

Exploring the relationship between working from home, mental and physical health and wellbeing: a systematic review

Lindsay Blank,^{*} Emma Hock, Anna Cantrell,
Susan Baxter and Elizabeth Goyder

School for Health and Related Research, University of Sheffield, Sheffield, UK

^{*}Corresponding author l.blank@sheffield.ac.uk

Disclosure of interests of authors: The authors have no competing interests to declare.

Published May 2023
DOI: 10.3310/AHFF6175

Scientific summary

Exploring the relationship between working from home, mental and physical health and wellbeing: a systematic review

Public Health Research 2023; Vol. 11: No. 4
DOI: 10.3310/AHFF6175

NIHR Journals Library www.journalslibrary.nihr.ac.uk

Scientific summary

Introduction

Understanding the impact of working from home on health and wellbeing is highly topical and of great interest to employers and employees alike, with a strong need for up-to-date guidance. There is therefore a need to formally and systematically synthesise evidence from both before and during the COVID-19 pandemic to understand the potential impact of current trends in home working and hybrid working and how negative impacts might be mitigated.

Methods

We undertook a systematic review synthesising qualitative, quantitative and observational data. The overall aim of this review was to identify, appraise and synthesise existing research evidence that explores the impact of home working on health and wellbeing outcomes for working people and health inequalities in the population. Database searching was accompanied by the following additional search methods: scrutiny of reference lists of included papers; searches for UK grey literature; citation searching of key included papers. We extracted and tabulated key data from the included papers. Data extraction was performed by one reviewer, and checked for accuracy and consistency by a second reviewer. Quality (risk of bias) assessment was undertaken using appropriate tools for the types of study designs included in the review. The extracted data have been synthesised narratively due to the diverse nature of the evidence.¹ Factors associated with the relationship between home working and health outcomes reported in the literature were displayed by constructing mind maps² of each individual association which had been identified. The findings from our review were combined with an a priori model³ to develop a final model which was validated in consultation with stakeholders.

Inclusion criteria

Population

The population included anyone in the working population who spends all or some of their working time at home. Papers which look at students, and those studying, rather than undertaking paid employment at home, were excluded from this review. Studies which looked at the impact of temporary remote teaching on teachers (where that was not their normal mode of teaching) as a result of COVID-19 lockdown measures were also excluded from the main review (these studies are discussed separately; see *Supplementary Material: Full paper excluded studies*). Studies from Organisation for Economic Co-operation and Development⁴ countries only were included in the review.

Exposure

This included hybrid models of home working where some time is spent working at home and some in the office or other traditional place of work. Other aspects of flexible and remote working which do not relate directly to home working, for example studies about flexible office hours or specifically about working in remote locations away from the home, along with the impact of work accessibility (e.g. the impact of remote access to emails on home life), were considered to be outside the scope of this review.

Context

The extent to which people have been asked to work at home has escalated dramatically in response to the COVID-19 pandemic and much of the recent evidence relates to the specific circumstances of home working during the pandemic. The review and model take steps to take account of this by considering evidence from both before and during the pandemic and also considering the implications for future research and policy directions.

Outcomes

Any factor that has been shown to be associated with the health of people working at home was included. An association is defined as the link between two variables (often an exposure and an outcome) which is not necessarily a causal relationship. This included all measures of physical health (including self-reported outcomes) and mental health (including clinical indicators such as diagnosis and treatment and/or referral for depression and anxiety alongside self-reported measures). All measures associated with wellbeing including but not limited to wellbeing, happiness, mood and stress-related outcomes were included. Work satisfaction, along with all other employment-related outcomes such as job performance and work-life balance, as outside the scope of this review.

Studies

We included quantitative, qualitative, mixed-method and observational studies. Studies with and without a comparator group were included. Books and dissertations were excluded (but references were checked for relevance in specific cases). Case studies were considered on an individual basis in terms of their study design and risk of bias.

