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Workplace-based interventions to promote healthy lifestyles in the NHS workforce: a rapid scoping and evidence map

Gary Raine, Sian Thomas, Mark Rodgers, Kath Wright and Alison Eastwood



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Abstract

Workplace-based interventions to promote healthy lifestyles in the NHS workforce: a rapid scoping and evidence map

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Background: The health and well-being of staff working in the NHS is a significant issue for UK health care. We sought to identify research relevant to the promotion of healthy lifestyles among NHS staff on behalf of NHS England.

Objectives: To map existing reviews on workplace-based interventions to promote health and well-being, and to assess the scope for further evidence synthesis work.

Design: Rapid and responsive scoping search and evidence map.

Participants: Adult employees in any occupational setting and in any role.

Interventions: Any intervention aimed at promoting or maintaining physical or mental health and well-being. Early intervention initiatives and those addressing violence against staff, workplace bullying or harassment were also included.

Main outcome measures: Any outcome related to the effectiveness, cost-effectiveness or implementation of interventions.

Data sources: A scoping search of nine databases was conducted to identify systematic reviews on health and well-being at work. Searches were limited by publication date (2000 to January/February 2019).

Review methods: The titles and abstracts of over 8241 records were screened and a total of 408 potentially relevant publications were identified. Information on key characteristics were extracted from the titles and abstracts of all potentially relevant publications. Descriptive statistics (counts and percentages) for key characteristics were generated and data from reviews and 'reviews of reviews' were used to produce the evidence map.

Results: Evidence related to a broad range of physical and mental health issues was identified across 12 'reviews of reviews' and 312 other reviews, including 16 Cochrane reviews. There also exists National Institute for Health and Care Excellence guidance addressing multiple issues of potential relevance. A large number of reviews focused on mental health, changing lifestyle behaviour, such as physical activity, or on general workplace health/health promotion. Most of the reviews that focused only on health-care staff addressed mental health issues, and stress/burnout in particular.

Limitations: The scoping search process was extensive and clearly effective at identifying relevant publications, but the strategy used may not have identified every potentially relevant review. Owing to the large number of potentially relevant reviews identified from the scoping search, it was necessary to produce the evidence map using information from the titles and abstracts of reviews only.

Conclusions: It is doubtful that further evidence synthesis work at this stage would generate substantial new knowledge, particularly within the context of the *NHS Health and Wellbeing Framework* [NHS England. *Workforce Health and Wellbeing Framework*. 2018. URL: www.nhsemployers.org/-/media/Employers/Publications/Health-and-wellbeing/NHS-Workforce-HWB-Framework_updated-July-18.pdf (accessed 10 January 2019)] published in 2018. Additional synthesis work may be useful if it addressed an identifiable need and it was possible to identify one of the following: (1) a specific and focused research question arising from the current evidence map; it may then be appropriate to focus on a smaller number of reviews only, and provide a more thorough and critical assessment of the available evidence; and (2) a specific gap in the literature (i.e. an issue not already addressed by existing reviews or guidance); it may then be possible to undertake further literature searching and conduct a new evidence review.

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List of abbreviations

HIV	human immunodeficiency virus	RMAs	reviews and meta-analyses
NICE	National Institute for Health and Care Excellence	RoR	review of reviews
NIHR	National Institute for Health Research		

Plain English summary

The health and well-being of staff working in the NHS is an important issue. We were asked by NHS England to identify research relevant to the promotion of healthy lifestyles among NHS staff. We looked for existing reviews of studies conducted in any workplace setting that examined the effects or value for money of different interventions or how they were viewed by staff or how they were delivered. We then produced a descriptive map of the available research evidence.

In total, we searched nine databases, checked over 8000 papers published since 2000 and found 408 potentially relevant reviews. As we found such a large number of potentially relevant reviews, it was necessary to produce the evidence map using information provided in the titles and abstracts of reviews only.

We found a large number of reviews focused on mental health, changing lifestyle behaviour such as physical activity, and on general workplace health/health promotion. Most of the reviews that focused just on health-care staff addressed mental health issues such as stress and burnout.

We do not believe that further synthesis work on this issue would be useful unless it addressed a clear need, and it was possible to identify either a focused research question or a specific gap in the literature. It may then be appropriate to focus on a smaller number of reviews and conduct a more detailed examination of the available evidence or, if necessary, undertake further literature searching and conduct a new evidence review.

Scientific summary

Background

The health and well-being of staff working in the NHS is a significant and long-standing issue for UK health care. Sickness absence among NHS staff is known to be higher than in other public sector organisations as well as among those in the private sector. Poor staff health and well-being has significant financial implications and also potentially has an impact on quality of care, patient outcomes and safety.

Research has indicated that musculoskeletal and mental health conditions are major causes of ill health and sickness absence among NHS staff. The level of violence, harassment and abuse experienced by staff from a number of different sources has also been identified as a key issue. Evidence indicates that poor mental well-being can negatively affect lifestyle behaviours, and vice versa. Notably, studies suggest that a large proportion of individuals working in the NHS do not meet public health guidance in relation to healthy lifestyle behaviours; however, this is not solely the result of factors under the control of individuals. The negative influence that organisational-level factors can have on the lifestyle behaviours of health-care staff has been highlighted in past UK studies. This includes long working hours, inadequate break times and low staffing levels.

Over a number of years, there have been various initiatives to improve the health and well-being of NHS staff; for example, the *NHS Health and Wellbeing Framework* [NHS England. *Workforce Health and Wellbeing Framework*. 2018. URL: www.nhsemployers.org/-/media/Employers/Publications/Health-and-wellbeing/NHS-Workforce-HWB-Framework_updated-July-18.pdf (accessed 10 January 2019)] was introduced in 2018 to assist NHS providers to develop and implement a staff health/well-being strategy. The framework has a key focus on promoting healthy lifestyles in addition to addressing mental health and musculoskeletal health.

In December 2018, the York Health Services and Delivery Research Evidence Synthesis Centre was asked by NHS England to identify evidence relevant to the promotion of healthy lifestyles among NHS staff. For this piece of work, the term 'NHS staff' was conceptualised broadly as any individual working for the organisation in any post.

Objectives

To map existing reviews on workplace-based interventions to promote health and well-being, and to assess the scope for further evidence synthesis work. It was not the purpose of this piece of work to extract, evaluate and synthesise findings from individual publications.

Methods

A scoping search of nine databases was conducted to identify systematic reviews on health and well-being at work. Results were limited by publication date (2000 to January/February 2019). No language or geographical limits were applied. The following databases were searched:

- Cochrane Database of Systematic Reviews (CDSR)
- Database of Abstracts of Reviews of Effects (DARE)
- HTA database
- Epistemonikos

- Health Evidence
- Database of promoting health effectiveness reviews (DoPHER)
- PROSPERO
- MEDLINE
- Business Source Premier.

Owing to the large number of potentially relevant publications identified, reviews were screened for inclusion in the evidence map based on information in the title and abstracts of records only; however, the full text of a number of 'reviews of reviews' identified during the selection process was retrieved in order to conduct a more detailed examination of these publications.

Records were selected for inclusion in the evidence map based on the following criteria:

- Population – adult employees (aged ≥ 18 years) in any occupational setting and in any role. Any reviews focusing solely on self-employed workers or including participants from other settings (e.g. school students) were not eligible for inclusion.
- Interventions – any intervention aimed at promoting or maintaining physical or mental health and well-being (however conceptualised). Interventions could also be focused on early intervention and reducing the incidence or symptoms of common mental health conditions (stress, anxiety or depression) among staff. Reviews of interventions addressing violence against staff, workplace bullying or harassment were also eligible for inclusion. Occupational health interventions and those aimed at returning employees to work after absence were considered beyond the scope of the review. Occupational health interventions were conceptualised as those with a predominate focus on promoting safer working environments and practices, and reducing injuries and workplace health risks. Interventions could be either or both (1) individual-level interventions, for example, initiatives focused on individual behaviour modification, (2) organisational-level interventions aimed at modifying the workplace environment, culture or ethos.
- Outcomes – any outcome related to the effectiveness of interventions. Relevant outcomes could include (but were not limited to) staff satisfaction, sickness absence, mental resilience, staff uptake of flu vaccination, lifestyle choices (smoking rates, alcohol consumption, physical activity levels, sedentary behaviour, dietary behaviour), coping skills, symptom reduction, levels of violence against staff and levels of bullying. Reviews could also report on outcomes related to the implementation of initiatives.
- Study design – any form of evidence synthesis including systematic reviews of effectiveness, systematic reviews of implementation, meta-analyses, qualitative reviews or realist reviews. Reviews could include primary studies of any design or other reviews (i.e. reviews of reviews).

The reviews of reviews that were examined in greater detail also met the following additional study design criteria: authors (1) searched at least two sources and (2) reported inclusion/exclusion criteria.

Data on key characteristics were extracted from titles and abstracts only into a spreadsheet, including type of document, focus of the review, intervention type (where identifiable), population(s) and whether the review had a primary focus on effectiveness, costs/cost-effectiveness or implementation. Data from the spreadsheet were subsequently imported into the software package IBM SPSS Statistics version 25 (IBM Corporation, Armonk, NY, USA) and descriptive statistics for key characteristics generated (counts and percentages). Data from the reviews and reviews of reviews were used to produce a map and descriptive summary of the evidence. The mapping work was conducted to meet the requirements of NHS England, which was consulted at the start of the process to establish the goals and scope of the work. Further consultation with NHS England and National Institute for Health Research colleagues occurred via a teleconference following the submission of an interim report. The purpose of the teleconference was to discuss the interim results, conclusions and scope for further evidence synthesis work. Owing to the rapid and responsive nature of the work, patient or public representatives were not asked to be involved.

Results

The title and abstracts of over 8241 records were screened and a total of 408 potentially relevant publications were identified. Evidence relating to a broad range of physical and mental health issues was identified across 12 reviews of reviews and 312 other reviews, including 16 potentially relevant Cochrane reviews, published since 2000. There also exists National Institute for Health and Care Excellence guidance addressing multiple issues of potential relevance ($n = 6$). Existing reviews largely addressed effectiveness, but some focused primarily on cost-effectiveness and implementation issues. A total of 78 protocols for reviews were also identified, 19 of which focused on health-care staff only. Out of the 296 standard (non-Cochrane) reviews and meta-analyses:

- 144 focused on aspects of lifestyle ($n = 78$) or general health/health promotion ($n = 66$)
- 94 focused on mental health
- 18 focused on work relations including violence and bullying
- 27 focused on other health-related issues such as sleep/fatigue, and influenza vaccination among health-care workers
- 13 focused on general work issues including absenteeism and presenteeism.

In addition, 95 reviews and meta-analyses focused solely on individuals working in a health-care setting. Most of these reviews and meta-analyses addressed mental health issues rather than lifestyle or general health/health promotion.

The 12 reviews of reviews addressed workplace interventions targeting a range of physical and mental health issues. There was a considerable degree of heterogeneity between reviews of reviews in terms of specific focus, interventions and outcomes. Reviews focused predominantly on evidence of effectiveness and few data were reported on intervention costs or implementation issues. Five of the 12 reviews of reviews were over 5 years old and several reviews of reviews, regardless of their publication date, included reviews from before 2000. This could have implications for the current relevance of some of the findings reported. The same issue could also apply to the reviews and meta-analyses in the evidence map as some may have included primary studies that were conducted prior to 2000.

Conclusions

The review team is doubtful that further evidence synthesis work at this stage would provide NHS England colleagues with substantial new knowledge, particularly within the context of the new *NHS Health and Wellbeing Framework*. Additional synthesis work may be useful if it addressed an identifiable need and it was possible to identify one of the following:

- A specific and focused research question arising from the current evidence map. It may then be appropriate to focus on a smaller number of reviews only, and provide a more thorough and critical assessment of the available evidence.
- A specific gap in the literature (i.e. an issue not already addressed by existing reviews or guidance). It may then be possible to undertake further literature searching and conduct a new evidence review; for example, the limited number of reviews that focused specifically on groups of health-care-based staff other than doctors, nurses or medical/nursing students could indicate a potential research gap.

Funding

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Chapter 1 Objectives

- To conduct a rapid scoping exercise to identify existing reviews on workplace-based interventions to promote health and well-being.
- To produce a descriptive map of the extent and nature of the available research evidence, and assess the scope for further evidence synthesis work.

Chapter 2 Background

The health and well-being of staff working in the NHS is a significant and long-standing issue in UK health care. In 2019, NHS England reported that in the NHS the sickness absence rate (4%) is higher than in both other public sector organisations (2.9%) and the private sector (1.9%); the cost of sickness absence of NHS staff has been estimated at £2.4B.¹ In addition to having financial implications for the NHS through levels of sickness absence, there is strong evidence linking staff health and well-being with quality of care, safety and patient outcomes/experience.²⁻⁵ More broadly, the NHS has a responsibility to protect the health of all its employees.⁶ The NHS constitution makes a pledge to support staff in maintaining their health, well-being and safety.⁷ Guidance produced by the Health and Safety Executive also addresses staff well-being, including work-related stress (e.g. Health and Safety Executive⁸).

