



BUSINESS

Working in the Digital Economy:

**A Scoping Review of the
Impact of Work from
Home Arrangements on
Personal and Organizational
Performance and
Productivity**

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Executive Summary

Background

Work-from-home (WFH) has become an increasingly adopted practice across the globe. Given the emergence of the COVID-19 pandemic, WFH arrangements have risen substantially in an extremely short amount of time. WFH has been associated with several physical and mental health outcomes, however these health and safety issues often receive little resources and attention from a business and managerial perspective compared to organizational and worker performance and productivity. Therefore, aligning WFH practices and strategies with business goals of organizations may help catalyze awareness from decision makers and serve to effectively implement WFH policies.

Objective

We conducted a scoping review to synthesize current knowledge on the impact of WFH arrangements on personal and organizational performance and productivity.

Methodology

Through a two-step screening process, we selected and extracted data from 37 relevant articles from a search of four databases that yielded 3,402 articles. Key search terms included terminology surrounding two core concepts: WFH and productivity and performance.

Results

The findings from this scoping review suggest that WFH can have positive impacts on personal and organizational productivity and performance, however these positive impacts are likely related to non-mandatory arrangements. When WFH becomes mandatory and full-time in nature, or external factors (such as the COVID-19 pandemic) are at play, the overall impacts are less positive and can be detrimental. Further, evaluation of the effectiveness of a WFH arrangement vary greatly in terms of the measurement tools used and the types of questions asked. The lack of consistency will make it difficult for organizations to infer conclusive results as to the impacts of WFH and highlights the need for organizational policies to define what productivity and performance means to them, and what measurements are best suited to reflect these impacts.

Key Messages:

The results of this scoping review will help foster a broader understanding of the impact of WFH arrangements on personal and organizational productivity and performance, help inform the development of recommendations of organizational strategies to prepare employers to create an effective, resilient, and inclusive WFH workplace, and serve as a means to effectively implement WFH policies when aligned with business goals of the organization.



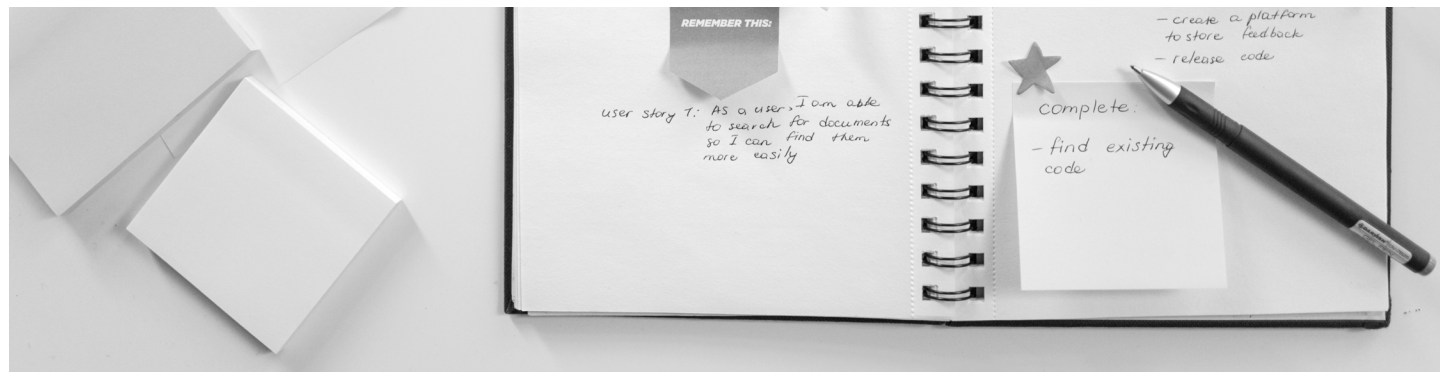
1.0 Introduction

1.1 Flexible work arrangements

Since the introduction of the term “telework” in the 1970s¹, the use of flexible working arrangements by organizations has grown in popularity due to improvements in technology^{2,3}, in support of greater work-life balance⁴, and as a means of staying competitive at attracting new generations of workers. Of these flexible work arrangements, work-from-home (WFH), remote work and telework (terms often used interchangeably) have become an increasingly adopted practice across the globe. Since its adoption, researchers have taken a particular interest in understanding the relationship between WFH arrangements and personal and organizational performance, albeit demonstrating mixed results. On one hand, evidence indicates that WFH can have positive impacts including the need for fewer breaks and sick days, greater focus with less distractions⁵, increased job autonomy, greater job satisfaction and flexibility to work around life commitments⁶. From an organizational perspective, these factors can have promising results on productivity, employee turnover and cost savings⁵⁻⁷.

Conversely, some studies have also identified challenges associated with WFH, including blurred lines between work life and home life⁸, loss of identity and an inability to unplug⁸⁻¹¹. When most employees are work from home, organizations may have difficulty building a supportive culture, resulting in reduced motivation and lower job satisfaction¹². Additionally, WFH can be complicated by reduced access to resources and opportunities for social interaction^{6,13,14}. Such negative impacts have been associated with adverse individual outcomes such as anxiety, problems with task completion and irritability¹⁵, as well as decreased productivity, reduced motivation, increased stress¹⁶⁻¹⁹. From an organizational perspective, productivity may be reduced due to limited access to resources, reduced opportunities for social interaction^{6,13,14}, and reductions in cost savings, employee morale, absenteeism, and other firm-level metrics²⁰⁻²².

Despite the rise in WFH arrangements, the scientific literature reveals mixed evidence on its effectiveness, and it is clear the relationship between WFH and personal and organizational productivity and performance is complex. Recent work has highlighted the need for formalized organizational policies to protect employees and ensure positive and productive experiences for both the worker and the organization, whilst acknowledging the need for future research²³. To the best of our knowledge, no study has been undertaken which comprehensively reviews the literature on the impacts of WFH arrangements on personal and organizational performance and productivity. Therefore, the purpose of this scoping review was to synthesize current knowledge on the impacts of WFH for both personal and organizational and productivity and performance.



1.2 WFH and the COVID-19 pandemic

This scoping review is extremely timely given the declaration of COVID-19 as a global pandemic on March 11, 2020 by the World Health Organization (WHO), causing millions of people and organizations around the world to have a sudden and radical change in the way they work. In Canada for example, we have observed a drastic jump from 4% of the working population working from home in 2016 to an estimated 32% as of 2021²⁴. Similar trends have been observed around the globe. In the United States, it is suggested that nearly half of the workforce had a WFH arrangement during COVID-19, a jump from 17% prior to the pandemic^{25,26}. Europe saw nearly 40% of its workers in a WFH arrangement as compared to 10% previously²⁷, and Australia reports a jump from under 20% to nearly 50%²⁸.

Unfortunately, many organizations may not have been prepared for the sudden and drastic shift in the way their workforce functioned, with insufficient or non-existent policies and recommendations in place to support the transition to WFH. Traditionally, many of the organizational policies that support employees in WFH arrangements are considered safety matters and are often regulated to organizational health and safety with restricted influence and resources^{29,30}. As a result, policies and recommendations that would protect the WFH employee can be overlooked or difficult to implement and apply³¹. Aligning policies with organizational goals are effective strategies to position health and safety issues, such as those surrounding WFH employees, at the attention of decision-makers within an organization^{32,33}. Such strategies could include organizational and individual worker performance and productivity, which are powerful agendas that receive more resources and attention than is traditionally provided for health and safety issues^{29,32,33}.

Prior to the COVID-19 pandemic, many WFH arrangements were voluntary in nature and available on a part time basis (i.e., workers were able to WFH for a subset of their working hours per week), which allowed individuals to choose solutions that worked best for their needs. Literature on the impacts of WFH on productivity and performance often reflect the effects associated with these voluntary arrangements. Given the sudden

necessity of organizations and their employees to shift to involuntary and full-time remote work, in an effort to reduce the spread of COVID-19, there exists an urgent need to understand the complex relationship between WFH arrangements and personal and organizational productivity and performance.

A recent rapid review investigated the impact of WFH arrangements on workers’ mental and physical health, with a view to informing optimization of the working environment at home²³. This extensive review identified several negative health outcomes influenced by the degree of organizational and peer/colleague support, social connectedness, and levels of work-family conflict. A gender-focused analysis also revealed that women were less likely to experience improved health outcomes from WFH arrangements²³. The findings supported the need for formalized organizational policies but noted many gaps in the available literature, in particular the influence of mandatory WFH arrangements on employees’ health and well being. By undertaking the current scoping review, we have helped establish an understanding about the relationship between WFH and personal and organizational productivity and performance through the context of both WFH arrangements prior to, and during the COVID-19 pandemic. This work will ensure workers and their organizations are equipped with the knowledge, resources, and recommendations to maintain a productive and healthy workforce.



