hope future research is able to develop fine-grained definitions of facets
9 within each broad code used here.

10 **Conclusions**

11 We build on prior reviews and conceptual frameworks by studying the full range of
12 interventions, and synthesizing evidence on how a comprehensive range of implementation
13 factors are linked to intervention outcomes. The reviews' contributions are threefold. First, we
14 identify areas requiring targeted empirical investigation. Gaps in research are associated with
15 evidence statements that were rated as promising or initial evidence, or where no strength of
16 evidence rating was given (Table 5).

17 Second, the review summarizes empirical regularities that can become a basis for
18 further theoretical development. An important finding is that there is strong evidence that
19 WHWPs have their effects on psychological wellbeing through activating mechanisms
20 whether intended in the planning of the WHWP or emergent from its implementation.
21 Mechanisms emergent from implementation tended to be associated with social factors, a
22 finding consistent with ideas that social mechanisms provide paths to WHWP effectiveness
23 (Karanika-Murray & Biron, 2013). Non-effective interventions were either not implemented
24 or contextual factors inhibited activation of mechanisms.

1 We found that a critical success factor for WHWP implementation is continuity of
2 effort and adaptation of interventions, supported by functional learning and governance
3 structures. Learning structures and consultative and inclusive governance structures may
4 provide means to capture local adaptations during implementation, to disseminate adaptations
5 to across the organization, and to communicate regularly with stakeholders to establish a
6 coherent narrative around the WHWP. Governance structures that include senior managers
7 and are well resourced may act as signals of the importance of worker health and wellbeing,
8 and encourage positive worker and line manager attitudes and behaviors towards WHWPs.
9 Findings therefore suggest that further conceptual development could focus on the role of
10 continuity of effort and supporting learning and governance structures in activating intended
11 and emergent mechanisms.

12 Third, we have identified ambiguities requiring theoretical resolution. Our review
13 indicates that a range of adverse contextual factors can influence WHWP implementation;
14 however, they do not do so predictably. Abstracting across all of areas of omnibus and
15 discrete context, research on WHWP implementation has left largely unexplored the inherent
16 conflicts between existing organizational processes (political, cultural, sociotechnical) and
17 WHWP implementation. Therefore, conceptual work is needed on how organizations resolve
18 conflicts between WHWP implementation and other organizational processes.

19 Some studies in our review suggest ways to resolve these conflicts. The first of these
20 is implement WHWPs so that they are compatible with existing organizational processes,
21 leaving existing organizational processes largely unchanged (3, Augustsson et al., 2015;
22 Tafvelin, et al., 2018; von Thiele Schwarz et al., 2015, 2017; 8, Fridrich et al., 2016; Jenny et
23 al., 2011, 2015; 17, Busch et al., 2017; 20, Lundmark et al., 2017; 52, Volker et al., 2015,
24 2017). Examples include using existing meeting structures to discuss how to improve health
25 and wellbeing (8, Fridrich et al., 2016; Jenny et al., 2011, 2015). However, ensuring

1 compatibility may not be beneficial if the intervention replicates existing practices (18,
2 Kidger et al., 2016). Seeking harmonious resolution between WHWP implementation and
3 other organizational processes may be inappropriate where organizational practices and norms
4 are harmful (around e.g., bullying). Here, existing practices and norms may need challenging
5 (28, Chapleau et al., 2011; 70, Tregaskis et al., 2013). In one example, the intervention
6 incorporated training on how to challenge others' unsafe working practices (70, Tregaskis et
7 al., 2013). Another way to negate conflict is to introduce WHWPs in ways that create a
8 common purpose or interpretation (3, Augustsson et al., 2015, Tafvelin, et al., 2018, von
9 Thiele Schwarz et al., 2015, 2017; 24, Edwards & Higuchi, 2018; 61, Csiernik et al., 2012ab;
10 63, Mabry et al., 2018; Olson et al., 2016; 65, Gilbert-Ouimet et al., 2011; 70, Tregaskis et
11 al., 2013; 74, Sørensen & Holman, 2014). Examples from the review include: Co-opting
12 stakeholders onto governance structures (61, Csiernik et al., 2012ab) and convening
13 integrative workshops (e.g., 63, Mabry et al., 2018).