Consistent with the situation in other occupational sectors, data reveal that musculoskeletal and mental health conditions are major causes of ill health and sickness absence among NHS staff. The Boorman review found that musculoskeletal disorders account for almost half of all sickness absence in the NHS.⁹ Findings from the 2017 NHS staff survey revealed that 26% of respondents experienced musculoskeletal problems as a result of work activities in the previous 12 months.¹⁰ A large proportion of musculoskeletal disorders cases result in long-term absence.⁶

Approximately one-third of sickness absence in the NHS is a consequence of mental health issues.¹¹ The 2017 NHS staff survey found that 38% of all staff, and 49% of individuals working in ambulance trusts, had felt unwell because of work-related stress in the last 12 months.¹² As a professional group, doctors experience high levels of mental health problems and have one of the highest suicide rates.⁴ The existence of a bi-directional relationship between mental and physical health is well recognised, and evidence suggests that poor mental well-being can negatively affect lifestyle behaviours. For example, a study conducted by the *Nursing Standard* of 3500 nurses, midwives and health-care assistants in the UK reported that workplace stress had a negative impact on the diet of 60% of respondents.¹³

Health professionals, and nurses in particular, have been encouraged to promote healthy lifestyle choices among patients.¹⁴ Emphasis has been placed on staff taking responsibility for their own health and acting as a positive role model for engaging in healthy behaviours.¹⁵ Notably, a number of recent UK studies found that a large proportion of health-care staff do not themselves meet public health guidance in relation to healthy lifestyle behaviours including consumption of fruit and vegetables,^{16,17} consumption of fats,¹⁶ consumption of sugars,¹⁶ physical activity^{16,17} and alcohol consumption;¹⁷ for example, Mittal *et al.*¹⁶ reported that 83% of all staff did not eat the recommended five or more portions of fruit or vegetables per day. Similarly, Schneider *et al.*¹⁷ found that 68% of nurses, 53% of other health-care professionals and 82% of unregistered care workers (including nursing auxiliaries and assistants) did not eat five or more portions of fruit or vegetables daily. They also reported that 46% of nurses, 49% of other health-care professionals and 44% of unregistered care workers did not meet physical activity guidelines.¹⁷ These figures for physical activity are consistent with the proportion reported by Mittal *et al.*¹⁶ for all staff (44%). In addition, the proportion of UK health-care workers who reported being overweight or obese in four recent studies ranged from 44% to 69%.^{14,16,18,19}

Schneider *et al.*¹⁷ raised concerns about the potential impact of nurses' low personal adherence to public health guidance in relation to healthy lifestyles on their health promotion work with patients and its effectiveness. Furthermore, Kyle *et al.*¹⁴ highlighted an increased risk of both musculoskeletal and mental health conditions from having excess body weight, which, as highlighted earlier, are leading causes of ill health and sickness absence among NHS staff.

The negative influence that organisational-level factors can have on the lifestyle behaviours of health-care staff has been highlighted in past UK studies; for example, 51% of the hospital staff

who responded in the study by Mittal *et al.*¹⁶ indicated that long working hours impeded their ability to stay fit. Furthermore, in the *Nursing Standard* study reported by Keogh,¹³ 79% of respondents indicated that eating a healthy meal while at work was made difficult by a lack of breaks. Over half (56%) of respondents also reported that inadequate staff levels had a negative impact on their food choices.¹³

Findings from the 2017 NHS staff survey showed that 15% of all staff, and around one-third (34%) of employees at ambulance trusts, had experienced physical violence from patients, relatives or the public in the previous 12 months. In addition, over one-quarter of all staff (28%) and nearly half of the staff at ambulance trusts (47%) also suffered harassment, bullying or abuse from patients, relatives, or members of the public in the last 12 months. Just under one-quarter of all staff (24%) experienced harassment, bullying or abuse from other members of staff.¹²

The importance of improving the health and well-being of NHS staff has repeatedly been recognised in government and NHS England publications published within the last 10 years. The *NHS Long Term Plan*¹ re-emphasises the key role that employers have in supporting staff to remain healthy, and provides a clear commitment to the continued promotion of positive physical and mental well-being among the NHS workforce. This includes reducing the level of violence and abuse experienced by staff.

Over a number of years, there have been various initiatives to improve the health and well-being of NHS staff. On a national level, the NHS Healthy Workforce Programme was established in 2016 to identify best practice in relation to promoting staff health. The focus within the programme was on the implementation of employer-led health and well-being initiatives as well as creating organisational practices and culture that are supportive of staff health.¹¹

The *NHS Health and Wellbeing Framework*²⁰ introduced in 2018 was informed by the findings and learning from the NHS Healthy Workforce Programme.⁶ The framework document includes guidance and actionable steps to enable all NHS providers to plan and implement a staff health and well-being strategy.²¹ There is a focus within the framework on promoting healthy lifestyles in addition to addressing mental health and musculoskeletal health. Health and well-being interventions incorporated into the framework comprise prevention-/self-management-focused approaches (e.g. physical activity classes) and more targeted forms of support such as weight loss services, health checks, addiction support, counselling and physiotherapy. An accompanying diagnostic tool enables organisations to carry out self-assessment against the *Health and Wellbeing Framework*.²¹

The *NHS Staff and Learners' Mental Wellbeing Commission* report²² published in 2019 by Health Education England reviewed evidence of good practice in relation to organisational policies within NHS organisations that had made mental health and well-being of staff and learners a priority. A number of recommendations were made to improve support, including ensuring the provision of tailored in-house mental health support and signposting to clinical help.

A Commissioning for Quality and Innovation (CQUIN) payment was introduced in 2016 in order to provide financial incentives for NHS providers to support staff health and well-being. Payment is dependent on (1) the introduction of workplace health and well-being initiatives, with a particular focus on physical activity, and improving support for mental health and musculoskeletal issues, (2) encouraging healthier food choices and (3) increasing staff uptake of the influenza vaccination.¹¹

The York Health Services and Delivery Research Evidence Synthesis Centre was asked by NHS England to identify evidence relevant to the promotion of healthy lifestyles among NHS staff. For this piece of work, the term 'NHS staff' was conceptualised broadly as any individual working for the organisation in any post.

Chapter 3 Methods

Scoping and mapping of the evidence

This rapid scoping and mapping exercise was undertaken to provide a high-level overview of the available evidence from existing reviews and reviews of reviews (RoRs). The objective was to classify the evidence in terms of broad descriptive characteristics and it was not intended that the findings from the reviews or RoRs would be extracted, evaluated and synthesised.

Although we did not aim to conduct a full systematic review, aspects of systematic review research methodology were applied, wherever possible, to maintain the rigour, transparency and reproducibility of the mapping process.

Identification of evidence

Database searches were undertaken to identify systematic reviews about health and well-being at work. Results were limited by publication date (2000 to January/February 2019). No language or geographical limits were applied. The following databases were searched:

- Cochrane Database of Systematic Reviews (CDSR)
- Database of Abstracts of Reviews of Effects (DARE)
- HTA database
- Epistemonikos
- Health Evidence
- Database of Promoting Health Effectiveness Reviews (DoPHER)
- PROSPERO
- MEDLINE
- Business Source Premier.

The search strategies are provided in *Appendix 1*. Searches were limited to the year 2000 onwards to maximise the relevance of the evidence identified.

Once it became apparent that database searches had identified a large number of potentially relevant reviews, it was decided not to undertake supplementary searching of specific websites to identify any additional relevant publications or grey literature.

Selection procedure

A sample of title and abstracts were initially pilot screened by two reviewers independently and their decisions compared. On achieving at least 90% agreement, the remaining title and abstracts were screened against the selection criteria by one reviewer only. If there was uncertainty regarding the eligibility of any record, it was discussed with a second reviewer. Records without an abstract were screened on title only.

It had been intended that the full text of potentially relevant reviews would be retrieved and screened for inclusion, but because of the large number identified, this was not practical within the available time frame. A pragmatic post-protocol decision was taken to adjust the approach and select reviews for inclusion in the evidence map based on information in the title and abstracts of records only.

However, the full text of all RoRs identified during the selection process was retrieved in order to conduct a more detailed examination of these publications.

Selection criteria

Records were screened for potential inclusion against the following selection criteria:

- Population – adult employees (aged ≥ 18 years) in any occupational setting and in any role. Any reviews focusing solely on self-employed workers or including participants from other settings (e.g. school students) were not eligible for inclusion.
- Interventions – any intervention aimed at promoting or maintaining physical or mental health and well-being (however conceptualised). Interventions could also be focused on early intervention and reducing the incidence or symptoms of common mental health conditions (stress, anxiety or depression) among staff. Reviews of interventions addressing violence against staff, workplace bullying or harassment were also eligible for inclusion. Occupational health interventions and those aimed at returning employees to work after absence were considered beyond the scope of the review. Occupational health interventions were conceptualised as those with a predominate focus on promoting safer working environments and practices, and reducing injuries and workplace health risks. Interventions could be either or both (1) individual-level interventions, for example, initiatives focused on individual behaviour modification, (2) organisational-level interventions aimed at modifying the workplace environment, culture or ethos.
- Outcomes – any outcome related to the effectiveness of interventions. Relevant outcomes could include, (but were not limited to) staff satisfaction, sickness absence, mental resilience, staff uptake of flu vaccination, lifestyle choices (smoking rates, alcohol consumption, physical activity levels, sedentary behaviour, dietary behaviour), coping skills, symptom reduction, levels of violence against staff and levels of bullying. Reviews could also report on outcomes related to the implementation of initiatives.
- Study design – any form of evidence synthesis including systematic reviews of effectiveness, systematic reviews of implementation, meta-analyses, qualitative reviews or realist reviews. Reviews could include primary studies of any design or other reviews (i.e. RoRs).

All RoRs also met the following additional study design criteria: authors (1) searched at least two sources, and (2) reported inclusion/exclusion criteria. One of the sources searched must have been a named database. Other acceptable sources were conducting internet searches, hand-searching journals, citation searches, reference checking, contacting other authors.

It was stated in the protocol that all forms of evidence synthesis would have to meet the two criteria above to be included in the map; however, as the full text of reviews was not retrieved, this stipulation could not be implemented. In most cases, there was insufficient detail reported in title and abstracts alone to complete an assessment.

Data extraction

For each included review, data on key characteristics were extracted from titles and abstracts into a spreadsheet, including type of document, focus of the review, intervention type (where identifiable), population(s) and whether the review had a primary focus on effectiveness, costs/cost-effectiveness or implementation. A sample of reviews were extracted independently by two reviewers to ensure consistency of coding and decisions compared. Once there was a high level of agreement, data extraction was conducted by one reviewer.

For the included RoRs, data on key characteristics were also extracted by one reviewer. In addition, comments by the RoRs' authors reflecting on the included evidence were noted. One reviewer checked to ensure that relevant reviews reported in the RoRs had been identified in the searches and included in the mapping of the evidence. Data extraction was not checked by a second reviewer, which represents another post-protocol change necessitated by the large number of relevant publications identified and the limited time available.

Summary of post-protocol changes

As indicated previously, it was necessary for the review team to make the following post protocol changes:

- No supplementary searching of specific websites was conducted to identify any additional relevant publications or grey literature.
- Reviews and meta-analyses (RMAs) were selected for inclusion in the evidence map based on information in the title and abstracts only.
- It was not possible to assess whether or not RMAs were conducted using a systematic methodology.
- Data extraction was not checked by a second reviewer.

Synthesis

Data from the spreadsheet were imported into the software package IBM SPSS Statistics version 25 (IBM Corporation, Armonk, NY, USA) and descriptive statistics for key characteristics generated (counts and percentages). Data from the reviews and RoRs were then used to produce a map and descriptive summary of the evidence. This provided an overview of the extent and nature of the current evidence base relevant to promoting healthy lifestyles in NHS staff. Reviews and RoRs were grouped by topic focus (e.g. lifestyle behaviour, mental health, violence/bullying) and briefly described.

External engagement

This mapping work was conducted for NHS England, which was consulted at the start and end of the process. The research team initially received a very brief outline of the topic area of interest via the National Institute for Health Research (NIHR). A teleconference with NHS England and NIHR colleagues was subsequently held to establish the goals and scope of the work. Based on this discussion, the research team produced a review protocol, conducted the mapping exercise and produced an interim report for NHS England.

Following the submission of the interim report, a second teleconference was held between the York research team, NHS England and NIHR in order to discuss the interim results, conclusions and scope for further evidence synthesis work. During this teleconference, the York research team gave a presentation of key findings and answered any questions arising. On the basis of this discussion, no additional evidence synthesis work was requested from the research team. Three regional medical directors at NHS England were involved over the course of the work. Owing to the rapid and responsive nature of the work, patient or public representatives were not asked to be involved.

Chapter 4 Results

In total, 9622 search results were downloaded and imported into a reference management software package. After deduplication there was a total of 8241 unique records. In total, we identified 408 potentially relevant reviews of workplace-based interventions focused on the health and well-being of staff. The flow of literature through the review is shown in *Figure 1*.

Figure 2 shows the different types of publications identified from the scoping searches of key databases.

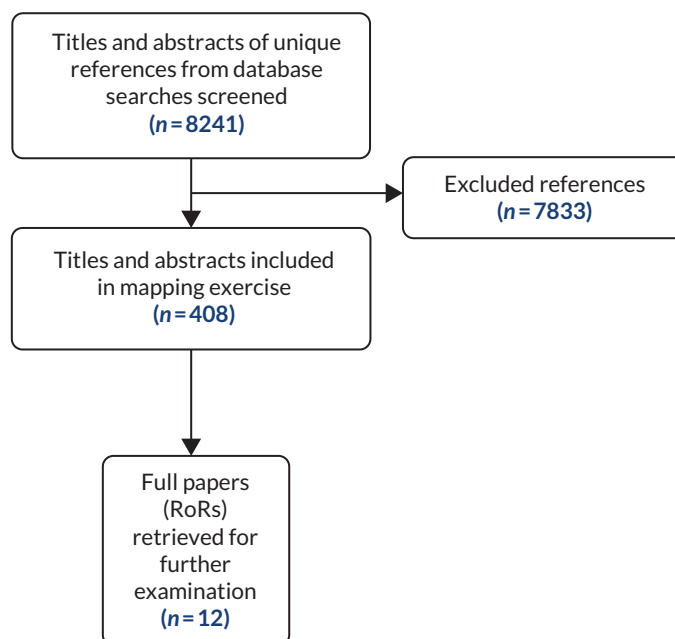


FIGURE 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart.

