

The Impact of COVID-19 on Dual-Physician Couples: A Disproportionate Burden on Women Physicians

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Abstract

Background: Currently, physicians face an unprecedented crisis with the novel coronavirus disease 2019 (COVID-19) pandemic. The impact of the pandemic on dual-physician households remains unknown. In this survey study, we examined the impact of the COVID-19 pandemic on dual-physician families and described gendered differences related to the impact of the pandemic.

Methods: This was a cross-sectional survey distributed via e-mail and social media, with results collected from April 30, 2020 until May 26, 2020. Respondents were members of a dual-physician couple. Respondents provided information on demographic characteristics and the impact of the pandemic on their professional lives, personal lives, and well-being. Categorical variables were compared using chi-squared or Fisher's exact test. Ordinal variables were compared between genders using Cochran-Armitage trend test. Feeling emotionally and physically drained compared to pre-pandemic was analyzed as a binary outcome in a multivariable logistic model.

Results: Of the 1799 physicians who completed the survey, 52% were between 30 and 39 years old, 81% self-identified as women, and 62% were white. Women were more likely to report increased worry about their job security, finances, personal health, partner's health, and children's health ($p=0.02$, $p=0.01$, $p<0.001$, $p<0.001$, and $p<0.001$, respectively). Seventy-eight percent of respondents reported feeling more drained during the pandemic. Multivariable analysis revealed that female gender (odds ratio [OR] 2.4, 95% confidence interval [CI] 1.7–3.3, $p<0.001$), and having children younger than 5 years of age (OR 1.43, 95% CI 1.05–1.95, $p=0.02$) were associated with an increased risk of feeling more drained.

Conclusions: Women were more likely to report increased worry about job security, finances, and health and had an increased risk of feeling more drained during the pandemic. While the COVID-19 pandemic is a significant stress for all physicians, women in dual-physician families were disproportionately affected, demonstrating the need for increased support from hospital administrations.

Keywords: dual-physician, couples, COVID-19, survey, physician

Introduction

ON DECEMBER 31, 2019, the World Health Organization was notified of the appearance of a mysterious pneumonia, which would eventually be attributed to the novel coronavirus disease 2019 (COVID-19). The COVID-19 pandemic subsequently swept the world, with the United States declaring a national emergency on March 13, 2020. Health care workers around the globe have reported signifi-

cant psychological burden due to the pandemic.¹ This physical and mental fatigue can be attributed to limited resources, longer shifts, and the fear of exposing loved ones to the disease, with evidence for wide transmission to family members by health care workers in China.^{1–4} These fears are especially prevalent in physicians in high-risk areas such as the intensive care unit (ICU) and emergency department (ED).⁵ Physicians have also expressed concerns about the inability to care for non-COVID-19 patients and the loss of

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personal income.⁴ The adverse psychological effects of the pandemic have been linked to physical symptoms that mimic the symptoms of COVID-19, further compounding physician stress and anxiety.⁶

Dual-physician couples (both members of the couple are practicing physicians) may be doubly impacted by the COVID-19 pandemic. A survey conducted in 2009 showed that approximately half of all physicians are married to physicians.⁷ Although dual-physician couples can mutually understand work-related pressures, these couples faced unique challenges even before the COVID-19 pandemic, often starting during the “couples match” and continuing throughout their careers.⁸ These stressors include managing two demanding careers and juggling household and childcare duties.⁹ Previous studies identified interspecialty differences in marital satisfaction¹⁰ and adverse effects on spousal satisfaction resulting from reduced time spent with physician partners and increased number of nights on call.^{11,12} Before the pandemic, women in heterosexual couples spent more time on domestic activities and childcare and fewer hours at work than men.^{10,13} As the COVID-19 pandemic is expected to continue with greater strength in the winter months, it is crucial to determine how COVID-19 is affecting dual-physician couples.

The purpose of this study was to examine the impact of COVID-19 on the work environment, home life, and overall well-being of physicians in dual-physician couples. We further examined gender differences related to the impact of the pandemic. The results of this study will inform employer interventions to enhance support for dual-physician couples during the current pandemic and future crises.

Methods

Study setting and population

This was a cross-sectional study with participants recruited using snowball sampling through social media platforms and e-mail. The Qualtrics survey platform was used to collect responses from April 30, 2020 until May 26, 2020. The survey was distributed via email to listservs within and outside of the authors' institutions and posted to Twitter, Facebook, and LinkedIn by the authors. To reach our study population of dual-physician couples impacted by COVID-19, a link to the survey was posted on specific Facebook group pages, such as Dual-Physicians Families and COVID-19 Physicians Group. The survey was completely anonymous to facilitate candid disclosure; therefore, we were unable to link the surveys of partners within the same couple. The study protocol was approved by the Institutional Review Board at Washington University in St. Louis, with consent implied by completing the survey.

