

BMJ Open Influences and outcomes of less than full-time working in the medical profession: a systematic review protocol

Magdalen Baker , Ann Griffin, Jane Dacre, Asta Medisauskaite 

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Research Department of Medical Education, UCL Medical School, University College London Division of Medicine, London, UK

Correspondence to

Dr Magdalen Baker;
magdalen.baker.13@ucl.ac.uk

ABSTRACT

Introduction An impoverished medical workforce is a global phenomenon, which can impact patient care significantly. Greater flexibility in working patterns is one approach policy-makers adopt to address this issue, and the expansion of less than full-time (LTFT) working forms part of this. Studies suggest that LTFT working has the potential to improve recruitment and retention by aligning with how doctors increasingly want to balance their careers with other commitments and interests. What is less well understood are the influencing factors and outcomes related to LTFT working among doctors. This protocol outlines the methodology for a systematic review that will evaluate existing knowledge on LTFT working in the medical profession.

Methods and analysis The Preferred Reporting Items for Systematic Reviews and Meta Analyses guidelines will be followed. Embase, MEDLINE, PsycINFO, Health Management Information Consortium, Web of Science, Cochrane Library, Healthcare Administration, and Applied Social Sciences Index and Abstracts will be searched for studies published up to March 2022. Unpublished literature from EThos and ProQuest Dissertations & Theses Global will also be searched. Bibliographic searching, citation searching and handsearching will be used to retrieve additional papers. Authors will be contacted for data or publications if necessary. Two independent reviewers will undertake study screening, data extraction and quality assessment, with disagreements resolved by consensus or by a third reviewer if necessary. Data synthesis will be by narrative synthesis and meta-analysis if possible.

Ethics and dissemination The proposed study does not require ethical approval; however, it forms part of a larger body of research on the impact of LTFT working on the medical workforce for which ethics approval has been granted by the Research Ethics Committee at University College London. Findings will be published in a peer-reviewed journal and will be presented at national and international conferences.

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INTRODUCTION

The quality and performance of a country's healthcare system is greatly influenced by the size, skill mix and allocation of its health workforce,^{1–4} which the WHO defines as 'all people engaged in actions with the primary intent of enhancing health' (World Health

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ A systematic and structured approach will be used to identify, critically appraise and synthesise data on the factors which influence doctors' choices to work less than full-time and the associated outcomes, providing a thorough and auditable summary of pertinent evidence on this topic.
- ⇒ A comprehensive search strategy and detailed eligibility criteria informed by published recommendations for conducting systematic reviews will be used, adding rigour to the study.
- ⇒ The review will synthesise data from a variety of study designs and methodology, providing a rich overview of the topic but also potentially increasing the likelihood of heterogeneity of the study findings.
- ⇒ Two independent reviewers will perform data extraction and quality assessment on all included studies, to ensure agreement.
- ⇒ The review will only include studies published in the English language due to the language proficiency of the reviewers and this could introduce bias.

Organization, p1).⁵ This includes clinical staff, for example, doctors and nurses, and non-clinical staff, for example, hospital managers and accountants. Health workforce shortages are a worldwide problem and the WHO estimates that by 2030, there will be a projected worldwide shortfall of 18 million health workers.⁵ In England, the National Health Service is regarded to be in crisis with an estimated shortage of approximately 100 000 health workers.⁶ This poses a real risk to patients because the ratio of health workers, especially doctors, to the overall population is strongly linked to important health outcomes.^{3 4 7 8} Furthermore, emerging data suggest that maintaining health sector employment can contribute to the growth of other sectors in society and can bolster the resilience of national economies during downturns.^{9 10}

