Discover Psychology

Review

Effectiveness of interventions to improve job-related wellbeing of employees working from home: a rapid review

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Abstract
We conducted a rapid review examining the effectiveness of organisational interventions intended to improve job-related wellbeing of adult employees working from home. A systematic search was conducted on MEDLINE, PsycINFO, and Social Sciences Citation Index in June 2021. Studies were included of adult employees working from home, with wellbeing interventions implemented by organisations for all (or groups of) employees and study designs with any (or no) comparator group. Outcomes were quantitative/qualitative data related to employee psychological and subjective well-being. A total of 1906 unique records were retrieved, of which five studies with a total of 332 participants were included. All five studies included an online intervention, and each had a different type of intervention: well-being and performance coaching; positive psychology coaching; employee empowering sessions; corporate wellbeing programme; and yoga. Interventions showed a pattern of reducing stress levels and enhancing wellbeing. Review results should be interpreted with caution due to study small sample sizes, occurring during the pandemic and having inactive control or no control group, which may mean fluctuating levels of stress unrelated to interventions. The nature of the rapid review meant grey literature may have yielded more studies. This review was registered on Prospero (CRD42021262655).

Keywords Rapid review · Wellbeing · Home working · Stress · Coaching · Positive psychology, · UK/Europe/USA

1 Introduction

In 2020, 35.9% of the employed population in the UK worked from home for some or all of their working time due to the COVID-19 pandemic, compared to 26.6% in 2019 [1].Post-pandemic, it was forecast that there would be 18% more homeworkers than pre-pandemic [2]. The key difference between the pre-pandemic and pandemic home worker population is that home workers were previously doing so out of personal choice [3], through flexible working policies, rather than the enforced homeworking resulting from the imposition of lockdown, an example of which was the UK's Stay at Home order [4].

Evidence on homeworking is mixed and dependent on the circumstances in which it occurs. Pre-pandemic, homeworking was associated with high levels of employee satisfaction when they have a choice about hybrid working and when they work from home [5]. Additionally, home working enables employees to manage work and family time [6]. However,

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this is less likely to be the case when employees work from home full-time and when this work arrangement is imposed. It has been suggested that adverse effects on employee wellbeing might arise from professional isolation [7], reduced support [8], and fewer opportunities for interaction with colleagues [9]. There is also increased cognitive load related to interacting virtually [10] and physical fatigue due to sitting in one place and not moving about between meetings [11]. Thus, home workers' wellbeing can be affected in various ways and can lead to a reduction in quality of life.

1.1 Wellbeing interventions

Psychological wellbeing has been defined as 'Feeling good/experiencing fulfilment and purpose' [12]. Wellbeing thus incorporates both hedonic concepts that focus on feeling good (e.g., satisfaction, engagement) and avoidance of pain (e.g., stress) as well as eudaimonic concepts that focus on the pursuit of meaning, fulfilment and purpose (e.g., work-life balance and high quality relationships) [13].

Interventions that organisations might implement to address employee wellbeing could take various forms. Primary level interventions that aim to prevent stress happening in the first place (such as designing jobs and work systems to reduce stress and promote better wellbeing) tend to be less common but can improve both individual and organisational outcomes [17]. The most common type of intervention that organisations implement are secondary interventions, which focus on modifying responses to stressors and preventing or reducing the severity or duration of stress [14, 15]. Secondary interventions are not intended for those already experiencing severe clinical consequences of stress (which would require tertiary treatments like therapeutic counselling) but rather are intended for those experiencing initial symptoms of stress and to improve coping and prevent further decline [15, 16]. Such interventions might include stress management training, coaching sessions, relaxation and meditation skills training. Consistent with work based wellbeing models such as the job demands resources model [18], primary interventions often focus on reducing or mitigating the impact of stressors and demands for all employees in the workplace, as well as increasing work based resources (such as social support and job autonomy) that promote positive wellbeing. Secondary level interventions tend to focus on building personal resources (such as resilience and coping skills) that help employees deal with stressors and demands more effectively but may also involve job redesign for individuals to take preventative (primary) actions to modify the demands in their jobs [19].

1.2 Working from home and interventions

Several studies have recommended that research is needed to understand the impact of the pandemic over time and among different groups of employees [20, 21]. This will be increasingly important as many organisations have continued with home working or implemented hybrid working post-pandemic. According to recent surveys in the UK, between September 2022 and January 2023, 16% of working adults report only working at home, and 28% work part in the office and part at home (ONS, 2023). [22]

The literature on the relationship between flexible (including home) working and employee mental health is complex. Research suggests that flexible working (including some time working from home) can improve employee mental health through mechanisms such as increased autonomy and fitting work around family commitments [23]. However, flexible working can be a risk to employee mental health if there is social isolation from colleagues. In addition, when home is a workplace this could result in difficulty disengaging from work which may lead to disrupted sleep [23].

The impact of home working due to the pandemic on wellbeing has been explored in several studies using survey methods. A European study conducted in early lockdown identified advantages of working from home during the COVID-19 pandemic in improved work-life balance, without time wasted commuting, and having control over when to take breaks [24]. Other studies found the transition to working from home was associated with more anxiety than unchanged work [25] however employees experienced less anxiety than expected [26] and those feeling positive about working from home experienced lower rates of burnout [27].Perceived advantages were better work-life balance [28], altered work timelines and expectations [29], lack of commute, opportunities for self-care, and increased flexibility [26]. Perceived disadvantages were missing colleagues [29], problems with technology and remote communication [26, 27, 29], difficulty with boundaries between work and nonwork hours [26] especially where employees had caring responsibilities [27].