Survey instrument and measures

The survey was based on a literature review and input from physicians in dual-physician couples. The survey included the following categorical sociodemographic variables for the physician and their partner: age, gender, race, ethnicity, and location. Specialty-type was classified as surgical or non-surgical. Those who selected “other” and did not specify a subspecialty were placed in the “other” category. Physicians were asked the following categorical questions about their careers and their partners' careers: practice setting (private

practice, academic, or hospital-employed); current training level (residency, fellowship, or attending); hours at work (full or part-time); current position (clinical, research, education, and/or administration); and inpatient versus outpatient practice. Physicians also were asked if they have children and/or dependents. These data were refined by asking the age and number of children and dependents.

The impact of COVID-19 on work-life was assessed. Physicians were asked the following categorical questions: working at home and clinically before and during the pandemic, caring for patients diagnosed with COVID-19, working in the ICU, working in the ED, performing aerosolizing procedures at work, and the use of telemedicine in practice.

The effects of COVID-19 on physicians' personal lives were examined through the following categorical questions: whether decontamination routines were instituted, consideration of alternative housing, and if anyone in the family was diagnosed with COVID-19. Physicians provided categorical approximations of percentage of time spent on childcare and domestic responsibilities before and during the pandemic. A standard 5-point Likert scale was used to inquire about time spent on the following activities: interacting with partner, household duties, work-related duties, and interacting with children with responses ranging from significantly decreased, decreased, neutral/no change, increased, or significantly increased.

To assess wellness, physicians answered whether they felt more emotionally and physically drained during the pandemic than pre-pandemic. A standard 5-point Likert scale was used to assess the degree of worrying about job security, finances, personal health, partner's health, and children's health with responses ranging from significantly decreased, decreased, neutral/no change, increased, or significantly increased.

Data analysis

Categorical variables were compared between the groups of interest using chi-squared or Fisher's exact test, as appropriate. Ordinal variables were compared between genders using the Cochran-Armitage trend test. An increase in feeling more physically and emotionally drained during the pandemic was analyzed as a binary outcome in a multivariate logistic model. Variables with univariate p -value <0.1 were input into the model. The final model was selected using a backward elimination process. The model fit was assessed using the Hosmer-Lemeshow test, and standard regression diagnostics were performed. All analyses were performed using R statistical software.

Results

Surveys were completed by 2109 physicians. However, 310 did not complete demographic data and were excluded from the analysis, resulting in a final sample size of 1799. Demographics are described in Table 1. The response rate for each analyzed questionnaire item was over 90%. The numbers in Table 1 exclude observations with missing values. More than half of respondents and almost half of respondents' partners were aged 30–39 years old. Women comprised 81% of respondents, and 62% were white. More than 90% of respondents and their partners were non-Hispanic. A total of 97% of respondents resided within the United States, with more than one-third living in the Midwest. Same-

TABLE 1. DEMOGRAPHICS OF SURVEY RESPONDENTS AND THEIR PARTNERS

	All respondents (n = 1799)	Partner
Age (%)		
20–29	53 (2.9)	45 (2.5)
30–39	938 (52)	836 (47)
40–49	611 (34)	676 (38)
50–59	157 (8.7)	180 (10)
>60	40 (2.2)	62 (3.4)
Male (%)	344 (19)	1448 (81)
Nonheterosexual (%)	33 (1.8)	33 (1.8)
Race (%)		
Asian	521 (29)	479 (27)
Black	24 (1.3)	25 (1.4)
White	1127 (63)	1179 (66)
Multiracial/Other	127 (7.1)	117 (6.5)
Non-Hispanic ethnicity (%)	1687 (94)	1696 (94)
Country of residence (%)		
United States ^a	1747 (97)	—
Region in United States (%)		
Midwest	591 (36)	—
Northeast	361 (22)	—
Southeast	273 (17)	—
Southwest	156 (9.4)	—
West	272 (17)	—
Specialty type (%)		
Surgical	288 (17)	336 (22)
Nonsurgical	1388 (80)	1058 (70)
Other	58 (3.3)	129 (8.5)
Practice setting (%)		
Academic center	863 (50)	742 (43)
Nonacademic center		
Hospital-employed	410 (24)	442 (26)
Private practice or other	462 (27)	546 (32)
Work setting (%)		
Inpatient	414 (25)	472 (29)
Outpatient	511 (31)	441 (27)
Combination	724 (44)	738 (45)
Position (%)		
Attending	1512 (88)	1478 (86)
Fellow	97 (5.6)	103 (6.0)
Resident	118 (6.8)	142 (8.2)
Part-time (%)	352 (20.4)	99 (5.7)
Working clinically (%)	1658 (96)	1658 (96)
Currently have children (%)	1474 (85)	—
No. of children (%)		
1	289 (17)	—
2	780 (45)	—
3	312 (18)	—
>4	85 (4.9)	—
Age of children (%)		
Younger than elementary	796 (46)	—
Elementary school	759 (44)	—
Middle school or older	344 (20)	—