2.0 Methods and Analysis

We conducted a scoping review to examine the extent, range, and nature of research activity in the current literature. Scoping reviews are performed with the goal of summarizing a range of evidence to convey the breadth and depth of a field³⁴. Although these reviews do not evaluate the effectiveness and quality of the research, they are useful in identifying gaps in existing literature and disseminating research findings³⁵. In our scoping review, we sought to summarize the current literature on the impacts that WFH arrangements have on personal and organizational performance and productivity, and to identify the existing gap in the research area.

2.1 Identifying relevant studies

Our systematic search included four large databases: Scopus, PubMed, PsychInfo, and Business Source Complete. We identified two core concepts that encompassed the key aspects of our research question, those relating to work from home (e.g., "telecommute") and work-related outcomes (e.g., "performance", "productivity"). We worked with a librarian to generate a list of relevant search terms for each concept (Table 1). The Boolean operator "OR" was used between search terms within each concept, and the Boolean operator "AND" was used across concepts.

To be included in the review, studies were required to focus on adult employees working from home in some capacity, and to evaluate the work arrangement on personal or organizational productivity or performance. To ensure we captured the overarching question, we did not limit the search to a particular industry, sector, or region. However, articles were required to be written in English, published between January 2010 and February 2021, and published in peer-reviewed journals. January 2010 was chosen to coincide with the US Telework Enhancement Act of 2010. Signing of the act was thought to have encouraged strategic intervention for supporting organizational effectiveness, and as such, scientific evaluation of this effectiveness followed.

Table 1. Search terms

Work from home terms	work from home, work at home, telecommute, virtual work, remote work, distributed work, telework
Personal or organizational productivity/performance terms	work performance, job satisfaction, efficiency, productivity, job satisfaction, work satisfaction, organizational objectives, presenteeism, absenteeism, innovation, cost saving, turnover, work life balance, sales, quality, competitive, task completion, collaboration, work culture, employee morale, customer relations, customer satisfaction
Exclusions	homework, schoolwork, teleoperation, telemental, telemetry, telemedicine, homecare, residential facilities, domestic work, residential care, aged care, elder care, childcare
Limitations	Must be written in English language, published 2010 and later, and in peer reviewed journals

2.2 Select relevant studies

Much like the methodological approach described by Yung and colleagues³⁶, our scoping review involved a two-step screening process: (1) title and abstract screening, and (2) full text review and data extraction. All titles and articles that were identified from our search strategy were retrieved and uploaded into Rayyan QCRI, a web and mobile app that compiles and organizes articles for systematic reviews³⁷. Duplicate articles were removed from further screening using the program. For the first screening step, a screening tool of inclusion/exclusion criteria was developed. We excluded articles with a primary focus of work-life balance, job satisfaction, or organizational commitment without context to productivity or performance. We also excluded articles where the WFH population were full time students and not organizational employees. Two reviewers independently screened the first 5% of the titles and abstracts to confirm inter-rater agreement. Any discrepancies in decisions were discussed until consensus was reached. After discussion, no difference of opinions remained. Each reviewer then independently screened the titles and abstracts of the remaining articles.

The remaining articles were subjected to our second screen, full text review and data extraction. Using a standardized form in Microsoft Excel, both general information (e.g., author, journal, publication year, type of study) and detailed information (e.g., objective, sample size, measures, and outcomes) were gathered.

We broadly categorized articles as:

- 1) organizationally focused,
- 2) personally focused or,
- 3) both, determined by evaluating the objective of the study, the variables measured and the application of the findings

Table 1 outlines the screening extraction process for these full-text reviews. The first five articles were screened by three reviewers to ensure accuracy of data extraction. Discrepancies were discussed until consensus was reached. The reviewers then independently extracted data from the remaining articles.

2.3 Measures and their outcomes

After our second screening process was complete, we returned to the data for a further screening step surrounding the type of measures used in the articles. As part of the initial search, to ensure we were as inclusive as possible in addressing the productivity and performance measures, we had extracted data from articles that measured variables associated with productivity and performance in addition to these specific term). This list of measures included variables that both directly related to productivity and performance (i.e., turnover, cost savings), and indirectly related the measures (i.e., job satisfaction, organizational commitment). This allowed us to further screen the articles to ensure that articles that did not contain any of the direct measures, including productivity and performance were excluded. In Table 2 below, we outline the specific details that were extracted from each article.



Table 2. Details of the second screen extraction process from full-text reviews

Extraction Type	Category	Definitions
Study information		Title, authors, publication year, journal, type of study, country/region of interest, sample size, COVID-19 specific research, industry of focus, full vs part time WFH
Target measures	Personal	Articles involving measures of productivity or performance focused on the employee's job, role, task, or responsibility.
	Organizational	Articles that included measures of productivity or performance focused on the overall output or quality of goods and services impacting the organization. Can be used to access an organization's progress and efficacy in obtaining organizational goals.
	Both	Articles that included measures of productivity and performance focused on both the impact at the personal/individual level and at the organizational level.
Outcomes	Performance	Assesses whether a person or organization performs a job, role, task, or responsibility. Can be measured at the individual or organizational level.
	Productivity	The efficiency of production of goods or services expressed by some measure. Can be measured at the individual or organizational level.
Associated direct outcomes	Turnover	The rate at which employees leave a workplace and are replaced.
	Cost savings	A set of actions or policies that reduce the historical or expected cost of a given transaction.
	Work intensification	Refers to the increasing amount of effort an employee must invest during the workday that results from increased economic pressure and societal changes. Includes the need to work longer days or on weekends.
	Distractions	Involve the process of diverting someone's attention away from his/her desired area of focus.
	Absenteeism/sick days	Employee absence from work for lengths beyond what is considered an acceptable time span (absenteeism); paid time off from work that workers can use to stay home to address health needs (sick days).
Associated indirect outcomes	Job satisfaction	Job or employee satisfaction is a measure of worker's contentedness with their job, whether they like the job or individual aspects or facets of jobs such as the nature of work or supervision. Can be measured in cognitive, affective, or behavioural components.
	Work-life balance	The equilibrium between personal life and career work. How people manage time spent at and outside of work. Time outside of work may include managing relationships, family responsibilities, and interests/hobbies.
	Work engagement	The harnessing of organization member's selves to their work roles: in engagement, people employ and express themselves physically, cognitively, emotionally, and mentally during role performances. Includes cognitive, emotional, and physical engagement.
	Organizational commitment	An organization's member's psychology towards his/her attachment to the organization that he/she is working for. Plays a pivotal role in determining whether an employee will stay with the organization and work passionately

		towards achieving the organization's goal. Includes affective commitment, continuance commitment and normative commitment.
	Stress	A state of mental or emotional strain or tension resulting from adverse or very demanding circumstances.
	Motivation	A set of internal and/or environmental/contextual forces that originate within individuals, and in their environment, to initiate work-related behaviours and determine their form, direction, intensity, and duration.
	Morale	Overall satisfaction, outlook, and feelings of well-being that an employee holds in the work environment.



3.0 Results

3.1 Overall results

We retrieved a total of 3,402 citations and removed 949 duplicates, which left 2,453 citations for title and abstract screening. Of the 206 studies retained for full text screening and data extraction, 37 were included (Figure 1).

For inclusion in this scoping review, all articles were required to have specifically measured either productivity or performance, at either the personal or organizational level (or both). As previously described, several additional measures were identified as relevant to establishing an understanding of the effects of WFH on productivity and performance. Table 3 provides a summary of the number of articles examining specific measures. In total, productivity measures were examined in 27 of the 37 articles^{5, 38-63} and performance was measured in 16 of the 37 articles^{5, 44, 58, 60, 62-73}. Direct measures included: turnover [n=1]⁵, cost savings [n=4]^{5, 40, 61, 64}, work intensification [n=8]^{40, 41, 45, 52, 55, 56, 70, 71}, distractions [n=6]^{40, 42, 49, 61, 63, 64}, and absenteeism/sick days [n=3]^{40, 61, 71}. We also captured the indirect productivity and performance measures examined in the studies. These included job satisfaction [n=17]^{38, 40, 42, 44, 45, 48, 52, 58-62, 64, 70-73}, work-life balance [n=13]^{39, 40, 46, 49, 52, 56, 57, 61, 63, 66, 69-71}, work engagement [n=1]⁶⁶, organizational commitment [n=7]^{38, 40, 55, 57, 64, 69, 70}, stress [n=6]^{39, 46, 52, 59, 61, 66}, motivation [n=4]^{44, 49, 62, 64}, and employee morale [n=2]^{40, 61}.

The articles that were retained varied by the type of questions used for each measure. Twenty studies^{38-42, 44-46, 48, 54, 55, 58-61, 66, 70-73} relied on self-reported or perceived outcomes of specific measures such as perceived performance while in a WFH arrangement, or self-reported improvements in productivity. Several studies asked participants to rate their level of agreement with specific statements for measures such as job satisfaction or work-life balance. Less commonly, articles included quantifiable evaluations of specific measures, such as the number of tasks completed in a certain length of time or the total cost savings per employee. Examples of the types of questions included for each measure are described in Table 3.

