#Pop Health Lab

Research protocol

Primary Care Physician eHealth profile and burnout: an international cross sectional study

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IMPRESSUM

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Background

Digital health, or eHealth, encompasses various technologies such as mobile health (mHealth), health information technology, wearable devices, telehealth, and telemedicine, fundamentally transforming medical practice [1]. It holds promise for improving management of chronic conditions like diabetes [2] or cardiovascular diseases [3], and enhancing patient well-being [4]. Digital health also enables patient-centered health services through communication technologies [5,6], which are increasingly important amid the growing burden of chronic diseases in aging populations [7]. Despite its promises, the adoption of digital health faces significant challenges at both individual and systemic levels. Physicians often worry about disruptions to patient relationships and insufficient evidence on the benefits and risks of digital tools [8]. Moreover, disparities in access across countries further complicate the equitable adoption of digital healthcare [9].

The Unified Theory of Acceptance and Use of Technology (UTAUT) framework offers a lens through which to examine these barriers. UTAUT identifies four main factors—performance expectancy, effort expectancy, social influence, and facilitating conditions—that determine whether individuals adopt or resist new technologies [10,11]. For instance, concerns about the effectiveness of digital tools may lower performance expectancy, reducing motivation for adoption. Additionally, eHealth technologies can increase administrative burden and workload [12], directly affecting effort expectancy, as physicians may perceive the use of these tools as demanding or time-consuming. These dynamics could help understanding why digital health tools, despite their potential, are not universally adopted by healthcare professionals.

Badly designed eHealth tools or insufficient integration of digital health into standard workflows“ can add to workplace stress, ultimately contributing to burnout. Burnout is defined as “a syndrome […] resulting from chronic workplace stress that has not been successfully managed” [13], and it is highly prevalent among physicians [14]. It correlates with reduced care quality, empathy, and increased clinical errors [16]. The growing administrative burden associated with electronic health records, is a recognized contributor to burnout [17]. However, digital health could also act as a facilitating condition, due to its ability to alleviate some of these burdens, potentially giving physicians more time for clinical activities and patient interaction. Understanding the link between primary care physician burnout and digital health adoption is important, as they play a pivotal role in the wider uptake of eHealth technologies by patients.

Our study will apply the UTAUT framework to explore these dynamics and their association with burnout. Using data from a large survey of primary care physicians across 10 OECD countries, we will first describe their use of eHealth through a digital health score, and their self-assessment of burnout. Next, we will provide a ranking of digital health scores and burnout levels by country. Finally, we will analyze the association between eHealth use and burnout to better understand its role as either a barrier or facilitator to the adoption of digital health in clinical practice.

Methods

Study design
We will conduct a secondary analysis of the 2022 International Health Policy (IHP) Survey of the Commonwealth Fund (CWF), whose methodology has been described elsewhere [20]. The CWF is a non-profit foundation in the USA that has been conducting IHP surveys since 1998 to compare the health system performances in USA and several other high-income countries. Three target groups are surveyed every three years: the resident population aged 18 years and over, the resident population aged 65 years and over, and primary care physicians [21].

In 2022, the IHP survey of primary care physicians, on which our analysis is based, was conducted in 10 OECD countries (Australia, Canada, France, Germany, the Netherlands, New Zealand, Sweden, Switzerland, the United Kingdom, and the United States of America). Ethical approval was obtained to conduct the IHP of the CWF and no additional steps were required for secondary analysis of IHP survey data.

Target and study populations
For this analysis, we will use data from all participants of the 2022 IHP survey. The target populations are primary care physicians not working in hospitals in the surveyed countries. In several countries included in this survey, primary care physicians treat children and adults. In the other countries, pediatricians were also invited to participate.

The CWF partnered with various statistics companies to identify the target population (i.e. all potentially eligible physicians) and obtained a random sample from this group to send the questionnaire. However, the exact number of physicians screened for the study was not specified for some countries.