Anand and Bärnighausen³ and Speybroeck *et al*⁸ demonstrated that health worker density (ie, the number of doctors, nurses and midwives per specified measure of the



population) is significant in accounting for mortality rates in children under 5, and maternal mortality rates. Both studies showed that when examined alone, doctor density was significant at lowering maternal and childhood mortality rates—a result not consistently replicated when the combined density of nurses and midwives was examined separately from doctors. This suggests that there is something particularly important about the relationship between the number of available doctors and population health outcomes. Pálsdóttir *et al* demonstrated the social and economic benefits of investing in health professionals with outcomes such as enhanced health worker retention in rural areas, improved health outcomes and the generation of new economic activity and social capital in local communities.¹¹ The European Jobs Monitor report from 2013 showed that during the great recession between 2007 and 2009, stable health sector employment in high-income countries contributed to their economic resilience during that time.⁹

Less than full-time working among doctors

So far in this review protocol, the term ‘health workforce’ has been used to describe the different professionals associated with the provision of healthcare in line with the WHO’s definition.¹² However, this review will concentrate solely on doctors because they represent one of the most well-recognised professions within the health workforce and, as mentioned earlier, the supply of doctors in particular has significant effects on population health.^{3 8} For this review, the term ‘medical workforce’ will be used specifically for doctors who contribute to the health workforce of any given population, in keeping with the same use of this term by the General Medical Council.¹³

Governments and policy-makers have historically explored different strategies to tackle the problem of medical workforce shortages.^{14 15} One such strategy, which aims to improve doctors’ work–life balance and retain more doctors in the profession, is to provide greater flexibility in the workplace.^{16 17} Flexible working has multiple definitions and comprises a range of practices, including working-from-home, less than full-time (LTFT) or part-time working, job sharing, annualised hours and career breaks. Flexible working patterns which give the worker more choice or control have been shown to reduce employee stress and increase job satisfaction, productivity and well-being.^{16 18–20} It can also benefit employers by increasing organisational performance, reducing employee absenteeism and enhancing employee retention.^{21 22} From August 2022 in the UK, postgraduate medical training will see the expansion of LTFT working to anyone who is interested, without the need for the previous eligibility criteria where doctors must either have caring responsibilities, an illness or exceptional circumstances to qualify.²³ Although this new model will be introduced gradually, little is known about how an expansion of LTFT working might impact the workforce, patient care and doctors themselves over time. This review will increase our understanding of some of

the career-related choices doctors make, and the interplay between these choices, the factors which influence them and the consequences on the environment in which the doctors work. These are important considerations when supporting doctors towards career success and a healthy work–life balance, and for enabling robust medical workforce planning—all of which could have beneficial effects on both doctors and patients.

A systematic review of literature on doctors choosing to work LTFT has never previously been carried out to our knowledge. A systematic approach has been chosen to ensure an exhaustive and reproducible search process encompassing peer-reviewed empirical research of different methods (ie, qualitative, quantitative and mixed methods) as well as literature from other sources such as unpublished work and the grey literature. As LTFT working among doctors in postgraduate training becomes more accessible in the UK, it is likely that this review will be repeated in the future. The use of clear criteria *a priori* for searching, selecting, appraising and synthesising the literature in this protocol will therefore allow for greater transparency and scientific rigour,²⁴ and will serve as an important template from which future literature searches and systematic reviews on this topic can be updated in due course.

Systematic review aim and questions

The aim of the review is to provide an overview of what is currently known about the factors and outcomes associated with doctors working LTFT, and to identify gaps in the literature where further research can be directed.

The review questions are as follows:

1. What factors and characteristics are associated with doctors who work LTFT?
2. What outcomes are there for patients, the medical workforce/health service and doctors in relation to doctors working LTFT?

METHODS AND ANALYSIS

Protocol registration

This systematic review protocol has been developed in line with the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 015 guideline,²⁵ and is registered with the International Prospective Register of Systematic Reviews (PROSPERO)²⁶ (registration number: CRD42022307174). In the event of any amendments to the protocol, the changes along with the date and rationale for them will be updated in PROSPERO. Please see research checklist 1 in online supplemental information for the PRISMA-P checklist.