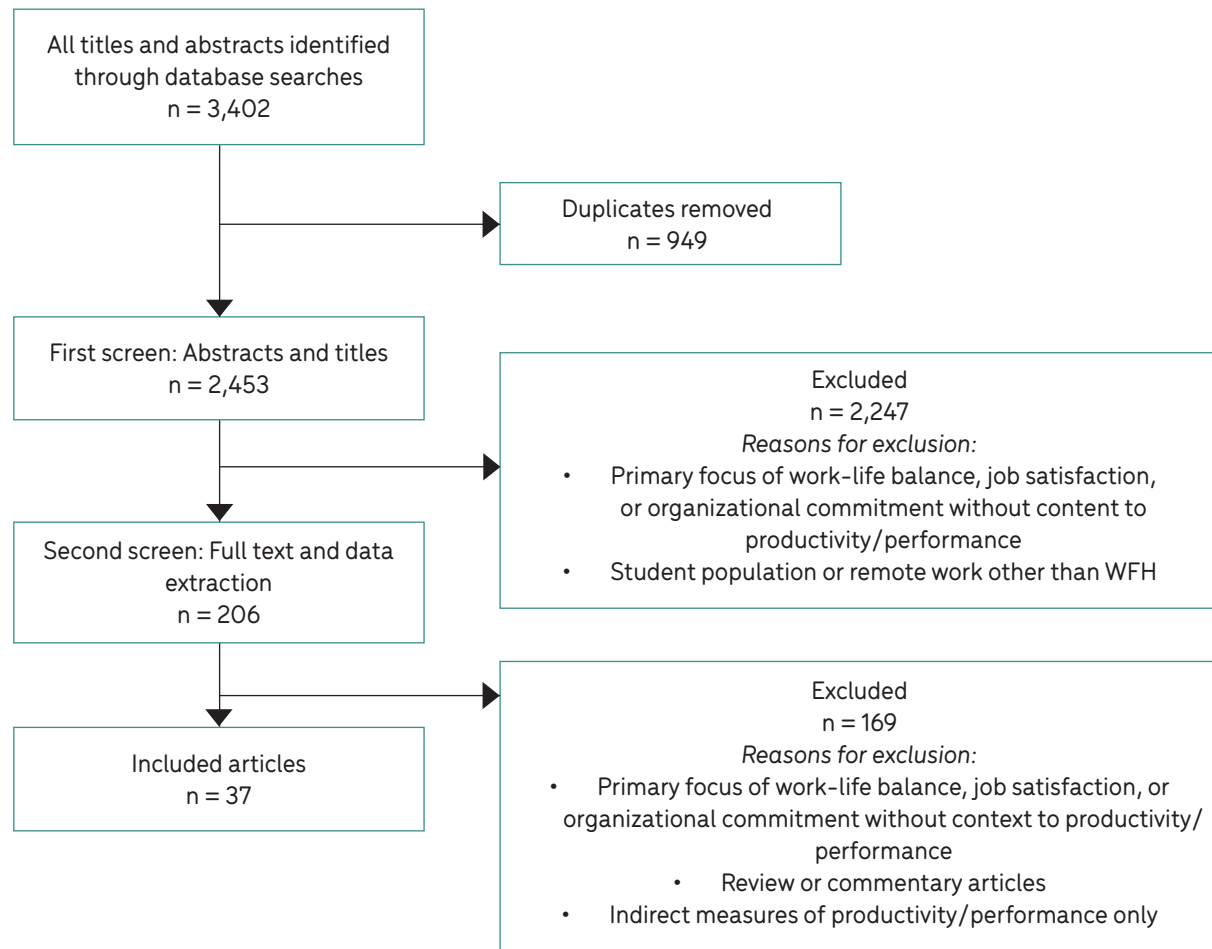


Figure 1. Search process of identifying, screening, and extracting data from obtained articles.



Table 3. Number of articles examining each type of measure, and examples of the types of questions involved in the studies.

Measure	Number of Articles	Type of Questions
Performance	16	Self-reported: overall performance during daily performance (i.e., task or in-role performance) Self-reported: overall job performance or extra role performance Self-reported: perceived quality of work Evaluation: supervisor performance rating of employees Quantitative: number of tasks completed Open-ended interview questions
Productivity	27	Self-reported: overall productivity on tasks Self-reported: comparative productivity pre and post Quantitative: number of tasks completed Quantitative: ratio (annual income/working hours per week) Open-ended interview questions
Turnover	1	Quantitative: rate at which employees leave a workplace
Cost Savings	4	Self-reported: perceived changes in monthly expenses or travel costs Quantitative: value attributed per employee based on performance measures and turnover rate
Work intensification	7	Self-reported: perceived increase in working hours Self-reported: perceived changes in work demand Quantitative: number of hours worked during week, evenings, or weekends Open-ended interview questions
Distractions	6	Self-reported: changes in the number of distractions during working hours
Absenteeism/sick days	3	Self-reported: changes in the number of sick days taken
Job satisfaction	17	Self-reported: overall satisfaction with work Self-reported: willingness to recommend WFH arrangement or job to others Self-reported: comparative job satisfaction pre and post
Work-life balance	13	Self-reported: perceived changes in overall work-life balance or and conflicts between work and home Self-reported: rating prevalence of time-based and strain-based conflicts Semi-structured and open-ended interview questions
Work engagement	1	Self-reported: overall engagement and excitement about work
Organizational commitment	7	Self-reported: affective or normative commitment/loyalty to company Self-reported: turnover intention Open-ended interview questions
Stress	6	Self-reported: general, daily, or work-related levels of stress
Motivation	4	Self-reported: overall motivation towards completing work tasks Open-ended interview questions
Morale	2	Self-reported: overall employee morale

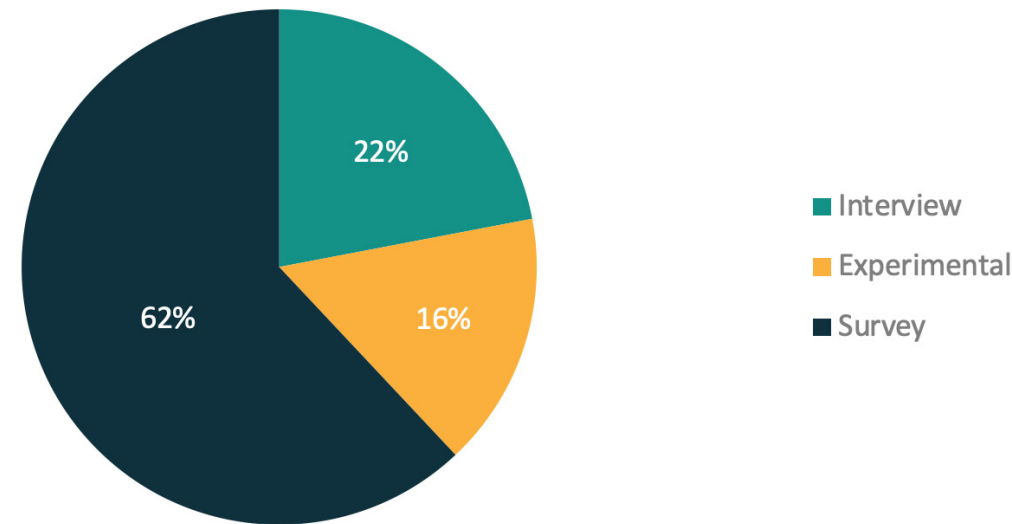
The retained articles are summarized by study characteristics in Table 4. Many of the articles used a survey-based design (62%)^{38-43,45,46,48,52,54-56,58,59,61,64,67-69,72,73}, followed by interviews (22%)^{44,49,51,53,57,62,63,65}, and experimental designs (16%)^{5,47,50,66,70,71} (Figure 2a). Although a variety of countries were investigated, the United States of America [n=10]^{45,47,48,58,60,67-69,72,73} was disproportionately represented compared to all other countries, which included one to four articles each. Articles also covered a range of industries, with many articles including participants from more than one industry [n=16]^{38,41,42,44,46,48,49,52,53,55,56,58-60,63,67}.

Specific industries of interest included academia, telecommunications, skilled trades, service, government, finance, insurance, IT/software, life sciences, defence, call centers, tax, and accounting. Sample sizes varied based on the study design: survey-based articles ranged from 57 to 9,200 participants, interview-based studies ranged from 7 to 1,134 participants, and experimental studies included 78 to 2,912 subjects. Twenty-five articles provided a gender/sex split of their sample size^{38,40,41,43,44,47-49,52,54,55-60,62-64,67,69-73}, with the percentage of female participants ranging from 18%-100% of the sample (average 51.9%). Twelve articles either did not provide a gender/sex breakdown or it was not applicable because the experiment did not include individual participants^{5,39,42,45,46,51,53,61,65,66,68}.