The targeted study populations, random sample, valid sample, and number of participants per country are shown in **Table 1**. Of all physicians screened for participation, 9526 completed the questionnaire and constituted our study sample **(Figure 1)**, with participation ranging from 4.3 % to 39.1% across countries. As some regional associations in Germany did not provide any details of their sample management, their detailed participation process cannot be described. The characteristics of the 9526 participants are shown in **Table 2**.

Data collection and measurement
Between February and September 2022, physicians completed an online, mail, postal, or phone questionnaire about their personal and workplace characteristics, their personal satisfaction, their burnout symptoms, and their use of digital health. The questionnaire was designed by the CWF and data collection in the 10 countries was performed by various statistics companies in collaboration with local health agencies.

For our analysis, we will use the following physician and workplace characteristics: country, age, gender, degree of urbanization of the practice location, weekly working hours, number of patients seen per week, and number of full-time equivalents in the practice.

Physicians' digital health use will be assessed by computing a score based on responses to 10 questions about teleconsultation, use of connected health tools, electronic patient records, and various online services for patients. **Table 3** shows the items on which the digital health score will be based, by assigning a value of 0 or 1 to each response, and by adding up these values to get a score ranging from 0 to 10. The higher the digital health score, the higher the physicians' use and involvement in digital health. The score will be created based on background knowledge and authors' expertise because we have not found any previous score to assess physicians' digital health use based on the IHP data.

The evaluation of physician burnout will be based on a single categorical self-assessment question, as shown in **Table 4**. Furthermore, since electronic health records place a significant burden on administrative tasks, leading to longer working hours and disruptions to work-life balance, we will also assess several burnout-related variables such as perceived stress, satisfaction with daily workload, time spent on administrative tasks, and overall satisfaction with work-life balance.

Statistical analysis
For the first aim of this study, we will present descriptive statistics on the characteristics, digital health use, and burnout-related outcomes of primary care physicians. Categorical variables will be displayed as numbers and percentages.

For the second aim, we will conduct stratified analyses to assess cross-country differences in digital health scores and burnout levels

For the third aim, we will use linear regression analyses to examine the association between the digital health score and both the burnout self-assessment and burnout-related outcomes.

Open science
Data are publicly available by contacting the CWF or local health agencies of the participating countries. The code used to perform the analyses of this study can be shared upon request. Statistical analyses will be performed using Stata 17 software (Stata Corp, TX, 2021) without using specific packages.

Expected results and implications

We expect substantial cross-country differences in the use of digital health, represented by the digital health score.

We expect a relatively high prevalence of burnout symptoms, high levels of perceived stress, and an overall dissatisfaction with the workload, the administrative work, and the work-life balance, with substantial cross-country differences.

We do not expect burnout to be directly associated with digital health use.

The implications of this study will focus on understanding the differences in digital health adoption and physician burnout across countries. By examining these variations, we will identify whether a relationship exists between the use of digital health technologies and levels of physician burnout. These insights can inform the development of targeted strategies to support healthcare professionals in managing stress and workload, considering the unique healthcare environments in each country.

Funding

The Commonwealth Fund is primarily funded through an endowment made of financial assets and investments. Additionally, it may receive contributions and grants from philanthropic organizations, government agencies, and individual donors who support its mission to improve healthcare access and quality.

For “The Commonwealth Fund’s 2022 International Health Policy Survey of Primary Care Physicians in 10 Countries”, the core funding was from the Commonwealth Fund. There were co-funding or technical assistance from the following organizations:

- The Australian Institute of Health and Welfare
- The Canadian Institute for Health Information ; Commissaire à la santé et au bien-être du Québec ; Ministère de la Santé et des Services sociaux
- French La Haute Autorité de Santé ; the Caisse Nationale d'Assurance Maladie des Travailleurs Salariés
- German Ministry of Health and IGES Institut GmbH
- The Dutch Ministry of Health, Welfare and Sport
- The Royal New Zealand College of General Practitioners
- The Swedish Agency for Health and Care Services Analysis (Vård- och omsorgsanalys)
- The Swiss Federal Office of Public Health
- The Health Foundation.