14 Another area for conceptual development is to consider context in a dynamic and
15 multilayered way (19, Russell et al., 2016). Studies in our review that reported changes in
16 workplace social relationships, cultures, and norms indicate WHWPs can change omnibus
17 contexts, potentially making the context conducive for implementing more WHWPs (Hall et
18 al., 2018). The connections between WHWPs in the same workplace have been ignored in the
19 implementation literature, although comprehensive approaches may be more effective than
20 single interventions (cf. LaMontagne et al., 2007). Therefore, there exists a possibility of a
21 further differentiation of context that includes the discrete micro-context of implementing a
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23 with the introduction and management of multiple WHPWs over an extended period of time.

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Table 1: Typology of Workplace Health Intervention Frameworks

| | Implementation frameworks | Appraisal frameworks | Realist frameworks | Best Practice models | Regulatory Compliance Guidance |
|-----------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Framework features | Normative: How to undertake a single intervention; what content should go into a successful intervention. | Normative: Identifying the factors that affected intervention effectiveness as a learning platform for better-informed interventions. | Methodological: Identifying the underpinning configurations of Context, Mechanisms, Outcomes (CMO) that generate effective interventions. | Normative: Factors to consider during intervention implementation. | Normative: Factors to consider during intervention implementation, incorporating best practice for regulatory compliance. |
| Framework represents | A descriptive and empirical mapping of the literature. | A route map for robust evaluation | A methodology for building theory through creating an empirical evidence-base, focused on intervention configurations. | A prescriptive, usually linear, sequence of activities. | A prescriptive staged model of intervention implementation. |
| Unit of analysis | Intervention implementation process; single interventions | Intervention features associated with effectiveness | Interaction of context, mechanism and outcome in an intervention and/or implementation | Intervention implementation | Intervention implementation |
| Characteristics | Dynamic: Process variables and participatory processes | Evidence based implementation appraisal | Dynamic: Context-Mechanism-Outcome (CMO) | Activity focused. Issues to consider and actions to undertake. Some accommodation of dynamism | Activity focused incorporating standards: Issues to consider and actions to undertake |
| Temporal features | Focus on pre- and during intervention features; linear staged | Focus on post-intervention appraisal | Focus on micro-temporal features of mechanisms that generate outcomes | Focus on pre-and during intervention actions; predominantly linear staged prescriptions (or stage-gates, i.e. feedback loops for adaptation) | Focus on linear staged prescriptions during intervention implementation |

Table continues

Table 1: Continued

| | Implementation frameworks | Appraisal frameworks | Realist frameworks | Best Practice models | Regulatory Compliance Guidance |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Theory level | Intra- and inter-personal psycho-social micro-theory (primarily micro) | Not specified | Can vary according to CMO configuration. In application, this is predominantly micro | Universal best practice principles | Regulatory compliance through universal best practice principles |
| Main contributions | <ul style="list-style-type: none"> • Acknowledges dynamism • Proposes contextual influences • Acknowledges influence of key actors/and social systems | <ul style="list-style-type: none"> • Identification of weakness in reporting implementation effectiveness • Identification of measurement and methodological weaknesses | <ul style="list-style-type: none"> • Provides a method for theorization • Provides a method for analyzing dynamics in relation to context, mechanisms and outcomes. | <ul style="list-style-type: none"> • Typologies or categorization of organizational resources, structures and process to aid intervention success, configured round roles and activities of practice-actors | <ul style="list-style-type: none"> • Guidelines that represent regulatory and compliance best practice, configured around activities |
| Calls for action arising/research gaps | Theoretical explanations are fragmented and there is a need for greater integrative theory building to underpin the frameworks | Theory and implementation need to pay attention to dynamism. Lack of integrative theory to explain effective implementation. Detailed reporting post hoc to provide basis for evaluation of longer-term and systemic effectiveness. Improved longitudinal designs. | Requires accumulation of body of empirical evidence of theorized configurations in order to make theoretical progress. | Refinement and development required of staged models, mapping and assessment techniques, in practice settings. | Call for application of guidance by organizations. |
| Exemplary papers | Biron & Karanika-Murray, 2014; Fridrich et al.,2015; Nielsen, 2013,2017; Nielsen & Randall,2013; Havermans et al.,2016) | Egan et al.,2009; Hoefsmith et al.,2012; Moran et al.,2014; Murta et al.,2007; Passey et al.,2018; Rojatz et al.,2016; Wierenga et al.,2013 | Pawson & Manzano-Santaella, 2012 | Ammendolia et al.,2016; Herrera-Sanchez et al.,2017; Rasmussen et al.,2017, Von Thiele Schwarz et al.,2016 | Health & Safety Executive, 2017/2019 |