We also categorized the articles based on whether the research was conducted during the COVID-19 pandemic. Articles were categorized as either COVID-19 specific (examined during the COVID-19 pandemic) or “pre-pandemic” articles (i.e., examined prior to March 11, 2020). This categorization separated articles where WFH was a mandatory, full-time arrangement as required by government lockdowns and where unique factors associated with the ongoing COVID-19 pandemic may influence the results. In total, 65% of the articles were conducted during “pre-pandemic” times [n=24]^{5,38,40,44,47,49,51-53,57,58,60-62,64-73}, and 35% were conducted during the COVID-19 pandemic [n=13]^{39,41-43,45,46,48,50,54-56,59,63}.

Table 4 also lists the specific productivity and performance measures examined in each article. Overall, 62% [n=23]^{39-43,45-50,54,56,57,59,60,63,64,67,68,71-73} of the articles focused on personal target measures: productivity outcomes [n=15]^{39-43,45-50,54,56,57,59}, performance outcomes [n=6]^{64,67,68,71-73}, or both outcomes [n=2]^{60,63}. Meanwhile, only 14% [n=5]^{5,51,53,61,65} articles were concerned with organizational target measures: productivity [n=3]^{51,53,61}, performance [n=1]⁶⁵, both outcomes [n=15]; and 24% [n=9]^{38,44,52,55,58,62,66,69,70} focused on both personal and organizational target measures: productivity [n=3]^{38,52,55}, performance [n=3]^{66,69,70}, and both [n=3]^{44,58,62}. These results are displayed Figure 2b.

2a)



2b)

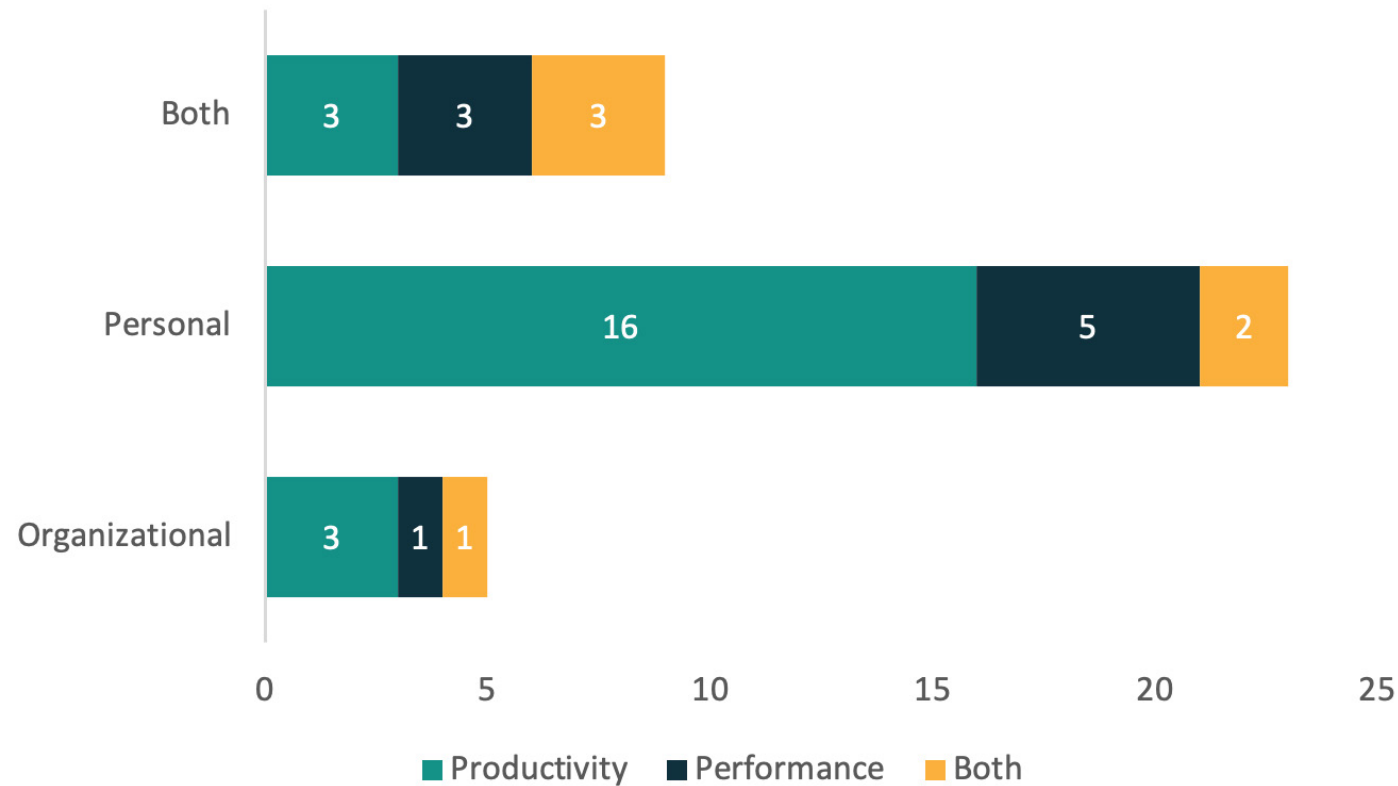


Figure 2a. Percentage of articles with study designs that were survey, interview or experimental, and b) the number of articles by target measures (productivity, performance, or both), as they relate to either outcome measures (personal, organizational or both).

Table 4. Summary of articles by study characteristics (WLB = work-life balance).

Study Design	Authors, Year	Sample Size (% female)	COVID -19?	Country of Interest	Industry	Measures
Survey	⁶⁴ Aboalmaal i, Abedi & Ketabi, 2014	316 (53%)	N	Iran	Government	Performance, cost saving, distractions, job satisfaction, organizational commitment, motivation
	³⁸ Aboelmag ed & Subbaugh, 2012	199 (32%)	N	Egypt	Variety	Productivity, job satisfaction, organizational commitment
	³⁹ Atiku, Jeremiah & Boateng, 2020	473 (unknown)	Y	Africa	Service	Productivity, WLB, stress
	⁴⁰ Baard & Thomas, 2010	63 (46%)	N	South Africa	Telecommunications Finance	Productivity, cost saving, work intensification, distractions, absenteeism/sick days, job satisfaction, WLB, organizational commitment, morale
	⁴¹ Bolisani, Scarso, Ipsen, Kirchner, Hansen, 2020	1,000 (40%)	Y	Italy	Variety	Productivity, work intensification
	⁴² Bucurean, 2020	57 (unknown)	Y	Romania	Variety	Productivity, distractions, job satisfaction
	⁴³ Chapman & Thamrin, 2020	163 (72%)	Y	Australia	Academia	Productivity
	⁴⁵ Dixit, Chinnam, & Singh, 2020	300 (unknown)	Y	USA	Defense	Productivity, work intensification, job satisfaction
	⁴⁶ Drumea, Cristina, 2020	N/A	Y	Unknown	Variety	Productivity, WLB, stress
	⁴⁸ Feng & Savani, 2020	286 (49%)	Y	USA	Variety	Productivity, job satisfaction
	⁶⁷ Gajendran , Harrison, & Delaney-	323 (53%)	N	USA	Variety	Performance

	Klinger, 2014					
	⁶⁸ Golden, & Gajendran, 2019	273 (unknown)	N	USA	Unknown	Performance
	⁶⁹ Greer, & Payne, 2014	342 (48%)	N	USA	Accounting	Performance, WLB, organizational commitment
	⁵² Kazekami, 2019	9,200 (31%)	N	Japan	Variety	Productivity, work intensification, job satisfaction, WLB, stress
	⁵⁴ Ralph et al., 2020	225 (18%)	Y	Global	IT/Software	Productivity
	⁵⁵ Tanpipat, Wen Lim & Deng, 2021	414 (59%)	Y	Thailand	Variety	Productivity, work intensification, organizational commitment
	⁵⁶ Tavares, Santos, Diogo & Ratten, 2020	359 (59%)	Y	Portugal	Variety	Productivity, work intensification, WLB
	⁵⁸ Torten, Reaiche, & Caraballo, 2016	400 (49%)	N	USA	Variety	Productivity, performance, job satisfaction
	⁵⁹ Toscano, & Zappala, 2020	265 (63%)	Y	Italy	Variety	Productivity, work-life balance, stress
	⁶⁰ Turetken, Jain, Quesenberry, & Ngwenyama, 2011	89 (51%)	N	USA, Canada	Variety	Productivity, performance, job satisfaction
	⁶¹ Tustin, 2014	310 (unknown)	N	South Africa	Academia	Productivity, cost saving, distractions, absenteeism/sick days, job satisfaction, WLB, stress, morale
	⁷² Vega, Anderson, & Kaplan, 2015	180 (59%)	N	USA	Government	Performance, job satisfaction
	⁷³ Virick, DaSilva & Arrington, 2010	88 (25%)	N	USA	Telecommunications	Performance, job satisfaction
Interview	⁶⁵ Coenen & Kok, 2014	7 (unknown)	N	Unknown	Telecommunications	Performance
	⁴⁴ Davidescu, Apostu,	220 (45%)	N	Romania	Variety	Productivity, performance, job