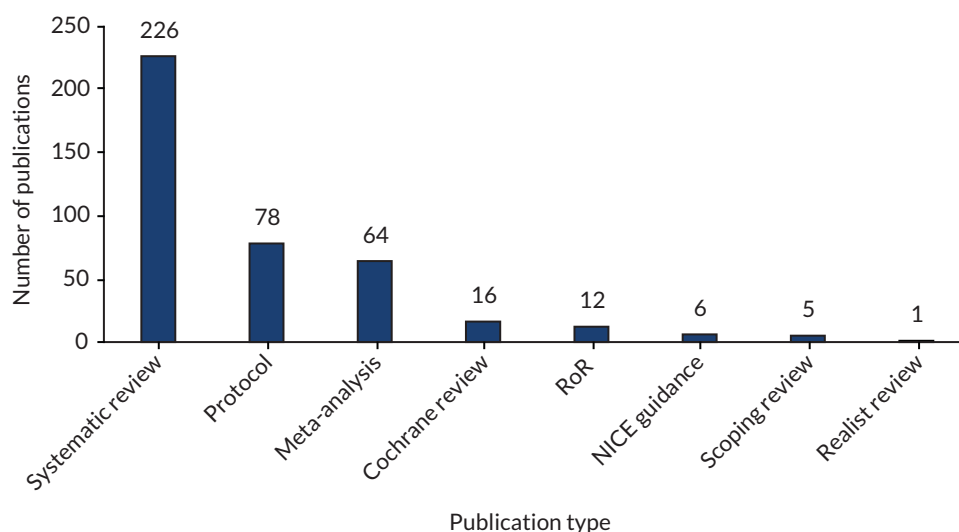


FIGURE 2 Type of publication ($n = 408$). NICE, National Institute for Health and Care Excellence.

Results are presented below by the following categories of publication type: RoRs; Cochrane reviews; National Institute for Health and Care Excellence (NICE) guidance; a merged grouping of systematic reviews, scoping reviews, realist reviews, and meta-analyses, which has been labelled as 'reviews and meta-analyses' (RMAs); and protocols.

'Reviews of reviews'

It can be seen from *Figure 2* that there is a sizeable number of existing RoRs ($n = 12$). These have examined the effectiveness of workplace interventions targeting both physical and mental health. Two reviews addressed interventions focused on employees in the health sector.^{23,24} The primary topic addressed in each of the 12 RoRs is outlined below:

General health and lifestyles/mixed physical and mental health

- Health promotion and primary prevention, including interventions focused on stress, physical activity, nutrition and smoking.²⁵
- Smoking cessation.²⁶
- 'Healthy lifestyles' focused on physical activity, healthy weight and good nutrition.²⁷
- 'Workplace health programmes' for improving both physical and mental health. This review addressed implementation issues as well as effectiveness.²⁸
- Organisational-level interventions in the 'health sector' to improve health.²³
- Physical activity.²⁹
- Dietary change.³⁰

Mental health

- Stress management with a particular emphasis on preventing common mental health disorders (anxiety and depression).³¹
- Mental health including stress management and the prevention of psychological disorders.³²
- Common mental disorders (depression and anxiety).³³
- Interventions to prevent mental health problems and absenteeism.³⁴
- Physician burnout (including medical students and residents).²⁴

A more detailed description of the 12 RoRs is provided in *Review of reviews: full-text scoping*.

Cochrane reviews

Out of the 16 Cochrane reviews identified,³⁵⁻⁵⁰ eight were targeted at general health, physical health or lifestyle behaviour. This included reviews related to improving physical activity through the use of pedometers,³⁷ decreasing sitting time at work,⁴⁶ sex risk behaviour and preventing human immunodeficiency virus (HIV) infection,⁴³ and smoking cessation.³⁶ The latter review examined the effectiveness, costs and cost-effectiveness of smoking cessation interventions.³⁶ Strategies to improve the implementation of workplace-based policies/practices aimed at lifestyle behaviours (diet, physical activity, obesity, tobacco use and alcohol use) have also been examined in a Cochrane review. The effectiveness and cost-effectiveness of such strategies were also assessed as secondary outcomes.⁵⁰

Four Cochrane reviews examined the effectiveness of interventions to prevent or reduce workplace stress/burnout, two of which were focused on health-care workers.^{45,49} One other review that was also focused on the well-being of health-care personnel, reported on the psychological effects of making changes to the physical workplace environment, although only one primary study met the authors' inclusion criteria.⁴⁸ One Cochrane review on the prevention of workplace bullying was identified. In addition, there are Cochrane reviews of interventions addressing sleepiness and sleep disorders among

shift workers; the effects of flexible working interventions on the health and well-being of employees and their families; breastfeeding support at work; alertness and mood in daytime workers; and absenteeism among workers with inflammatory arthritis.

National Institute for Health and Care Excellence guidance

The National Institute for Health and Care Excellence has produced evidence-based guidance on a number of workplace health issues including the promotion of mental well-being,⁵¹ physical activity⁵² and encouraging employees to stop smoking.⁵³

Reviews and meta-analyses

Workplace settings

In total, 296 reviews (systematic reviews/scoping/realist reviews) and meta-analyses were identified, which focused on primary studies with 23 different groups of workers. For a full list of all 23 population groups/workplace settings in the 296 RMAs, see *Appendix 2, Table 13*. The largest proportion of RMAs had a focus on generic 'workplace' interventions, and did not state a specific target group of workers ($n = 155$, 52%). There were 31 RMAs focused on primary studies with nurses of all types, and a similar number were focused on 'health-care' workers ($n = 28$). A further 36 RMAs had a specific focus on other groups of health-care workers, and these are shown in *Table 1*. Out of the 296 RMAs identified, a total of 95 (32%) focused on individuals working in a health-care setting in some capacity. Among RMAs not focused on health care, the groups of workers most frequently studied were individuals who work shifts ($n = 9$), those based in offices ($n = 7$) and female workers ($n = 7$).

Health focus of reviews and meta-analyses

The primary health focus of each review or meta-analysis was categorised into seven broad groupings: lifestyles, general health/health promotion, mental health, physical health, work relationships, general work and 'other' health-related interventions. As the grouping of RMAs was based on information in titles and abstracts only, it should not be considered a definitive categorisation of health focus. It is also important to recognise that there is potentially considerable overlap between some of the groups depending on the specific aims of interventions, and particularly the general health/health promotion and lifestyles categories.

TABLE 1 Health-care-focused RMAs ($n = 95$)

Staff groups	Number of RMAs
Nurses	31
'Health-care' staff	28
Staff working in mental health care	8
Medical students	7
Doctors	7
Nurses/nursing students	4
Nursing students	3
Emergency medical service personnel	3
Midwives/obstetricians and midwives	2
Doctors/medical students	1
Health-care students/professionals	1

RESULTS

Figure 3 shows the primary health focus of the 296 identified RMAs. In order to retain pertinent information, RMAs have been separated into those that had a specific focus on health-care settings (health care focused) and those that did not (non-health care focused). However, it should be recognised that some of the RMAs without a health-care focus could, depending on the inclusion criteria applied, have also potentially included primary studies conducted with staff in health-care settings. A full bibliographic list for the 296 RMAs by primary health focus and setting is provided in Appendix 3.

Lifestyles

In total, 78 out of the 296 RMAs addressed lifestyles and lifestyle behaviour, of which four were focused on staff in health-care settings. As Table 2 reveals, the largest proportion of the non-health-care focused

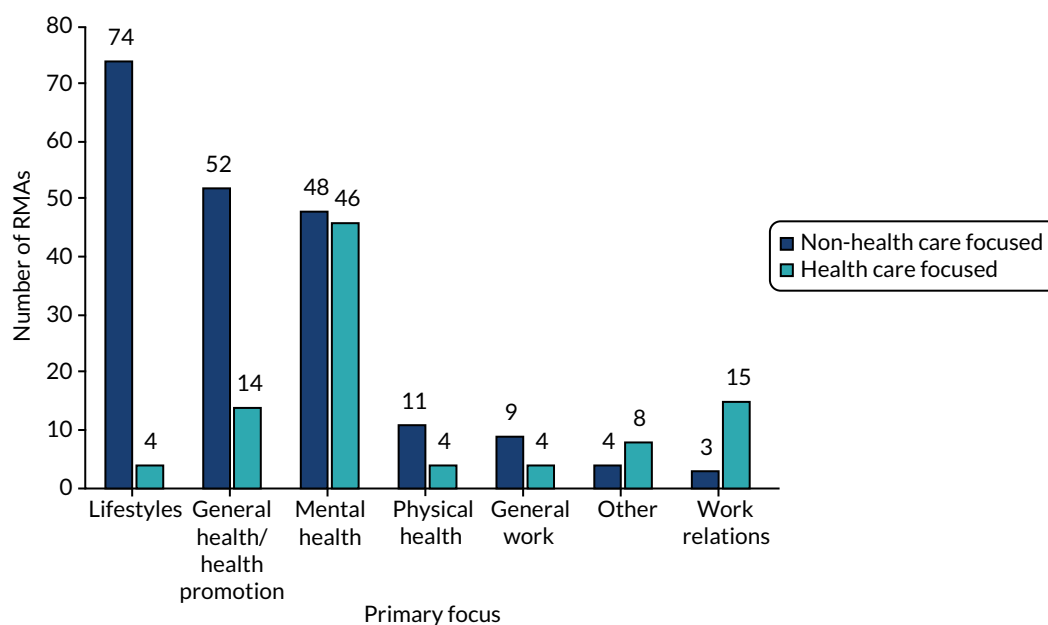


FIGURE 3 Primary focus of RMAs (n = 296).

TABLE 2 Health focus of RMAs related to lifestyles (n = 78)

Health focus	Number of RMAs	
	Non-health care focused	Health care focused
Physical activity/sedentary/sitting time	29	0
Obesity/weight	11	1
Smoking cessation	9	0
Diet/nutrition	7	1
Physical activity/diet/nutrition	5	2
Alcohol	3	0
Fruit/vegetable consumption	3	0
Diabetes	2	0
Substance use	2	0
Dietary behaviours/adiposity	1	0
Physical activity/diet/weight	1	0
Substance use and HIV-risk behaviours	1	0
Total	74	4

RMA addressed physical activity, sedentary behaviour or sitting time ($n = 29$). Five RMAs included interventions that examined both physical activity and/or dietary behaviour/nutrition. It can also be seen from Table 2 that a total of 22 non-health-care-focused RMAs were on obesity/weight status ($n = 11$), general diet/nutrition ($n = 7$), fruit and vegetable consumption ($n = 3$) or dietary behaviours and adiposity ($n = 1$). A further nine RMAs addressed smoking cessation or employees' smoking behaviour. The four RMAs related to health-care staff were focused on physical activity and/or dietary behaviour ($n = 2$), weight status ($n = 1$) and dietary behaviour ($n = 1$). Of these four RMAs, two were focused on nurses and two on a broad grouping of 'health-care' staff.

In terms of interventions, it was possible to determine from information provided in the abstracts that at least 12 of the non-health-care-focused RMAs had included both individual- and organisational-level interventions. These addressed weight status ($n = 5$); physical activity, sedentary behaviour or sitting time ($n = 3$); alcohol ($n = 1$); smoking ($n = 1$); physical activity/diet/weight ($n = 1$); and diet/nutrition ($n = 1$). It was not possible to make a similar determination for the four RMAs conducted in health-care settings.

Eight lifestyle RMAs (seven non-health care focused and one health care focused) examined organisational-level interventions or policies only. The one health-care-based review was commissioned by Public Health England to examine the evidence on environmental (choice architecture) interventions to increase the purchase and consumption of healthier food and drinks by NHS staff.⁵⁴

Interventions evaluated in six other RMAs (all non-health care focused) were aimed at reducing sedentary behaviour in office workers through desk-based changes such as the use of active workstations, and cycle and treadmill desks.

Among the 74 non-health-care-focused RMAs, one had a primary focus on the costs and financial return of worksite programmes aimed at improving various lifestyle behaviours rather than effectiveness. Furthermore, four other RMAs (addressing physical activity and smoking) focused primarily on implementation and process-related issues.

General health/health promotion

The scoping searches identified 66 RMAs that were concerned with general health promotion or interventions to promote the health and well-being of workers in broad terms. Of this total, 14 had a specific focus on health-care staff.

The most common intervention type that was identified among the 52 non-health-care-focused RMAs was various forms of 'workplace health promotion programmes' ($n = 18$). Other specific types of intervention that were also identified included:

- alterations to the jobs or work patterns of employees; for example, changing shift patterns, task restructuring, increasing employee control and job redesign ($n = 5$)
- organisational-level interventions including improving the social or psychosocial work environment ($n = 4$)
- digital-/technology-based interventions ($n = 2$)
- mentoring, training or support ($n = 2$).

One of the 14 RMAs of general health promotion in health-care settings was commissioned by the Department of Health and Social Care in the UK and examined whole-system approaches to improving the health and well-being of health-care workers.⁵⁵

Where a specific intervention type could be determined, three out of the other 13 health-care-focused RMAs addressed alterations to jobs or work patterns. Other RMAs examined clinical supervision; mentoring, training and support; Schwartz Center Rounds; exercise interventions to promote both physical and mental health; and health promotion programmes to improve behavioural health-risk factors.

RESULTS

Table 3 provides details of the specific groups of staff that were the target population in the 14 health-care-focused RMAs.

Reviews and meta-analyses of general health/well-being were largely focused on effectiveness outcomes, but several had a primary aim of evaluating the costs and economic impact of worksite health promotion programmes. One RMA focused solely on process issues and the factors that influence the implementation of workplace health promotion interventions. Similarly, one RMA, focused on health-care staff, examined barriers to promoting the health and well-being of Brazilian health-care workers.

Mental health issues

In total, 94 RMAs had a focus on mental health issues. Notably, almost half of all RMAs focused on health-care staff were related to mental health ($n = 46$, 49%). The largest proportion of RMAs (38/94) comprised primary studies that were aimed at improving psychological health or well-being outcomes (non-health care focused, $n = 23$; health care focused, $n = 15$). The remaining 56 RMAs had a primary focus on more specific mental health issues, and these are shown in Table 4. The majority of the

TABLE 3 Type of staff in health-care specific RMAs with a general health/health promotion focus ($n = 14$)

Staff groups	Number of RMAs
Nurses	7
Health-care workers	3
Medical students	2
Doctors	1
Mental health-care workers	1

TABLE 4 Specific mental health focus of RMAs ($n = 56$)

Focus	Number of RMAs	
	Non-health care focused	Health care focused
Stress	8	11
Burnout	5	12
Compassion fatigue/secondary traumatic stress/vicarious traumatisation	0	2
Stress/burnout	0	2
Compassion fatigue	1	1
Coping/resilience	0	1
Depression	6	1
Stress/burnout/depression/suicide	0	1
Anxiety	1	0
Depression/anxiety	1	0
PTSD	1	0
Suicide prevention	2	0
Total	25	31

PTSD, post-traumatic stress disorder.