Organisations should therefore seek to consider interventions that help employees to benefit from the advantages of working from home/hybrid working and mitigate any potential negative effects. Awareness of evidence-based interventions would be of use to organisations. However, to the best of our knowledge no existing review has systematically searched for studies of the effectiveness of interventions to improve the wellbeing of employees working from home.

2 Aims of the current study

We report the results of a rapid review, to examine the effectiveness of organisational and group/team-level interventions intended to improve job-related wellbeing of adult employees working from home. For this review, outcomes were employees' subjective wellbeing, including mental health, resilience, psychological stress, work-life balance. Interventions were sought to discover the different types of intervention being assessed by employers, with the hope that sufficient data would be available to analyse which aspects of interventions had been effective, and how these could be applied to future interventions.

3 Methods

A rapid review was conducted to identify studies of employer interventions to improve the wellbeing of employees working from home.

3.1 Data sources

A systematic search was conducted on MEDLINE, PsycINFO (both via Ovid), and Social Sciences Citation Index via Web of Science on 27th June 2021. The search strategy for MEDLINE is shown in Table 1. The search strategy was peer-reviewed using the PRESS checklist [30]. Records were imported into Endnote software [31] for duplicate removal. After removal of duplicates, all potentially relevant references were imported into EPPI-Reviewer software [32] for screening. As this was a rapid review, only three databases were searched [33], with additional searching of reference lists of included studies and systematic reviews identified by the search.

Study selection was conducted according to the following review eligibility criteria.

Table 1 Search strategy for MEDLINE, MEDLINE In-Process, MEDLINE Daily, Epub Ahead of Print

#	Query	Results from 27th June 2021
1	Teleworking/	103
2	(telework* or tele-work* or telecommut* or tele-commut* or virtual team*).mp	416
3	(home work* or home office).mp	1079
4	((hybrid adj3 work*) or homework*).mp	2457
5	(work* adj2 home).mp	4292
6	remote* work*.mp	254
7	work* remote*.mp	119
8	((flexibl* adj2 work*) and home*).mp	107
9	(flexi place or flexiplace or flexplace or flex-place).mp	4
10	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9	7835
11	Health Promotion/	76,701
12	((organi?ation* or workplace* or workforce* or work force or staff or employer* or employee* or management or manager* or leadership or team* or group*) adj3 (intervention* or program* or project* or support* or initiative* or workshop* or training)).mp	216,052
13	((promot* or support* or service* or project* or program* or priorit* or increas* or improv* or better or enhanc*) adj3 (empower* or emotion* or mental health or wellbeing or "well being" or wellness or psychological or psychosocial or psycho-social or communication or job engagement or job satisfaction or work-life balance)).mp	183,521
14	((reduc* or decreas* or minimis* or minimiz*) adj3 (stress* or conflict* or isolat* or job strain*)).mp	61,717
15	or/11–14	504,949
16	10 and 15	1169
17	limit 16 to yr = "2015-Current"	637
18	remove duplicates from 17	634

3.2 Inclusion criteria

Population: Employees aged 18 years and over working from home for some, or all, of their working hours were included.

Intervention: Primary and secondary wellbeing interventions implemented by organisations for all employees, or groups of employees working from home were included. Definitions of primary and secondary interventions are taken from Holman et al. [15]; primary interventions aim to prevent stress occurring; secondary interventions "aim to reduce the severity or duration of stress once it has occurred and to prevent the level of stress becoming problematic".

Comparator: Studies including any comparator (active or inactive) and study types with no comparator group were included.

Outcomes: Quantitative /qualitative data related to worker psychological and subjective well-being were included. Example outcomes of interest included mental health, resilience, psychological stress, job engagement, job satisfaction, psychological distress, life satisfaction, optimism, happiness, emotion, meaning, purpose, burnout, work-family conflict, work-life balance, work-family enrichment, and work-family facilitation.

Setting: Studies conducted in the UK and high-income countries with similar work cultures to the UK, such as those within Europe, USA, Canada and Australasia were included.

Study designs: Randomised controlled trials (RCTs), quasi-experimental studies, controlled before-and-after studies, field experiments, cohort studies, case-controlled studies, systematic reviews, and realist evaluations.

Publication types: Articles in peer-reviewed journals were included.

Language: Studies published in the English language.

Date of Publication: Studies published from 2015 onwards.

3.3 Exclusion criteria

Studies were excluded where: the majority of the population did not meet inclusion criteria, unless results for the subgroup meeting inclusion criteria were reported separately; employees without the option to work from home; interventions for individuals; interventions and outcomes not related to wellbeing (e.g. work performance). Studies from countries within Asia, and other high-income countries that do not have a similar work culture to the UK were excluded, as were low and middle-income countries. Publication types excluded were dissertations, theses, conference abstracts, book chapters, letters and editorials.