	Paul, & Casuneanu, 2020					satisfaction, motivation
	⁴⁹ Grant, Wallace, & Spurgeon, 2013	11 (64%)	N	United Kingdom	Variety	Productivity, distractions, WLB, motivation
	⁵¹ Karia & Asaari, 2016	N/A	N	Malaysia	Skilled Trades or Construction	Productivity
	⁵³ Neirotti, Paolucci, & Raguseo, 2012	1,134 (unknown)	N	Italy	Variety	Productivity
	⁵⁷ Tietze & Nadin, 2011	7 (100%)	N	Unknown	Tax	Productivity, organizational commitment
	⁶² Viorel, Ionut, & Andreea-Oana, 2018	220 (45%)	N	Romania	Academia Service	Productivity, performance, job satisfaction, motivation
	⁶³ Wang, Liu, Qian & Parker, 2020	661 (52%)	Y	China	Variety	Productivity, performance
Experimental	⁵ Bloom, Liang, Roberts & Ying, 2013	249 (unknown)	N	China	Call center	Productivity, performance, turnover, cost saving
	⁶⁶ Delanoetje & Verbruggen, 2020	78 (unknown)	N	Belgium	Skilled Trades or Construction	Performance, WLB, work engagement, stress
	⁴⁷ Dutcher, 2012	125 (48%)	N	USA	Academia	Productivity
	⁵⁰ Hardy, Marcolino, & Fontanari, 2021	100 (unknown)	Y	unknown	Unknown	Productivity
	⁷⁰ Nijp, Beckers, van de Voorde, Geurts, & Kompier, 2016	2,912 (36%)	N	Netherlands	Finance Insurance	Performance, work intensification, job satisfaction, WLB, organizational commitment
	⁷¹ Sherman, 2018	187 (100%)	N	United Kingdom	Life Sciences	Performance, work intensification, absenteeism, job satisfaction, WLB

3.2 Results from pre-pandemic specific articles

We summarized results based on the effect of WFH arrangements. Table 5 displays these outcomes for “pre-pandemic articles”. In general, these articles found a positive effect of WFH on productivity and performance. Of the pre-pandemic specific articles, 79% [n=19]^{5,38,40,44,49,51,53,57,61,62,64-69,71-73}, reported that WFH increased or improved personal or organizational productivity and performance, whereas 21% [n=5]^{47,52,58,60,70} demonstrated both an increase and decrease or no effect (Figure 3). No “pre-pandemic” articles reported negative impacts on productivity or performance. Several associated measures were positively affected in all studies examining them: reduced turnover rates [n=1]⁵ and stress [n=4]^{40,52,61,66}, increased cost savings [n=4]^{5,40,61,64}, work engagement [n=1]⁶⁶ and morale [n=2]^{40,61}. Further, the majority also demonstrated positive impacts on the following: increased job satisfaction [n=10]^{5,38,40,44,60-62,64,72,73}, better work-life balance [n=7]^{40,49,52,57,61,66,69}, reduced absenteeism [n=3]^{40,61,71}, greater organizational commitment [n=4]^{38,40,64,69}, and increased motivation [n=3]^{44,64,62}. Interestingly, despite improvements in productivity and performance, articles demonstrated mixed results as to whether WFH increased or decreased the number of distractions [n=4]^{40,49,61,64}, and there was a split with work intensification [n=2]^{40,71}.

Of the five articles reporting both or no effects of WFH on productivity and performance, work intensification increased [n=2]^{52,70}, stress decreased [n=1]⁵², and organizational commitment was not affected [n=1]⁷⁰. Mixed results were identified for job satisfaction [n=4]^{58,60,70,71}, and work-life balance [n=2]^{70,71}.

A description of the specific main outcomes for each study can be found in Table 6.

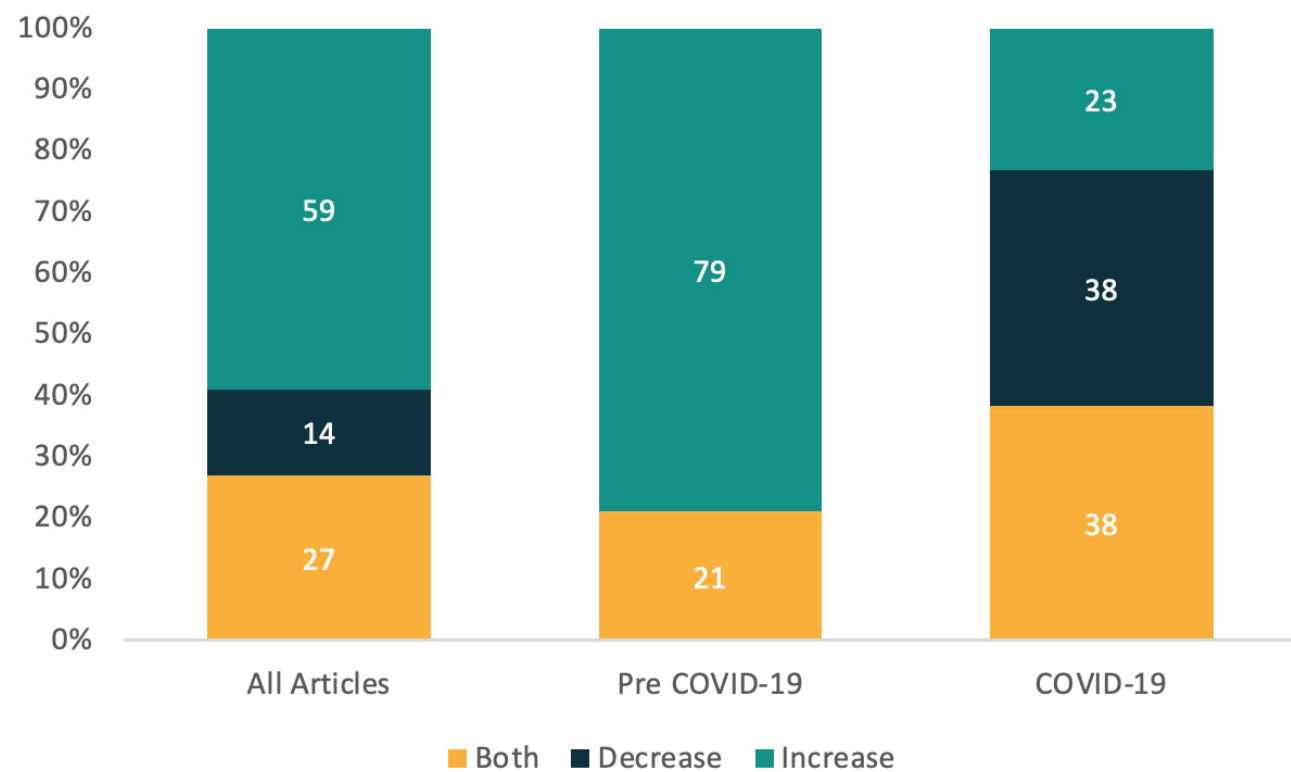


Figure 3. Percentage of articles by effect on performance/productivity.

Table 5. Outcomes of “pre-pandemic” articles (↑ increased, ↓ decreased, * moderating effect, ↕ both increase/decrease, ∅ no effect). Note that for articles reflecting group effects (indicated in the author column), outcome symbols represent all effects observed. N=24.