Source: Developed by authors

Table 2: Coding structure

| Code | Description |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Intervention | <i>Primary work redesign focused; Primary health behavior focused; Multifocal</i> (e.g., secondary + primary work redesign); <i>Secondary; Tertiary</i> |
| Benefits | <i>Beneficial</i> : Demonstrable effectiveness on at least one health/wellbeing marker (and no adverse effects) between control and intervention conditions (direct effects shown). <i>Contingently beneficial</i> : No demonstrated effectiveness on any health/wellbeing marker (and no adverse effects) between control and intervention conditions, but changes in at least one health/wellbeing marker for sub-groups (moderation) or in conditions where the intervention was implemented (effects transmitted through a mediator that is a marker of intervention implementation or intervention mechanisms). <i>Non-beneficial</i> : Null or adverse effects. One adverse effect in the presence of other improvements in health/wellbeing is classified as non-beneficial, although such cases should be flagged in the analyses. |
| Changes made (mechanisms activated) | Changes made, not made or not made as intended to (e.g.; wellbeing related roles, wellbeing related Human Resources, wellbeing related education, job quality, physical environment, tangible wellbeing resources), to activate mechanisms (or not) that explain changes in wellbeing. <i>Mechanisms can be intended</i> – the intervention worked according to the theoretical principles of intervention (e.g., a work redesign intervention evidences changes in job quality linked to changes in wellbeing). <i>Mechanisms can be unintended</i> – evidence the mechanisms worked according to some process not anticipated (e.g., a health promotion intervention evidences changes in social relationships linked to wellbeing, rather than changes in health behaviors). <i>Negative mechanisms</i> - unintended mechanisms producing adverse effects (e.g., a health promotion intervention encourages competition between work teams, leading to deteriorating social relationships). |
| Omnibus context | |
| External omnibus context | External shocks (e.g., financial crash) or a range of other external facilitators/inhibitors (e.g., labor market conditions). |
| Internal omnibus context | Factors internal to the organization not directly related to the intervention, including shocks (e.g., takeovers), competing priorities/logics, organizational capability/capacity (e.g., availability of resources). |

Table continues

Table 2: continued

| Code | Description |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Discrete context | |
| Organizational culture/political factors | Evidence of changing rituals and routines for symbolic purposes (e.g., middle manager stress management training, which may serve as a signal to others); evidence of narratives relating wellbeing to organizational values; evidence of symbolic involvement of senior managers and decisions to invest effort funds; evidence of use of power to influence the intervention. |
| Governance/delivery structures | Co-ordination and management of intervention activities, including factors such as presence of a steering committee, assigned responsibility for wellbeing and intervention implementation, who is represented in the governance structures, level of planning and program theory guiding the intervention, use of evidence-based practice, embedding wellbeing initiatives in a strategy. |
| Sequencing | Planned order of events/activities (e.g., prescribed order of assessment, decision, intervention, evaluation). |
| Continuity | Perseverance in implementation efforts, local adaptations, embedding practices into everyday activities. |
| Learning structures | Procedures for capturing learning from implementation for adaptation and/or capacity/capability building. |
| Service/service provider characteristics | Features of the intervention (e.g., novelty) or the people implementing aspects of the intervention at an operational level (e.g., training delivery). Relates to perceptions/attitudes/expectations and behaviors including commitment, value placed on health/wellbeing, beliefs on responsibility for health/wellbeing, denial/withdrawal from intervention, diffidence about health/wellbeing, passive and active resistance to intervention, competence/capacity/capability for implementation, passive or proactive engagement in intervention. |
| Worker dispositions | Dispositions of recipients of the intervention. Examples the same for service provider characteristics. |
| Line/middle manager dispositions | Dispositions of immediate managers of the recipients or other managers whose day-to-day work may affect the intervention implementation. Examples the same for service provider characteristics. |
| Senior manager dispositions | Dispositions of senior organizational leaders (CEO and other C-suite executives). Examples the same for service provider characteristics. |
| Expert/strategic implementers dispositions | Specialist functional roles with relevant expertise for implementation at a strategic/program level rather than operational level – mainly related to dispositions of human resources or occupational health functions. Examples the same for service provider characteristics. |