Ten percent of titles and abstracts were screened by all three reviewers, and twenty percent by two independent reviewers. As this demonstrated a high level of agreement between reviewers, the rest were screened by one reviewer with a second opinion sought where necessary. Full texts retrieved were checked by one reviewer, with any unclear decisions discussed until a consensus was reached, with involvement of subject experts and funders if needed.

3.4 Data extraction and synthesis

Data extraction and quality assessment were conducted by one reviewer, and checked by a second reviewer. Quality assessment was conducted using the MMAT tool [34] for quantitative and qualitative studies. Quality of studies was categorised according to the system used by Wong et al [35], with quality defined as high (5/5 criteria low risk of bias), medium (4/5 criteria low risk of bias) and low (three or fewer criteria low risk of bias). Study results were tabulated and discussed in a narrative review.

4 Results

4.1 Quantity and quality of studies

A total of 1906 unique records were retrieved by the systematic search. Study selection is shown in Fig. 1. At abstract sift, 1815 were excluded. At full text sift 86 were excluded. Five studies met the inclusion criteria for the review.

The five included studies reported data from a total of 332 participants. Three studies had very small sample sizes (≤ 20 [36–38]). For two studies, a minority of participants were outside of the target population (Jarosz et al. 2021 [36] some Chinese participants, and Kumar et al. 2020 [38] some research students). Two studies did not report age range of

participants, however time in employment indicates population over 18 years old [37, 39]. All five studies investigated secondary interventions [40]. All five studies were conducted during the pandemic in 2020–2021, and were conducted online.

Studies were small, and there was heterogeneity of interventions, outcome measures, populations, and study designs (Table 2), therefore meta-analysis was precluded. Due to the limited number of studies, data did not allow the investigation of subgroups, such as age, gender, or new versus established employees.

Quality of studies was assessed [34, 35] to categorise level of quality as high, medium or low. Two studies were assessed to be of high quality [36, 37], one study [41] to be of medium quality, and two studies [38, 39] were of low quality. If the target population is considered to be all employees of a company, then across the studies, participants were not representative of the target population. There was either insufficient data to assess this or participants were self-selecting so that it was not a random sample. However, in practice it is likely that there would be some degree of self-selection for employees choosing to engage with an intervention. Blinding was not feasible for study participants or intervention deliverers.

Only one study adequately considered the relationship between researcher and participants [37] and none of the studies demonstrated that the interpreter was free from bias. Only two studies gave details of funding for the study [38, 39].