^aThree percent of respondents located beyond the United States, indicated that their country of origin included Albania, Australia, Afghanistan, Mexico, Canada, the United Kingdom, Israel, Italy, Sweden, Spain, the Philippines, Norway, India, Romania, and Qatar.

sex couples comprised 1.8% of respondents. Of the 3% of respondents located beyond the United States, their country of origin included Albania, Australia, Afghanistan, Mexico, Canada, the United Kingdom, Israel, Italy, Sweden, Spain, the Philippines, Norway, India, Romania, and Qatar. Physicians in nonsurgical specialties comprised 80% of respondents and 70% of their partners.

Almost half of respondents and their partners were employed in an academic setting, and 96% of respondents and their partners worked in the clinical setting. Residents and fellows, physicians still in training, comprised 12% of the study respondents and 14% of their partners. Practice setting, specifically whether or not they are employed by an academic institution, and breakdown of physicians working in the inpatient or outpatient setting can be seen in Table 1. Eighty percent of respondents worked full-time, and 94% of their partners were employed full-time. Eighty-five percent of respondents reported having at least one child, with the children's ages stratified in Table 1.

The impact of COVID-19 at the respondents' workplaces is presented in Table 2. Less than 4% of respondents worked from home before the pandemic, whereas more than half reported working at home during the pandemic. Of those who reported that they were working clinically, 50% reported caring for patients with COVID-19, while 15% worked in the ICU, and 14% worked in the ED. Men were more likely to care for COVID-19 patients ($p < 0.001$), work in the ICU ($p < 0.001$), and work in the ED ($p < 0.001$) than women. Thirty-five percent of respondents reported performing aerosolizing procedures at work, and 73% reported using telemedicine more often now than before the pandemic.

The impact of COVID-19 on respondents' home lives is presented in Table 3. Approximately 90% of respondents initiated a decontamination routine. Approximately 6% of respondents reported that they or their family members had been diagnosed with COVID-19. Women were more likely to contribute a greater share of childcare and domestic responsibilities both before ($p < 0.001$) and during ($p < 0.001$) the pandemic than men in dual-physician families. Most respondents reported spending less time on work-related duties during the pandemic. A greater percentage of respondents reported that they spent more time with their partner, on household duties, and with their children during the pandemic than before the pandemic. However, women were more likely than men to report spending more time on household duties ($p < 0.001$) and with children ($p = 0.006$) during the pandemic.

The COVID-19 pandemic impact on overall physician well-being is presented in Table 4. Most physicians reported increased worry about job security, finances, personal health, partner's health, and children's health. In each of these categories, women were more likely than men to report increased worry in each of these categories ($p = 0.02$, $p = 0.01$, $p < 0.001$, $p < 0.001$, and $p < 0.001$, respectively).

Seventy-eight percent of respondents reported feeling more emotionally and physically drained during the pandemic. Multivariate analysis indicated that having middle school- to high school-aged children (odds ratio [OR] 0.52, 95% confidence interval [CI] 0.37–0.75, $p < 0.001$) was associated with reduced risk of feeling more emotionally or physically drained during the pandemic. By contrast, self-identifying as a woman (OR 2.43, 95% CI 1.71–3.35, $p < 0.001$), having children younger than 5 years of age

TABLE 2. IMPACT OF COVID-19 ON WORK LIVES OF RESPONDENTS

	Overall (n=1799)	Gender		p
		Women (n=1455)	Men (n=344)	
Working from home before pandemic	62 (3.6)	50 (3.6)	12 (3.7)	1
Working from home during pandemic	914 (53)	741 (53)	173 (54)	0.89
Working clinically during pandemic	1603 (94)	1299 (93)	304 (95)	0.43
Currently caring for COVID patients	793 (50)	606 (47)	187 (62)	<0.001
Working in ICU	241 (15)	172 (13)	69 (23)	<0.001
Working in ED	218 (14)	151 (12)	67 (22)	<0.001
Performing aerosolizing procedures	552 (35)	438 (34)	114 (38)	0.22
Using telemedicine more often during pandemic	1244 (73)	1026 (74)	218 (68)	0.06

Numbers in parentheses represent percent of total.