Eligibility criteria

Studies which focus on LTFT or part-time working among doctors of any grade, in any specialty and from any country, published up to March 2022 will be included. For the purpose of this review, LTFT working refers to a working pattern chosen by a doctor or group of doctors and clearly described as LTFT or part-time, or, in which

≤40 hours are worked per week in keeping with the maximum LTFT working hours in the UK. Studies which focus on undergraduate medical trainees or on health professionals other than doctors, and studies which focus on externally enforced reduced working hours or on outcomes related solely to gender differences within the medical profession rather than working patterns, will be excluded as these concepts are outside the scope of this review. Only studies published in the English language will be included because this is the only language common to the reviewers. Reviews will not be included so as not to duplicate findings from individual empirical studies. Instead, the bibliography of relevant reviews will be screened for suitable individual studies. Conference abstracts will not be included because of limited presented data, but authors of relevant abstracts will be contacted to provide further data and/or publications. Similarly, if

relevant full-text publications are not available through the university subscription, authors will be contacted for full text. If there is no response from any author after 4 weeks, their study will be excluded. Opinion papers and commentaries with no primary data will be excluded. Relevant grey literature such as theses, dissertations, government papers and organisational reports will be included because although not peer-reviewed, they represent detailed bodies of work which have either undergone thorough academic scrutiny, or have been sanctioned by important stakeholders. See [table 1](#) for further details on the inclusion and exclusion criteria.

Search strategy and information sources

The literature search will be performed in March 2022. The electronic databases Embase, MEDLINE, PsycINFO, Health Management Information Consortium (HMIC),

Table 1 Inclusion and exclusion criteria based on the PICO framework

Concept	Inclusion criteria	Exclusion criteria
Population	Doctors in postgraduate medical training (all grades) Specialist doctors General Practitioners	Other health professionals Undergraduates Studies with no clarification of which health professionals were studied Doctors undertaking LTFT postgraduate degree courses (eg, MSc or PhD) Doctors who only work LTFT in academic and not clinical medicine Doctors accredited in multiple specialties and work LTFT in one of their specialties but work full-time overall
Intervention	LTFT or part-time working Flexible work schedule involving voluntary reduced hours	Externally enforced reduced working hours for example, European Work Time Directive Studies focused on the flexibility to increase working hours Studies which describe reduced work hours but which fall outside of the review's definition of LTFT hours (ie, ≤40 hours per week)
Comparison	Full-time working or no comparison	
Outcomes	Characteristics and factors which influence LTFT working for example, sex, age, parenthood, career stage, etc Patient outcomes, for example, patient safety, patient satisfaction, clinical outcomes, etc Workforce/health services outcomes for example, doctor recruitment, staffing levels of doctor-led healthcare services, attrition from medical career, etc Doctor outcomes, for example, career satisfaction, well-being, burn-out, etc	Outcomes related to gender differences within the medical profession rather than working patterns Outcomes related to externally enforced reduced working hours
Context	Any specialty within medicine Any country Publications up to March 2022	Studies published in languages other than English
Study type	Quantitative Qualitative Mixed methods Grey literature such as theses, dissertations, government papers and reports from relevant organisations	Reviews Conference abstracts unless further data or publications can be obtained from authors Opinion papers, editorials and commentaries without primary data Book chapters or sections

LTFT, less than full time.

Healthcare Administration, Applied Social Sciences Index and Abstracts (ASSIA), Web of Science and Cochrane Library will be searched for published literature, while ProQuest Dissertations & Theses Global and EThos will be searched for unpublished theses and dissertations. Embase, MEDLINE, PsycINFO and HMIC will be searched together via the OVID interface using a search strategy which incorporates subject headings that are common to all the individual databases. Where subject headings do not overlap across the four OVID databases, the extensive list of keywords in the search strategy will enable all the pertinent studies to be captured. No filters will be used, and no limits will be placed on publication date nor on language but, as mentioned in the previous section, only studies published in the English language will eventually be included in the systematic review. Healthcare Administration, ASSIA and ProQuest Dissertations & Theses Global will be searched together via the ProQuest interface using a search strategy which aligns with the ProQuest search parameters and thesaurus terms. In the ProQuest search strategy, no limits will be placed on date or language, but a filter will be applied to the ProQuest Dissertations & Theses Global database to exclude theses from Business, Science & Technology, Literature & Languages, The Arts and History because these subjects are not relevant to the review topic. Web of Science, Cochrane Library and EThos will be searched individually, each with its own search strategy with no limits and no filters. Please see online supplemental material 1 for the search strategies for each of the databases. The rest of the literature search for the review will comprise the following steps:

1. Bibliography searching, and citation searching of included papers for further relevant studies and additional grey literature such as government papers and reports from relevant organisations.
2. Handsearching if any particular journals are identified as key sources of relevant studies through the searches listed above.
3. Contacting authors if important data within included studies are unclear or incomplete.

