High Psychological Burden of Young Family Physicians Early in the COVID-19 Pandemic: Results from an Exploratory Survey

Hohe psychische Belastung junger Hausärzte zu Beginn der COVID-19-Pandemie: Ergebnisse aus einer explorativen Umfrage

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Background

Previous pandemics such as SARS in 2002 revealed an especially high psychological burden of frontline healthcare professionals in hospitals directly involved in the treatment of confirmed cases. As family physicians are among the first exposed to the SARS-CoV-2 virus, assessing their psychological burden and needs for support is important.

Methods

A web-based survey was distributed among family physicians of a German university teaching practice network. The questionnaire consisted of validated instruments to evaluate symptoms of psychological distress, i.e., the patient health questionnaire (PHQ-9), generalized anxiety disorder 7 (GAD-7), peritraumatic distress inventory (PDI), and insomnia severity index (ISI). Additional self-developed items addressed sociodemographic and professional characteristics including professional duties and protective equipment available. Effects between the symptoms were examined using bivariate Pearson correlation.

Results

The participation rate was 31 % (36 of 116) with 33 valid cases. About 47 % (n = 17) of the respondents were 56 years old or more. 66.7 % (n = 22) physicians reported moderate to severe depressive symptoms (PHQ-9 ≥ 10) and 51.5 % (n = 17) moderate to severe signs of anxiety (GAD-7 ≥ 10). Physicians with depressive symptoms showed more signs of anxiety (p < .001) and insomnia (p < .001). There is a negative correlation between age and severity of depressive symptoms (p = .041) and insomnia (p = .002). The regression analysis showed that younger participants were more likely to show depressive symptoms (β = –.358, p = .046), even after correcting for gender (R^2 = .402).

Conclusions

Depressive symptoms were frequent among family physicians, especially in younger physicians who were also more likely to report symptoms of insomnia. The symptoms of psychological distress are unlikely to be explained by a lack of protective equipment, because the majority had sufficient supplies.

Keywords

COVID-19; pandemic; psychological distress; family medicine; healthcare professionals

Hintergrund

Frühere Pandemien, wie die SARS-Pandemie 2002, zeigten eine besonders hohe psychische Belastung bei Krankenhauspersonal, das direkt an der Behandlung beteiligt war. Da Hausärzte in der ambulanten Versorgung dem SARS-CoV-2-Virus direkt ausgesetzt sind, ist es wichtig, ihre psychische Belastung und ihre Unterstützungsbedarfe zu ermitteln.

Methoden

Es wurde eine webbasierte Umfrage unter Hausärzten eines deutschen universitären Lehrpraxennetzwerks durchgeführt. Der Fragebogen bestand aus validierten Instrumenten zur Beurteilung von Symptomen psychischer Belastung, wie dem „patient health questionnaire (PHQ-9)", „generalised anxiety disorder 7 (GAD-7)", „peritraumatic distress inventory (PDI)" und dem „insomnia severity index (ISI)". Zusätzliche selbst entwickelte Fragebögen erfassten soziodemografische und berufliche Merkmale einschließlich der verfügbaren Schutzausrüstung. Effekte zwischen den Symptomen wurden mittels bivariater Pearson-Korrelation untersucht.

Ergebnisse

Die Teilnahmequote lag bei 31 % (36 von 116), mit 33 gültigen Fällen. Etwa 47 % (n = 17) der Befragten waren 56 Jahre alt oder älter. 66,7 % (n = 22) der Ärzte berichteten über mittelschwere bis schwere depressive Symptome (PHQ-9 ≥ 10) und 51,5 % (n = 17) über mittelschwere bis schwere Anzeichen von Angstzuständen (GAD-7 ≥ 10). Ärzte mit depressiven Symptomen zeigten mehr Anzeichen von Angst (p < 0,001) und Schlaflosigkeit (p < 0,001). Es besteht eine negative Korrelation zwischen Alter und Schweregrad der depressiven Symptome (p = 0,041) und Schlaflosigkeit (p = 0,002). Die Regressionsanalyse zeigte, dass jüngere Teilnehmer eher depressive Symptome aufwiesen (β = –0,358, p = 0,046), auch nach Korrektur für das Geschlecht (R^2 = 0,402).

Schlussfolgerungen

Depressive Symptome waren häufig, insbesondere bei jüngeren Ärzten, die auch häufiger über Schlaflosigkeit berichteten. Es ist unwahrscheinlich, dass die psychische Belastung durch einen Mangel an Schutzausrüstung erklärt werden kann, da die Mehrheit der Hausärzte über eine ausreichende Versorgung verfügte.

