

The Association Between Remote Work During the First Wave of the Pandemic and Faculty Perceptions of Their Productivity and Career Trajectory: A Cross Sectional Survey

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ABSTRACT

Introduction: Early in the pandemic, studies documented that there are gendered differences in many factors related to working during the pandemic, especially for caregivers. This study aimed to focus on the effects of remote work, rather than the pandemic in general, on perceptions of productivity and career trajectory in research and education faculty at an academic health center.

Methods: A questionnaire was developed and distributed to all faculty in the Department of Medicine. We obtained demographic information and asked respondents to report the effect that remote work had on their research or teaching productivity. Those who reported a decrease in productivity were asked to choose a degree of impact. We also asked about the level of concern for the effect remote work would have on their career trajectory in research and teaching and about the impact of remote work on academic wellness.

Results: We received responses from 51.4% of 479 faculty. A little less than half were females, and most were subspecialists. More than half (60.6%) were responsible for providing care to children, parents, or others. Nearly one-quarter of respondents (22.8%) reported a negative effect of remote work on teaching productivity, which was more pronounced in senior faculty versus junior faculty (28.6% vs 16.5%, $P=0.03$). Few faculty (7.4%) were concerned about their career trajectory in teaching; however, those who provided care at home were significantly more likely to be concerned (10.7% vs 2.1%, $P=0.01$). Over half of respondents (56.6%) reported a negative effect of remote work on research productivity; this was significantly higher for tenure faculty than clinician educators (71.9% vs 50.7%, $P=0.01$). Almost half of respondents (39.6%) were concerned about their career trajectory in research, and this concern was significantly higher in specialists than in generalists (42.9% vs 15.8%, $P=0.02$) and in clinician educators versus clinicians (39.7% vs 0.0%, $P=0.007$). A small number of faculty (11.5%) reported a negative impact of remote work on their academic wellness; this impact was higher in specialists than in generalists (13.2% vs 3.7%, $P=0.05$). There were no significant differences in any areas of concern for males versus females or in those with or without leadership roles.

Conclusions: In this single-center study during the first wave of the pandemic, faculty perceived reduced productivity in teaching, research, and academic wellness. Our study found that remote work concerns were overall more evenly distributed across gender and those responsible for caregiving than had been reported previously; however, caregivers were more concerned about their career trajectory in teaching than noncaregivers. The lack of significant differences may have been due to several factors: remote work allowed flexibility when caregiving arrangements were disrupted; remote work was required of all faculty, mitigating concerns that caregivers were singled out; and institutional support offset some of the challenges. Further studies are needed to determine whether social or operational interventions in academic health centers can reduce the negative perception of remote working on academic productivity.

INTRODUCTION

Shortly after a state of emergency was declared in the United States in March 2020 related to the COVID-19 pandemic, academic operations in the Department of Medicine at the University of Wisconsin School of Medicine and Public Health were reduced to essential activities. Physicians, scientists, and educators adjusted their efforts to preserve and promote the future of the academic mission. A large part of this shift was a transition to working from home or otherwise working remotely. This transition was a significant departure from prepandemic norms, and the unique circumstances surrounding this policy change mean that the consequences—both benefits and burdens—may have been experienced differently across groups.

Earlier reports during the pandemic demonstrated gendered differences in burnout, perception of work-life balance, passing up leadership opportunities, and

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planning to reduce hours or leave a job among physicians and scientists, with a greater negative effect on females overall and most markedly on female parents/caregivers of preschool aged children.^{1,2} There also have been reports of a gender gap in manuscript submission and, specifically, COVID-19–related research manuscript submission, with an early paper showing only 12% female authors for COVID-19–related research at the time of the analysis.³ The greater negative effects of the pandemic on female faculty in prior studies have been attributed to exacerbation of prepandemic biases and inequalities compounded by gendered division of domestic labor and caretaking responsibilities.⁴

Studies prior to the pandemic have examined the complexity of the relationship of remote work to wellness and productivity.⁵ Work productivity can be negatively affected if a remote worker lacks adequate resources in the remote work set-up^{6,7} or if they are expected to take on increased home responsibilities.⁸ Historically, remote work has been associated with lower likelihood of promotion and lower wage growth—particularly for women with higher frequency of remote work use.⁹ Remote work and requests for more flexible work arrangements may be perceived as signs of less commitment to work and career advancement.¹⁰ Taken together, these factors contribute to individuals’ hesitancy to use remote work options¹¹ and concerns that remote work can be harmful to career prospects.