Screening and study selection

All the studies retrieved from the full literature search will be exported to EndNote V.20 where duplicates will be removed. The remaining papers will be exported to Rayyan where a title and abstract sift, followed by screening of full texts, will be conducted by the first reviewer to identify papers which are relevant to the review questions, and to remove those which are not. A sample of 10% of all the original studies from the full search will be screened by a second reviewer independently, using the eligibility criteria listed in [table 1](#) to ensure agreement. Any disagreement between the two reviewers will be discussed and resolved by consensus, and if necessary, a third reviewer will facilitate this. The resultant included articles will undergo data extraction, quality assessment and data synthesis as described below. A PRISMA flow

diagram for systematic reviews²⁷ will be used to illustrate the study selection process, an example of which is shown in [figure 1](#).

Data extraction

A data extraction form adapted from the Best Evidence Medical Education coding sheet²⁸ has been designed to capture pertinent information from the selected papers including publication details, study design, study objectives, location and setting, methods of data collection and types of outcomes measured (see online supplemental material 2). This will facilitate the assessment of the degree of heterogeneity in the data, and thus, whether a meta-analysis of quantitative studies can be carried out. The data extraction form also incorporates a scoring system as an initial evaluation of the quality of the papers. As discussed below, any numerical appraisal scores for the studies will only be used as a way of informing the reader of the quality of the paper and will not be used to exclude articles. Data extraction from all the included studies will be undertaken by two reviewers independently. Any disagreements will be discussed and resolved by consensus and facilitated by a third reviewer if necessary. All extracted information will be uploaded onto a Microsoft Excel spreadsheet.

Quality assessment

Based on scoping the literature, it is anticipated that this review will yield empirical research papers with different study types (quantitative, qualitative and mixed methods) and outcomes. Grey literature will also be reviewed. To ensure that the methodological quality of the selected studies is rigorously assessed, the Mixed Methods Appraisal Tool (MMAT)²⁹ will be used to appraise empirical studies, and the AACODS (Authority, Accuracy, Coverage, Objectivity, Date, Significance) checklist³⁰ will be used to appraise grey literature. The MMAT is a critical appraisal tool originally developed in 2006 to assess the quality of quantitative, qualitative and mixed-methods studies in reviews.³¹ It was updated in 2018 to make the tool more efficient²⁹ and is an appropriate choice for this review given the likely heterogeneity of the studies that will be included. The AACODS checklist was designed for evaluating grey literature by critically appraising six domains: authority, accuracy, coverage, objectivity, date, and significance.³⁰

The use of summative numerical scores to determine the quality of individual studies is common practice in the appraisal process of reviews^{32–34}; however, the authors of the MMAT version 2018 discourage this because they argue that the specific details which determine the quality of the studies cannot be explicated by a single number. Instead, they advise reviewers to present the ratings of each criterion within the MMAT so that the reader has a better understanding of where the strengths and limitations of the included studies lie. In keeping with this advice, the ratings in both the MMAT and AACODS checklist for the included studies will be displayed in a