Results

In total, 96 pieces of relevant evidence were identified and included. Of 96 studies which were found to meet the inclusion criteria for the review, 30 studies were published before the COVID-19 pandemic (or using data from before the COVID-19 pandemic, without making particular reference to it) and a further 66 were published during the pandemic (and made specific reference to COVID-19 and the pandemic influence on home working). This demonstrates the significant increase in the evidence base throughout 2020–2021 as a result of working from home in the pandemic. Overall, the quality of evidence was limited by the study designs employed by the authors, with the majority of studies being cross-sectional surveys ($n = 59$), mostly conducted online during the COVID-19 pandemic. For the most part, for studies which collected quantitative data, measures were self-reported. A small number of studies used validated scales to measure specific outcomes such as wellbeing, quality of life (QoL), general health, anxiety and depression.

Pre-COVID studies

Prior to the COVID-19 pandemic, the evidence base for the impact of working from home on overall health was limited. We identified only seven studies which considered these factors.⁵⁻¹¹ A more substantial volume of evidence exists which consists of 24 studies considering the effects of working at home on a broad range of wellbeing and mental health-related measures prior to the COVID-19 pandemic.^{6,12-34}

COVID-19 studies

As a result of the COVID-19 pandemic and work-at-home orders given as part of lockdown restrictions in many countries the evidence base on the health impacts of working from home has developed rapidly in the last two years. However, the focus on wellbeing over physical health persists and most studies consisted of cross-sectional survey data with self-reported outcomes. Even as a result of increased working from home due to COVID-19 the volume of literature linking working at home with general health outcomes has not increased substantially. A further five studies linking the outcomes of QoL, higher demands and lifestyle factors (diet and alcohol intake) show an inconsistent picture in terms of their associations with working at home.³⁵⁻³⁹ The COVID-19 pandemic has also resulted in a slight increase in the number of studies reporting factors which influence the associations between working at home and physical health measures.⁴⁰⁻⁴⁶ Notably all the factors reported had a negative impact on the health outcomes (or no association was found).

The largest volume of evidence identified consisted of studies conducted during the COVID-19 pandemic which looked at factors which influence the associations between working from home and measures relating to mental health and wellbeing.^{17,35,42,44,45,47-59} A broad range of measures relating to wellbeing were used by study authors including direct measures of wellbeing and measures of mental

health (including negative affect, anxiety, depression, psychological distress) and stress (including perceived stress, perceived self-efficacy, 'stress, worry and pressure', burnout, 'cognitive worsening' and specific stress including parenting stress and occupational stress). Measures linked to wellbeing included sleep (sleep quality, time sleeping and fatigue), alcohol use and physical activity (PA)/inactivity (opportunity to exercise, sedentariness, standing and movement, lack of sports facilities open). Increased health concerns were also reported, as were factors linked with social interaction (social isolation, loneliness, minimal contact with others and social support). Satisfaction with working from home (including sense of worthwhile life) and QoL measures were also reported. Lack of choice over whether to work from home along with work autonomy and measures linked to videoconferencing (videoconference fatigue and technostress) were also considered in respect to wellbeing. Further measures linked to the home-work environment and wellbeing included feeling in control of time, lack of commute, more time with the family, lower work/family conflict, and spaces shared with others. Openness to new ways of living was also included.

Inequalities and studies which consider sub-populations

A total of 15 studies considered the potential for working at home to have different effects for different subgroups of the population.^{12,27-30,38,42,50,60-67} A combination of studies which recruited specific sections of the population and those which included subgroup analyses within their reported results suggested overall that working at home may have more negative consequences during the COVID-19 pandemic for women and, in particular, mothers. However, it was impossible to tell whether this was primarily as a result of lockdown-related childcare responsibilities and home schooling or related to other aspects of home working during the pandemic. There was very little evidence on age, ethnicity, education or income in terms of moderating home working effects, and very limited evidence from before the COVID-19 pandemic.

The impact of COVID-19 on working from home

A notable omission from the evidence is that the concept of enforced working from home and having 'no choice' was reported in only one paper prior to the pandemic and two papers reporting on working from home as a result of COVID-19 and the associated lockdown measures. However, the concept of lack of choice around working from home was implicit in much of the literature published during COVID-19 – even though it was not directly measured.