There is the potential that significant differences in research and education productivity and academic wellness may have emerged between groups, despite a universal policy enacted across all faculty requiring remote work. We conducted a survey of faculty on the effects of remote working on educational and research productivity, as well as overall academic wellness. A distinguishing feature of this study versus other studies is the focus on the impact of remote working—rather than the pandemic in general—on academic productivity and well-being, with attention to differences across subgroups.

METHODS

Survey Subjects

The Department of Medicine consists of 479 faculty whose academic rank includes instructors, scientists, assistant professors, associate professors, and professors. This is a mixture of clinical faculty, clinician educators, clinician researchers, and researchers.

Questionnaire

This survey was developed and administered in collaboration with the University of Wisconsin Survey Center. Informed consent was not obtained because the study was of minimal risk, the survey was conducted anonymously and voluntarily, and it involved no procedures for which written consent would be required outside of the research context. It was approved by the Institutional Review Board.

All 479 Department of Medicine faculty were invited to par-

ticipate to assess their perception of remote work on their academic productivity and well-being. This invitation was based on university employment records, and an email was sent from a Department of Medicine address, which is excluded from spam filters.

The first section of the survey used multiple choice questions and asked about academic track (Instructor, Scientist, Clinician, Clinician Educator, and Tenure—the latter of which is a heavily research-focused faculty track), rank, subspecialty, area of operation, administrative leadership roles (“Do you currently hold any administrative leadership roles within the department, school or campus?”), area of research and/or education, distribution of work (proportion of effort devoted to clinical/research/education/administration), gender (choices were male, female, or no response), and ethnicity. Data about caregiving responsibilities also were collected where applicable, including a breakdown of care by “full-time” or “part-time” (not further defined in the survey) and by the following groups: “caring for children <5 years old,” where enrollment in school is not a given; “caring for children 5-18 years old,” where school enrollment is typical; “caring for parents,” or “other.”

The second part of the survey included questions about research, educational activities, and academic wellness prepandemic and intrapandemic. In the area of research activity, faculty were asked whether remote work had increased, decreased, or had no effect on their productivity. For those respondents who indicated a decrease, they were asked further about the degree of the impact; multiple choice options were “a little,” “a moderate amount,” “quite a bit,” and “a great deal.” We also asked how concerned they were that remote work would affect their career trajectory in research. For respondents who indicated a concern, multiple choice options were “not at all,” “a little,” “somewhat,” “very,” and “extremely.”

In the area of education, faculty were asked whether remote work had increased, decreased, or had no effect on their productivity in teaching. For those respondents who indicated a decrease, they were further asked about the degree of the impact; multiple choice options were “a little,” “a moderate amount,” “quite a bit,” and “a great deal.” We also asked how concerned they were that remote work would affect their career trajectory in teaching. For respondents who indicated a concern, multiple choice options were “not at all,” “a little,” “somewhat,” “very,” and “extremely.”

Faculty also were asked about the impact of remote work on their academic wellness, defined as a faculty member’s ability to manage research and teaching workloads while developing skills and preparing for the future in a healthy way.

Data Collection

The survey was sent in August 2020 by email with a Qualtrics link asking participants to complete the survey anonymously.

Second and third reminders were sent to all participants asking for responses if they had not yet completed the survey.

Univariate and bivariate analyses were used for all analyses. Proportions are presented and compared across subgroups by chi-square tests.

RESULTS

A total of 246 faculty members responded to any of the questions in the three areas (teaching, research, or wellness), representing 51.4% of the 479 faculty members (Table 1). The completion rate differs across the specific areas, as not all participants were asked to complete each section (eg, only those participating in research were asked to complete the research-related sections).

Hospitalists and general internists were combined for analysis to group the two divisions more heavily involved in clinical care and education. This group was compared to the other specialties in the department that are generally more research focused. Of all respondents, a little less than half were female, and most were subspecialists (ie, not hospitalists or general internists). More than half were responsible for providing care for children, parents, or others. About half of those providing care did so on a part-time basis.