Schlüsselwörter

COVID-19; Pandemie; psychische Belastung; Allgemeinmedizin; medizinisches Personal

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Background

Since the first occurrence of the Sars-CoV-2 virus in China at the end of 2019, the virus has rapidly spread all over the world. As the prevalence of infections increases worldwide, the fear of disease combined with restrictions such as lock-downs, impose a serious psychological strain to affected populations [1, 2], vulnerable groups with pre-existing psychological disorders [3] and frontline healthcare professionals [4]. Early studies from China indicate that physicians and nurses directly involved in the treatment of suspected and confirmed COVID-19 cases had increased signs of psychological distress such as anxiety, depression, and insomnia [5].

Previous pandemics and epidemics such as SARS in 2002 have shown similar impacts on healthcare professionals confronted with critically ill patients. Therefore, questionnaires were introduced to assess their mental stress as well as their need for self-protection and support. During the H1N1 pandemic in 2009, Imai et al. showed that support measures by the government and employer were key factors for healthcare professionals to feel more secure and motivated at work [6].

Current estimates show that seven of eight/three of four COVID-patients are treated in primary care/ambulatory. Especially in times of a pandemic, family physicians are challenged to treat infected outpatients and to maintain regular primary care simultaneously [7]. Consequently, they are among the first healthcare professionals exposed to a potential infection and potential harm [8]. Previous questionnaire surveys on the mental health status of frontline healthcare professionals merely focused on hospital staff. During the current pandemic, Amerio et al. already showed that almost one quarter (n = 30) of the Italian family physicians surveyed showed moderate to severe symptoms of depression, underlying the need for further investigations regarding this exposed population [9]. This exploratory study aimed at evaluating psychological distress of German family physicians early, namely three months into the COVID-19 pandemic.

Methods

Using a cross-sectional, anonymous, web-based questionnaire survey, our aim was to evaluate the psychological distress of family physicians and assess their needs for psychological support in order to respond adequately to the COVID-19 pandemic.

Sampling

The questionnaire was distributed via e-mail among 116 family physicians affiliated with the University Hospital Bonn as teaching practices in May 2020. A reminder was sent after two weeks. The study was approved by the Ethics' Committee of the Medical Faculty of the University of Bonn, Germany (140/20, 09.04.2020). Respondents gave their informed consent by checking a box before accessing the survey.

Questionnaire

The questionnaire was composed by the Institute of General Practice and Family Medicine and the Department for Neurodegenerative Diseases and Geriatric Psychiatry of the University Hospital Bonn. It comprised 80 single choice, three multiple choice and two open questions:

- Symptoms of depression were assessed using the 9-item patient health questionnaire (PHQ-9), ranging on a four-point Likert-scale (0 = not at all to 3 = almost every day) [10].
- Symptoms of anxiety were assessed using the 7-item generalized anxiety disorder questionnaire (GAD-7), ranging on a four-point Likert-scale (0 = not at all to 3 = almost every day) [11].
- Symptoms of peritraumatic distress were assessed using the 13-item peritraumatic distress inventory (PDI), ranging on a five-point Likert-scale (0 = not correct to 4 = completely correct) [12].
- Symptoms of insomnia were assessed using the 7-item insomnia severity index (ISI), ranging on a five-point Likert-scale (0 = not at all to 4 = very severe) [13].
- Professional duties, exposure to COVID cases and protective strategies were requested in a modified version of a published questionnaire by Imai et al. (2010), which is categorized into the main groups "fear of risk of infection", "protective measures", "level of information", "working conditions", "individual effects", "isolation" and "private stress factors". The answer options ranged on a four-point Likert-scale (0 = not correct to 4 = completely correct) [6].
- Open questions: At the moment, what worries you most about the COVID-19 pandemic at your workplace?; What kind of support would you like to receive to help you cope better at your workplace during the COVID-19 pandemic?

Additionally, socio-demographic data, information on professional duties, personal protection equipment (PPE), work-related contact to confirmed, and suspected COVID-19 patients as well as prior individual testing(s) for the Sars-CoV2-Virus were requested.