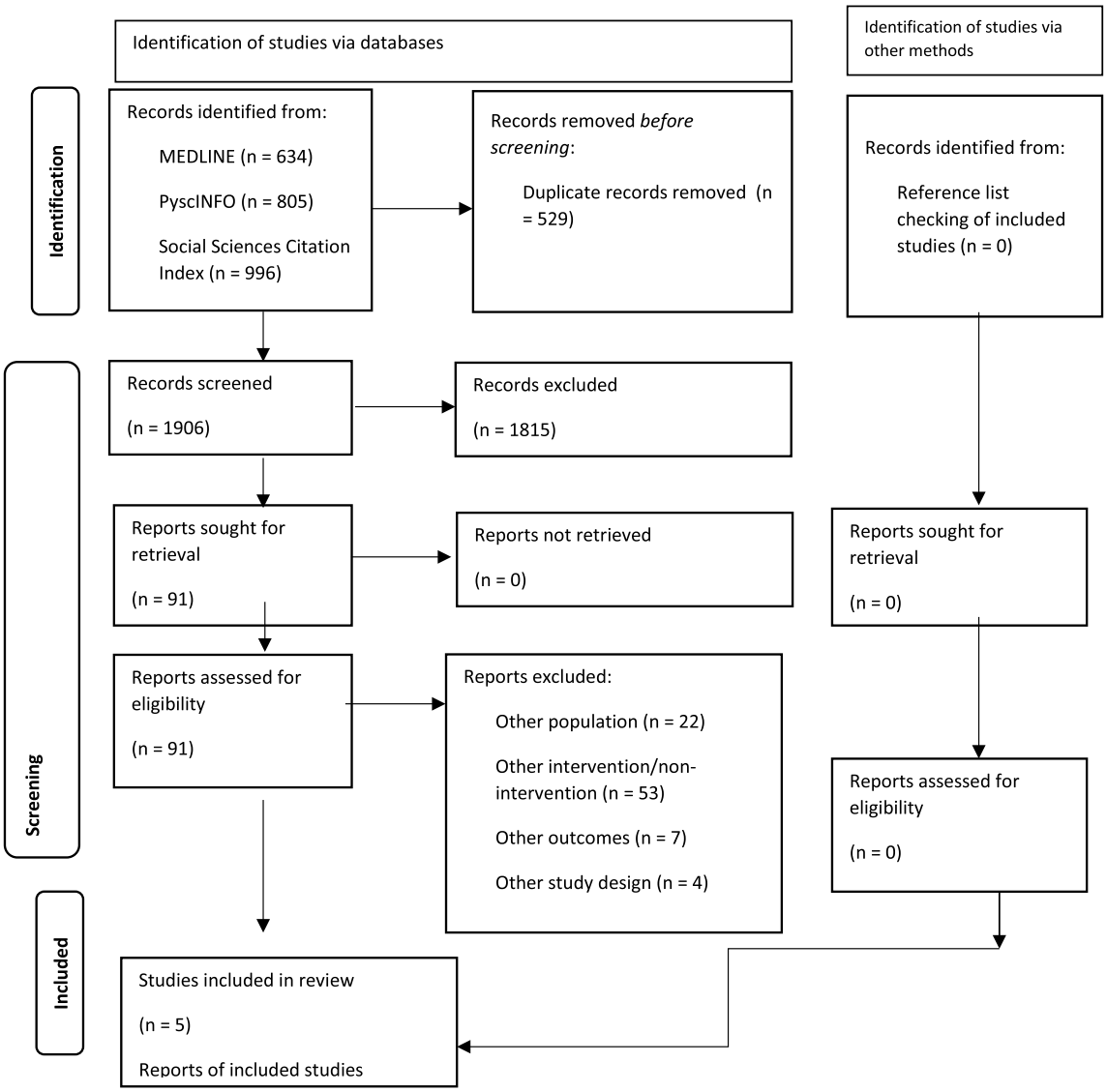

Fig. 1 PRISMA 2020 Flow Diagram

Table 2 Study characteristics

Study citation	Study design	Intervention	Control	Population	Setting	Wellbeing outcome measures (bold if validated measure)	Quality assessment
Jarosz 2021 [36]	Non-randomised controlled study	**Wellbeing and Performance Coaching** (n = 10)	No intervention received (n = 10)	Working from home due to pandemic (gender not reported) Aged between 35–40 years old	Managers of teams from banking, technical, sales, academic or marketing, in China, England, Germany, Poland, Spain, or the United States [n from each country not reported]	**Scales of Psychological Wellbeing questionnaire** [42] Team Barometer for both wellbeing and performance outcomes (designed by study researcher) Qualitative data from unstructured interviews and observation of group coaching sessions	High
van Nieuwerburgh et al. 2021 [37]	Qualitative (Interpretative Phenomenological Analysis)	**Positive Psychology Coaching** (n = 6)	Not applicable, uncontrolled study	Employees in the company providing the intervention, working from home due to pandemic n = 5 female, n = 1 male (age not reported)	Financial services company, UK	Interpretative Phenomenological Analysis, which allows themes to emerge, rather than seeking specific wellbeing outcomes (Note: wellbeing was not the primary outcome, which was lived experience of coaching)	High
Kumar et al. 2020 [38]	Case study (quantitative)	**Empowering sessions** (n = 9)	No intervention received (n = 10)	Employees in the company providing the intervention, working from home due to pandemic N = 10 female, n = 9 male age ranged from 22 to 50 years	Basic science researchers, University of Tennessee Health Science Center, USA	**Perceived Stress Scale (PSS) (10-item scale)** [43] COVID-19-Related Stress Score (COVID-SS) – assessing statements relating to fear, knowledge, growth mindset	Low

Table 2 (continued)

Study citation	Study design	Intervention	Control	Population	Setting	Wellbeing outcome measures (bold if validated measure)	Quality assessment
Nunez-Sanchez et al. 2021 [39]	Case study (mixed methods: observation; qualitative interview; quantitative questionnaire) [note only quantitative results considered here as quantitative assessment of employees, and qualitative assessment for employer]	**Corporate wellbeing programme, adapted for COVID-19 situation** (intervention available to all employees n = 695, data available for n = 253)	Not applicable, uncontrolled study	Employees in the company providing the intervention, working from home due to pandemic N = 92 female, n = 161 male (age not reported)	Mahou San Miguel Brewery, Spain	Satisfaction with intervention and company support, measured by a company administered questionnaire	Low
Wadhen et al. 2021 [41]	Pilot RCT with wait-list control	**Yoga, online** (n = 26 recruited, n = 17 in analysis)	Wait-list (n = 26 recruited, n = 17 in analysis)	Working from home due to pandemic n = 31 female, n = 3 male Mean age (SD): 42.2 years (10.20)	Corporate organisations and academic institutions, London, UK	**Perceived Stress Scale-14 items; (PSS-14)** [44] **The Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS)** [45] **Coping Self-Efficacy Scale (CSES-26)** [46] **Depression, Anxiety & Stress scale (DASS-21)** [47]	Medium

The study design will also affect risk of bias. There were a variety of study designs: pilot RCT, non-randomised controlled study, qualitative study, and two case studies (Table 2). The yoga study [41] was a randomised controlled trial (RCT), and according to the accepted hierarchy of evidence, RCTs provide the most authoritative forms of evidence. The wellbeing and performance coaching study [36] is non-randomised and therefore prone to selection bias. The corporate wellbeing study [39] and the positive psychology coaching study [37] were uncontrolled studies and therefore at risk of bias as it is unclear if changes pre-post intervention are due to the intervention or other factors. However, it should be noted that fully experimental designs are often not feasible in organisations, studies are more likely to be quasi- experimental that contain some rigour and controls, but it is rare to be able to get to the standard of a randomised controlled trial.

4.1.1 Interventions

All five studies had a different type of intervention (Table 3). Although there were two coaching interventions, they differed in ideological basis and duration. All five interventions were delivered online. One intervention [37] involved one-to-one interaction of employee with intervention deliverer, whereas the others involved group interactions or a mixture of group and individual interactions (Table 3).

The Well-Being and Performance Coaching (W&PC) of Jarosz [36] followed coaching as a holistic approach, and focussed on wellbeing, performance and the impact managers could have, across four weeks.