56 RMA's concerned interventions targeting stress and/or burnout among workers ($n = 39$). Stress and burnout-related interventions were a particular focus of RMA's in health-care settings (26/31). In addition, nine of the RMA's on stress and/or burnout were based on primary studies with nurses.

It is likely that a number of the issues in *Table 4* were also outcomes of interest in at least some of the 38 broad RMA's of mental health interventions in the workplace. Consequently, the table potentially underestimates the frequency with which issues have been addressed in RMA's.

Eleven mental health-related RMA's had an identifiable focus on mindfulness-/meditation-based interventions (health care focused, $n = 6$; non-health care focused, $n = 5$). Four addressed digital or web-based interventions including apps (applications). In addition, two RMA's examined the effectiveness of physical activity interventions to improve mental health outcomes. It was further possible from the abstracts to determine that 19 other RMA's included both individual and organisational-level interventions. In terms of outcomes, nearly all RMA's synthesised evidence in relation to the effectiveness of interventions; however, one had a primary focus on the financial return and cost-effectiveness of mental health interventions in the workplace, and another examined process-related outcomes in workplace stress management intervention studies. Finally, one review reviewed workplace guidelines to prevent, detect and manage mental health issues.

Physical health issues

Fifteen RMA's addressed a number of other issues related to the physical health of the workforce, and these are shown in *Table 5*. The largest group (8/15 RMA's) was focused on issues around fatigue, sleep, sleepiness, insomnia and alertness, particularly among shift workers. Interventions included changing shift patterns and length, napping, restorative breaks, fatigue training and other non-pharmacological measures. Three RMA's had a specific focus on reducing cardiovascular risk, one of which evaluated lifestyle-targeted interventions. Another addressed internet-based cardiovascular wellness and prevention programmes.

Work relations

Eighteen RMA's were related to violence, bullying or other unacceptable behaviour in the workplace. Fifteen RMA's were focused on health-care settings, 12 of which addressed violence/aggression prevention or management. The other three health-care-focused RMA's addressed bullying, violence and/or incivility. Approximately half ($n = 8$) involved interventions conducted with nursing staff, and two focused solely on nurses working in emergency departments. Some of the health-care-focused RMA's evaluated specific forms of interventions including de-escalation techniques training and aggression management programmes. The prevention of bullying, incivility or unprofessional behaviour was the focus of three RMA's of non-health-care settings.

TABLE 5 Physical health issues ($n = 15$)

Focus	Number of RMA's	
	Non-health care focused	Health care focused
Sleep/fatigue	4	4
Cardiovascular risk	3	0
Cervical cancer screening	1	0
Headaches	1	0
Hearing difficulties	1	0
HIV/tuberculosis	1	0
Total	11	4

General work issues

Table 6 shows the primary focus of 13 RMAs that addressed general work issues. It can be seen that an equal number of RMAs were related to sickness absence ($n = 4$) and absenteeism ($n = 4$), and a further two had a focus on presenteeism. Three of these 11 RMAs examined the role of physical activity in reducing sickness absence, absenteeism or presenteeism. Two health-care-focused RMAs synthesised evidence on the effectiveness of interventions and strategies to support student well-being during their transition to becoming qualified nurses.

Other health-related issues

Four RMAs of workplace interventions aimed to promote or support breastfeeding. Eight RMAs were also identified that addressed influenza vaccination among health-care workers. Five examined interventions to improve vaccination uptake and two focused on implementation issues. This included exploring factors that may influence the success of strategies to increase uptake, as well as exploring the views and experiences of health-care staff. One other review investigated both barriers to health-care staff getting vaccinated and components of effective programmes.

Review protocols

The scoping searches identified 78 protocols for reviews, of which 19 had a health-care focus and 59 did not. A bibliographic list of all 78 protocols is provided in Appendix 3. As Table 7 details, approximately 83% (65/78) were published on PROSPERO or elsewhere from 2016 onwards.

TABLE 6 General work issues ($n = 13$)

Focus	Number of RMAs	
	Non-health care focused	Health care focused
Sickness absence	3	1
Absenteeism	3	1
Transition to work	0	2
Presenteeism	1	0
Presenteeism and mental health	1	0
Work ability	1	0
Total	9	4

TABLE 7 Protocols by year of publication ($n = 78$)

Year of publication	Number of protocols	
	Non-health care focused	Health care focused
2009	0	1
2010	1	0
2013	0	3
2014	2	0
2015	3	3
2016	8	3
2017	19	4
2018	25	5
2019	1	0
Total	59	19

The two protocols from 2014 were registered on PROSPERO, and the records indicate that both have been completed. One examined environmental interventions for changing the eating behaviours of employees, and the other evaluated the effectiveness of height-adjustable desks for decreasing sedentary behaviour among office workers. Both these reviews were included in the current evidence map. The status of reviews relating to the other 11 protocols published between 2009 and 2015 is unclear.

The status of reviews based on the more recent protocols published since the end of 2015 is also currently unknown. Nonetheless, the focus of the 65 protocols (53 non-health care focused and 12 health care focused) that were published between 2016 and 2019 is shown in *Table 8*.

Approximately half of the non-health-care-focused protocols were related to general health and well-being or lifestyle-related behaviours, such as physical activity, sedentary behaviour, sitting time, dietary behaviour and alcohol consumption. These protocols have targeted effectiveness, financial outcomes or process-related outcomes including:

- digital [mhealth (mobile health)] interventions to promote physical activity and reduce sedentary behaviour
- return on investment for workplace chronic disease prevention programmes
- factors influencing the implementation of interventions to improve workplace health and well-being.

TABLE 8 Focus of review protocols published between 2016 and 2019 ($n = 65$)

Focus	Number of protocols	
	Non-health care focused	Health care focused
General health/health promotion	14	4
Mental health and well-being	12	2
Physical activity/sedentary/sitting	10	0
Cardiovascular health	4	0
Alcohol	2	0
Breastfeeding	2	0
Absenteeism and presenteeism	1	0
Depression (prevention)	1	0
Dietary behaviour	1	0
Musculoskeletal problems	1	0
Physical activity/diet/sleep	1	0
Resilience	1	0
Self-confidence	1	0
Sleep/fatigue	1	0
Work/life balance	1	0
Violence/aggression	0	5
Violence/harassment/bullying	0	1
Total	53	12

The largest number of health-care-focused protocols (6/12) were on the prevention of violence or bullying/harassment. Two protocols published recently (2018) focused on the effectiveness of general health and lifestyle interventions. One aimed to synthesise evidence on the effectiveness of interventions to improve the health and well-being of hospital staff, with a specific focus on nutrition, physical activity, stress and musculoskeletal interventions. The other was targeted at improving the health risk of nurses using behavioural and/or educational interventions. Finally, two other health-care-related protocols were published in 2018, which addressed the following issues:

- health, well-being and support interventions for UK ambulance service personnel
- use of technology to provide social or emotional support to nurses.

Review of reviews: full-text scoping

The full texts of all 12 RoRs were retrieved and key characteristics examined in greater depth.²³⁻³⁴ The reviews were published between 2009 and 2019, seven of which had been published since 2016. There was variation between the RoRs in terms of focus, interventions and outcomes; therefore, the RoRs have been described individually below. *Table 9* shows the main focus of the reviews.

Workplace settings

Only two RoRs explicitly stated that they had a health-care focus. One RoR evaluated interventions to improve mental health by reducing physician burnout.²⁴ The other evaluated interventions that facilitate sustainable jobs and have a positive impact on the health of workers in health-sector workplaces. However, the included RMAs evaluated interventions in a range of workplace settings, only some of which were in the health sector.²³

The remaining RoRs reported little information on workplace setting. Some did incorporate RMAs that included staff in the health sector; however, other workplace settings were included and findings were not reported separately.

Health focus of reviews of reviews

Lifestyles

Three RoRs addressed lifestyles and lifestyle behaviours but each evaluated different interventions.^{26,29,30} None of the RoRs was explicitly set in a health-care sector. The RoRs were published from 2013 to 2019 and included RMAs published from 1994 to 2017. The main focus of the RoRs are listed in *Table 10*.

TABLE 9 Focus of the included reviews of reviews (n = 12)

Focus	Number of RoRs	
	Non-health care focused	Health care focused
Lifestyle	3	0
General health/health promotion	3	1
Mental health	4	1
Total	10	2

TABLE 10 Lifestyle-focused interventions (n = 3)

Focus	Number of RoRs	
	Non-health care focused	Health care focused
Dietary change	1	0
Physical activity	1	0
Smoking cessation	1	0
Total	3	0

Schliemann and Woodside³⁰

The most recent RoR,³⁰ published in 2019, included 21 RMAs and evaluated the effectiveness of dietary workplace interventions. However, authors reported that only one component of a workplace intervention had to be dietary and, therefore, RMAs also reported other components that were largely general wellness programmes (e.g. physical activity, smoking cessation, alcohol use). As well as reporting effects on dietary behaviour, such as fruit and vegetable consumption, some environmental aspects (e.g. catering policies, healthy choices, labelling healthy options) were reported together with economic outcomes (e.g. absenteeism, productivity and health-care costs). In their discussion section, authors reported a lack of consistency across the results due to variation of the RMAs and the included primary studies. They noted many of the outcomes were self-reported rather than objectively measured and there were a lack of process evaluations.

Jirathananuwat and Pongpirul²⁹

One RoR published in 2017²⁹ included 11 RMAs and aimed to categorise interventions into factors that could optimise improvements in physical activity in the workplace. The factors were classified as enabling (e.g. information, self-motivation, programme training), predisposing (e.g. instrument resources such as pedometers), reinforcing (e.g. incentives, social support), policy regulatory (e.g. organisational action) and environmental development (e.g. break rooms, signage). The interventions addressed multiple health behaviours of which promoting physical activity was just one part; others included diet, stress management, weight control and smoking cessation. Workplaces included health service, government, industry, factory, educational and private sectors, but results were not reported separately for the health-service settings.

Fishwick *et al.*²⁶

A RoR evaluating smoking cessation was published in 2013²⁶ and included six RMAs. The journal article also included a summary of a systematic review of relevant published qualitative literature, two case studies and findings from an expert focus group. Interventions included workplace cessation programmes (including behavioural, self-help and pharmacological) as well as legislative smoking bans. Specific workplace settings were not described by the RoR authors. Outcomes included rates of cessation, abstinence, quit rates and costs.

General health/health promotion

Four RoRs had a more general health focus;^{23,25,27,28} one of which evaluated interventions aimed at improving the health of health-sector employees, although RMAs in a non-health-care setting were also included.²³ RoRs were published between 2010 and 2016 and included RMAs published between 1997 and 2014. The main focus of the RoRs is listed in *Table 11*.

TABLE 11 Interventions focused on general health/health promotion (n = 4)

Focus	Number of RoRs	
	Non-health care focused	Health care focused
Workplace health programmes for both physical and mental health	1	0
Organisational level to improve health	0	1
'Healthy lifestyles' (physical activity, weight and nutrition)	1	0
Health promotion and primary prevention	1	0
Total	3	1

Brunton *et al.*²⁸

The Department of Health and Social Care (UK) commissioned a report, published in 2016,²⁸ to understand whether or not workplace health programmes are effective for improving health and business outcomes and to identify characteristics that potentially influence their success. As well as a RoR, the authors included research on stakeholders' views and experiences and a summary of key workplace health policy documents. Although the RoR identified a large number of RMAs ($n = 106$), the authors chose to include only those providing pooled effects sizes ($n = 24$). Interventions were multicomponent including education, exercise, counselling, screening, change to company regulations or policy, and risk assessments. Health-related outcomes included body mass index, diabetes risk, stress and physical activity. Business outcomes included absenteeism and related costs, health-care costs and productivity. The RoR authors did not report details of the types of workplace included in the RMAs. They did report that interventions differed across varying types of workplace making it difficult to judge the applicability of interventions to other settings. They also commented that physical activity interventions predominated and there were few data on other public health topics. Costs were rarely evaluated and few RMAs reported on the follow-up of interventions, therefore, making it difficult to assess the sustainability of the interventions.

Haby *et al.*²³

One RoR²³ published in 2016 (containing 14 RMAs) evaluated interventions to facilitate sustainable jobs and promote the health of workers in health-sector workplaces. However, the included RMAs evaluated interventions in a range of workplace settings, only some of which were in the health sector. Interventions included flexible work arrangements, compressed working week and task restructuring. Reported outcomes varied widely between RMAs and included disease incidence and prevalence, health-service use, and health and socioeconomic inequalities. Authors commented that interventions were not well described, which made it difficult to fully understand important factors such as delivery of the intervention and whether it was supported by employees or managers.

Schröer *et al.*²⁷

A RoR published in 2014²⁷ included 15 RMAs and evaluated interventions promoting healthy lifestyles, preventing disease and reducing health-care costs. Physical activity and/or dietary interventions at the individual and/or organisational level were assessed. Details of workplaces and employees were not described in the RoR. Outcomes of interest were weight, physical activity and nutritional, together with some limited economic data. The authors reported a lack of consistency in the findings, and noted that few outcomes were evaluated long term.

Goldgruber and Aherns²⁵

A RoR conducted in 2010²⁵ with 17 RMAs focused on the effectiveness of workplace health promotion and primary prevention interventions. The authors did not report details of workplace settings. The interventions targeted stress reduction, physical activity and nutrition, organisational development,

smoking cessation, as well as ergonomics and back pain. Multiple outcomes were reported including psychosocial, physical and mental health, and economic indicators.

Mental health

Five RoRs focused on mental health,^{24,31-34} one of which evaluated interventions aimed at health-care staff.²⁴ RoRs were published between 2009 and 2016 and included RMA published between 1996 and 2016. The main focus of the RoRs are listed in *Table 12*.

Kalani *et al.*²⁴

Reductions in physician burnout was the focus of one RoR published in 2018²⁴ with four RMAs. Participants included medical students, interns, physicians, residents and fellows. One of the three RMAs also included nurses. Most of the interventions were at an individual level including counselling, support groups and mindfulness. Organisational-level interventions included duty standards, shift-work staffing and change in workload. The authors commented that there were conflicting findings across RMAs at both individual and organisational level. It was suggested by the review authors that this could be owing to primary studies including different groups of physicians or other mediating or moderating factors that were not investigated. Sample sizes were also reported to be small in some primary studies and interventions differed across reviews.