Author	Year	Productivity	Performance	Turnover	Cost Saving	Work Intensification	Distractions / Focus	Absenteeism	Job Satisfaction	Work-Life Balance	Engagement	Organizational Commitment	Stress	Motivation	Morale
⁴⁰ Baard & Thomas	2010	↑			↑	↑	↑	↓	↑	↑		↑	↓		↑
⁷³ Virick, DaSiliva & Arrington	2010		↑						↑						
⁵⁷ Tietze & Nadin	2011	↑								↑		↓			
⁶⁰ Turetken, Jain, Quesenberry & Ngwenyama (task interdependence & tenure effect)	2011	↕	↕						↑						
³⁸ Aboelmaged & Subbaugh	2012	↑							*			*			
⁵³ Neirotti, Paolucci, & Raguseo	2012	↑													
⁴⁷ Dutcher	2012	↕													
⁵ Bloom, Liang, Roberts & Ying	2013	↑	↑	↓	↑				↑						
⁴⁹ Grant, Wallace, & Spurgeon	2013	↑					↓		↑					↕	
⁶⁴ Aboalmaali, Abedi & Ketabi	2014		↑		*		*		*			*		*	
⁶⁵ Coenen & Kok	2014		↑												
⁶⁷ Gajendran, Harrison, & Delaney-Klinger	2014		↑												
⁶⁹ Greer, & Payne	2014		↑							↑		↑			
⁶¹ Tustin	2014	↑			↑		↓	↓	↑	↑			↓		↑
⁷² Vega, Anderson, & Kaplan	2015		↑						↑						
⁵¹ Karia & Asaari	2016	↑													
⁷⁰ Nijp, Beckers, van de Voorde, Geurts & Kompier	2016		∅			↑			∅	∅		∅			

⁵⁸ Torten, Reaiche, & Caraballo (experience, tenure, days teleworked/week)	2016	↕	↕			↕	
⁷¹ Sherman (caregiver and gender effects)	2018		↑	∅	∅	↕	↕
⁶² Viorel, Ionut, & Andreea-Oana	2018	↑	↑			↑	↑
⁶⁸ Golden, & Gajendran	2019		↑				
⁵² Kazekami	2019	↕		*		↑	↑
⁴⁴ Davidescu, Apostu, Paul, & Casuneanu	2020	↑	↑			↑	↑
⁶⁶ Delanoëije & Verbruggen (daily effects)	2020		↑			↑	↑



Table 6. Summary of “pre-pandemic” articles including effect on productivity/performance, author/year and the main findings. N=24.

Effect on Productivity / Performance	Author	Year	Main Finding
Increase	⁴⁰ Baard & Thomas	2010	Increased productivity, job satisfaction, morale, organizational commitment, work-life balance. distractions, stress, and sick days. Longer working hours and higher cost savings.
	⁷³ Virick, DaSiliva & Arrington	2010	Increased performance positively associated with increased job satisfaction
	⁵⁷ Tietze & Nadin	2011	Increased productivity and work-life balance but decreased organizational commitment.
	³⁸ Aboelmaged & Subbaugh	2012	Job satisfaction and organizational commitment increased perceived productivity.
	⁵³ Neirotti, Paolucci, & Raguseo	2012	Increased productivity.
	⁵ Bloom, Liang, Roberts & Ying	2013	Increased performance (13%), productivity, job satisfaction. Decreased turnover (50% drop) and more cost savings (\$2,000/employee).
	⁴⁹ Grant, Wallace, & Spurgeon	2013	Increased productivity, and work-life balance. Motivation increased for some participants but decreased for others.
	⁶⁴ Aboalmaali, Abedi & Ketabi	2014	Increased performance. Factors with a positive relationship with performance include organizational commitment, cost saving, motivation, job satisfaction and focus.
	⁶⁵ Coenen & Kok	2014	Increased performance and improved product quality.
	⁶⁷ Gajendran, Harrison, & Delaney-Klinger	2014	Increased performance (task and contextual). strong supervisor-employee relationship increased individual effectiveness
	⁶⁹ Greer, & Payne	2014	Increased performance and work-life balance. Decreased turnover intention (organizational commitment) with specific strategies to overcome challenges.
	⁶¹ Tustin	2014	Increased productivity, job satisfaction, work-life balance, and morale. Decreased travel cost (more cost saving), distractions, stress, and absenteeism.
	⁷² Vega, Anderson, & Kaplan	2015	Increased performance, increased job satisfaction
	⁵¹ Karia & Asaari	2016	Increased productivity and competitive advantage with proper technology adoption.
	⁷¹ Sherman	2018	Increased performance increased overall, but most beneficial to mothers. Increased job satisfaction for men and was unchanged in women. Decreased work-family conflict for mothers but not fathers or nonparents. No change in sick leave or work intensification.
	⁶² Viorel, Ionut, & Andreea-Oana	2018	Increased performance and productivity, job satisfaction and motivation

	⁶⁸ Golden, & Gajendran	2019	Increased performance. More extensive telecommuting is related to greater performance.
	⁴⁴ Davidescu, Apostu, Paul, & Casuneanu	2020	Increased performance, organizational performance, job satisfaction, and motivation.
	⁶⁶ Delanoije & Verbruggen	2020	Increased performance and engagement on days of teleworking compared to office work, but only on days when employee was teleworking. Decreased stress.
Both or no change	⁶⁰ Turetken, Jain, Quesenberry, & Ngwenyama	2011	Experience teleworking, communication skills and task interdependence determines success (productivity and performance). Tenure only positively correlates with job satisfaction.
	⁴⁷ Dutcher	2012	Increased productivity with creative tasks but decreased with dull tasks.
	⁷⁰ Nijp, Beckers, van de Voorde, Geurts, & Kompier	2016	No change in performance, organizational commitment, job satisfaction, or work-life balance, but work intensification increased.
	⁵⁸ Torten, Reaiche, & Caraballo	2016	Experience teleworking and tenure positively relate to productivity but not performance or job satisfaction. Number of days teleworking per week impacts performance and satisfaction but not productivity.
	⁵² Kazekami	2019	Increased productivity with appropriate working hours but decreases with too many hours (work intensification). Increased life satisfaction (work-life balance) and job satisfaction Decreased stress. These three factors do not impact productivity.



3.3 Results from COVID-19 specific articles

We completed a similar process for the "COVID-19 specific" articles and summarized the outcomes in Table 7. Contrary to the general positive impact of WFH on productivity and performance in the "pre-pandemic" articles, the "COVID-19" articles showed mixed results. Only 23%^{39,43,55} of articles reported positive impacts of WFH on productivity and performance, whereas 38%^{41,45,46,48,50} demonstrated both effects and another 38%^{42,54,56,59,63} reported negative impacts. It should be noted that only one "COVID-19" article focused on both performance and productivity, which reported an overall decrease in both measures, while the remaining articles only focused on productivity.

Table 7. Outcomes of COVID-19 articles (↑ increased, ↓ decreased, * moderating effect, ↕ both increase/decrease, ∅ no effect). N=13.

Author	Year	Productivity	Performance	Turnover	Cost Saving	Work Intensification	Distractions / Focus	Absenteeism	Job Satisfaction	Work-Life Balance	Engagement	Organizational Commitment	Stress	Motivation	Morale
³⁹ Atiku, Jeremiah & Boateng	2020	↑								↑					
⁴¹ Bolisani, Scarso, Ipsen, Kirchner, Hansen	2020	↕				↓								↑	
⁴² Bucurean	2020	↓					↕		↓						
⁴³ Chapman & Thamrin	2020	↑													
⁴⁵ Dixit, Chinnam, & Singh	2020	↕				↕			↑						
⁴⁶ Drumea, Cristina	2020	↕								*				*	
⁴⁸ Feng & Savani (gender effects)	2020	↕							↕						
⁵⁴ Ralph et al.	2020	↓													
⁵⁶ Tavares, Santos, Diogo & Ratten	2020	↓				↑				↑					
⁵⁹ Toscano, & Zappala	2020	↓							*					*	
⁶³ Wang, Liu, Qian & Parker (effects of social support)	2020	↓	↓				↓			↓					
⁵⁰ Hardy, Marcolino, & Fontanari	2021	↕													
⁵⁵ Tanpipat, Wen Lim & Deng (effect of organizational norm)	2021	↑				∅						↑			

Articles with positive impacts on productivity also demonstrated an improvement in work-life balance [n=1]³⁹ and organizational commitment [n=1]⁵⁵. However, mixed results were found for other associated measures within the remaining articles. The five articles demonstrating decreases in productivity and performance reported greater work intensification [n=1]⁵⁶, and stress [n=1]⁵⁹, but a mixed impact on job satisfaction [n=2]^{42,59}, work-life balance [n=2]^{56,63}, and distractions [n=2]^{42,63}. Lastly, the five articles reporting both increases and decreases in productivity and performance also showed mixed outcomes for the associated measures: work intensification [n=2]^{41,45}, job satisfaction [n=2]^{45,48}, and both a mediating effect on work-life balance [n=1]⁴⁶, and stress [n=1]⁴⁶. A description of the specific main outcomes for each study can be found in Table 8.

Table 8. Summary of COVID-19 articles including effect on productivity/performance, author/year and the main findings. N=13.