Table 3: Studies in the review, sample sizes, and intervention types.

| No. | Authors and study features | No. | Authors and study features |
|-----|-----------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------|
| 1 | Pålsson et al.,2018, I=10, C=0, PW | 38 | Carolan & de Visser,2017,2018, I=28, I=28, C=28, T |
| 2 | Biron et al.,2010, I=60, C=0, PW | 39 | Page & Vella-Brodrick,2013, I=13, C=10, S |
| 3 | Augustsson et al.,2015; Tafvelin, et al.,2018; von Thiele Schwarz et al.,2015,2017, I=111, C=91, PW | 40 | Jia et al.,2018, I=719, C=0, PH |
| 4 | Hviid et al.,2013, I=34, C=0; PW | 41 | Shulman et al.,2018, I=20, C=0, PW |
| 5 | Andersen et al.,2014; Martin et al.,2012,2013,2015,I=88, C=80, T | 42 | Günüşen & Üstün,2009,2010, I=36, I=36, C=36, T |
| 6 | Abildgaard et al.,2016,2018; Nielsen et al.,2014; von Thiele Schwarz et al.,2017, I=140, C=137, PW | 43 | van Oostrom 2009,2010, I=73, C=72, T |
| 7 | Mejías Herrera & Huaccho Huatuco,2011, sample size not given, PW | 44 | Albertsen et al.,2014; Garde et al.,2012, I=128, I=193, I=87, C=323, PW |
| 8 | Fridrich et al.,2016; Jenny et al.,2011,2015, I=1530, C=0, M | 45 | Schelvis et al.,2016,2017, I=204, C=152, PW |
| 9 | Hoefsmit et al.,2016ab, I=31, C=22, T | 46 | van Berkel et al.,2011,2013,2014, I=129, C=128, M |
| 10 | Chau et al.,2014,2016, I=22, C=17, PH | 47 | Hendriksen et al.,2016, I=167, C=0, PH |
| 11 | Aust et al.,2010, I=128, C=103, PW | 48 | Byron et al.,2015, I=18, C=0, S |
| 12 | Braganza et al.,2018, I=19, C=0, S | 49 | Arends et al.,2014ab, I=67, C=63, T |
| 13 | Geraedts et al.,2014abc, I=116, C=115, T | 50 | Hadgraft et al.,2017; Healy et al.,2017, I=136, C=95, M |
| 14 | Larsson et al.,2015; Rigotti et al.,2014, I=142, C=72, PW | 51 | Brakenridge et al.,2016,2018, I=66, C=87, S |
| 15 | Moen et al.,2016,2017, n=889 no data on size of treatment or control group, PW | 52 | Volker et al.,2015,2017, I=131, C=89, T |
| 16 | Menzel et al.,2015, I=2472, C=0, PH | 53 | Anderson & Sice,2016, sample size not given, PW |
| 17 | Busch et al.,2017, I=114, C=71, PW | 54 | Saksvik et al.,2015,2018; Undebakke et al.,2015, I=59, C=3783, PW |
| 18 | Kidger et al.,2016, I=208, C=141, M | 55 | Havermans et al.,2018ab, I=111, C=99, PW |
| 19 | Russell et al.,2016, I=225, C=59, PW | 56 | Moll et al.,2018ab, I=68, I=79, C=0, PW |
| 20 | Lundmark et al.,2017, I=303, C=0, M | 57 | Mikkelsen et al.,2011, sample size not given, PW |
| 21 | Jensen,2013, I=118, C=86, T | 58 | Haslam et al.,2018, I=431, I=271, C=218, PH |
| 22 | Müller et al.,2016, I=31, C=27, S | 59 | Notenbomer et al.,2018, I=21, I=31, C=30, M |
| 23 | Goldberg et al.,2015, I≥466 C=0, PH | 60 | Cummings et al.,2013, I=242, C=0, PW |
| 24 | Edwards & Higuchi,2018, I≥44, C=0, PW | 61 | Csiernik et al.,2012ab, I=2263, C=0, M |
| 25 | Coffey et al.,2009, I=16 focus groups, sample size not given, C=0, PW | 62 | Sorensen et al.,2011,2016, I=206, C=95, PW |
| 26 | Nielsen & Randall,2012; Nielsen et al.,2010,2017; Randall et al.,2009, I=128, C=152, PW | 63 | Mabry et al.,2018; Olson et al.,2016, I=63, C=59, PW |
| 27 | McGilton et al.,2013, I=18, C=0, PW | 64 | Lee et al.,2014, I=40, C=40, S |
| 28 | Chapleau et al.,2011, I=14, C=0, PW | 65 | Gilbert-Ouimet et al.,2011, I≥1330, C=0, PW |
| 29 | Kinser et al.,2016, I=27, C=0; S | 66 | Brisson et al.,2006; Oude Hengel et al.,2011,2013, I=171, C=122, M |
| 30 | Lappalainen et al.,2014; Muuraiskangas et al.,2016, I=25, C=0, S | 67 | Clay-Williams & Braithwaite,2015; Clay-Williams et al.,2013, I=10, C=0, PW |
| 31 | Andersen & Westgaard,2013, I=138, C=0, PW | 68 | van Wingerden et al.,2013, I=50, C=0, PW |
| 32 | Foureur et al.,2013, I=26, C=0, S | 69 | Stansfeld et al.,2105, I=225, C=59, PW |
| 33 | Bartlett et al.,2017, I=11, C=22, S | 70 | Tregaskis et al.,2013, I=401, C=0, PW |
| 34 | Zhang et al.,2015,2016, I=29, C=0, PH | 71 | Greasley & Edwards,2015; Greasley et al.,2012, I=383, C=0, M |
| 35 | Lundmark et al.,2018, I=90, C=0, PW | 72 | Füellemann et al.,2016, I=203, C=0, PW |
| 36 | Allexandre et al.,2016, I=10, I=15, I=16, C=20, S | 73 | Hasson et al.,2014, I=180, C=0, PW |
| 37 | Edmunds et al.,2013, I=89, C=0, PH | 74 | Sørensen & Holman,2014, I=154, C=0, PW |