Joyce *et al.*³³

Workplace interventions for common mental health disorders were the focus of a RoR published in 2016³³ containing 20 RMAs. Interventions were aimed at primary, secondary and tertiary prevention, but details of workplace settings were not reported. Primary prevention interventions aimed to reduce the onset of a condition as well as reducing the impact of related risk factors; for example, through increasing employee control, physical activity and workplace health promotion. Secondary prevention interventions aimed to identify early symptoms and risk factors to reduce progression and included screening, counselling, stress management programmes and post-trauma debriefing. Tertiary prevention interventions aimed to provide therapy and rehabilitation to those formally diagnosed with a mental health condition and included cognitive-behavioural therapy, exposure therapy and medication. Outcomes included changes in physical activity, symptom reduction and occupational outcomes (e.g. sickness absence). The authors commented that few RMAs explored the impact of interventions on work-related aspects such as absenteeism and presenteeism.

Wagner *et al.*³⁴

A RoR also published in 2016³⁴ and including 14 RMAs aimed to determine the level of evidence supporting mental health interventions relating to work outcomes such as absenteeism, productivity and cost. Workplace settings varied widely, where reported. Interventions also varied and many were multicomponent. Others included cognitive-behavioural therapy, exercise and injury prevention.

TABLE 12 Mental health-focused interventions (n = 5)

Focus	Number of RoRs	
	Non-health care focused	Health care focused
Physician burnout (including medical students, residents and fellows)	0	1
Common mental health disorders (anxiety and depression)	1	0
Prevention of mental health problems and absenteeism	1	0
Mental health including stress management and prevention of psychological disorders	1	0
Stress management	1	0
Total	4	1

Dalsbø *et al.*³²

Workplace interventions for employees' mental health was the subject of a RoR published in 2013³² in Norwegian with an English summary. Only three RMAs were included. Employees included health-care workers, law enforcement officers as well as 'all employees' in workplace settings. Interventions included stress management, mental image training and flexible working. Outcomes were stress, mental strain, self-image, quality of sleep and alertness. The RoR authors commented that no outcomes were reported for productivity, absence, sick leave, costs or adverse events.

Bhui *et al.*³¹

A synthesis of evidence on the effectiveness of different workplace stress management interventions was the focus of a RoR published in 2012,³¹ which included 23 RMAs. Interventions varied and included those at the individual (e.g. stress management, cognitive-behavioural therapy, relaxation, mindfulness) and organisational level (e.g. wellness programmes, support groups, problem-solving committees, work redesign). However, details of workplaces were not reported by the RoR authors. Outcomes were anxiety, depression and absenteeism. Authors reported that interventions differed in their components, mode of delivery and whether they targeted individuals or organisations. This made it difficult to compare benefits from any single intervention across a number of primary studies both within a RMA and across RMAs. Furthermore, outcomes of anxiety and depression were measured in different ways and there was not always clarity within RMAs as to which outcomes were included in meta-analyses. It was also reported that although many RMAs appeared to be reviewing the same evidence, they did not all identify the same primary studies and, therefore, did not always reach the same conclusions.

Further details about the characteristics of the 12 RoRs are provided in *Appendix 4, Table 14*.

Chapter 5 Discussion and conclusions

Summary of process

This evidence map provides a descriptive overview of the extent and nature of the available research evidence relevant to the promotion of healthy lifestyles among NHS staff. It was conducted to meet the requirements of NHS England, which was consulted at the start and end of the mapping process. It was not the aim of this piece of work to extract, evaluate and synthesise findings from individual publications.

In total, the title and abstracts of over 8000 records were screened and 408 potentially relevant publications were identified. Such a large number of potentially relevant reviews meant that it was necessary to map reviews based on details provided in titles and abstracts rather than on the full text of publications.

Summary of key findings

Workplace interventions targeting health and well-being, including the promotion of healthy lifestyle behaviours, have been reviewed extensively in the literature. Existing reviews have largely addressed effectiveness, but some have focused primarily on cost-effectiveness and/or implementation.

Evidence relating to a broad range of physical and mental health issues was identified across 12 RoRs and 312 other reviews, including 16 potentially relevant Cochrane reviews, published since 2000. Cochrane reviews are systematic reviews that are recognised to be methodologically rigorous and have high standards of reporting. Furthermore, there exists NICE guidance addressing multiple issues of potential relevance. NICE public health guidance is developed through a rigorous process and is based on the best available evidence in relation to effectiveness and cost-effectiveness.⁵⁶ In addition to published reviews of all types, RoRs and NICE guidance, protocols for a further 65 potentially relevant reviews were published between 2016 and 2019.

In terms of the health issues addressed in publications, some differences were identified between reviews that had a specific focus on health-care settings (health care focused) and ones that did not (non-health care focused). In total, 144 RMAs addressed aspects of lifestyle or general health/health promotion. Out of the 144 RMAs, most ($n = 126$, 88%) were non-health care focused. Furthermore, approximately 63% of all non-health-care RMAs addressed lifestyle and general health/health promotion ($n = 126/201$). In comparison, lifestyle and general health/health promotion reviews/meta-analyses constituted a relatively small proportion of all health-care-focused RMAs (19%, $n = 18/95$). The largest proportion of health-care-focused RMAs addressed mental health issues ($n = 46/95$), and stress and burnout in particular ($n = 26/46$).

Physical activity, sedentary behaviour or sitting time was the issue most commonly addressed in lifestyle-focused RMAs. In total, 37 RMAs were identified that addressed physical activity/sedentary behaviour/sitting time either as the sole focus of a review or in combination with other issues such as diet and nutrition. Multiple RMAs also examined the effectiveness of physical activity interventions to improve broader outcomes including those related to mental health, sickness absence and presenteeism.

Sixty seven out of the 95 health-care-focused RMAs involved a specific group of workers. However, the roles and settings examined were quite limited in scope, and nearly all RMAs were focused on nurses of various types, nursing students, doctors, medical students or staff working in mental health settings.

On a general level, it is unclear to what extent findings from reviews of studies conducted in non-health-care settings or in other countries are generalisable to the NHS workforce. There could be factors specific to UK health-care settings that impact on the ability of staff to adopt healthier behaviours, which limit the generalisability of findings from existing reviews; for example, differing organisational structures and practices, or the working conditions of staff. Most reviews are likely to have synthesised international evidence, and some may have drawn conclusions that are broadly generalisable across countries. Others could have taken local context into consideration when interpreting findings from primary studies.

Several publications identified in the scoping searches were commissioned by agencies in the UK. One RoR and one other review were commissioned by the Department of Health and Social Care.^{28,55} A third review was conducted on behalf of Public Health England.⁵⁴ The RoR by Brunton *et al.*²⁸ examined workplace health programmes for improving health and business outcomes in any occupational setting. In contrast, the two reviews by Al-Khudairy *et al.*⁵⁴ and Brand *et al.*⁵⁵ included approaches to promoting health or health-related behaviour among health-care staff. The study by Al-Khudairy *et al.*⁵⁴ evaluated environmental level interventions to promote healthier food and drink choices. Brand *et al.* reviewed interventions to improve the health of health-care workers that adopted a whole-system approach. A considerable number of other reviews have also evaluated organisational-level interventions, or a combination of both individual and organisational-level interventions. Evidence on the effectiveness of interventions that integrate workplace health promotion and occupational health and safety activities has also been evaluated; for example, integrated 'Total Worker Health' programmes.

Multiple reviews were identified that focused on the same broad health issue, and in the case of physical activity, obesity and stress/burnout in particular, a large number of potentially relevant RMAs were mapped. It is possible, therefore, that there was considerable overlap in the primary studies included across RMAs (i.e. the same primary studies being included in multiple RMAs), which increases the potential for bias. If an in-depth synthesis were to be conducted on a subset of the evidence, it would be important to assess the extent of overlap in primary studies included across reviews.

A more in-depth examination was conducted of the 12 RoRs. These focused predominantly on evidence of effectiveness, with little information reported on costs or the delivery of interventions. Review questions, inclusion criteria and included publications differed across RoRs. There was also variation within individual RoRs in terms of interventions assessed, outcomes and length of follow-up (most were short term). It is worth noting that 5 of the 12 RoRs were over 5 years old (at the time of inclusion), and several RoRs, regardless of their publication date, included reviews from before 2000. This could have implications for the current relevance of some of the findings reported. The same issue could also apply to the RMAs in the evidence map as some may have included primary studies that were conducted prior to 2000.

Limitations of the scoping and mapping review

A pragmatic search strategy was developed for this mapping exercise, which was designed to identify key reviews related to the promotion of health and well-being in all types of workplace settings. It involved searching six databases with a primary focus on indexing evidence reviews. A more focused search of two other databases was also conducted specifically to identify additional reviews of interventions in health-care settings only. Although the search process was extensive and clearly effective at identifying relevant publications, the strategy used may not have identified every potentially relevant review; however, this is not a significant concern given the very large number of publications that were identified. Any reviews that the searches failed to capture would not have impacted significantly on the broad results of this evidence map.

Including publications in the evidence map based only on information in titles and abstracts should be recognised as a limitation. Without examining the full text of publications, it was not possible to verify that all reviews met the inclusion criteria. It also prevented a definitive determination being made about the health focus of reviews, and little detail was reported in title and abstracts about the specific type of intervention being examined. In addition, some of the reviews included in the map may not have been conducted in a systematic way; for example, a proportion may have been non-systematic literature review style publications, which are potentially at a high risk of bias and have poorer reliability.

Implications for additional synthesis work

The current mapping exercise was conducted on behalf of NHS England shortly after the introduction in 2018 of the *NHS Health and Wellbeing Framework*.²⁰ The framework exists to enable NHS providers to develop a staff health/well-being strategy, and it has a key focus on promoting both healthy lifestyles and positive mental health. The framework was the product of a multiorganisation collaboration and incorporated 'best practice, research and insights'.²¹

In addition, NICE has produced evidence-based public health guidance on a number of relevant issues. These were not examined in depth for the mapping exercise, but the guidance documents are appropriate for all employers, including the NHS. NICE routinely reviews its guidance and produces updates as required. Information provided on the NICE website indicates, for example, that:

- The guidance on workplace smoking cessation was last checked in 2014 and no major evidence that would affect the recommendations was identified.⁵³
- The guidance on promoting physical activity in the workplace was last checked in January 2019. It was assessed as still being largely relevant, but an update is being planned for 2021 to incorporate evidence on sit-stand desks.⁵⁷
- The guidance on mental well-being at work was last checked in March 2018, and NICE is planning to update some recommendations in order to incorporate new evidence around certain issues including the effectiveness of educational and well-being interventions at an organisational level; the effectiveness of specific interventions such as mindfulness, cognitive-behavioural therapy and stress management.⁵⁸

The review team is doubtful that further evidence synthesis work at this stage would be of value to NHS England and add substantially to the existing knowledge base. Additional synthesis work may be useful if it addressed an identifiable need, and it was possible to identify one of the following:

- A specific and focused research question arising from the current evidence map. It may then be appropriate to focus on a smaller number of reviews only, and provide a more thorough and critical assessment of the available evidence.
- A specific gap in the literature (i.e. an issue not addressed by existing reviews or guidance). It may then be possible to undertake further literature searching and conduct a new evidence review; for example, the limited number of reviews focused specifically on groups of health-care staff other than doctors, nurses or medical/nursing students could indicate a potential research gap.

Conducting a 'meta-review' of evidence would not be appropriate as there was a considerable degree of heterogeneity between RoRs, for example in terms of focus and interventions.

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Gary Raine (<https://orcid.org/0000-0002-0354-0518>) (Research Fellow, Evidence Synthesis) drafted the protocol and carried out study selection, data extraction, and write up of the report.

Sian Thomas (<https://orcid.org/0000-0003-0917-0068>) (Research Fellow, Evidence Synthesis) carried out study selection, data extraction, and write up of the report.

Mark Rodgers (<https://orcid.org/0000-0002-5196-9239>) (Research Fellow, Evidence Synthesis) contributed to the write up of the report.

Kath Wright (<https://orcid.org/0000-0002-9020-1572>) (Information Specialist) conducted all searching, wrote the search sections of the report and commented on the draft report.

Alison Eastwood (<https://orcid.org/0000-0003-1079-7781>) (Professor, Research) oversaw the project, contributed advice and expertise and commented on all drafts of the report.

All authors commented on the protocol.

Data-sharing statement

All data requests should be submitted to the corresponding author for consideration. Access to available anonymised data may be granted following review.

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Appendix 1 Search strategy

The search strategies used for the literature search are reproduced below.

Cochrane Database of Systematic Reviews

Via The Cochrane Library.

Search date: 29 January 2019.

Records retrieved: 76.

Search strategy

- ID Search
- #1 MeSH descriptor: [Workplace] explode all trees
 - #2 (workplace*):ti,ab,kw OR (worksite*):ti,ab,kw (Word variations have been searched)
 - #3 MeSH descriptor: [Occupational Health] explode all trees
 - #4 ((work* or employment) near/6 "health promot*"):ti,ab,kw (Word variations have been searched)
 - #5 MeSH descriptor: [Health Promotion] explode all trees
 - #6 MeSH descriptor: [Work] explode all trees
 - #7 MeSH descriptor: [Employment] explode all trees
 - #8 #5 and (#6 or #7)
 - #9 #1 or #2 or #3 or #4 or #7

Database of Abstracts of Review of Effects

Via the Centre for Reviews and Dissemination website at www.crd.york.ac.uk/CRDWeb/HomePage.asp.

Search date: 29 January 2019.

Health Technology Assessment database

Via the Centre for Reviews and Dissemination website at www.crd.york.ac.uk/CRDWeb/HomePage.asp

Search date: 29 January 2019.

Search strategy

- DARE ((workplace):TI OR (worksite):TI) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS)) FROM 2000 TO 2019 (60)
- DARE ((work) AND (health promotion)) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS)) FROM 2000 TO 2019 (50)

HTA (workplace):TI OR (worksite):TI IN HTA FROM 2000 TO 2019 (3)
HTA work):TI OR (health promotion):TI IN HTA FROM 2000 TO 2019 (36)
DARE & HTA MeSH Descriptor Workplace AND Mesh Descriptor Health Promotion (58)

Epistemonikos

Via the website at www.epistemonikos.org/.