Data analysis

Frequencies and percentages were calculated for all socio-demographic, professional and workplace characteristics. Percentages and mean values are reported for valid cases. The different scales addressing mental health were analyzed using the standard approach for each scale:

- PHQ-9: Sum scores were calculated and the severity of depressive symptoms was categorized into normal (0–4), mild (5–9), moderate (10–14), moderate/severe (15–19), and severe (20–27) [10]. A dichotomous variable was computed with a cut-off at 10.
- GAD-7: Sum scores were calculated and the severity of anxiety was categorized into normal (0–4), mild (5–9), moderate (10–14), and severe (15–21) [11]. A dichotomous variable was computed with a cut-off set at 10.
- PDI: Sum scores were calculated and the severity of peritraumatic distress was categorized into no symptoms of peritraumatic distress (0–26) and symptoms of peritraumatic distress (27–52) [12].
- ISI: Sum scores were calculated and the severity of insomnia was categorized into normal (0–7), subthreshold (8–14), moderate (15–21), and severe (22–28) [13].

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- Professional duties, exposure to COVID cases and protective strategies: Higher mean values indicate greater fear of infection, greater perception of security, high level of information, better working conditions, a stronger work ethic, an increased social isolation and a higher burden in private life. Mean values ranged from 0 to 4.
- Content analysis of answers to open questions: Categories were categorized through an inductive content analysis independently by two researchers (LK, NA) with subsequent comparison. Differences were solved by discussion amongst the researchers.

Effects between the results of the scales and demographic data (gender, age, years of professional experience) were examined using bivariate Pearson correlation. Bivariate analyses were used to investigate the association between age, years of professional experience and symptoms of psychological distress. Regression analyses were conducted for the PHQ-9 and the GAD-7, using age and gender as predictors. The statistical significance was set at $p < .05$. Statistical analyses were performed using IBM SPSS Statistics for Windows, version 24 (Armonk, NY: IBM Corp.).

Results

Thirty-six participants accessed the survey (response rate: 31 %) of which three participants were excluded from the analyses due to non-response to most questions. The final sample size consisted of 33 family physicians of which 60.6 % (n = 20) were male and 53.1 % (n = 17) were at least 56 years old. 93.9 % (n = 31) were specialized in family medicine, while 6.1 % were general internists; 97 % (n = 32) worked in a family medicine practice. The majority of the family physicians (93.9 %) lived in a partnership, had children (90.9 %) and more than 20 years of professional experience (69.7 %, n = 23) (Table 1).

Personal protective equipment and safety precautions at workplace

More than 90 % of the participants reported to have hand disinfection,

	n	%
Male	20	60.6
Age [1]		
36–45 years	5	15.6
46–55 years	10	31.3
≥ 56 years	17	53.1
Medical discipline		
Family medicine	31	93.9
Internal medicine	2	6.1
Years of professional experience		
0–10 years	2	6.0
11–20 years	8	24.2
21–30 years	11	33.3
31–40 years	12	36.4
Way to work		
On foot	4	12.1
By bicycle	4	12.1
By car	25	75.8
By public transportation	0	0
Marital status		
Single or divorced	2	6.1
Married or living in a relationship	31	93.9
≥ 1 child	30	90.9
≥ 1 additional person in household	30	90.9
Workplace characteristics	**n**	**%**
Personal protective measures at workplace [2]		
Hand desinfection	30	96.8
Disposable gloves	30	96.8
Surgical face mask	28	90.3
FFP2 or FFP3 mask	30	96.8
Disposable protective gown	28	90.3
Protective goggles	26	83.9
Selfmade face masks	14	45.2
Other safety precautions at workplace [2]		
Screening by phone to identify suspected cases before entering the practice	29	93.5
Information signs for patients at the entrance	30	96.8
Protective glass at the reception	27	87.1
Chip card reader is operated by patients	16	51.6
Decreased waiting periods for patients	30	96.8
Prescriptions send by post	29	93.5
Increased patient treatment via phone	27	87.1
Increased patient treatment via video call	10	32.3
Separated treatment facilities for suspected cases	23	74.2
Regular team meetings on the current situation	27	87.1
Suspected cases are only seen by selected personal (e.g., doctor)	23	74.2
Hospital and practice admissions of suspected cases are clearly communicated	26	83.9

Table 1 Socio-demographic and workplace characteristics (including protective measures) of participating family physicians (N = 33)