Positive Psychology Coaching (PPC) was employed in the van Nieuwerburgh et al. 2021 [37] study. One coaching session was given to each participant, with focus on meaningful goals to enhance wellbeing.

Kumar et al. 2020 [38] aimed to mitigate stress by engaging employees in group meetings in which to listen and learn, with focus on motivation and empowerment (hereafter referred to as "empowering sessions") over five months.

The Corporate Wellbeing Programme in Nunez-Sanchez et al. 2021 [39] ran throughout the pandemic, with data collected at six months. The programme provided a variety of information to individuals in differing formats online and also offered group exercises. The topics covered staying physically active; quitting tobacco; mental health; and healthy diet.

Wadhen et al. 2021 [41] described an online yoga intervention, over six weeks, with participant choice over when and how many sessions to attend. There were physical and meditative components to the approach to yoga.

4.2 Outcomes

Wellbeing outcome measures were varied (Table 2). Two studies (Kumar et al. 2020 [38] Wadhen et al. 2021 [41]) used different versions of the same tool: the Perceived Stress Scale (PSS) 14-item, and 10-item versions. No other studies used versions of the same scales. Three quantitative studies (Jarosz 2021 [36] Kumar et al. 2020 [38] Wadhen et al. 2021 [41]) used one or more validated scales (Table 2).

The Well-Being and Performance Coaching (W&PC) non-randomised controlled study [36], reported similar directions of changes in wellbeing in both intervention and control group (Table 4). For both groups, total wellbeing had increased at week two, decreased at week three, and increased to a level above baseline for weeks four and five. The similar directions of effect suggest influence of factors outside the intervention (which could be assumed to be the pandemic). Although the experimental group had numerically higher increases in wellbeing, the only exception to showing similar direction of change was for self-acceptance which increased in the intervention group and decreased in the control group from week one to five ($p < 0.1$). Qualitative themes included: introducing fun and inspiring ideas; managers focusing to reduce information provided to teams to reduce "noise" from too much information [36].

The Positive Psychology Coaching (PPC) study was a qualitative study (unlike the other studies which had one of more quantitative measures of wellbeing as their primary outcome) [37]. It sought qualitative themes from interpretative phenomenological analysis, on participants lived experience of the intervention, in which wellbeing was central to the coaching [37]. The researchers identified five themes emerging from the participant interviews: valuing opportunity for safe reflection; increasing awareness; alleviation of negative emotions; re-energised by identifying a way forward; and renewed confidence (Table 4). These themes are consistent with a beneficial effect on wellbeing. Sample size was small ($n = 6$, of whom $n = 5$ were female), making it difficult to generalise to the general population.

The empowering sessions case study [38] reported the intervention group showed reduced general stress compared to the control group (Perceived Stress Scale 10 item version (PSS-10) $p < 0.01$, COVID-19-Related Stress Score (COVID-SS) $p < 0.05$). The study findings suggest that the intervention strategy to deal with COVID-related stress and anxiety significantly and consistently decreased fear and increased knowledge (Table 4).

Table 3 Interventions

Study citation	Intervention	Duration	Intervention delivered by	Individual or group interaction	Participants (intervention recipients)	Intervention details
Jarosz 2021 [36]	Well-Being and Performance Coaching (W&PC), online	Weekly group coaching sessions (maximum 45 min); and individual coaching sessions (maximum 30 min), throughout 4 weeks, data collection at week 5	The researcher, a certified coach (International Coach Federation certified)	Both	Employed in various organisations	Started with a detailed programme overview to familiarise participants with the concepts of coaching, well-being and its components (autonomy, environmental mastery, positive relationships with others, purpose in life, personal growth, self-acceptance). Participants set agendas for each session, focussing on a particular aspect of wellbeing or performance The coaching approach followed the Core Competency Model by the International Coach Federation [48]
van Nieuwerburgh et al. 2021 [37]	Positive Psychology Coaching (PPC), online	One session of 75–90 min	Delivered by one of three positive psychology coaches	Individual	Employees of the company providing the intervention Working for the company from less than a year to 17 years	Coaching based on authors' definition of PPC "a managed conversational process that supports people to achieve meaningful goals in a way that enhances their wellbeing", [49] emphasis on client wellbeing, client-as-expert, meaningful goals to improve quality of life, and optimal functioning, using the "GROW conversational framework", [50] designed to be consistent across the three coaches
Kumar et al. 2020 [38]	Empowering Sessions, online	Weekly 2-h meeting, additional one-on-one meetings as needed, throughout 5 months	Employer organised	Both	Employees of the company providing the intervention (time working for employer not reported)	Employees had virtual group meetings, focussing on listening to concerns and empowering each other. Discussion topics included: how the pandemic impacted people differently; faith/dreams vs. panic/fear; facts/reality vs. opinion/hype; safety vs. carelessness; managing the crisis; thriving vs. surviving;how to improve productivity and manage stress; the advantages of working from home. These were followed by reflection exercises (individual and group)

Table 3 (continued)