COVID, coronavirus disease; ED, emergency department; ICU, intensive care unit.

TABLE 3. IMPACT OF COVID-19 ON HOME LIVES OF RESPONDENTS

	Overall (n=1799)	Gender		p
		Women (n=1455)	Men (n=344)	
Implementation of decontamination routine	1469 (87)	1201 (87)	268 (85)	0.39
Consideration of alternative housing	589 (35)	477 (34)	112 (35)	0.84
Diagnosis of self or family with COVID-19	98 (5.7)	80 (5.8)	18 (5.6)	1
Prior share of childcare				<0.001
<50/50	151 (11)	54 (5.9)	97 (40)	
50/50	378 (28)	261 (24)	117 (49)	
More than 50/50	805 (60)	779 (71)	26 (11)	
Current share of childcare				<0.001
<50/50	176 (13)	76 (6.9)	100 (42)	
50/50	354 (27)	258 (24)	94 (40)	
More than 50/50	805 (60)	761 (70)	44 (18)	
Prior domestic labor share				<0.001
<50/50	169 (11)	85 (6.6)	84 (28)	
50/50	515 (32)	371 (29)	144 (48)	
More than 50/50	906 (57)	834 (65)	72 (24)	
Current domestic labor share				<0.001
<50/50	167 (11)	79 (6.1)	88 (29)	
50/50	549 (35)	397 (31)	152 (51)	
More than 50/50	873 (55)	813 (63)	60 (20)	
Time with partner				0.39
Decreased	500 (31)	416 (32)	84 (28)	
Neutral	360 (22)	283 (22)	77 (25)	
Increased	746 (47)	604 (46)	142 (47)	
Time on household duties				<0.001
Decreased	217 (14)	168 (13)	49 (16)	
Neutral	401 (25)	304 (24)	97 (32)	
Increased	971 (61)	818 (63)	153 (51)	
Time spent on work duties				0.89
Decreased	591 (37)	480 (37)	111 (37)	
Neutral	443 (28)	358 (28)	85 (28)	
Increased	555 (35)	449 (35)	106 (35)	
Time spent with children				0.006
Decreased	226 (17)	172 (16)	54 (22)	
Neutral	200 (15)	161 (15)	39 (16)	
Increased	929 (69)	778 (70)	151 (62)	

Numbers in parentheses represent percent of total.

COVID-19, coronavirus disease 2019.

TABLE 4. IMPACT OF COVID-19 ON WELL-BEING OF RESPONDENTS

	Overall (n=1799)	Gender		p
		Women (n=1455)	Men (n=344)	
Reported feeling more emotionally and physically drained than before pandemic	1248 (78)	1048 (81)	200 (67)	<0.001
Worry about job security				0.02
Decreased	94 (5.9)	74 (5.7)	20 (6.6)	
Neutral	691 (43)	542 (42)	149 (50)	
Increased	808 (51)	676 (52)	132 (44)	
Worry about finances				0.01
Decreased	45 (2.8)	33 (2.6)	12 (4.0)	
Neutral	560 (35)	439 (34)	121 (40)	
Increased	991 (62)	822 (64)	169 (56)	
Worry about own health				<0.001
Decreased	12 (0.8)	7 (0.5)	5 (1.7)	
Neutral	257 (16)	187 (15)	70 (23)	
Increased	1322 (83)	1098 (85)	224 (75)	
Worry about partner's health				<0.001
Decreased	9 (0.6)	6 (0.5)	3 (1.0)	
Neutral	196 (12)	136 (11)	60 (20)	
Increased	1392 (87)	1152 (89)	240 (79)	
Worry about children's health				<0.001
Decreased	16 (1.2)	13 (1.2)	3 (1.2)	
Neutral	327 (24)	244 (22)	83 (34)	
Increased	1023 (75)	863 (77)	160 (65)	

Numbers in parentheses represent percent of total.

(OR 1.43, 95% CI 1.05–1.95, $p=0.02$), working in a non-academic setting (OR 1.36, 95% CI 1.02–1.81, $p=0.03$), caring for COVID-19 patients (OR 1.77, 95% CI 1.33–2.37, $p<0.0001$), and increased work responsibilities (OR 4.29, 95% CI 3.00–6.27, $p<0.0001$) were associated with an increased risk of feeling more emotionally or physically drained during the pandemic.