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		n	%
Depression (PHQ-9)			
Normal (0–4)		0	0
Mild (5–9)		11	33.3
Moderate (10–14)		18	54.5
Moderate/Severe (15–19)		3	9.1
Severe (20–27)		1	3
Anxiety (GAD-7)			
Normal (0–4)		0	0
Mild (5–9)		16	48.5
Moderate (10–14)		15	45.5
Severe (15–21)		2	6.1
Peritraumatic distress (PDI)			
No traumatic experiences (0–26)		32	97
Traumatic experiences (27–52)		1	3
Insomnia (ISI)			
Normal (0–7)		8	24.2
Subthreshold (8–14)		16	48.5
Moderate (15–21)		6	18.2
Severe (22–28)		3	9.1
COVID-19 related concerns		**Mean**	**SD**
Fear of risk of infection		1.77	0.33
Protective measures		2.83	0.41
Level of information		3.58	0.51
Working conditions		3.24	0.3
Individual effects		2,89	0.34
Isolation		1.5	0,63
Private stress factors		1.73	0.56

Table 2a Mental health characteristics of participants (N=33)

	Age	Years of professional experience	PHQ-9	GAD-7	PDI	ISI
Age	1					
Years of professional experience	.833**	1				
PHQ-9	–.377*	–.254	1			
GAD-7	–.265	–.246	.669**	1		
PDI	–.133	–.114	.358*	.599**	1	
ISI	–.484**	–.527**	.676**	.748**	.462**	1

* p ≤ 0.05; ** p ≤ 0.01

Table 2b Bivariate Pearson correlations

disposable gloves, surgical facemasks, FFP2 or FFP3 masks and disposable protective gowns available at their workplace. Protective goggles were available for at least 83.9 % (n = 26). Safety precautions to minimize the risk of infection at the practice included in over 90 % telephone screenings for suspected cases, patient information signs at the entrance, decreased waiting times and prescriptions send by post to reduce the patient flow. 87.1 % of the family physicians reported to give treatment advices to patients via phone compared to 32.3 % via video call. In 74.2 % suspected patients were only seen by selected personal (e.g., family physician) and/or were treated in separated rooms. A quarter of family physicians lacked the opportunity for separated treatment facilities (Table 1).

Mental health

All participants showed at least mild symptoms of depression or anxiety. Two thirds (66.6 %, n = 22) reported moderate to severe depressive symptoms (PHQ-9 ≥ 10) and 51.6 % (n = 17) moderate to severe signs of anxiety (GAD-7 ≥ 10). 27.3 % (n = 9) were suffering from moderate to severe symptoms of insomnia (ISI ≥ 15), while only one participant reported experiences of peritraumatic distress. Most of the family physicians felt sufficiently informed about the pandemic and reported good working conditions. There was little fear of infection, social isolation and stress in private life. See Table 2a for details on mental health characteristics.

Family physicians with more depressive symptoms showed more signs of anxiety (p < .001) and insomnia (p < .001). There is a negative correlation between the age of family physicians and the severity of depressive symptoms (p = .041) as well as insomnia (p = .002) (Table 2b).

When including age and gender in a linear regression model no significant effect was found for anxiety. However, the model for depressive symptoms (R^2 = .402) showed that age had a unique effect on depressive symptoms (β = –.358, p = .046) even if correcting for gender, indicating that younger participants more often

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What worries you most about the COVID-19 pandemic at your workplace at the moment?	Example 1	Example 2
Fear of COVID-19 infections (patients, relatives and the doctor himself) (n = 13)	Risk of infection for my patients	Protection of the family
Financial burden (n = 10)	Financial losses	Patients don't come to the practice [anymore].
Infections and strain of staff (n = 5)	Permanent psychological stress for the employees	Infection of my employees or colleagues
Political mistakes and ambiguities (n = 4)	Wrong decisions regarding the pandemic	[…], political activism
Uncertainty about pandemic development (n = 3)	Duration of the pandemic, […]	That there will be a second wave of infection.
Lack of protective equipment (n = 2)	Lack of protective equipment (protective gowns), […]	Lack of protective clothing, […]
What types of support would you like to receive to help you cope better at your workplace during the COVID-19 pandemic?	**Example 1**	**Example 2**
Financial support (n = 10)	Hedging financial risks	Financial aid
Clear instructions and information on how to deal with the pandemic (n = 10)	Better communication between the public health department and the family physicians	Develop emergency plan logistics for the next pandemic
More protective equipment (n = 7)	More protective equipment from the public health department, I have very few FFP2 masks and protective gowns.	Sufficient availability and application of personal protective measures
No need for support (n = 6)	None at the moment. At the beginning [of the pandemic] more information and protective equipment.	I get along well.
Relieve patients and staff of their fears and provide them with better information (n = 4)	To take away patients' fear of the doctor's practice	[…], information for staff
Reduction of the administrative workload (n = 2)	Reduction of administrative efforts with regard to the Association of Statutory Health Insurance Physicians and health insurance companies	Reduction of bureaucracy

Table 3 Content analysis of answers to open questions

show depressive symptoms regardless of gender.