Key. PW=primary work redesign, PH=primary health behavior; M=multifocal, S=Secondary; T=Tertiary. I=n in treatment group(s), C=n in control group.

Table 4: Summary of intervention benefits.

| Summary of intervention effects | Studies where no changes implemented or changes not implemented as planned | Studies where contextual factors hindered implementation/activation of mechanisms | Studies where changes implemented, but no mechanisms activated | Studies where intended mechanisms activated | Studies where unintended mechanisms activated | Studies where negative mechanisms were activated |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|
| Beneficial to wellbeing | No studies | No studies | No studies | 41,65,70,3,7,17,24,63, 47,58,48,12,49,52,33 <i>N</i> in treatment groups=3225 <i>N</i> in control groups=4320 | 54,56,10,16,37,50,39,32, 36 <i>N</i> in treatment groups=3005 <i>N</i> in control groups=0 | No studies |
| Contingently beneficial – benefits realized in a sub-sample | 44,57,68,38 <i>N</i> in treatment groups=514 <i>N</i> in control groups=351 | 74,20,73,15 <i>N</i> in treatment groups=637 <i>N</i> in control groups=0 | No studies | No studies | 6,8,40 <i>N</i> in treatment groups=1793 <i>N</i> in control groups=0 | No studies |
| Non-beneficial | 4,27,62,69,2,11,14,31,45, 53,46,55,5,9 <i>N</i> in treatment groups=1441 <i>N</i> in control groups=808 | 1,25,26,60,71 <i>N</i> in treatment groups=688 <i>N</i> in control groups=153 | 18,51 <i>N</i> in treatment groups=349 <i>N</i> in control groups=153 | No studies | No studies | No studies |

Numbers refer to study numbers, table 3

Bold unshaded=beneficial intervention; *italic partial shade*=contingently beneficial intervention; **white font shaded**=non-beneficial intervention