Table 2 summarizes responses regarding the effect that remote work had on productivity and career trajectory. For respondents who indicated a negative impact on productivity, we report in aggregate the responses that the negative impact was “a moderate amount,” “quite a bit,” or “a great deal,” and we did not include “a little.” For the questions regarding concern about remote work affecting their career trajectory in research or teaching, we report in aggregate the responses of “somewhat,” “very,” or “extremely,” and we did not include “not at all” or “a little.” Approximately one quarter (22.8%) of respondents reported that remote work had a negative impact on teaching productivity. Senior faculty were significantly more likely to report a negative impact on overall teaching productivity than junior faculty (28.6% vs 16.5%, $P=0.03$). Only 7.4% of respondents reported concern about the effect of remote work on their teaching career trajectory. Those with caregiving responsibilities differed only slightly from their counterparts without caregiving responsibilities in terms of teaching productivity but were more likely to be concerned about their teaching career trajectory (10.7% vs 2.1%; $P=0.01$), though this comparison is based on relatively few respondents. Teaching productivity and concern about the impact of remote work on career trajectory did not differ significantly between generalists and subspecialists, females and males, those in different academic ranks, and those with and without leadership roles.

Over half (56.6%) of respondents reported a negative impact of remote work on research productivity, and almost half (39.6%) were concerned about the effect of remote work on their career trajectory. There were no significant differences across those with and without caregiving responsibilities, females and males, those

Table 1. Participant Characteristics

	N (%)
Completed teaching, research, or wellness questions	246
Completed teaching questions	245 (99.6)
Completed research questions	159 (64.6)
Completed wellness questions	227 (92.3)
Gender	
Male	115 (46.7)
Female	97 (39.4)
No response	34 (13.8)
Specialty	
Generalist	55 (22.4)
Other	182 (74.0)
No response	8 (3.2)
Caregiving	
Yes	149 (60.6)
< 5 years old	47 (19.1)
5–18 years old	111 (45.1)
Parents/others	35 (14.2)
Part-time	107 (43.5)
Full-time	42 (17.1)
Junior faculty	75 (30.4)
Senior faculty	77 (31.3)
No	95 (38.6)
No response	2 (0.8)
Leadership role	
Yes	86 (35.0)
No	158 (64.2)
No response	2 (0.8)
Rank	
Junior: instructor/scientist	26 (10.6)
Junior: assistant professor	87 (35.4)
Senior: associate professor	69 (28.0)
Senior: professor	61 (24.8)
No response	28 (11.4)
Academic track	
Clinician	71 (28.9)
Clinician educator	93 (37.8)
Tenure	59 (24.0)
Other (eg, instructor, scientist)	23 (9.3)

N (%) of total respondents who completed the teaching, research, or wellness questions.

with and without leadership roles, or junior and senior rank. Significantly more tenure track faculty reported reduced research productivity when compared to clinician teacher faculty (71.9% vs 50.7%; $P=0.01$). Significantly more clinician educator faculty reported being concerned about the impact of remote work on their research trajectory compared to clinical faculty (39.7% vs 0%; $P=0.007$). A nonsignificantly higher proportion of specialists than generalists reported reduced research productivity (57.9% vs 47.4%; $P=0.39$), but a significantly higher proportion of specialists reported being concerned about the impact of remote work on their research career trajectory (42.9% vs 15.8%; $P=0.02$).

Only about 1 in 10 respondents (11.5%) reported a negative impact of remote work on academic wellness. A higher propor-

tion of specialists reported an impact on academic wellness than generalists (13.2% vs 3.7%; $P=0.05$). This comparison, however, is based on relatively low numbers. Significantly more clinician educator faculty reported a negative impact on their academic wellness than clinicians (14.9% vs 2.9%; $P=0.01$) The impact on academic wellness did not differ significantly across categories of gender, caregiving, leadership, or rank.

DISCUSSION

Previous studies of the impact of the COVID-19 pandemic on work-life balance, burnout, well-being, and career activities have demonstrated differences in the experience and reactions of physicians and scientists across gender, career focus, and home life factors.^{1,2,3,7,12} Prior studies have focused largely on the effect of the pandemic in general on these areas, whereas this study specifically focused on the impact of remote work during the pandemic on the areas of research, education, academic wellness, and concern for career trajectory.

Remote work can negatively affect workers' well-being when it leads to increased professional isolation,¹³ which can lead to decreased opportunities for mentorship and knowledge exchange, and productivity can be hampered for highly interdependent work¹⁴—factors that are important in a large academic department across all faculty. We observed results that likely reflected these collaboration factors—particularly for faculty in the clinician educator and tenure tracks where there were disproportionate effects on research trajectory or productivity.