Content analysis: Work-place worries

For the open question regarding worries at the workplace, six categories were be distinguished based on the answers. The two most frequent worries were "fear of COVID-19 infections (patients, relatives and the physician himself)" and "financial burden", which was reported by 13 and 10 participants respectively. Interestingly, physicians also voiced concern regarding potential wrong political decision-making in the pandemic.

Regarding types of support wished at the workplace, seven categories were delineated. The two most common types of preferences were "financial support" and "clear instructions and information on how to deal with the pandemic", which were reported by 10 participants each (Table 3).

Discussion

With every second family physician suffering from at least moderate symptoms of anxiety and every third reporting at least moderate symptoms of depression, the identified prevalence of both psychopathological states is alarmingly high. Regarding anxiety, comparable results (40 % of n = 531) were reported in Columbian family physician during the pandemic in March/April 2020 [14]. The high rates of depressive symptoms may be explained by the fact, that the prevalence of depression generally is relatively high in family physicians and other physicians [15]. Also, the prevalence of high chronic stress was higher in German family physicians than in the general population [16]. In our study, younger family physicians were more likely to report symptoms of depression and insomnia. A study in April/May 2020 among 2049 Italian physicians reported that 75 % and 37 % suffer from anxiety (assessed using the State-Trait Anxiety Inventory-Form Y1) or depressive symptoms (assessed using the Beck Depression Inventory) respectively. Similar to our findings, these psychopathological symptoms were more frequently

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reported in younger, female family physicians with less professional experience [17]. To our knowledge, there are no prior studies in German family physicians using the same study instruments, therefore direct comparison to times before the COVID-19 pandemic is not available. Yet, a significantly higher prevalence of burnout symptoms was shown in a 2016 survey in younger employed physicians compared to practice owners in German family practice (20.8 % versus 6.8 %, p = .037) [18]. Similarly, the same survey showed a higher prevalence for chronic stress among younger physicians [18]. Regarding age, one of the reasons may be that older family physicians have already experienced former pandemics like the H1N1 pandemic in 2009 and therefore showed fewer signs of psychological distress.

The content analysis of the answers to the open questions showed that some of the main concerns of family physicians were financial burden, sufficient PPE supplies and clear instructions and information on how to deal with the pandemic by the government and local public health departments.

Physicians' answers in the category "financial burden" indicated that patients were more afraid to see their doctor at the practice, most likely because of fear of infection. The accompanying economic burden for the family physicians (who are predominantly self-employed in the German health care system) might explain this concern of the participants.

We did not identify an association between the availability of important PPE and the symptoms of psychological distress, as 90 % of the family physicians had sufficient PPE. The answers in the category "more protective equipment" contrast the aforementioned reported sufficiency of PPE by most of the family physicians. The most common mentioned PPE needed were FFP2 and FFP3 masks, showing that family physicians might be worried about an insufficient supply of these important protective measures during the course of the pandemic.

The answers in the category "clear instructions and information on how

to deal with the pandemic" are indicating that family physicians wish a better communication with the public health departments in order to cope better with COVID-19 cases. There seems to be a demand for well-structured pandemic plans provided by the government to tackle the actual and future pandemics adequately. The Colombian study showed that family physicians who feel protected by the government have 43 % less symptoms of anxiety [14]. Based on the experiences from the H1N1 pandemic and the EHEC outbreak in Germany in 2011, Eisele et al. emphasized five key areas to improve the si-

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tuation of family physicians during a pandemic/epidemic, i.e. "provision of information for family physicians, workload, financing of epidemic-related measures, organization of the practices, care of those taken ill" [19]. Furthermore, it became clear from the different answers in the category "fear of COVID-19 infections" that the worry about patients and relatives outweighed the worry for oneself. The fact that already one third of the family physicians offer video consultations indicates a tendency towards an expanding telemedical infrastructure in German primary care. In

three quarters of the practices, suspected patients were only treated by selected personal and/or in separated rooms, which has to be regarded as an important attempt to prevent a chain of infection among practice staff and patients.