Search date: 29 January 2019.

Records retrieved: 392.

Search strategy

(advanced_title_en:(health promotion AND work) OR advanced_abstract_en:(health promotion AND work)) OR advanced_title_en:(workplace) OR advanced_title_en:(worksite) [Filters: protocol=no, classification=systematic-review, min_year=2000, max_year=2019]

Additional searches were conducted on 14 February 2019 as described below.

Search 1

(title:(title:(“Occupational health”) OR abstract:(“Occupational health”))) OR abstract:(title:(“Occupational health”) OR abstract:(“Occupational health”))) AND (title:(doctor OR doctors OR clinician OR clinicians OR physician OR physicians OR nurse OR nurses OR dentist OR dentists) OR abstract:(doctor OR doctors OR clinician OR clinicians OR physician OR physicians OR nurse OR nurses OR dentist OR dentists)) 47 records

Search 2

(title:(workers OR workplace OR workplaces OR worksite OR worksites OR employment OR employees OR “job satisfaction”) OR abstract:(workers OR workplace OR workplaces OR worksite OR worksites OR employment OR employees OR “job satisfaction”)) 97 records

Restricted to 2000 to 2019. Broad synthesis category.

Search 3

(title:(workers OR workplace OR workplaces OR worksite OR worksites OR employment OR employees OR “job satisfaction”) OR abstract:(workers OR workplace OR workplaces OR worksite OR worksites OR employment OR employees OR “job satisfaction”)) 4206 records

Restricted to 2000 to 2019. Broad synthesis category.

Health Evidence

Via the website at www.healthevidence.org/.

Search date: 29 January 2019.

Records retrieved: 159.

Search strategy

ID	Number of hits	Search terms
#11	0	(workplace or worksite) AND Limit: Date = Published from 2019 to 2019
#10	17	(workplace or worksite) AND Limit: Date = Published from 2018 to 2018
#9	20	(workplace or worksite) AND Limit: Date = Published from 2017 to 2017
#8	14	(workplace or worksite) AND Limit: Date = Published from 2016 to 2016
#7	21	(workplace or worksite) AND Limit: Date = Published from 2015 to 2015
#6	22	(workplace or worksite) AND Limit: Date = Published from 2014 to 2014
#5	16	(workplace or worksite) AND Limit: Date = Published from 2013 to 2013
#4	22	(workplace or worksite) AND Limit: Date = Published from 2012 to 2012
#3	9	(workplace or worksite) AND Limit: Date = Published from 2011 to 2011
#2	18	(workplace or worksite) AND Limit: Date = Published from 2010 to 2010
#1	274	(workplace or worksite)

Database of promoting health effectiveness reviews

Via the website at <https://epi.ioe.ac.uk/webdatabases4/Intro.aspx?ID=9>.

Search date: 29 January 2019.

Records retrieved: 307.

Two search strategies were used.

Search 1

Search #	Search	Number of hits
1	Freetext (Title): work	75
2	Freetext (Title): workplace	97
3	Freetext (Title): worksite	55
4	1 OR 2 OR 3	221

Search 2

Search #	Search	Number of hits
5	Freetext (All but Authors): workplace	117
6	Freetext (All but Authors): worksite	89
7	5 OR 6	246

MEDLINE (via OVID)

Search date: 7 February 2019.

Records retrieved: 3063.

Database: Ovid MEDLINE® ALL < 1946 to 05 February 2019>.

Search strategy

- 1 (NHS employees or NHS practitioners or NHS professionals or NHS staff or NHS workforce or NHS workers).ti,ab. (695)
- 2 (hospital employees or hospital practitioners or hospital professionals or hospital staff or hospital workforce or hospital workers).ti,ab. (7035)
- 3 (healthcare employees or healthcare practitioners or healthcare professionals or healthcare staff or healthcare workforce or healthcare workers).ti,ab. (26,580)
- 4 (health care employees or health care practitioners or health care professionals or health care staff or health care workforce or health care workers).ti,ab. (33,594)
- 5 (health employees or health practitioners or health professionals or health staff or health workforce or health workers).ti,ab. (62,452)
- 6 (medical employees or medical practitioners or medical professionals or medical staff or medical workforce or medical workers).ti,ab. (21,254)
- 7 (medical students or medical undergraduates).ti,ab. (32,692)
- 8 (nurse\$ or nursing or doctor\$ or physician\$ or midwi\$).ti,ab. (853,683)
- 9 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 (977,641)
- 10 Mental Health/ or Anxiety/ or Occupational Stress/ or Burnout/ or Bullying/ (107,669)
- 11 Lifestyle/ or Exercise/ or Diet/ or Obesity/ or Overweight/ (429,256)
- 12 exp Substance-Related Disorders/ or Smoking/ or Alcoholism/ (386,075)
- 13 Sick Leave/ or Absenteeism/ or Occupational Health/ or Influenza Vaccines/ or Workplace Violence/ (57,885)
- 14 10 or 11 or 12 or 13 (950,112)
- 15 9 and 14 (51,674)
- 16 ((wellbeing or well-being or wellness or health promot\$ or health check\$) adj3 (NHS employees or NHS practitioners or NHS professionals or NHS staff or NHS workforce or NHS workers)).ti,ab. (6)
- 17 ((wellbeing or well-being or wellness or health promot\$ or health check\$) adj3 (healthcare employees or healthcare practitioners or healthcare professionals or healthcare staff or healthcare workforce or healthcare workers)).ti,ab. (72)
- 18 ((wellbeing or well-being or wellness or health promot\$ or health check\$) adj3 (health care employees or health care practitioners or health care professionals or health care staff or health care workforce or health care workers)).ti,ab. (84)
- 19 ((wellbeing or well-being or wellness or health promot\$ or health check\$) adj3 (health employees or health practitioners or health professionals or health staff or health workforce or health workers)).ti,ab. (164)
- 20 ((wellbeing or well-being or wellness or health promot\$ or health check\$) adj3 (medical employees or medical practitioners or medical professionals or medical staff or medical workforce or medical workers)).ti,ab. (16)
- 21 ((wellbeing or well-being or wellness or health promot\$ or health check\$) adj3 (medical students or medical undergraduates)).ti,ab. (110)
- 22 ((wellbeing or well-being or wellness or health promot\$ or health check\$) adj3 (nurse\$ or nursing or doctor\$ or physician\$ or midwi\$)).ti,ab. (2048)
- 23 ((wellbeing or well-being or wellness or health promot\$ or health check\$) adj3 (hospital employees or hospital practitioners or hospital professionals or hospital staff or hospital workforce or hospital workers)).ti,ab. (20)

- 24 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 (2505)
- 25 (sick\$ adj3 (leave or absence) adj3 (NHS employees or NHS practitioners or NHS professionals or NHS staff or NHS workforce or NHS workers)).ti,ab. (4)
- 26 (sick\$ adj3 (leave or absence) adj3 (healthcare employees or healthcare practitioners or healthcare professionals or healthcare staff or healthcare workforce or healthcare workers)).ti,ab. (14)
- 27 (sick\$ adj3 (leave or absence) adj3 (health care employees or health care practitioners or health care professionals or health care staff or health care workforce or health care workers)).ti,ab. (13)
- 28 (sick\$ adj3 (leave or absence) adj3 (health employees or health practitioners or health professionals or health staff or health workforce or health workers)).ti,ab. (5)
- 29 (sick\$ adj3 (leave or absence) adj3 (medical employees or medical practitioners or medical professionals or medical staff or medical workforce or medical workers)).ti,ab. (1)
- 30 (sick\$ adj3 (leave or absence) adj3 (medical students or medical undergraduates)).ti,ab. (0)
- 31 (sick\$ adj3 (leave or absence) adj3 (nurse\$ or nursing or doctor\$ or physician\$ or midwi\$)).ti,ab. (155)
- 32 (sick\$ adj3 (leave or absence) adj3 (hospital employees or hospital practitioners or hospital professionals or hospital staff or hospital workforce or hospital workers)).ti,ab. (10)
- 33 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 (197)
- 34 ((flu vaccinat\$ or influenza vaccinat\$) adj3 (NHS employees or NHS practitioners or NHS professionals or NHS staff or NHS workforce or NHS workers)).ti,ab. (3)
- 35 ((flu vaccinat\$ or influenza vaccinat\$) adj3 (healthcare employees or healthcare practitioners or healthcare professionals or healthcare staff or healthcare workforce or healthcare workers)).ti,ab. (186)
- 36 ((flu vaccinat\$ or influenza vaccinat\$) adj3 (health care employees or health care practitioners or health care professionals or health care staff or health care workforce or health care workers)).ti,ab. (151)
- 37 ((flu vaccinat\$ or influenza vaccinat\$) adj3 (health employees or health practitioners or health professionals or health staff or health workforce or health workers)).ti,ab. (20)
- 38 ((flu vaccinat\$ or influenza vaccinat\$) adj3 (medical employees or medical practitioners or medical professionals or medical staff or medical workforce or medical workers)).ti,ab. (7)
- 39 ((flu vaccinat\$ or influenza vaccinat\$) adj3 (medical students or medical undergraduates)).ti,ab. (14)
- 40 ((flu vaccinat\$ or influenza vaccinat\$) adj3 (nurse\$ or nursing or doctor\$ or physician\$ or midwi\$)).ti,ab. (173)
- 41 ((flu vaccinat\$ or influenza vaccinat\$) adj3 (hospital employees or hospital practitioners or hospital professionals or hospital staff or hospital workforce or hospital workers)).ti,ab. (13)
- 42 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 (550)
- 43 ((anxiety or depressed or depression or mental health or stress or burnout or bullying or harass\$ or violence or violent\$) adj3 (NHS employees or NHS practitioners or NHS professionals or NHS staff or NHS workforce or NHS workers)).ti,ab. (15)
- 44 ((anxiety or depressed or depression or mental health or stress or burnout or bullying or harass\$ or violence or violent\$) adj3 (healthcare employees or healthcare practitioners or healthcare professionals or healthcare staff or healthcare workforce or healthcare workers)).ti,ab. (287)
- 45 ((anxiety or depressed or depression or mental health or stress or burnout or bullying or harass\$ or violence or violent\$) adj3 (health care employees or health care practitioners or health care professionals or health care staff or health care workforce or health care workers)).ti,ab. (611)
- 46 ((anxiety or depressed or depression or mental health or stress or burnout or bullying or harass\$ or violence or violent\$) adj3 (health employees or health practitioners or health professionals or health staff or health workforce or health workers)).ti,ab. (6280)
- 47 ((anxiety or depressed or depression or mental health or stress or burnout or bullying or harass\$ or violence or violent\$) adj3 (medical employees or medical practitioners or medical professionals or medical staff or medical workforce or medical workers)).ti,ab. (178)
- 48 ((anxiety or depressed or depression or mental health or stress or burnout or bullying or harass\$ or violence or violent\$) adj3 (medical students or medical undergraduates)).ti,ab. (608)
- 49 ((anxiety or depressed or depression or mental health or stress or burnout or bullying or harass\$ or violence or violent\$) adj3 (nurse\$ or nursing or doctor\$ or physician\$ or midwi\$)).ti,ab. (12,284)

- 50 ((anxiety or depressed or depression or mental health or stress or burnout or bullying or harass\$ or violence or violent\$) adj3 (hospital employees or hospital practitioners or hospital professionals or hospital staff or hospital workforce or hospital workers)).ti,ab. (76)
- 51 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 (19,671)
- 52 ((healthy eating or diet or nutrition or obesity or overweight or exercise or physical activity or sedentary behavi\$ or lifestyle) adj3 (NHS employees or NHS practitioners or NHS professionals or NHS staff or NHS workforce or NHS workers)).ti,ab. (5)
- 53 ((healthy eating or diet or nutrition or obesity or overweight or exercise or physical activity or sedentary behavi\$ or lifestyle) adj3 (healthcare employees or healthcare practitioners or healthcare professionals or healthcare staff or healthcare workforce or healthcare workers)).ti,ab. (120)
- 54 ((healthy eating or diet or nutrition or obesity or overweight or exercise or physical activity or sedentary behavi\$ or lifestyle) adj3 (health care employees or health care practitioners or health care professionals or health care staff or health care workforce or health care workers)).ti,ab. (130)
- 55 ((healthy eating or diet or nutrition or obesity or overweight or exercise or physical activity or sedentary behavi\$ or lifestyle) adj3 (health employees or health practitioners or health professionals or health staff or health workforce or health workers)).ti,ab. (359)
- 56 ((healthy eating or diet or nutrition or obesity or overweight or exercise or physical activity or sedentary behavi\$ or lifestyle) adj3 (medical employees or medical practitioners or medical professionals or medical staff or medical workforce or medical workers)).ti,ab. (36)
- 57 ((healthy eating or diet or nutrition or obesity or overweight or exercise or physical activity or sedentary behavi\$ or lifestyle) adj3 (medical students or medical undergraduates)).ti,ab. (208)
- 58 ((healthy eating or diet or nutrition or obesity or overweight or exercise or physical activity or sedentary behavi\$ or lifestyle) adj3 (nurse\$ or nursing or doctor\$ or physician\$ or midwi\$)).ti,ab. (3065)
- 59 ((healthy eating or diet or nutrition or obesity or overweight or exercise or physical activity or sedentary behavi\$ or lifestyle) adj3 (hospital employees or hospital practitioners or hospital professionals or hospital staff or hospital workforce or hospital workers)).ti,ab. (21)
- 60 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 (3887)
- 61 ((smoking or tobacco or alcoholism or alcohol abus\$ or alcohol addict\$ or alcohol drink\$ or alcohol misus\$ or drug abus\$ or drug addict\$ or drug misus\$) adj3 (NHS employees or NHS practitioners or NHS professionals or NHS staff or NHS workforce or NHS workers)).ti,ab. (0)
- 62 ((smoking or tobacco or alcoholism or alcohol abus\$ or alcohol addict\$ or alcohol drink\$ or alcohol misus\$ or drug abus\$ or drug addict\$ or drug misus\$) adj3 (healthcare employees or healthcare practitioners or healthcare professionals or healthcare staff or healthcare workforce or healthcare workers)).ti,ab. (46)
- 63 ((smoking or tobacco or alcoholism or alcohol abus\$ or alcohol addict\$ or alcohol drink\$ or alcohol misus\$ or drug abus\$ or drug addict\$ or drug misus\$) adj3 (health care employees or health care practitioners or health care professionals or health care staff or health care workforce or health care workers)).ti,ab. (105)
- 64 ((smoking or tobacco or alcoholism or alcohol abus\$ or alcohol addict\$ or alcohol drink\$ or alcohol misus\$ or drug abus\$ or drug addict\$ or drug misus\$) adj3 (health employees or health practitioners or health professionals or health staff or health workforce or health workers)).ti,ab. (241)
- 65 ((smoking or tobacco or alcoholism or alcohol abus\$ or alcohol addict\$ or alcohol drink\$ or alcohol misus\$ or drug abus\$ or drug addict\$ or drug misus\$) adj3 (medical employees or medical practitioners or medical professionals or medical staff or medical workforce or medical workers)).ti,ab. (31)
- 66 ((smoking or tobacco or alcoholism or alcohol abus\$ or alcohol addict\$ or alcohol drink\$ or alcohol misus\$ or drug abus\$ or drug addict\$ or drug misus\$) adj3 (medical students or medical undergraduates)).ti,ab. (247)
- 67 ((smoking or tobacco or alcoholism or alcohol abus\$ or alcohol addict\$ or alcohol drink\$ or alcohol misus\$ or drug abus\$ or drug addict\$ or drug misus\$) adj3 (nurse\$ or nursing or doctor\$ or physician\$ or midwi\$)).ti,ab. (2040)
- 68 ((smoking or tobacco or alcoholism or alcohol abus\$ or alcohol addict\$ or alcohol drink\$ or alcohol misus\$ or drug abus\$ or drug addict\$ or drug misus\$) adj3 (hospital employees or hospital practitioners or hospital professionals or hospital staff or hospital workforce or hospital workers)).ti,ab. (48)