Study citation	Intervention	Duration	Intervention delivered by	Individual or group interaction	Participants (intervention recipients)	Intervention details
Nunez-Sanchez et al. 2021 [39]	Corporate Wellbeing Programme, adapted for COVID-19 situation	Time engaged optional by participants, Programme running throughout the pandemic (feedback after 6 months)	Employer and outside contractors (run by a team within the company, with external experts for part of programme)	Both	Employees of the company providing the intervention 68.3% had been working for the company for more than 5 years	The programmewas made up of four facets: stay physically active; quitting tobacco; mental health; healthy diet. All included the provision of information online, including video tutorials, talks from a variety of experts, online advice. In addition there were online group exercise or mindfulness classes, an online physiotherapist, a specialist external consultancy service for stopping smoking, an emergency phoneline and an emotional coach service with Mahou San Miguel coaches. There were speeches by the employer every 2–3 weeks
Wadhen et al. 2021 [41]	Yoga, online	Time engaged optional by participants, intervention throughout 6 weeks	External provider, a registered yoga instruction	Group	Employed in various organisations, not practising yoga	Online streamed yoga classes offered at various times during 6 weeks, study participants could choose how many yoga classes to attend. Study recommended participants attended a minimum of 12 sessions during the 6 weeks of intervention. Based on Hatha Yoga, with simplified and modified versions of poses, breathing techniques and meditation technique, with a spiritual element

Table 4 Study results

Study citation	Intervention	Sample size	Outcome measures	Results
Jarosz 2021 [36] Non-randomised controlled study	**Wellbeing and Performance Coaching**	20 (10 intervention, 10 control)	Scales of Psychological Wellbeing questionnaire [42], 42 questions rated on scale of 1–6 (negative values reflect worsening)	Total Wellbeing, experimental (E) and control (C) % change in average wellbeing levels Week 1–2: E = 3.4, C = 1.0 Week 2–3: E = -4.5, C = -5.7 Week 3–4: E = 5.9, C = 4.4 Week 4–5: E = -0.4, C = 0.0 The gain scores were compared between E and C groups using Mann–Whitney U test. The only group difference considered statistically significant (at level $p < 0.10$) reported was in self-acceptance which increased in E group and decreased in the C group
			Team Barometer, rate direction of team's well-being over time from three options: lower, about the same, higher	For both groups, Total wellbeing had increased at week 2, decreased at week 3, and increased to a level above week 1 for weeks 4 and 5
			Qualitative, inductive data analysis, deductive data analysis, analysing participants' meaning, clustering, noting patterns and common themes search	Qualitative themes about lockdown included: struggles with distractions; technology was a challenge; overwhelming worries around sense of control; at week 3 novelty of the situation wearing off; at week 4 attempt at trying to get back to normal Intervention group helped by: Introducing fun and inspiring ideas; managers focusing to reduce information provided to teams to reduce "noise" from too much information
van Nieuwerburgh et al. 2021 [37] Qualitative (Interpretative Phenomenological Analysis)	**Positive Psychology Coaching**	6	Qualitative themes from Interpretative Phenomenological Analysis	Five overarching themes emerged from the data: valuing opportunity for safe reflection; increasing awareness; alleviation of negative emotions; re-energised by identifying a way forward; and renewed confidence. Particularly relevant to wellbeing "Alleviation of negative emotions"—reported that almost all participants felt this, quotes given from 4/6 participants to support this
Kumar et al. 2020 [38] Case study	**Empowering sessions**	19 (9 intervention, 10 control)	Perceived Stress Score (PSS) (10 item version) [43] Individual scores on the PSS can range from 0–40 with higher scores indicating higher perceived stress	Mean (SD) Intervention baseline17.4(2.7), month 5 13.8(2.3) Control group NS over time Mean ± SD across five months Intervention 14.7 ± 0.8 Control 19.3 ± 0.3 (group difference $p < 0.01$)
			COVID-19-Related Stress Score (COVID-SS) (Fear, Knowledge, Growth zones) Fear zone minimum score 0, maximum score 5 (a higher score is more negative) Knowledge zone minimum score 0, maximum score 7 (a higher score is more positive) Growth zone minimum score 0 maximum score 8 (a higher score is more positive)	Overall COVID-SS scores: Fear zone in intervention group significantly lower than control group (0.75 ± 0.26 vs. 1.74 ± 0.08, $p < 0.01$) Knowledge zone in intervention group significantly higher than the control group (4.80 ± 0.43 vs. 4.18 ± 0.21, $p < 0.05$) Growth zone in intervention group significantly higher than control group (6.13 ± 0.51vs. 4.88 ± 0.40, $p < 0.05$)

Table 4 (continued)