Strengths and limitations
To our knowledge, this explorative study was the earliest mental health survey among German family physicians since the beginning of the COVID-19 pandemic. A participation bias might apply as participants with a higher psychological burden might have been more likely to participate. The small study population and the regional focus on Bonn are limiting factors concerning generalizability, although 7-day incidences of COVID cases in the Bonn region were comparable to the North-Rhine Westphalian region and Germany in total (see eSupplement). The high prevalence of adverse mental symptoms indicates a need for larger studies in the physician workforce.

Conclusions
This study highlights younger family physicians as a special risk group for the development of psychological distress during the early stage of the COVID-19 pandemic in Germany. In general, prevention of psychological distress in family medicine is multifactorial and depends not only on the general organization of the practice and the availability of sufficient PPE, but also the communication between staff and leadership [20]. Further research needs to address especially the mental health of young family physicians and how to improve this as challenges of the COVID-19 pandemic are ongoing.

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for important intellectual content. ALF set up the data bank for data collection and reminder management. MS and SK contributed to data processing and the statistical analysis. AT and BW revised the manuscript for important intellectual content. KH, AS, CW and BW developed the COVID-19-Medical-Professionals-Questionnaire-Bonn and revised the manuscript for important intellectual content. All authors critically reviewed and approved the manuscript.

Additional material on the internet (www.online-zfa.de)

eSupplement 7-day incidence from May 2020 to March 2021

Competing Interests: None

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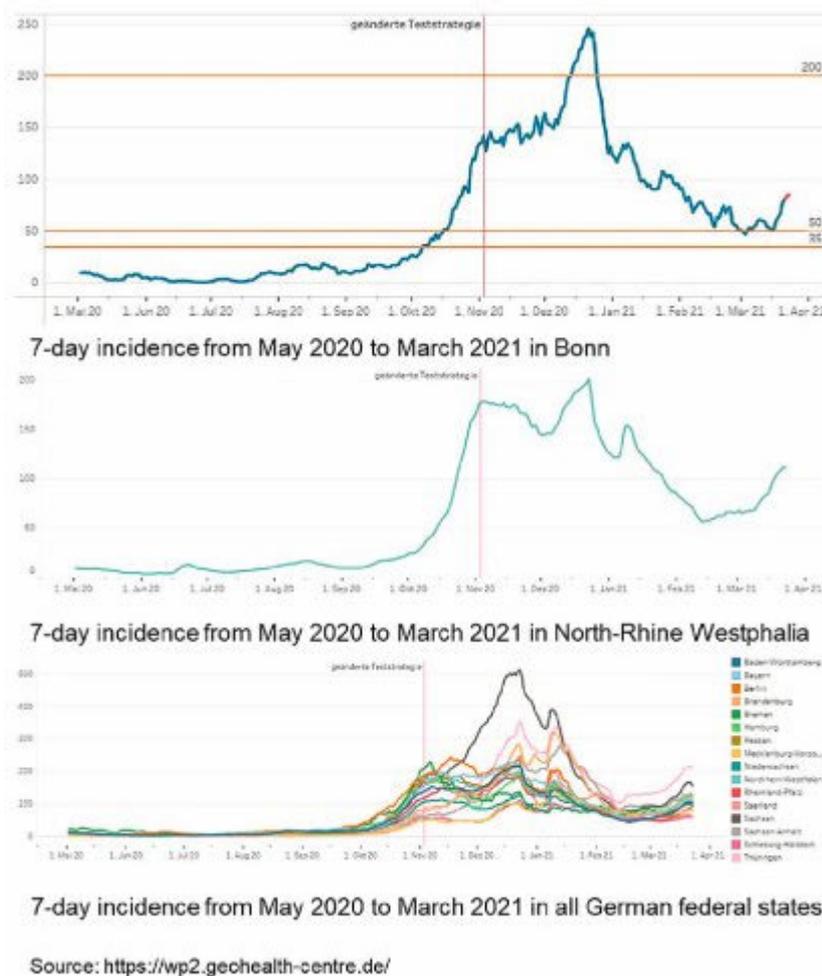

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Hohe psychische Belastung junger Hausärzte zu Beginn der COVID-19-Pandemie: Ergebnisse aus einer explorativen Umfrage

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7-day incidence from May 2020 to March 2021 in Bonn

7-day incidence from May 2020 to March 2021 in North-Rhine Westphalia

7-day incidence from May 2020 to March 2021 in all German federal states

Source: https://wp2.gechealth-centre.de/

eSupplement 7-day incidence from May 2020 to March 2021