Effect on Productivity / Performance	Author	Year	Main Finding
Increase	³⁹ Atiku, Jeremiah & Boateng	2020	Increased productivity and work-life satisfaction (work-life balance).
	⁴³ Chapman & Thamrin	2020	Increased productivity. Job experience results in greater productivity.
	⁵⁵ Tanpipat, Wen Lim & Deng	2021	Organizational norm increased productivity, and organizational commitment. Work demands (work intensification) is unaffected.
Both or no change	⁴¹ Bolisani, Scarso, Ipsen, Kirchner, Hansen	2020	Productivity increased with online meetings but decreased because of continuous online connection. Increased stress. Less demanding (work intensification).
	⁴⁵ Dixit, Chinnam, & Singh	2020	Decreased productivity and increased work intensification initially and then increased productivity and decreased work intensification after adapting. Increase job satisfaction.
	⁴⁶ Drumea, Cristina	2020	Productivity was negatively mediated by increased anxiety, isolation, confinement (categorized as stress), but positively mediated by improved work-life balance.
	⁴⁸ Feng & Savani	2020	Decreased productivity and job satisfaction for women. Increased productivity and job satisfaction for men.
	⁵⁰ Hardy, Marcolino, & Fontanari	2021	Introverts and extroverts' productivity are affected differently by social isolation and social distancing resulting from the COVID-19 pandemic.

Decrease

⁴² Bucurean	2020	More people were very dissatisfied than were very satisfied with their job; 57% of people said WFH negatively influences productivity; 43% do not keep regular hours; 50% report more distractions.
⁵⁴ Ralph et al.	2020	Decreased productivity.
⁵⁶ Tavares, Santos, Diogo & Ratten	2020	Increased work intensification and work-life balance. Decreased productivity.
⁵⁹ Toscano, & Zappala	2020	Decreased job satisfaction and productivity (result of social isolation). Increased stress.
⁶³ Wang, Liu, Qian & Parker	2020	Decreased productivity due to ineffective communication and increased procrastination (distractions). Increased performance with social support but decreased performance with lower social support.



4.0 Discussion

Industry and academic interest surrounding the impacts of WFH has grown in recent years in response to the increasing popularity of flexible work arrangements. From an academic perspective, WFH has been associated with several physical and mental health outcomes^{23,74-77}, however these typically fall under health and safety issues from a business and managerial perspective, which often receive little resources and attention compared to organizational and worker performance and productivity. Therefore, aligning WFH with business goals of organizations may help catalyze awareness from decision makers and serve to effectively implement WFH policies that protect worker health and maintain productivity and performance of both the individual and the organization. By undertaking this scoping review, we have identified the gaps in the literature necessary for future research on the topic and established the groundwork necessary the development of evidence-informed recommendations to assist organizations in ensuring their workforce remains healthy and effective in the transition to a future of WFH arrangements. We have also identified how impacts of WFH vary when the situation surrounding the arrangements differ, which has important implications for organizations as they continue to address the sudden changes to workplaces in response to the COVID-19 pandemic.

The results of our scoping review reveal that the current literature focuses more heavily on how WFH impacts productivity than it does on performance; 27 articles included measures of productivity, while 16 articles measured performance. Further, there is greater emphasis on the effects at the personal-level compared to the organizational-level. This disparity is intriguing and highlights the need for future research to consider the impact of WFH on all levels, particularly for the development of organizational recommendations and policies for WFH that enhance their productivity and performance. This need, and the necessity to understand the interplay between levels has also been voiced by Belanger and colleagues⁷⁸ who noted the possibility that the impacts of telecommuting at the individual, group, and organizational level may conflict with one another. Interesting, only nine studies included in our scoping review investigated both the personal and organizational levels, and of those, only three included measures of both productivity and performance.

Additionally, the results of our scoping review identified that the dominate study design was survey-based [n=23], and asked individuals to self-report on their perceptions of specific metrics, whereas interview-style [n=8] asked participants open-ended questions about their perceptions of specific measures associated with productivity and performance. In total, only 6 articles used an experimental study design. Of these articles, more direct measures of productivity and performance were examined such as attrition rate, and number of tasks completed during a set time frame. It should be noted that across all articles, regardless of study design, there was no commonality with respect to the number of questions asked per metric (for example, whether a metrics "score" was determined by 3, 5 or 7 questions) was rated on an aggregate score of or the scale used to rate responses. The most common metrics outside of productivity or performance (which we deemed as a requirement for inclusion in the current study) were job satisfaction [n=17], and work-life balance [n=13], both of which were considered indirect measures of productivity and performance in comparison to direct measures, such as turn over or cost savings. Beyond the commonality of measuring productivity or performance in some capacity, there was large variability in the combination of metrics used across the studies to evaluate the impact of WFH on productivity and performance.

This observation aligns with other research that has emphasized a shortage of experimentally based research studies focused on WFH outcomes²¹. When reviewing literature surrounding the impacts that telecommuting has on work-family conflict, Allen and colleagues²¹ noted an absence of controlled experimental studies, cautioning readers when inferring causality in non-experimental designs. Further, Belanger and colleagues⁷⁸ recognized the importance of time as a factor in understanding the true impacts of WFH, suggesting that the compounding effects of telecommuting over time may change as the experiences of the worker also change. Our review supports this need for longitudinal or experimental studies, as only six were experimental in nature, and only one examined how these outcomes change over time. Through a nine-month experimental WFH study, Bloom and colleagues⁵ demonstrated a dramatic 13% performance increase over the period and showed that the smaller rise in improvement observed over the first two months of the study was due to addressing IT and logistical challenges.



4.1 COVID-19 considerations

The outcomes from the studies included in our scoping review revealed varied and sometimes conflicting findings. Although other effects of telecommuting are consistent across a variety of studies (i.e., job satisfaction, organizational commitment, stress), moderating factors play an essential role and affect whether the impact on outcomes is strong or minimal. Overall, 59% of all the articles reported that productivity and/or performance increased while in a WFH arrangement, 14% demonstrated declines and 27% reported both effects depending on moderating factors (i.e., years of tenure, gender, or caring responsibilities).

In addition to the compounding role that moderating factors may play in contributing to the inconsistent impacts of WFH, we must acknowledge the different situations that results in the adoption of a WFH arrangement for organizations or individuals. Traditionally, organizations offering WFH options do so because they believe in the value of the practice, they have the technology and other support in place to permit it or employees requested it. Many telecommuting arrangements are designed to support employee choice with a combination of days in the office and home through employment negotiations. As such, those who want to WFH are more likely to utilize these programs and report the benefits of the arrangement. However, when WFH becomes a mandatory, full-time requirement, additional factors influence the impacts of such arrangements. The sudden shift to entire organizations and teams working remotely in response to the COVID-19 pandemic must be considered.

Our scoping review returned 13 articles specifically focused on the impacts of WFH on productivity and performance during the COVID-19 pandemic, all of which had employees working remotely on a full-time, mandatory basis. It is worth noting that of the 24 articles published prior to the onset of COVID-19, no articles focused on full-time, mandatory WFH. All participants either worked remotely part-time or chose to WFH on a full-time basis. Interestingly, when considering the consensus of WFH impact between these two work arrangement scenarios, only COVID-19 articles reported decreases in productivity and performance. Further, only 23% of articles specifically focused on COVID-19 (and therefore mandatory WFH), revealed overall positive impacts of WFH on productivity and performance, compared to 79% of the non-COVID-19 (and non-mandatory) WFH arrangements. Our findings suggest that the positive impacts that WFH can have on productivity and performance are likely related to non-mandatory arrangements, which supports other previous research review. A review by Allen and colleagues²¹ found moderate levels of telecommuting provides the most value, providing flexibility and minimizing the impediments to co-worker relationships, knowledge exchange and innovation. Future work in this area must consider the external factors leading to WFH arrangements in both the design and analysis of the research study and to keep in mind that the workforce may not only be dealing with the traditional stressors of WFH, but in the case of COVID-19, also with external stressors that will no doubt be playing a role⁸⁰.

Specifically related to WFH during COVID-19, recent research has revealed that significant gender differences emerge when considering the advantages and disadvantages of WFH arrangements. Research has found that within-team- and off-hours messaging became more frequent, and that this effect was strong for women^{74,81}. Further, Oakman and colleagues²³ revealed that women were less likely to experience improved health outcomes from WFH arrangements. In our scoping review, although gender representation within sample sizes was evenly split (51.9% female, 48.1% male), gender analysis was not a focus for many articles. In fact, only two studies explicitly examined the impact of gender within their analysis. Interestingly, Sherman⁷¹ found that mothers reported greater job performance and decreased work-life conflict when having the option to WFH, whereas Feng and Savani⁴⁸ indicated that women reported decreased productivity and lower job satisfaction after WFH became mandatory during COVID-19. These results may be attributed to increased home responsibilities during lockdown situations that pose pressures not normally present when WFH.