We found less effect of remote work on caregiver responsibilities than we expected. When integrating family and work, there are ways that work responsibilities complicate home life (work interfering with family [WIF]) and vice versa (family interfering with work [FIW]). Remote work has historically been found to decrease WIF but can increase FIW. For example, removing commuting time leaves more time for home activities, and when remote work is paired with flexible hours, it can further improve abilities to balance work and home life.¹⁵ While our results showed a trend toward greater negative impact on those with caregiving responsibilities across research, education, and academic wellness, these results did not reach statistical significance, with the single exception of where faculty considered their

Table 2. Proportion (%) of Respondents With Negative Impact, by Respondent Characteristics

	Teaching		Research		Academic Wellness
	Productivity	Concern About Career Trajectory	Productivity	Concern About Career Trajectory	
Negative impact	22.8	7.4	56.6	39.6	11.5
Generalist					
Yes	20.0	8.2	47.4	15.8	3.7
No	24.0	3.6	57.9	42.9	13.2
<i>P</i> value	0.54	0.25	0.39	0.02	0.05
Caregiving (any)					
Yes	24.8	10.7	55.9	37.5	11.0
No	20.9	2.1	57.1	40.2	12.1
<i>P</i> value	0.48	0.01	0.88	0.74	0.81
Sex					
Male	25.4	8.7	58.7	40.0	11.1
Female	18.8	4.2	53.1	37.5	11.4
<i>P</i> value	0.25	0.18	0.51	0.76	0.96
Leadership role					
Yes	23.3	10.5	53.3	43.3	11.7
No	23.4	5.7	58.2	36.7	11.3
<i>P</i> value	0.98	0.18	0.55	0.41	0.94
Rank					
Junior	16.5	9.2	52.1	43.0	12.3
Senior	28.6	5.4	60.5	35.6	10.7
<i>P</i> value	0.03	0.26	0.29	0.34	0.72
Track					
Clinician	26.8	7.0	25.0	0.0	2.9
Clinician educator	20.4	9.7	50.7	39.7	14.9
Tenure	25.4	6.8	71.9	50.9	20.0
<i>P</i> value ^a	0.34	0.55	0.10	0.007	0.01
<i>P</i> value ^b	0.47	0.53	0.01	0.20	0.45

^a*P* value = Clinician compared to clinician educator faculty.

^b*P* value = Clinician educator faculty compared to tenure faculty.

career trajectory in education. This was based on a small number of respondents; however, it is possible these faculty had a different workload that was more affected by caregiving and felt more uncertainty about the future of child care that was scarce early in the pandemic. That the negative impact was more evenly distributed across gender, rank, specialty, and degree of caregiving responsibility may be intuitive when the following factors are considered:

1. The degree to which the pandemic disrupted prior arrangements for caregiving (and education of school-age children) and created an immense need for flexibility, enhancing the benefit of remote work in relation to potential FIW conflicts.
2. The fact that remote work was undertaken as a whole and at the directive of the institution, rather than opted into by individuals, potentially mitigating the concerns about professional isolation and perceived relative dedication to career.
3. The presence of institutional support to provide the necessary equipment and technology to successfully transition to remote work where possible and to provide tools to allow for as immer-

sive an experience as possible for teams to work remotely. This potentially offsets some of the challenges to productivity for those involved in more interdependent work and helping to ensure a more level playing field across all faculty in terms of adequate resources.

Limitations of this study include that we used a single though large department within a single academic institution, which may not represent the perspectives of other departments or institutions. Timing of the survey also may have been a factor, since faculty may have been thinking and hoping that the pandemic would be over soon and that their home and work life would return to its pre-pandemic state. Participants more affected or concerned about the impact of COVID-related changes to the workplace may be more motivated to complete the survey, potentially resulting in an overestimation of the effect on their research, teaching, or wellness. We do not, however, expect this to bias the associations with other characteristics.

CONCLUSIONS

The COVID-19 pandemic prompted abrupt and dramatic shifts in the working lives of individuals around the world, and faculty in the Department of Medicine were no exception. One of the major changes was the swift transition to remote work for research, teaching, and some clinical work where possible. The shift to remote work had negative effects mostly on research productivity, less so on teaching productivity, and a small effect on academic wellness. This leveled impact may be explained by the complex interplay of factors contributing to the remote work experience and highlights several unique characteristics of remote work during the pandemic. Further exploration of this experience could lead to a greater understanding of ways to improve the remote work experience for faculty and enhance their research and academic productivity, while supporting career development and academic wellness. Further evaluation of the concern for effects on career growth may help us understand the concerns of the most affected groups and help address these with more targeted interventions. This knowledge would be key because of ongoing high levels of remote work and organizational planning for potential future needs.

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