Surprisingly, there were no clear patterns of wellbeing measures which changed from positive to negative association (or vice versa) during the pandemic. This is of course determined by what authors chose to measure and report, and the paucity of evidence on wellbeing measures prior to the pandemic, so should in no way be taken to suggest that pandemic home working did not have an effect on wellbeing overall. Numerous factors such as space available at home, the presence of children or housemates, and employee expectations around workload and working hours were relevant to health and wellbeing while working from home. Further it is impossible to separate out the effects of COVID-19 lockdown and uncertainties on wellbeing from the direct impacts of home working during this time on wellbeing, particularly for studies conducted during the early stages of the pandemic. In terms of physical and overall health measures, the significantly smaller number of studies measuring these types of association both before and during the COVID-19 pandemic made it even more challenging for any potential patterns to be identified. However, there is some indication that the association between working at home and PA measures became more negative during the COVID-19 pandemic, with five studies reporting reduced PA (compared with a more mixed picture before the pandemic of two studies reporting positive factors, one negative, and one reporting no effect). This is unsurprising given the lockdown measures in which home working was implemented, during which time sports facilities, leisure centres and gyms were closed.

Conclusions

The evidence base for the factors which influence the associations between home working and health-related outcomes has expanded significantly as a result of the need for those whose work could be done from home to work at home during the COVID-19 pandemic. However, it remains limited in terms of study quality and is focused on mental health and wellbeing-related measures at the expense of measures of physical and overall health. Due to the rapidly expanding nature of the evidence on this topic, it is possible that new studies were published after the final citation searches were conducted (November 2021) and before completion of this synthesis (mid-December 2021). The quality of the evidence base was very much limited by study designs, particularly for studies published during the COVID-19 pandemic, with the majority of studies consisting of data collected by cross-sectional surveys (often online).

The current evidence base is not strong enough to determine whether certain individual factors are most important in the pathway between home working and health outcomes and there is a further lack of evidence to determine which groups within a population might be at greatest risk of negative outcomes. However, the findings of our systematic review and resulting model of factors which influence the associations between working at home and employee health suggest that there are factors relating to the external context, the role of employers and the circumstances of the employee which contribute to determining whether someone works at home and what the associated impacts on health and wellbeing may be. External drivers and current trends, as well as the COVID-19 pandemic, contribute to the contextual factors. The employer response is determined by their capacity and willingness to allow and/or mandate home working and hybrid options. If those choices are offered, then the individual factors relating to the employee, their job and their home environment (including their exposure to health inequalities) determine whether they are enabled to choose to work at home, and ultimately whether their experience is positive or negative in respect to the impact on their health and wellbeing. Learning from the COVID-19 lockdown experience will be important to inform future policy on home working.

Funding

This project was funded by the National Institute for Health and Care Research (NIHR) Public Health Research programme (project reference 18/93 PHR Public Health Review Team) and will be published in full in *Public Health Research*; Vol. 11, No. 4. See the NIHR Journals Library website for further project information.

Study registration

This study is registered as PROSPERO 2021 CRD42021253474.

Public Health Research

ISSN 2050-4381 (Print)

ISSN 2050-439X (Online)

Public Health Research (PHR) was launched in 2013 and is indexed by Europe PMC, NCBI Bookshelf, DOAJ, INAHTA and Ulrichsweb™ (ProQuest LLC, Ann Arbor, MI, USA).

This journal is a member of and subscribes to the principles of the Committee on Publication Ethics (COPE) (www.publicationethics.org/).

Editorial contact: journals.library@nih.ac.uk

The full PHR archive is freely available to view online at www.journalslibrary.nih.ac.uk/phr.

Criteria for inclusion in the *Public Health Research* journal

Reports are published in *Public Health Research* (PHR) if (1) they have resulted from work for the PHR programme, and (2) they are of a sufficiently high scientific quality as assessed by the reviewers and editors.

Reviews in *Public Health Research* are termed 'systematic' when the account of the search appraisal and synthesis methods (to minimise biases and random errors) would, in theory, permit the replication of the review by others.