Study citation	Intervention	Sample size	Outcome measures	Results
Nunez-Sanchez et al. 2021 [39] Case study	**Corporate wellbeing programme**	253 responses	Company administered questionnaire	87.6% of respondents stated that they felt well or very well-guided by the company during the pandemic. Level of satisfaction with the programme: 53% giving a score of 10/10. Overall satisfaction 9/10 57.9% reported similar levels of an increase in physical activity 52% participation rate in the programme. Satisfaction with company support of employees enrolled in the programme 9.6/10, those not enrolled 8.4/10
Wadhen et al. 2021 [41] Pilot RCT with wait-list control	**Yoga**	34 (17 intervention, 17 control)	Perceived Stress Scale-14 items; (PSS-14) [44] Individual scores on the PSS can range from 0–56 with higher scores indicating higher perceived stress	Mean (SD) Intervention Group 32.29 (8.37) pre-intervention and 23.47 (8.56) post intervention Control Group 29.41 (8.03) pre-intervention and 28.12 (7.66) post-intervention Interaction (Group x Time) F-ratio mean = 10.30 p = 0.003, Q = < 0.01*
			The Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS)—14 items. [45] Possible scores from 14–70 with higher total scores indicating higher levels of mental wellbeing	Mean (SD) Intervention Group 41.59 (7.18) pre-intervention and 49.76 (6.55) post intervention Control Group 42.76 (7.06) pre-intervention and 44.24 (7.32) post-intervention Interaction (Group x Time) F-ratio mean = 9.84 p = 0.004, Q = < 0.02*
			Coping Self-Efficacy Scale (CSES-26) and its three subscales—Problem focused coping, stopping unpleasant thoughts and emotions, Getting support from family and friends. [46] 26-item scale with possible scores from 0–260 with higher scores indicating higher levels of coping	Mean (SD) Intervention Group 122.24 (39.90) pre-intervention and 167.29 (48.12) post intervention Control Group 147.47 (44.89) pre-intervention and 139.76 (45.35) post-intervention Interaction (Group x Time) F-ratio mean = 10.63 p = 0.003 Q = < 0.01*
			Depression, Anxiety and Stress scale (DASS-21) [47] 21-item scale with answers ranging from 0–4. Cut-off points for: Depression 0–4 normal to ≥ 14 extremely severe Anxiety 0–3 normal to ≥ 10 extremely severe. Stress 0–7 normal ≥ 17 extremely severe	Depression Mean (SD) Intervention Group 6.53 (2.98) pre-intervention and 3.06 (2.81) post intervention Control Group 6.35 (3.85) pre-intervention and 5.71 (3.80) post-intervention Interaction (Group x Time) F-ratio mean = 5.44 p = 0.026, Q = < 0.03* Anxiety Mean (SD) Intervention Group 4.47 (2.98) pre-intervention and 2.53 (2.37) post intervention Control Group 4.06 (2.79) pre-intervention and 3.76 (2.77) post-intervention Interaction (Group x Time) F-ratio mean = 3.09 p = NS / Q = NS Stress Mean (SD) Intervention Group 10.18 (4.09) pre-intervention and 6.47 (2.42) post intervention Control Group 9.59 (3.60) pre-intervention and 8.06 (3.63) post-intervention Interaction (Group x Time) F-ratio mean = 3.12 / p = NS / Q = NS

Table 4 (continued)

Study citation	Intervention	Sample size	Outcome measures	Results
			Qualitative, thematic analysis	Qualitative data: high acceptability and enjoyment of intervention. A range of benefits from programme participation including benefits to physical health, stress regulation, self and body awareness and finding a personal oasis. Participants welcomed convenience of online yoga intervention and flexibility of schedule of classes

NS not significant

*Adjusted significance value (Q) calculated using false discovery rate approach to take account of multiple comparisons

The Corporate Wellbeing Programme case study [39] reported overall level of satisfaction with the wellbeing programme 9/10 (Table 4). Although no control group was set up, there was a comparison made between employees opting to be enrolled in the programme, who had a higher satisfaction with company support (9.6/10), compared to those not enrolled (8.4/10). 57.9% reported similar levels of an increase in physical activity.

The yoga pilot randomised controlled trial [41] concluded that the online streamed yoga intervention to reduce stress when working from home was effective. Qualitative analysis reported the programme was acceptable, and felt there were benefits to health, wellbeing and stress-management (Table 4). Only women remained in the yoga group for data collection, so acceptability of the programme cannot be generalised to men. Both intervention and control groups showed similar direction of effect, that is with improvement at post-intervention measurement, on all outcomes apart from the Coping Self-Efficacy Scale (CSES-26) for which the intervention group improved and the control group numerically worsened (interaction effect $p = 0.003$).There was a significant interaction effect of group x time (six weeks) for PSS-14 $p = 0.003$, Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) $p = 0.004$, and depression on the DASS-21 scale $p = 0.026$ (Table 4), indicating greater improvement for the intervention group than the control group. Unlike other stress scores, DASS anxiety and DASS stress showed no significant difference group x time interaction. None of the measures were designated primary outcome, and there is no sample size calculation reported, and so results must be interpreted with caution.

As demonstrated by studies with a control group [36, 41], wellbeing fluctuated across time, and not all impact on wellbeing could be attributed to the interventions. Levels of stress at the beginning of the pandemic will vary according to individuals and their personal circumstances and may have improved over time regardless of whether or not they access an intervention. However, differences between intervention and control groups may have increased over time if interventions had longer durations.

4.2.1 Changes in measures of stress or anxiety

For the empowering sessions [38] stress measured by PSS decreased significantly in the intervention group between baseline and month four (benefit maintained at month five), and there was no significant change in control group. There was significantly lower stress across five months in the intervention than control group, as measured by both PSS and COVID-SS [38].

The yoga intervention showed significantly more benefit on PSS for the intervention group compared to control group after six weeks [41], however not on the anxiety and stress scales measured by DASS.

Qualitative themes around stress included stress regulation (identified by Wadhen and Cartwright from yoga) [41] or alleviation of negative emotions (identified by van Nieuwerburgh et al. from positive psychology coaching) [37].