There is no specific funding for this study.

Tables and figures

Table 1: Target population, random sample, physicians invited to participate, participants, and participation rate by country. Some values were not available (*NA*).

Country	Target population[1]	Random sample[2]	Non-deliverables and ineligibles[3]	Physicians invited to participate[4]	Participants[5]	Participation rate[6]
Australia	25000	3502	492	3010	321	10,7%
Canada	90000	6478	12	6466	1459	22,6%
France	68196	12650	487	12163	530	4,3%
Germany	26396	*NA*	*NA*	*NA*	947	*NA*
The Netherlands	4800	1600	20	1580	617	39,1%
New Zealand	*NA*	3936	17	3919	377	9,6%
Sweden	*NA*	6000	15	5985	2092	35,0%
Switzerland	8354	4000	59	3941	1114	28,3%
United Kingdom	72722	4606	20	4586	1010	22,0%
United States	350000	5852	53	5799	1059	18,3%

1: (approximate) number of potentially eligible physicians per country.
2: random sample from the study population provided by local health agencies.
3: participants excluded from the random sample.
4: valid sample after exclusion of non-deliverables and ineligibles.
5: sample who completed the questionnaire.
6: participants divided by the valid sample.

Table 2: Characteristics of primary care physicians and practice care settings (N = 9526).

Characteristics		N (%)
Country	Australia	321 (3)
	Canada	1459 (15)
	France	530 (6)
	Germany	947 (10)
	Netherlands	617 (6)
	New Zealand	377 (4)
	Sweden	2092 (22)
	Switzerland	1114 (12)
	United Kingdom	1010 (11)
	United States	1059 (11)
Age [year]	Under 35	1041 (11)
	35-44	2755 (29)
	45-54	2330 (24)
	55-64	2287 (24)
	65 or older	1097 (12)
Gender	Women	4573 (48)
	Men	4910 (52)
	Other	11 (<1)
Community type	Urban	4065 (43)
	Intermediate	3525 (37)
	Rural	1901 (20)
Weekly working hours	Less than 35	2188 (23)
	35-44	2654 (28)
	45 or more	4500 (47)
Number of patients seen per week	Less than 70	3771 (40)
	70-119	2721 (29)
	120 or more	2712 (28)
Number of patients seen per hour	Less than 2	4519 (47)
	2-4	3521 (37)
	4 or more	954 (10)
Number of full-time equivalents in the office	Less than 2	2191 (23)
	2 to 3	1392 (15)
	3 to 6	2923 (31)
	6 or more	2681 (28)

Table 3: Digital health score items of primary care physicians (N = 9526).