PHR programme

The Public Health Research (PHR) programme, part of the National Institute for Health and Care Research (NIHR), is the leading UK funder of public health research, evaluating public health interventions, providing new knowledge on the benefits, costs, acceptability and wider impacts of non-NHS interventions intended to improve the health of the public and reduce inequalities in health. The scope of the programme is multi-disciplinary and broad, covering a range of interventions that improve public health.

For more information about the PHR programme please visit the website: <https://www.nihr.ac.uk/explore-nihr/funding-programmes/public-health-research.htm>

This report

The research reported in this issue of the journal was funded by the PHR programme as project number NIHR134931. The contractual start date was in April 2021. The final report began editorial review in February 2022 and was accepted for publication in July 2022. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The PHR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health and Care Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, the PHR programme or the Department of Health and Social Care. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, the PHR programme or the Department of Health and Social Care.

Copyright © 2023 Blank *et al.* This work was produced by Blank *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health and Social Care. This is an Open Access publication distributed under the terms of the Creative Commons Attribution CC BY 4.0 licence, which permits unrestricted use, distribution, reproduction and adaptation in any medium and for any purpose provided that it is properly attributed. See: <https://creativecommons.org/licenses/by/4.0/>. For attribution the title, original author(s), the publication source – NIHR Journals Library, and the DOI of the publication must be cited.

Published by NIHR Journals Library (www.journalslibrary.nih.ac.uk), produced by Newgen Digitalworks Pvt Ltd, Chennai, India (www.newgen.co).

NIHR Journals Library Editor-in-Chief

Dr Cat Chatfield Director of Health Services Research UK

NIHR Journals Library Editors

Professor John Powell Consultant Clinical Adviser, National Institute for Health and Care Excellence (NICE), UK, and Professor of Digital Health Care, Nuffield Department of Primary Care Health Sciences, University of Oxford, UK

Professor Andrée Le May Chair of NIHR Journals Library Editorial Group (HSDR, PGfAR, PHR journals) and Editor-in-Chief of HSDR, PGfAR, PHR journals

Professor Matthias Beck Professor of Management, Cork University Business School, Department of Management and Marketing, University College Cork, Ireland

Dr Tessa Crilly Director, Crystal Blue Consulting Ltd, UK

Dr Eugenia Cronin Consultant in Public Health, Delta Public Health Consulting Ltd, UK

Dr Peter Davidson Interim Chair of HTA and EME Editorial Board. Consultant Advisor, School of Healthcare Enterprise and Innovation, University of Southampton, UK

Ms Tara Lamont Senior Adviser, School of Healthcare Enterprise and Innovation, University of Southampton, UK

Dr Catriona McDaid Reader in Trials, Department of Health Sciences, University of York, UK

Professor William McGuire Professor of Child Health, Hull York Medical School, University of York, UK

Professor Geoffrey Meads Emeritus Professor of Wellbeing Research, University of Winchester, UK

Professor James Raftery Professor of Health Technology Assessment, School of Healthcare Enterprise and Innovation, University of Southampton, UK

Dr Rob Riemsma Consultant Advisor, School of Healthcare Enterprise and Innovation, University of Southampton, UK

Professor Helen Roberts Professor of Child Health Research, Child and Adolescent Mental Health, Palliative Care and Paediatrics Unit, Population Policy and Practice Programme, UCL Great Ormond Street Institute of Child Health, London, UK

Professor Jonathan Ross Professor of Sexual Health and HIV, University Hospital Birmingham, UK

Professor Helen Snooks Professor of Health Services Research, Institute of Life Science, College of Medicine, Swansea University, UK

Professor Ken Stein Professor of Public Health, University of Exeter Medical School, UK

Professor Jim Thornton Professor of Obstetrics and Gynaecology, Faculty of Medicine and Health Sciences, University of Nottingham, UK

Please visit the website for a list of editors: www.journalslibrary.nihr.ac.uk/about/editors

Editorial contact: journals.library@nihr.ac.uk