- 69 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 (2654)
- 70 *Health Personnel/ (23,667)
- 71 (wellbeing or well-being or wellness or health promot\$ or health check\$).ti. (27,028)
- 72 (anxiety or depressed or depression or mental health or stress or burnout or bullying or harass\$ or violence or violent\$).ti. (418,265)
- 73 (healthy eating or diet or nutrition or exercise or physical activity or sedentary behavi\$ or lifestyle or obesity or overweight).ti. (338,587)
- 74 (alcoholism or alcohol abus\$ or alcohol addict\$ or alcohol drink\$ or alcohol misus\$ or drug abus\$ or drug addict\$ or drug misus\$ or smoking or tobacco).ti. (117,867)
- 75 (sick\$ leave or sick\$ absence or absenteeism or flu vaccinat\$ or influenza vaccinat\$).ti. (7982)
- 76 (back adj2 pain).ti. (17,183)
- 77 71 or 72 or 73 or 74 or 75 or 76 (909,277)
- 78 70 and 77 (2526)
- 79 15 or 24 or 33 or 42 or 51 or 60 or 69 or 78 (74,491)
- 80 (systematic\$ adj2 review\$).ti,ab. (146,640)
- 81 meta-analysis as topic/ (16,702)
- 82 meta-analytic\$.ti,ab. (6342)
- 83 meta-analysis.ti,ab,pt. (145,685)
- 84 metanalysis.ti,ab. (181)
- 85 metaanalysis.ti,ab. (1491)
- 86 meta analysis.ti,ab. (120,969)
- 87 meta-synthesis.ti,ab. (704)
- 88 metasynthesis.ti,ab. (272)
- 89 meta synthesis.ti,ab. (704)
- 90 meta-regression.ti,ab. (6211)
- 91 metaregression.ti,ab. (564)
- 92 meta regression.ti,ab. (6211)
- 93 (synthes\$ adj3 literature).ti,ab. (2860)
- 94 (synthes\$ adj3 evidence).ti,ab. (8651)
- 95 integrative review.ti,ab. (2383)
- 96 data synthesis.ti,ab. (10,216)
- 97 (research synthesis or narrative synthesis).ti,ab. (2374)
- 98 (systematic study or systematic studies).ti,ab. (10,981)
- 99 (systematic comparison\$ or systematic overview\$).ti,ab. (3005)
- 100 evidence based review.ti,ab. (1852)
- 101 comprehensive review.ti,ab. (12,741)
- 102 critical review.ti,ab. (14,551)
- 103 quantitative review.ti,ab. (629)
- 104 structured review.ti,ab. (740)
- 105 realist review.ti,ab. (239)
- 106 realist synthesis.ti,ab. (166)
- 107 pooled analysis.ti,ab. (7300)
- 108 or/80-107 (303,757)
- 109 review.pt. (2,477,929)
- 110 medline.ab. (100,321)
- 111 pubmed.ab. (90,896)
- 112 cochrane.ab. (67,385)
- 113 embase.ab. (72,406)
- 114 cinahl.ab. (22,305)
- 115 psyc?lit.ab. (913)
- 116 psyc?info.ab. (27,151)

- 117 (literature adj3 search\$.ab. (51,438)
- 118 (database\$ adj3 search\$.ab. (50,418)
- 119 (bibliographic adj3 search\$.ab. (2221)
- 120 (electronic adj3 search\$.ab. (18,711)
- 121 (electronic adj3 database\$.ab. (24,199)
- 122 (computeri?ed adj3 search\$.ab. (3365)
- 123 (internet adj3 search\$.ab. (2894)
- 124 included studies.ab. (18,879)
- 125 (inclusion adj3 studies).ab. (13,809)
- 126 inclusion criteria.ab. (72,125)
- 127 selection criteria.ab. (27,992)
- 128 predefined criteria.ab. (1770)
- 129 predetermined criteria.ab. (970)
- 130 (assess\$ adj3 (quality or validity)).ab. (69,431)
- 131 (select\$ adj3 (study or studies)).ab. (59,357)
- 132 (data adj3 extract\$.ab. (53,494)
- 133 extracted data.ab. (12,362)
- 134 (data adj2 abstracted).ab. (4848)
- 135 (data adj3 abstraction).ab. (1489)
- 136 published intervention\$.ab. (157)
- 137 ((study or studies) adj2 evaluat\$.ab. (166,265)
- 138 (intervention\$ adj2 evaluat\$.ab. (9967)
- 139 confidence interval\$.ab. (365,701)
- 140 heterogeneity.ab. (146,219)
- 141 pooled.ab. (77,750)
- 142 pooling.ab. (11,003)
- 143 odds ratio\$.ab. (239,017)
- 144 (Jadad or coding).ab. (167,100)
- 145 or/110-144 (1,284,446)
- 146 109 and 145 (222,997)
- 147 review.ti. (413,989)
- 148 147 and 145 (116,759)
- 149 (review\$ adj4 (papers or trials or studies or evidence or intervention\$ or evaluation\$)).ti.ab. (166,288)
- 150 108 or 146 or 148 or 149 (506,309)
- 151 letter.pt. (1,015,413)
- 152 editorial.pt. (481,572)
- 153 comment.pt. (752,482)
- 154 151 or 152 or 153 (1,694,614)
- 155 150 not 154 (494,494)
- 156 exp animals/ not humans/ (4,544,871)
- 157 155 not 156 (481,921)
- 158 79 and 157 (3336)
- 159 limit 158 to yr="2000 -Current" (3063)

Business Source Premier (via EBSCOhost)

Search date: 7 February 2019.

Records retrieved: 711.

Search strategy

#	Query	Number of hits
S19	S6 OR S8 OR S10 OR S12 OR S14 OR S16 OR S18	714
S18	S1 AND S4 AND S17	44
S17	TX "back pain"	7819
S16	S1 AND S4 AND S15	119
S15	TX smoking or tobacco or alcoholism or "alcohol abus*" or "alcohol addict*" or "alcohol drink*" or "alcohol misus*" or "drug abus*" or "drug addict*" or "drug misus*"	443,257
S14	S1 AND S4 AND S13	310
S13	TX "healthy eating" or diet or nutrition or obesity or overweight or exercise or "physical activity" or "sedentary behavi*" or lifestyle	797,679
S12	S1 AND S4 AND S11	661
S11	TX anxiety or depressed or depression or "mental health" or stress or burnout or bullying or harass* or violence or violent*	979,468
S10	S1 AND S4 AND S9	6
S9	TX "flu vaccinat*" or "influenza vaccinat*"	3366
S8	S1 AND S4 AND S7	114
S7	TX (sick* N3 (leave or absence)) OR TX absenteeism	39,270
S6	S1 AND S4 AND S5	295
S5	TX (wellbeing or well-being or wellness or "health promot*" or "health check*")	243,733
S4	S2 OR S3	62,535
S3	TI ("NHS employees" or "NHS practitioners" or "NHS professionals" or "NHS staff" or "NHS workforce" or "NHS workers") OR TI ("hospital employees" or "hospital practitioners" or "hospital professionals" or "hospital staff" or "hospital workforce" or "hospital workers") OR TI ("healthcare employees" or "healthcare practitioners" or "healthcare professionals" or "healthcare staff" or "healthcare workforce" or "healthcare workers") OR TI ("health care employees" or "health care practitioners" or "health care professionals" or "health care staff" or "health care workforce" or "health care workers") OR TI ("health employees" or "health practitioners" or "health professionals" or "health staff" or "health workforce" or "health workers") OR TI ("medical employees" or "medical practitioners" or "medical professionals" or "medical staff" or "medical workforce" or "medical workers") OR TI ("medical students" or "medical undergraduates") OR TI ("nurse* or nursing or doctor* or physician* or midwi*")	34,129
S2	DE "MEDICAL personnel" OR DE "DENTAL personnel" OR DE "ENGLISH language – Conversation & phrase books (for medical personnel)" OR DE "HEALTH practitioners" OR DE "HEALTH services administrators" OR DE "HOSPITAL personnel" OR DE "MENTAL health personnel" OR DE "NURSES" OR DE "PHYSICIANS" OR DE "PODIATRISTS"	37,984
S1	TI "systematic review" OR TI meta-analysis OR TX (review N3 (research or comprehensive or integrated or structured or realist or evidence)) OR TX (synthesis N3 (research or comprehensive or integrated or structured or realist or evidence)) OR TI (review AND (research or comprehensive or integrated or structured or realist or evidence))	136,990

PROSPERO

Via website at www.crd.york.ac.uk/prospéro/.

Search date: 30 January 2019.

Records retrieved: 357.

Search strategy

ID	Search terms	Number of hits
#1	(employees AND (health OR wellbeing)): TI, KW, RQ, SM	21
#2	(employees AND (health OR well-being)): TI, KW, RQ, SM	21
#3	(staff AND (health OR wellbeing)): TI, KW, RQ, SM	92
#4	(staff AND (health OR well-being)): TI, KW, RQ, SM	95
#5	(employment AND (health OR wellbeing)): TI, KW, RQ, SM	32
#6	(employment AND (health OR well-being)): TI, KW, RQ, SM	31
#7	(workplace): TI, KW, RQ, SM	168
#8	(worksites): TI, KW, RQ, SM	9
#9	MeSH DESCRIPTOR workplace EXPLODE ALL TREES	148
#10	MeSH DESCRIPTOR Occupational Health EXPLODE ALL TREES	67
#11	#10 OR #9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1	357

Appendix 2 List of population groups/workplace settings

TABLE 13 Full list of all population groups/workplace settings in reviews and meta-analyses

Population group/workplace setting	Number of reviews
Workplace	155
Nurses ^a	31
'Health-care' staff	28
Shift workers	9
Mental health care	8
Medical students	7
Office-based workers	7
Women	7
Doctors	7
Other ^b	6
Nurses/nursing students	4
Employees with conditions	3
Emergency medical services	3
Male	3
Managers/supervisors	3
Nursing students	3
Older workers	3
Public sector ^c	3
Midwives/obstetricians/midwives	2
Doctors/medical students	1
University and college staff	1
Workers (Latin American)	1
Health-care students and professionals	1

a Nurses includes acute mental health/psychiatric nurses, emergency department nurses, primary care nurses, mental health nurses, oncology and palliative care nurses, nurse leaders, nurses in acute care wards, nurses (caring for patients with sickle cell disease), oncology nurses and newly qualified nurses.

b Other includes animal care professionals; manufacturing workers; military and maritime workplaces; maritime workers and train drivers; various (police, transport workers and individuals injured at work); and low-wage workers.

c Public sector workers includes fire fighters, ambulance, police and military personnel; emergency and protective services employees; and emergency services.

Appendix 3 Reviews and meta-analyses, and protocols included in the evidence map

Lifestyles

Non-health care focused (n = 74)

Abraham C, Graham-Rowe E. Are worksite interventions effective in increasing physical activity? A systematic review and meta-analysis. *Health Psychol Rev* 2009;**3**:108–144.

Albertsen K, Borg V, Oldenburg B. A systematic review of the impact of work environment on smoking cessation, relapse and amount smoked. *Prev Med* 2006;**43**:291–305.

Allan J, Querstret D, Banas K, de Bruin M. Environmental interventions for altering eating behaviours of employees in the workplace: a systematic review. *Obes Rev* 2017;**18**:214–26. <https://doi.org/10.1111/obr.12470>

Anderson LM, Quinn TA, Glanz K, Ramirez G, Kahwati LC, Johnson DB, *et al*. The effectiveness of worksite nutrition and physical activity interventions for controlling employee overweight and obesity: a systematic review. *Am J Prev Med* 2009;**37**:340–57. <https://doi.org/10.1016/j.amepre.2009.07.003>

Archer WR, Batan MC, Buchanan LR, Soler RE, Ramsey DC, Kirchhofer A, Reyes M. Promising practices for the prevention and control of obesity in the worksite. *Am J Health Promot* 2011;**25**:e12–26. <https://doi.org/10.4278/ajhp.090421-QUAN-144>

Ausburn TF, LaCoursiere S, Crouter SE, McKay T. Review of worksite weight management programs. *Workplace Health Saf* 2014;**62**:122–6. <https://doi.org/10.3928/21650799-20140219-06>

Barbato DL, Sancini A, Caciari T, Rosati MV, Tomei G, Tomei F. [Dietary intervention programs in the workplace: an effective prevention strategy.] *G Ital Med Lav Ergon* 2010;**32**(Suppl. 4):100–3.