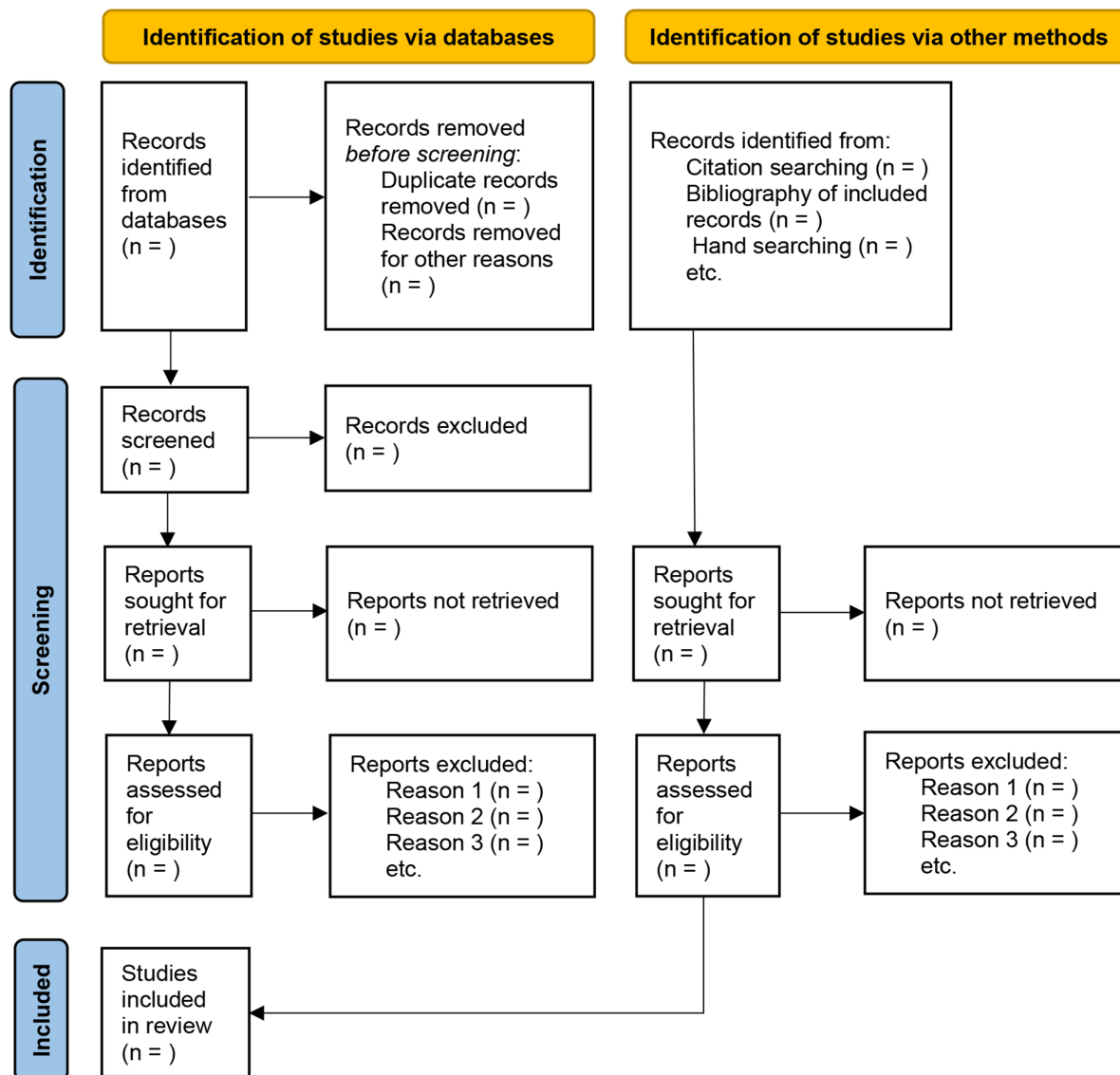


Figure 1 PRISMA flow diagram. PRISMA, Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols.

table to inform the reader's interpretation of the conclusions reached in the review. It is therefore anticipated that relevant studies will not necessarily be excluded solely based on what would conventionally be described as a low-quality score, because this review seeks to present as full a picture as possible of the existing data on LTFT working in medicine. Quality appraisal of all the included studies will be conducted by two reviewers independently, and any disagreements will be discussed and resolved by consensus and facilitated by a third reviewer if necessary. Please see online supplemental materials 3 and 4 for the MMAT and the AACODS checklists, respectively.