Table 5: Summary of evidence statements, strength of evidence grades and rationale for grades

| Evidence statements rated as strong | Number of studies, combined sample size | Reasons for strong ratings |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1: To produce benefits for wellbeing, a necessary but not sufficient condition is for the WHWP to activate intended mechanisms or mechanisms emergent from intervention implementation.</p> <p>7a: A critical success factor for WHWPs is continuity in efforts at implementing, adapting, or otherwise sustaining the intervention.</p> | <p>55 studies <i>N</i>=10517 in treatment groups, <i>N</i>=4545 in control groups</p> <p>27 studies <i>N</i>=10517 in treatment groups</p> | <p>Evidence comes from a large number of studies, large combined sample size (both statements).</p> <p>A number of studies used randomized or non-equivalent control group designs (statement 1).</p> |
| Evidence statements rated as promising | Number of studies, combined sample size | Reasons for promising ratings |
| <p>5: Effective governance and clear delivery structures appear to be a necessary but not sufficient condition to facilitate WHWP implementation.</p> <p>9: Positive service/service delivery features enhance WHWP implementation; negative service/service delivery features can be overcome.</p> <p>10: Positive worker dispositions towards WHWPs and WHWP implementation are associated with beneficial outcomes; negative dispositions can be overcome.</p> <p>11: Line managers can block or hinder implementation of changes, or undermine the effectiveness of any changes made.</p> <p>12: There relationship between senior manager dispositions towards WHWPs and WHWP implementation is unclear, although senior managers can block or hinder implementation of changes, or less frequently, undermine the effectiveness of changes that are made.</p> | <p>23 studies <i>N</i>=8442 in treatment groups</p> <p>37 studies <i>N</i>=7288 in treatment groups</p> <p>46 studies <i>N</i>=5280 in treatment groups</p> <p>20 studies <i>N</i>=2402 in treatment groups</p> <p>29 studies <i>N</i>=5433 in treatment groups</p> | <p>Evidence across a range of intervention types from a relatively large number of studies and a large combined sample size (all statements).</p> <p>Ambiguities in the evidence that require further investigation (all statements). Specifically, it is not clear when a positive contextual feature does not translate into a beneficial outcome (statement 5), where a negative contextual feature can be overcome (statements 9, 10) or why and how managers block interventions (statements 11, 12).</p> |

Table continues

Table 5: continued

| Evidence statements rated as initial | Number of studies, combined sample size | Reasons for initial ratings |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| 3: Adverse external environments affect detrimentally the WHWP implementation and effectiveness. | 4 studies <i>N</i> =5433 in treatment groups | Small number of studies and low combined sample size of workers exposed to interventions across the studies (statements 3, 7b, 8, 13) |
| 4: Overt use of power and/or cultural aids WHWP effectiveness, and adverse political and/or cultural factors hinder WHWP effectiveness. | 13 studies <i>N</i> =3270 in treatment groups | Explanations of the effects of context are inconsistent across the studies (statements 3, 4) |
| 7b: Frequent communication about the intervention assists continuity of efforts. | 3 studies <i>N</i> =346 in treatment groups | Most or all studies were of one intervention type, primary work redesign (statements 7b, 8, 13) |
| 8: Learning structures, coupled with effective governance structures, help adaptation and continuity in WHWP implementation. | 6 studies <i>N</i> =1820 in treatment groups | |
| 13: Expert and strategic implementers' dispositions to WHWPs influence WHWP implementation. | 6 studies <i>N</i> =912 in treatment groups | |
| Ungraded evidence statements | | Reason for not grading |
| 2: Although adverse internal omnibus contexts can affect the implementation and effectiveness of some WHWPs, overall there is mixed evidence on the relationship between the favorability of a range of internal contextual factors and WHWP implementation. | 53 studies <i>N</i> =14325 in treatment groups | Mixed or unclear evidence across the studies (both statements). |
| 6: The relationship between the sequencing of specific activities and WHWP implementation is unclear. | 35 studies <i>N</i> =7,577 in treatment groups | |