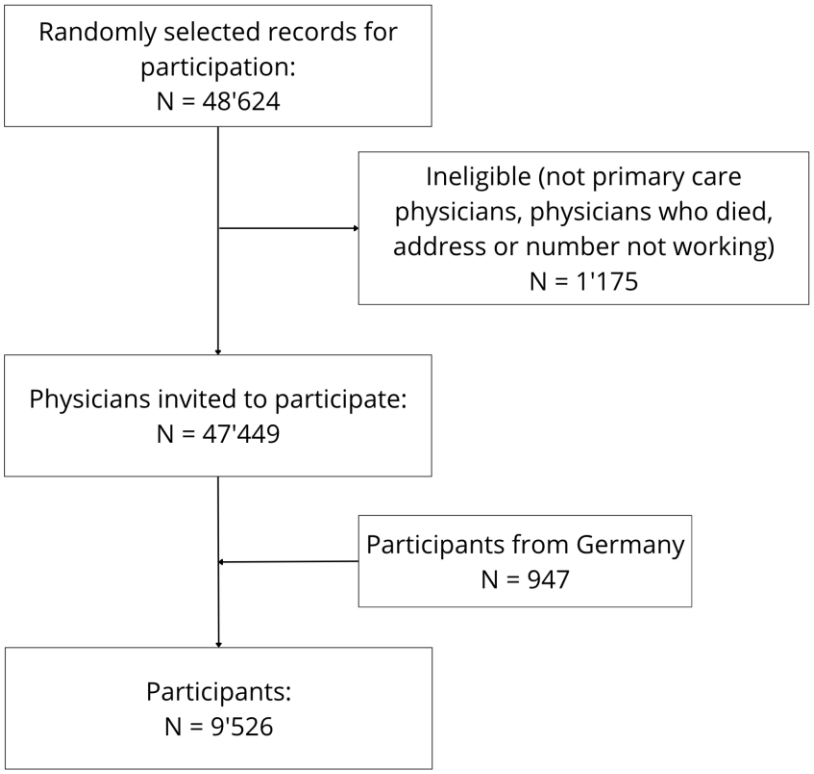
Digital health use		Score*	N (%)
Percentage of consultations by video	5% or more	1	2325 (24)
	Less than 5%	0	7079 (74)
Use of connected health tools to monitor the health of patients with chronic diseases	25% or more	1	3529 (37)
	Less than 25%	0	5796 (61)
Use of electronic patient medical records	Yes	1	8812 (93)
	No	0	680 (7)
Possibility to communicate electronically patient clinical summaries	Yes	1	5947 (62)
	No	0	3286 (35)
Possibility to communicate electronically diagnostic and laboratory tests	Yes	1	6560 (69)
	No	0	2690 (28)
Possibility to communicate electronically list of medications	Yes	1	6109 (64)
	No	0	3089 (32)
Practice allowing e-mail or web communications with patients	Yes	1	7216 (76)
	No	0	2181 (23)
Practice allowing online appointment taking with patients	Yes	1	4854 (51)
	No	0	4367 (46)
Practice allowing online medical prescriptions renewal	Yes	1	5691 (60)
	No	0	3728 (39)
Practice allowing online lab results acknowledgement by patients	Yes	1	5424 (57)
	No	0	3885 (41)

* Values used to build the score. We summed all variables to obtain a score ranging from 0 to 10.

Table 4: Primary care physician burnout self-assessment and burnout-related outcomes (N = 9526).

Burnout self-assessment and burnout-related outcomes		N (%)
Overall, based on your definition of burnout, how would you rate your current level of burnout?	I enjoy my work. I have no symptoms of burnout.	1286 (14)
	Occasionally I am under stress, and I don't always have as much energy as I once did, but I don't feel burned out.	4807 (50)
	I am definitely burning out and have one or more symptoms of burnout, such as physical and emotional exhaustion.	2193 (23)
	The symptoms of burnout that I'm experiencing won't go away. I think about frustration at work a lot.	736 (8)
	I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes or may need to seek some sort of help.	439 (5)
How stressful is your job?	Extremely stressful	1927 (20)
	Very stressful	3666 (38)
	Somewhat stressful	3228 (34)
	Not too stressful	553 (6)
	Not stressful at all	81 (1)
Satisfaction with daily workload	Extremely satisfied	123 (1)
	Very satisfied	1030 (11)
	Moderately satisfied	2943 (31)
	Slightly satisfied	2875 (30)
	Not at all satisfied	2518 (26)
Satisfaction with time spent on administrative work	Extremely satisfied	92 (1)
	Very satisfied	319 (3)
	Moderately satisfied	1431 (15)
	Slightly satisfied	2890 (30)
	Not at all satisfied	4754 (50)
Satisfaction with work-life balance	Extremely satisfied	302 (3)
	Very satisfied	1400 (15)
	Moderately satisfied	3339 (35)
	Slightly satisfied	2604 (27)
	Not at all satisfied	1830 (19)

Figure 1: Flow chart of the participants (N = 9526).



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