Data synthesis

A narrative interpretive approach to data synthesis will be adopted in keeping with the framework proposed by Popay *et al.*³⁵ Narrative synthesis primarily uses words and text to synthesise findings from multiple studies pertinent to a conceptual hypothesis or a review question. It is an

iterative process with four main elements, which are not necessarily completed in a linear fashion:

1. Developing a theory of change by making decisions about the review question and types of studies to be included.
2. Developing a preliminary synthesis of study findings by making initial descriptions of emerging patterns across the studies.
3. Exploring relationships in the data by identifying the factors which influence findings and describing how they influence the findings.
4. Assessing the robustness of the synthesis product by evaluating the strength of evidence from the data prior to drawing any conclusions.

Narrative synthesis can be used in a variety of review types, from those which require the manipulation of statistical data, to those which identify common themes across different sources to produce new insights or theories. It therefore lends itself well to this review which aims



to describe what is known about LTFT working among doctors by integrating findings from qualitative and quantitative sources. The process of developing a theory of change in this review has already commenced through a preliminary scoping search exercise, which facilitated the generation of the review questions and the eligibility criteria for relevant studies. The rest of the synthesis process will be carried out once the full literature search and study selection have identified the most relevant papers for data extraction.

The scoping search yielded quantitative articles in which a variety of variables and outcomes were studied. It is therefore possible that heterogeneity of studies may prohibit the pooling of quantitative data by meta-analysis. If this is the case, a purely narrative synthesis of data will be performed as described above. If, however, the full literature search generates enough appropriate quantitative studies for meta-analysis, this will be carried out using R software. Results from each included study will be summarised in tables showing dichotomous variables presented as risk ratios or ORs, and continuous variables presented as mean differences or standardised mean differences, with 95% CIs. Heterogeneity will be assessed using the χ^2 test where $p < 0.1$ will indicate the presence of heterogeneity. If present, the level of variation will be assessed using the I^2 test. If heterogeneity is high ($I^2 \geq 50\%$) and if feasible, this will be explored using subgroup analysis of covariates such as age, sex, parental status and specialty. In the case of high heterogeneity, a random effects model will be used for the meta-analysis. If there is sufficient data, funnel plots and the Egger test will be used to assess the likelihood of publication bias.

Patient and public involvement

Patients and members of the public were not involved in the development of this review protocol.

DISCUSSION

This is the first systematic review on LTFT working among doctors, and it will increase our understanding of the characteristics of doctors who choose to work LTFT, the factors which influence this choice and the impact on patients, the workforce and doctors themselves. This is important because in the current climate of doctor shortages, there is a need for a strong evidence base for any strategies adopted to increase workplace flexibility to enhance doctors' lives. Furthermore, gaining a better grasp of how working LTFT might influence different outcomes related to doctors could potentially inform decisions around future medical workforce planning so that health service provision and patient care are maintained to the highest standards. The review is also likely to uncover gaps in the literature and highlight areas for future research into the role of LTFT working in promoting the retention and recruitment of doctors.

There are some limitations associated with this study, which will be mitigated where possible. First, only papers

published in the English language will be selected for inclusion. Though this could potentially exclude relevant studies or introduce bias, it is a pragmatic decision based on the language proficiency of the reviewers, and readers will be invited to take this into account when interpreting the findings. Second, the broad scope of information sources could result in heterogeneity of study findings, making data synthesis more challenging. Narrative synthesis has therefore been chosen as the main method for data synthesis because words can be used to effectively summarise the findings from multiple studies, regardless of the study type. Meta-analysis will also be performed if there is sufficient quantitative data with comparable outcome measures.

Twitter Ann Griffin @DrAnnGriffin and Asta Medisaukaite @astamedis

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Contributors MB conceived the idea of the review and designed the protocol. AG, JD and AM substantively contributed to the development of the methodology. MB drafted the manuscript which was subsequently reviewed and approved by all authors.

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ORCID iDs

Magdalen Baker <http://orcid.org/0000-0001-9137-5913>

Asta Medisaukaite <http://orcid.org/0000-0002-0404-775X>

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