Discussion

Two principal findings emerged from our survey on the impact of COVID-19 on dual-physician couples. (1) Women were more likely to report increased worry about job security, finances, personal health, partner's health, and children's health. Women spent more time on household duties and childcare during the pandemic. (2) Most respondents (78%) reported feeling more emotionally and physically drained during the pandemic. Multivariate analysis identified higher risk of feeling more emotionally and physically drained for women with children younger than 5 years old and with increased work responsibilities. By contrast, having middle school- to high school-aged children was a protective variable.

Women faced inequities in medicine before the pandemic, including lower salaries, limited availability of mentorship, less research funding, underrepresentation in awards, and lack of flexibility in work schedules.^{14–16} Female physicians spend more time on domestic responsibilities than their partners, which correlates with higher career dissatisfaction.¹⁷ Women in academic medicine spend substantially more time on household duties than their male colleagues and are more likely to be the primary caregiver for their

children.¹⁸ Women physicians have been shown to experience burnout at higher rates than their male colleagues.^{19,20} Our findings indicate that the pandemic increased the reported domestic demands on female physicians while both genders were equally likely to report a decreased amount of time spent on work. The number of first-author article submissions to journals from female physicians disproportionately decreased during the pandemic compared to those from male physicians.²¹ Men were more likely to report spending more time in the ICU, ED, and in COVID-related care, possibly accounting for some of the gender-related discrepancies in household duties. However, the combined data indicate that this is a persistent gap between women and men, which existed before the pandemic. Therefore, it is crucial for institutions to implement prepandemic suggestions made by women-led advocacy groups, including the implementation of policies supporting gender equity, backup child care, lactation support, and schedule flexibility.²²

Variables associated with higher risk of feeling physically and emotionally drained included female gender, having young children, and greater work responsibilities. Having middle school- to high school-aged children was protective against feeling more drained, which could be explained by the independence of older children who require less parental supervision. Women physicians with young children experienced significant stressors related to school and childcare facility closures. Attempting to balance work stressors with household responsibilities became a constant source of uncertainty as the pandemic resulted in many abrupt changes to an already precarious situation. A study by the Brookings Institution modeling school closures nationwide found that an estimated 6%–19% of health care workforce hours would

be lost due to increased home childcare responsibilities.²³ A shift in work responsibilities was evident in health care workers across the board. Although some specialties had decreased clinical duties, many frontline specialties had significantly increased work demands. Many physicians had increased work responsibilities by way of newly formed committees addressing COVID-19 policies and procedures, working more hours without a commiserate change in compensation, or even pay cuts.

A major limitation of this study was sampling bias. As the study was distributed to social media groups focused on COVID-19, the sample was biased toward physicians who were actively involved in social media discussions related to COVID-19. This could explain the large number of physicians from nonsurgical specialties who responded to the survey.²⁴ However, because some hospitals were so overwhelmed that physicians from surgical specialties were diverted to roles outside the operating room, we included all physicians in our sample.²⁵ As more than 90% of respondents were from the United States, our results may not be applicable to the global physician population. As the pandemic continues, further investigations to evaluate the impact on the physician workforce worldwide are necessary. The study also included a greater percentage of white, Asian, and women respondents compared to national data from 2018.^{26,27} Although we know the data representing the physician workforce in America, the demographics of dual-physician couples nationally are unknown, and further larger survey studies are warranted to investigate these statistics. Surveys distributed through social media typically attract a greater proportion of women and younger respondents.^{24,28,29} Academic clinicians are overrepresented in this study population, accounting for 50% of respondents. However, even though approximately one in eight physicians in the United States is associated with an academic center, medical faculty have an influential role in the lives of other doctors.³⁰

The surveys were anonymous, which precluded linking the answers of partners. Physicians were asked about feeling more emotionally and physically drained pre- and during the pandemic as a surrogate for well-being. Given the limitations of a single survey question, further studies are warranted using validated survey instruments to provide further insight into the impact of the pandemic on well-being of dual-physician couples. The COVID-19 pandemic continues, and stresses on physicians may increase or decrease as we learn more about the novel disease.

Conclusions

In summary, our study demonstrates that women physicians have a disproportionate level of worry regarding job security, finances and health, spent more time on household and childcare duties, and had increasing levels of being mentally and physically drained, especially if they had young children when compared to male physicians in dual-physician families. As institutions create policies to support physicians and other providers during the pandemic, it is paramount to consider the domestic stressors on dual-physician couples. Institutions will need to develop strategies to support dual-physician couples as they try to balance remote work expectations and domestic responsibilities. Financial or childcare support provided by the institution for dual-physician couples

should be strongly considered to mitigate these stressors. Long-term effects of this pandemic on women in medicine could widen gender disparities unless these factors are taken into consideration. Institutional support could reduce gender-related discrepancies and significantly improve wellness.

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