Table 6: Summary of contextual factors

| Context code | Intervention outcome | Negative contextual features for implementation | ΣN in treatment groups -ve context | Positive context features for implementation | ΣN in treatment groups +ve context |
|-------------------------------|----------------------|----------------------------------------------------------------------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|
| Omnibus context | | | | | |
| External omnibus | Beneficial | No studies | n/a | No studies | n/a |
| | Contingent | 68 | 50 | No studies | n/a |
| | Non-beneficial | 66,9,5 | 290 | No studies | n/a |
| Internal omnibus | Beneficial | 70,54,24,17,65,41,16,10,50,48,36,32,12,49 | 4769 | 56,24,17,37,48 | 412 |
| | Contingent | <i>15,6,74,68,57,44,28,8,73,61,38</i> | 4795 | 74,44,8,38 | 2148 |
| | Non-beneficial | 53,26,4,45,25,2,60,31,11,69,67,62,27,19,34,66,55,71,59,46,51, 30,18,9,42,13,5 | 4447 | 31 | 138 |
| Discrete context | | | | | |
| Organization culture/politics | Beneficial | 50 | 136 | 70,3,48,12 | 549 |
| | Contingent | <i>44,73</i> | 588 | 8,74 | 1404 |
| | Non-beneficial | 67,34,71 | 422 | 66 | 171 |
| Governance/delivery | Beneficial | No studies | n/a | 56,70,3,7,17,24,63,16,37,47,50,48,12 | 3733 |
| | Contingent | <i>73</i> | 180 | <i>35,6,8,61</i> | 3843 |
| | Non-beneficial | 60,25,31,55,71,30 | 899 | 25,26,31,45,60,51,5 | 866 |
| Sequencing | Beneficial | No studies | n/a | 3,7,24,54,63,16,23,47,50,48,12,52,49,21 | 3871 |
| | Contingent | No studies | n/a | <i>6,35,74,8,38,43</i> | 1835 |
| | Non-beneficial | 2,5,25,45 | 368 | 19,27,14,2,25,31,45,53,60,71,55,30,13,5 | 1783 |

Numbers refer to study numbers, see Table 3

Bold unshaded=beneficial intervention; *italic partial shade*=contingently beneficial intervention; **white font shaded**=non-beneficial intervention

Table continues

Table 6: continued

| Context code | Intervention outcome | Negative contextual features for implementation | ΣN in treatment groups -ve context | Positive context features for implementation | ΣN in treatment groups +ve context |
|-------------------------------------|----------------------|----------------------------------------------------------------|--------------------------------------------|----------------------------------------------|--------------------------------------------|
| Discrete context | | | | | |
| Continuity of activities | Beneficial | No studies | n/a | 3,17,24,63,16,37,23,50,12,48,65 | 4762 |
| | Contingent | <i>6,28,57,40,8,61</i> | 4666 | No studies | n/a |
| | Non-beneficial | 62,27,69,1,2,46,53,51,5 | 596 | 25,62 | 206 |
| Learning structures | Beneficial | No studies | n/a | 3,7 | 111 |
| | Contingent | No studies | n/a | <i>6,74,8</i> | 1649 |
| | Non-beneficial | 2 | 60 | No studies | n/a |
| Service/provider | Beneficial | 54,41,50,48,36,32,52 | 431 | 54,24,56,10,23,50,29,48,12,39 | 951 |
| | Contingent | <i>6,68,44,28,73,59,61,38</i> | <i>3163</i> | <i>72,8,73,59</i> | <i>1965</i> |
| | Non-beneficial | 60,53,45,25,11,1,2,69,67,62,27,66,46,51,30,5,13,42 | 1786 | 66,46 | 300 |
| Worker characteristics | Beneficial | 24,7,70,41,10,32,36,39 | 567 | 3,47,50,29,36,39,22,48,65,21,49,52 | 2190 |
| | Contingent | <i>68,57,28,6,38</i> | <i>260</i> | <i>74,8,43</i> | <i>1757</i> |
| | Non-beneficial | 53,45,31,26,25,14,1,69,67,62,27,4,34,55,71,59,51,30,18,5,42,13 | 2281 | No studies | n/a |
| Line/middle manager characteristics | Beneficial | 17 | 114 | 24,3,47,50,48,32,49 | 569 |
| | Contingent | <i>20</i> | <i>303</i> | <i>74,35,6,20,73,43</i> | <i>940</i> |
| | Non-beneficial | 60,31,26,11,2,1,67,27,19,71,51,42 | 1480 | 45,46 | 333 |
| Senior manager characteristics | Beneficial | 54,50 | 195 | 56,3,12,48 | 295 |
| | Contingent | <i>68,57,44,73</i> | <i>638</i> | <i>8,38</i> | <i>1586</i> |
| | Non-beneficial | 60,53,31,25,14,2,69,67,19,34,71,55,30,42 | 1678 | 51 | 66 |
| HR/OH characteristics | Beneficial | No studies | n/a | 17,3 | 225 |
| | Contingent | 73 | 180 | No studies | n/a |
| | Non-beneficial | 2,71,51 | 507 | No studies | n/a |

Numbers refer to study numbers, Table 3.