Becker I, Wallmann-Sperlich B, Rupp R, Bucksch J. [Workplace interventions to reduce sedentary behavior: A systematic review]. *Gesundheitswesen* 2019;**81**:606–14.

Bell K, McCullough L, DeVries K, Greaves L, Jategaonkar N. *NICE Rapid review. Workplace Policies and Interventions for Smoking Cessation*. Vancouver, BC: British Columbia Centre of Excellence for Women's Health; 2006.

Bell K, Richardson L, McCullough L, Greaves L. *Workplace Interventions to Promote Smoking Cessation*. Vancouver, BC: British Columbia Center of Excellence for Women's Health; 2006.

Benedict MA, Arterburn D. Worksite-based weight loss programs: a systematic review of recent literature. *Am J Health Promot* 2008;**22**:408–16. <https://doi.org/10.4278/ajhp.22.6.408>

Brinkley A, McDermott H, Munir F. What benefits does team sport hold for the workplace? A systematic review. *J Sports Sci* 2017;**35**:136–48. <https://doi.org/10.1080/02640414.2016.1158852>

Brown SA, García AA, Zuñiga JA, Lewis KA. Effectiveness of workplace diabetes prevention programs: A systematic review of the evidence. *Patient Educ Couns* 2018;**101**:1036–50.

Burnhams NH, Musekiwa A, Parry C, London L. A systematic review of evidence-based workplace prevention programmes that address substance abuse and HIV risk behaviours. *Afr J Drug Alcohol Stud* 2013;**12**:1–22.

Cairns JM, Bambra C, Hillier-Brown FC, Moore HJ, Summerbell CD. Weighing up the evidence: a systematic review of the effectiveness of workplace interventions to tackle socio-economic inequalities in obesity. *J Public Health* 2015;**37**:659–70. <https://doi.org/10.1093/pubmed/fdu077>

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Physical health

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Appendix 4 Characteristics of reviews of reviews

TABLE 14 Key characteristics of RoRs

First author, year of publication						
Country of publication	Number of included reviews	Review designs				Review authors' comments on evidence
Title	Country and year of publication of included reviews	Designs of primary studies	Population	Interventions	Outcomes	
Aim/objective						
Lifestyles						
Schliemann, 2019 ³⁰	<i>n</i> = 21	Systematic reviews including three that were also meta-analyses	Adults	Workplace interventions of which one component had to be dietary. Other interventions included general wellness programmes (e.g. physical activity, smoking, alcohol use). Most interventions targeted multiple health behaviours of which diet was one	Dietary behaviour (e.g. fruit/vegetable intake), weight loss, environmental aspects, economic related (e.g. absenteeism, productivity, health-care costs)	Only four reviews were diet only, others were general workplace wellness programmes focusing on multiple health behaviours
UK	Described as American or Western Europe	Not explicitly reported but appears to include RCTs, non-RCTs, and uncontrolled studies				Lack of consistency across results due to heterogeneity of reviews (and included studies)
The effectiveness of dietary workplace interventions: a systematic review of systematic reviews	1996–2017					Environmental interventions should also be included
To summarise findings of systematic reviews that distinctively report dietary intervention components and their effects on diet-, health- and economic-related outcomes in the workplace setting						Many outcomes were self-report; there was a lack of process evaluations
						Improvements in diet could be linked to dietary interventions but conclusion for health and economic measures limited
						Recommendations that interventions and messages should be tailored to the study population and adapted to the requirements of each workplace to increase effectiveness. Should have longer-term evaluations

First author, year of publication	Country of publication	Number of included reviews	Review designs			Review authors' comments on evidence	
			Title	Country and year of publication of included reviews	Designs of primary studies		Population
Aim/objective							
Jirathananuwat, 2017 ²⁹	Thailand/USA	n = 11 NR 2009–14	Systematic reviews, meta-analyses, systematic reviews including meta-analyses Unclear but could include RCTs, quasi-experimental or observational studies	Workplaces included health service, government, company/workplace/industry, factory, educational institution, private sector	Interventions aimed to change multiple behaviours and included nutrition/dietary programmes, stress (mental health) management programmes, weight control programmes and smoking cessation programmes	Review aim was to classify rather than evaluate: sought to identify intervention factors including enabling (e.g. information delivery, self-motivation or programme training), predisposing (e.g. instrument resources such as pedometers), reinforcing (e.g. incentive, social support), policy regulatory (e.g. organisational action) and environmental development (e.g. break rooms, signage)	Interventions aimed to change multiple behaviours so were not exclusively focused on physical activity
Fishwick, 2013 ²⁶	UK	n = 6 NR 1994–2010	Systematic review and/or meta-analysis Unclear but included controlled studies, and some evaluating cost-effectiveness	Workplace	Legislative smoking bans; workplace cessation programmes including behavioural interventions, self help, pharmacological; and non-workplace cessation programmes	Rates of cessation, abstinence, quit; also costs	Findings on cost-effectiveness were mixed
continued							

TABLE 14 Key characteristics of RoRs (continued)

First author, year of publication	Country of publication	Number of included reviews	Review designs	Population	Interventions	Outcomes	Review authors' comments on evidence
Title	Aim/objective	Country and year of publication of included reviews	Designs of primary studies				
General health promotion							
Brunton, 2016 ²⁸	UK	<i>n</i> = 24 (gave pooled effect size. Overall 106 reviews identified but only those with a pooled effect size were included in the synthesis)	Systematic reviews Trials and outcome evaluations	Workplace	Multicomponent, education, exercise, counselling, screening, medical/assistance devices, access to resources, changes to company regulations or policy, risk assessment and participatory research	Health including mental health, stress, weight management Financial/business including absenteeism and related costs; health-care costs, job satisfaction, job stress, productivity	Interventions differed across varying types of workplace making it difficult to judge the generalisability of interventions to other settings Physical activity and mental health interventions predominated, whereas other public health topics, such as healthy eating, cancer prevention and cardiovascular risk reduction were rarely seen There is very little evaluation of costs across studies There was a lack of follow-up in interventions, which limits the amount of information available concerning the sustainability of workplace health interventions
Developing evidence-informed, employer-led workplace health	To understand whether or not workplace health programmes are effective for improving health and business outcomes, and to identify the characteristics of workplace health programmes that are thought to influence their success	International (countries not stated) 2001-13					

First author, year of publication	Country of publication	Number of included reviews	Review designs	Population	Interventions	Outcomes	Review authors' comments on evidence
Title	Country and year of publication of included reviews		Designs of primary studies				
Aim/objective							
Haby, 2016 ²³	Mexico/Brazil	n = 14	Systematic reviews	Health-sector workplace	Occupational health and safety; precarious employment/ production system rationalisation (e.g. downsizing, temporary work); flexible work arrangements; shift work – organisational level; task restructuring; employee participation – organisational level; professional nursing practice; paying for performance to improve the delivery of health interventions; and in-work tax credits for families	Various including disease incidence, prevalence and burden; mortality; morbidity; symptoms and signs of disease; health service use; quality of care; health-related costs; and health inequalities, including by gender, age, socioeconomic status, area of residence, etc.	To be included, systematic reviews had to report health outcomes, precluding reviews that only reported changes in environmental, economic, or peace and security outcomes Interventions were poorly described making it difficult to understand how interventions were implemented and whether or not managers were supportive of the interventions
Interventions that facilitate sustainable jobs and have a positive impact on workers' health: an overview of systematic reviews		Described as developed or developing. Included mainly 'developed countries'	RCTs (individuals or clusters); quasi-RCTs; controlled before-and-after studies; interrupted time series; and analytic observational studies (cohort, case-control, and cross-sectional studies). Economic evaluations were eligible but none were found				
To identify interventions that facilitate sustainable jobs and have a positive impact on the health of workers in health-sector workplaces		1997–2014					

continued

TABLE 14 Key characteristics of RoRs (continued)

First author, year of publication	Country of publication	Number of included reviews	Review designs	Population	Interventions	Outcomes	Review authors' comments on evidence
Title	Country and year of publication of included reviews	Designs of primary studies					
Aim/objective							
Schröer, 2014 ²⁷	n = 15	Systematic reviews	Workplace				
Germany	Australia, Belgium, Denmark, France, the Netherlands, the USA and the UK	Experimental (including RCTs) and non-experimental designs were included			Physical activity and/or dietary interventions at individual and/or organisational levels	Weight, physical activity and nutritional outcomes and some economic data	There was a lack of consistency in findings
Evidence-based lifestyle interventions in the workplace – an overview	2007–12						Some reviews mentioned poor-quality primary studies
To summarise the effectiveness of different workplace health interventions for promoting healthy lifestyle, preventing diseases and reducing health-care costs							Short-term outcomes
							Few employee characteristics reported
							Many outcomes were self-reported
Goldgruber, 2010 ²⁵	n = 17 (including two Cochrane reviews, one on occupational health and one on smoking cessation)	Systematic reviews and/or meta-analyses	Workplace				
Germany	Australia, Finland, the Netherlands, Norway, the USA and the UK	Multiple including RCTs, experimental and non-experimental			Stress, physical activity and nutrition; organisational development; smoking, and ergonomics and back pain	Multiple (mainly individual) psychosocial, health (physical and mental); economic (absenteeism); ergonomic; health-risk indicators	One of the challenges with multimodal interventions is that it is not obvious which components in what frequency should be applied
Effectiveness of workplace health promotion and primary prevention interventions: a review	2004–8						
Effectiveness of health promotion and primary prevention interventions in the workplace							

First author, year of publication						
Country of publication	Number of included reviews	Review designs				
Title	Country and year of publication of included reviews	Designs of primary studies	Population	Interventions	Outcomes	Review authors' comments on evidence
Aim/objective						
Mental health						
Kalani, 2018 ²⁴	n = 4	Reviews and systematic reviews	Medical students, interns, physicians, residents and fellows. One review also includes nurses	Most were individual level (e.g. counselling, support groups, mindfulness)	Reduction in burnout	Conflicting findings across reviews for individual- and organisational-level interventions. This may be as a result of individual primary studies including different groups of physicians but being considered as one group by a review, or other mediating or moderating factors not investigated
Iran	NR	Experimental (including RCTs) and non-experimental designs were included		Organisational-level interventions included pass/fail grading; duty standards, shift working staffing; change in workload		Sample sizes were limited in some of the primary studies included in reviews
Interventions for physician burnout: a systematic review of systematic reviews	2008–16					Differing interventions across reviews
To evaluate interventions to reduce physician burnout						

continued

TABLE 14 Key characteristics of RoRs (continued)

First author, year of publication	Country of publication	Number of included reviews	Review designs	Population	Interventions	Outcomes	Review authors' comments on evidence
Title	Country and year of publication of included reviews	Country and year of publication of included reviews	Designs of primary studies				
Aim/objective							
Joyce, 2016 ³³	Australia/Norway	n = 20 (includes six Cochrane reviews)	Described as reviews	Workplace	Primary prevention interventions included increasing employee control, physical activity and workplace health promotion. Secondary prevention interventions included screening, counselling, stress management programmes and post-trauma debriefing. Tertiary prevention interventions included cognitive-behavioural therapy, exposure therapy and medication	Multiple including employee control, increasing physical activity, symptom reduction	In most of the included reviews 'the impact the interventions had on work-related aspects such as absenteeism, presenteeism and productivity remained relatively unexplored'
Workplace interventions for common mental disorders: a systematic meta-review	Australia, Canada, Finland, the Netherlands, the USA and the UK	2001-12	Unclear				
To evaluate the effectiveness of workplace mental health interventions							

First author, year of publication	Country of publication	Number of included reviews	Review designs	Population	Interventions	Outcomes	Review authors' comments on evidence
Title	Country and year of publication of included reviews		Designs of primary studies				
Aim/objective							
Wagner, 2016 ³⁴	Canada	n = 14	Systematic reviews	Workplace	Multiple including multicomponent interventions, therapy, cognitive-behavioural therapy, exercise, injury prevention	Absenteeism, productivity and cost	Broad range of interventions from being handed a pamphlet to therapy
Mental health interventions in the workplace and work outcomes: a best-evidence synthesis of systematic reviews		2001-2	NR				Variation in populations, interventions and outcomes
To determine the level of evidence supporting mental health interventions as valuable to work outcomes							
Dalsbø, 2013 ³²	Norway	n = 3 (all are Cochrane reviews)	Systematic reviews	In the included reviews were health-care workers, law enforcement officers as well as 'all employees' in workplace settings	Stress management, mental image training, flexible working	Stress, mental strain, self-image, quality of sleep, alertness	Reviews did not include outcomes such as function, productivity, absence, disability, sick leave, costs and adverse events
Workplace-based interventions for employees' mental health		2009-10	RCTs, non-RCTs, controlled before and after				
To systematically review the research about the effects of workplace-based interventions							

continued

TABLE 14 Key characteristics of RoRs (continued)

First author, year of publication	Country of publication	Number of included reviews	Review designs	Population	Interventions	Outcomes	Review authors' comments on evidence
Title	Country and year of publication of included reviews	Designs of primary studies					
Aim/objective							
Bhui, 2012 ³¹	UK	n = 23	Systematic reviews	Workplace	Individual including stress management, cognitive-behavioural therapy, relaxation, massage, personal skills training, mindfulness	Anxiety, depression, and absenteeism	Interventions differed by their components, mode of delivery and whether they targeted individuals or organisations making it difficult for all of the reviews to compare benefits from any single intervention across a number of studies
A synthesis of the evidence for managing stress at work: a review of the reviews reporting on anxiety, depression, and absenteeism	1996–2011	NR	NR		Organisational including comprehensive wellness programmes, support groups, problem-solving committees, work redesign		There were many different outcome measures for assessing anxiety and depression, and many proxy measures of mental health, sometimes without clarity about which outcomes were used in the meta-analyses
To identify the key findings and gaps in the literature on the effectiveness of different stress management interventions for preventing anxiety and depression as the main cause of absenteeism							Although many reviews appeared to be reviewing the same evidence, the reviews did not all identify the same primary studies and, therefore, did not always reach the same conclusions

NR, not reported; RCT, randomised controlled trial.

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