One study (yoga) looked at depression as measured by DASS, and reported significantly more improvement for the intervention than the control group. [41]

4.2.2 Changes in measures of positive wellbeing

Scales of Psychological Wellbeing questionnaire, for the Wellbeing and Performance Coaching intervention for four weeks [36] mostly showed non-significant change except for positive effect on self-acceptance in the intervention group.

The yoga intervention showed significantly more benefit in mental wellbeing as measured by WEMWBS and for coping as measured by the CSES-26for the intervention compared to control group after six weeks [41].

Qualitative themes identified by van Nieuwerburgh et al. [37] included finding renewed confidence.

4.3 Practices for improving wellbeing

Given the small sample sizes, short duration of interventions and heterogeneity of study design, interventions and outcome measures, there is uncertainty in trying to draw lessons for practice. We have drawn together some themes that seem to have been beneficial from the literature reviewed, however further research would be needed to determine causal connections.

Practical organisational support: provision of adequate technology in home offices [36, 39]; allowing flexibility over schedule [41]; providing job security [39].

Social support from organisations: employees given opportunities to share thoughts and solutions to problems [36]; identifying ways forward [37]; fostering supportive relationships, e.g. between employee and coach [36], or employee and employer [39].

Reducing cognitive load: reducing distraction or overload from too much information [36]; allowing time taken out for reflection [37]; employees having control over their own schedule [38, 41] and place to work [38]; experience of autonomy [37].

Empowering individuals to cope with stress: increasing awareness of self and environment [37]; alleviation of negative feelings regarding work circumstances [37]; focus on personal strengths and renewed confidence [36, 37]; more time with family [38]; techniques to improve resilience and stress regulation [41].

Physical health: interventions incorporating increase in physical activity [39, 41]; home environment may increase opportunity to tend to physical health [38].

5 Discussion

Although many organisations have surveyed/attempted to improve performance and well-being of their employees, few formal investigations of the effectiveness of wellbeing interventions for homeworkers have been published. The current paper contributes to the literature by reviewing existing evidence for the effectiveness of interventions aimed specifically at the wellbeing of employees working from home. As far as we are aware, this is the first study to review this evidence.

All the included published studies investigated secondary interventions (aiming to improve coping and prevent initial levels of stress becoming more severe). This is consistent with previous reviews of wellbeing interventions offered by organisations, where secondary interventions are the most prevalent [14, 15].

The interventions studies included in this review seem to have (at least in the short-term) had a beneficial effect in improving wellbeing, reducing stress, or were considered an acceptable or supportive intervention. The interventions aimed to effect outcomes by enhancing personal resources, such as resilience, self-knowledge and the ability to manage stress. However, long term effects (beyond a few months) were not examined in these studies and so the sustained effectiveness of these interventions cannot be determined. It might be the case that to ensure that employees are able to benefit from the advantages and mitigate the negative aspects of working from home that primary interventions (focusing on changing demands or removing stressors) may also be required as well as secondary interventions (aimed at enhancing personal resources).

Adequate technology was essential for delivering the interventions, as this was the only mode of delivery at the time. Remote communication between groups provided support and allowed sharing of thoughts and problem solving. Autonomy was provided through employees controlling their schedules and taking breaks. Based on evidence from the wider literature about increases in cognitive load when working remotely via technology, cognitive load may be reduced by prioritising which information is needed by employees, so that information overload is limited. Interventions that focus on employee strengths, building confidence and resilience may also be beneficial in enabling them to cope with stress. Enabling self-care through physical health may also contribute to wellbeing.

5.1 Future research

More research is needed on primary interventions for those working from home (aimed at preventing stress from occurring in the first place).

All the included published studies investigated working from home in response to the Covid-19 pandemic. While this may inform what sort of interventions might be effective in any future mandated working from home, there may also be lessons from this review that can inform interventions for those working from home full-time or partially (in a hybrid capacity) post pandemic, especially if these new ways of working are not the preference of the employee. More research on interventions for hybrid working would be useful going forward to determine what type of intervention is required or is helpful for those working part time in the office and part time at home. All the interventions in the current

review were delivered online, and so it would be useful to examine the effectiveness of online delivery in comparison to face-to-face delivery in hybrid settings.

5.2 Limitations

Only five studies evaluating interventions relating to wellbeing were identified. As this was a rapid review, grey literature was not searched, and this may have yielded more studies. The majority of included studies had small sample sizes and the interventions were of short duration. Not all studies were controlled, and those that were had inactive controls. Heterogeneity of interventions and outcome measures make it difficult to draw lessons for practice. Participants were self-selecting, and so not representative of all employees of an organisation. There were not enough data to distinguish between established and new employees; it might be expected, for instance, that new employees would benefit more from meeting colleagues via videoconference if they had not met in person before the pandemic. Moreover, baseline levels of stress may have been elevated due to the circumstances of the pandemic.

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Author contributions All authors were involved in protocol design; MC conducted the searches; AS, ES, AC screened references, extracted data, conducted risk of bias assessment, tabulated data; ES, AS, AC, CA, SW were involved in the narrative synthesis; all authors approved the manuscript.

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Data availability Data were taken from published articles, and the authors confirm that the data supporting the findings in this study are available within this article.

Declarations

Competing interests The authors declare no competing interests.

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