Bold unshaded=beneficial intervention; *italic partial shade*=contingently beneficial intervention; white font shaded =non-beneficial intervention

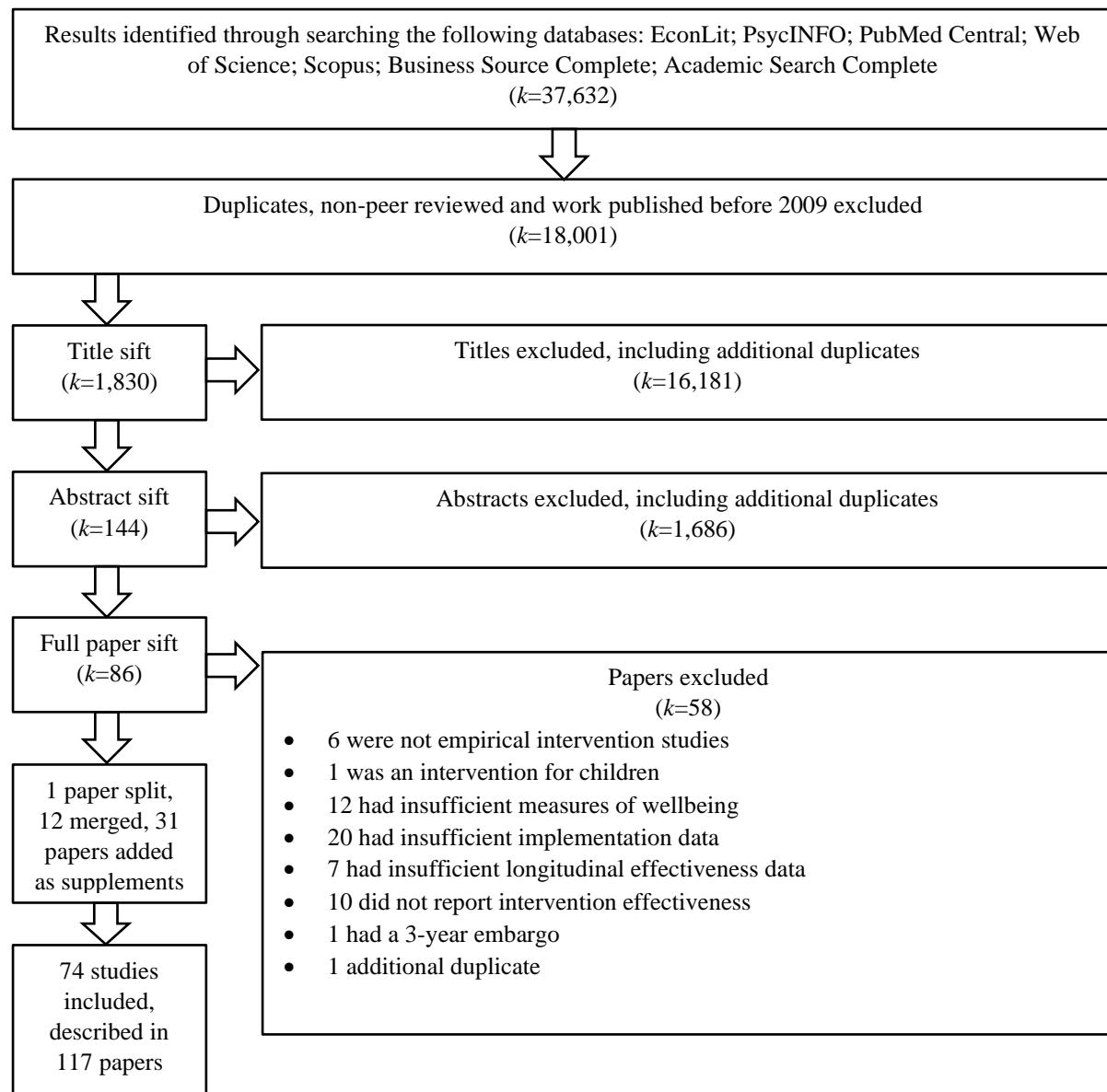


Figure 1: Flowchart of Sifting Process