4.2 Limitations and future research

As with all research, we must acknowledge the limitations of this work. First, for each of the two core concepts of our search (i.e., WFH terms and productivity/performance), we identified a list of key terms to be included in the search. Although we worked with a librarian to ensure we were inclusive and were reassured by the number of returned articles, it is possible that some relevant articles were missed. Given the lack of an internationally recognized definition of the term "telework"⁸², and the sudden rise in WFH as a result of the COVID-19 pandemic, new terminology or concepts surrounding references to WFH arrangements may have emerged, such as the term work from anywhere. Such terms were not included in the original search. Second, we limited our search to include articles which specifically indicated that they measured productivity and/or performance as a metric. We chose this approach to ensure that we were not interpreting results on behalf of the authors, however it is possible that articles addressing productivity and performance indirectly, through evaluation of metrics that can be associated with productivity and performance were excluded. For example, we did not include articles that only examined work-life balance, despite the possibility of inferring relationships between changes in work-life balance and changes in productivity and performance. Lastly, in response to the COVID-19 pandemic, there has been a sharp rise in interest surrounding the impacts of WFH in the academic literature. It is expected that a significant number of WFH-related research studies will be published as more data becomes rapidly available. This is evidenced by the number of articles returned by publication date; 35% of included articles focused on COVID-19 and were published in the final year of our search criteria. Therefore, we recognize that the specific literature surrounding WFH during COVID-19 included in this scoping review may be limited and we encourage future research groups to add to the interpretations of the impacts of WFH on productivity and performance under mandatory WFH arrangements as the literature grows and more longitudinal, and comprehensive studies are published.

Overall, the results of our scoping review find that the academic literature surrounding productivity and

performance during WFH arrangements can vary greatly in terms of measurements tools used, and the types of questions asked. However, in general, productivity was more actively studied than performance, and nearly all articles asked employees to self-report on their own productivity rather than asking supervisors or managers to evaluate their employees' productivity or performance, or using a more direct, quantitative measure. Further, personal productivity was more commonly examined than organizational productivity. Many studies did not specifically examine group differences such as sex and gender, caregiving responsibilities, or job type. Therefore, ample opportunity exists for future research to fill these gaps and contribute to the development of more explicit understanding of productivity and performance at the organizational level, understand how WFH impacts performance-based measures, examine and how these impacts differ between groups.



4.3 Implications and recommendations

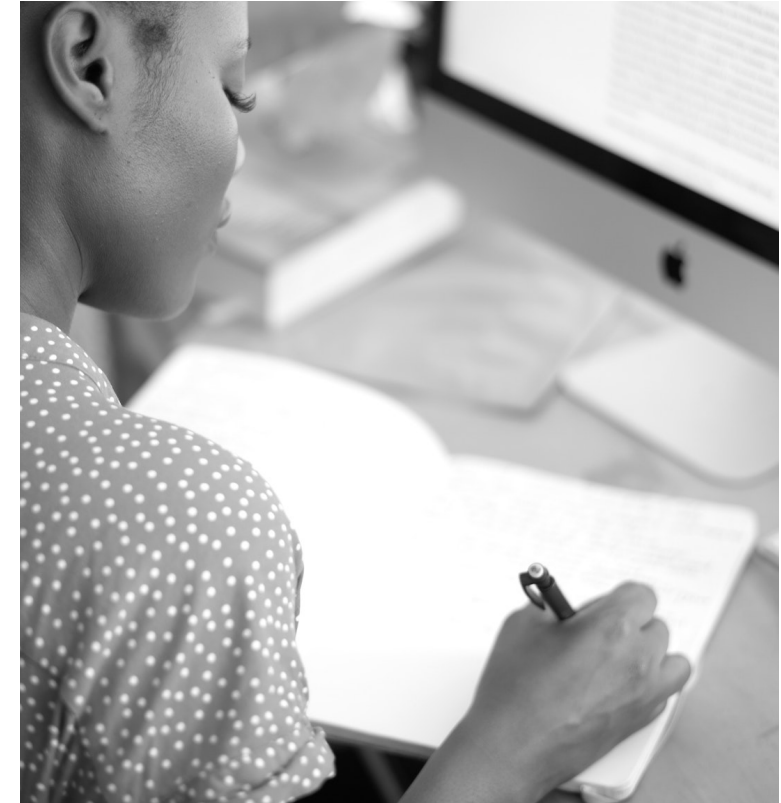
With entire organizations around the world suddenly required to work remotely as a means of mitigating the spread of COVID-19, organizations and policymakers are working to reduce the impact of such drastic changes on the labour markets. Even when working life begins to return to pre-pandemic "normal", some form of WFH arrangement is likely to stay, and organizations will need to be prepared to accommodate these arrangements and be equipped with the resources necessary to determine how WFH can work for them. This scoping review lays the groundwork necessary to help organizations develop evidence-informed resources and guidelines to ensure they maintain or optimize their productivity and performance.

When developing a WFH program, organizations should keep mind that WFH is not a one-size-fits-all arrangement. The positive and negative implications of WFH programs on productivity and performance can vary significantly depending on the type of arrangement in question (e.g., full-time, part-time, mandatory, or optional)⁵³. Evidence supports that the benefits of WFH, such as maximizing employee satisfaction and productivity, are realized when there is a balance between remote work and in-office work⁷³. Prior to the COVID-19 pandemic, research on WFH arrangements showed positive impacts on both organizational and personal productivity and performance. However, far less conclusive, and positive impacts are observed when reviewing the impacts of WFH during the COVID-19 pandemic. These results suggest external factors (e.g., supervision of children, impacts of lockdowns) should be considered when evaluating the effectiveness of a WFH program when it is mandatory. Setting clear goals and expectations for managing the workload of WFH is imperative, as overworking (i.e., work intensification) can be an issue⁴⁹, particularly in times of public health crises. Our results are in line with Virick and colleagues⁷³ who suggests that organizations should consider creating several types of WFH programs for employees that meet different needs.

In addition to the external circumstances leading to WFH arrangements, considerations should be made with respect to the type of jobs and tasks to be completed at home, the team dynamic, and what productivity or performance means to the organization. Jobs not requiring regular teamwork, or in-person facetime are well suited for WFH, as are those where quantity and quality of performance are easily quantifiable or where the link between effort and performance are direct⁵. Golden and Gajendran⁶⁸ suggested that job performance can be improved among WFH employees who hold complex jobs, for those who require low levels of interdependence, and for those who require less social support. Furthermore, job duties requiring creativity, rather than duties that involve more dull tasks, can also benefit greatly from a WFH arrangement^{47,72}. Regardless of the reason for a WFH program, finding a balance between the physical and virtual contact, when permitted, is important⁶⁶. Where this balance lies depends on the organization, the team, or the project and the requirements that need to be met.

Implementing and evaluating a WFH program will differ across organizations based on their own organizational priorities. However, in general, policies and resources should consider what performance and productivity means to the organization, how it is defined and how it will be measured. For example, when only person-level effects are considered, organizations may wrongly conclude that telework is ineffective regarding certain outcomes⁶⁶. Results from our scoping review support this recommendation. When evaluating the effectiveness of WFH, organizations are encouraged to ensure the breadth of their metrics examine a wide range of factors that can impact productivity and performance. Furthermore, it suggested that organizations (managers, decision makers, policy makers etc.) must consider the impact of remote work not only on those making the switch to WFH, but also in relation to those remaining in the office⁵⁷.

Lastly, successful WFH programs requires a culture shift in organizations⁸³. Training may be required to ensure all employees view WFH as a standard operating procedure through which work is accomplished, while adhering to a formal written telework policy⁸³⁻⁸⁵. Managers play an important role in facilitating successful WFH. However, for some managers, changes in their mode of communication or expectations may need to be modified. Training for managers may be required to support any changes necessary to facilitate the transition from more traditional assessment of productivity and performance to one that better suits a WFH arrangement. When viewing telework as a work design initiative, it can boost performance, rather than being primarily a work-family benefit⁶⁸. Managers should receive training to provide accurate support to help change traditional thinking and traditional assessment of performance into goal-oriented management and result oriented systems⁶⁴.



5.0 Conclusion

The popularity of WFH arrangements is increasing, and it is anticipated that a significant surge in the number of WFH employees will continue beyond the COVID-19 pandemic, signifying the importance of understanding the productivity and performance outcomes associated with WFH. Overall, the findings from this scoping review suggest that WFH can have positive impacts on personal and organizational productivity and performance. Productivity and performance appear to be impacted differently in WFH situations that are mandatory, such as during the COVID-19 pandemic. It is anticipated that the results of the scoping review will be used to create guidelines and recommendations to assist organizations with facilitating and evaluating an optimal WFH arrangement for their employees that promotes productivity and performance.



6.0 Knowledge Mobilization

Knowledge mobilization is an integral aspect of our research program and we actively engage with our stakeholders to develop and facilitate dissemination activities. We have developed a complementary webinar series, Working in the work-from-home era, consisting of five sessions focused on multiple aspects of WFH. Two of the five sessions have already been facilitated, including the session disseminating the research findings from this scoping review. These webinars are advertised through Conestoga College, on our website and through our social media platforms including LinkedIn and Twitter.

Infographics and a webpage to share the synthesis report and evidence brief with our network are currently under development, and we plan to publish this work in open access research journals, as well as in industry and professional newsletters. Furthermore, we plan to work with our extensive network of partners to promote the implementation of these WFH resources.



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