

Family Medicine Practitioners' Stress During the COVID-19 Pandemic: A Cross-Sectional Survey.

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Abstract

Background The COVID-19 pandemic has shaken the world, but also caregiver's practices. The World Health Organization warned about the stress it could generate for General Practitioners (GPs). In France, GPs were not involved in the decision-making process for organization of care before and during the first COVID-19 wave. Our objective was to estimate the self-perception of stress at the beginning of the pandemic in France, among GPs from the Auvergne-Rhône-Alpes (AuRA), a french administrative area severely impacted by COVID-19, and to identify which factors may have modulated this perception.

Methods We conducted an online cross-sectional survey between 8th of April to 10th of May 2020. The self-perception of stress was evaluated using the 10-item Perceived Stress Score (PSS-10). An agreement score developed by the study scientific committee was measured for 31 positive assertion. Factors associated with stress were investigated using logistic regression, and triangulation based on verbatim analysis.

Results Overall, 898 individual answers were collected. A total of 437 GPs (49%) were stressed ($PSS \geq 27$), and 283 GPs (32%) had a very high level of stress ($PSS \geq 30$). Perceived stress was associated with multiple components, and involved classic psychosocial risk factors such as emotional requirements: 415 GPs (49%) were affected by patient anxiety ($OR=3.41$, $95\%CI [1.87-6.36]$, $p<0.001$). But in this context of health crisis, the main determinant of GPs' stress appears to be the diversity and quantity of information from diverse sources (614 GPs (69%, $OR=2.21$, $95\%CI [1.40-3.50]$, $p<0.001$). GPs felt isolated in a hospital-based model.

Conclusion The first COVID-19 wave was stressful for AuRA's GPs. One of the main determinants seems to be the diversity and quantity of information received from the health authorities.

Background

In December 2019, the COVID-19 (SARS-COV-2 virus) epidemic started in Wuhan, China (1). The pandemic state was declared on 11th of March 2020 by the World Health Organization (WHO), and its impact on every part of daily life means the COVID-19 pandemic is one of the most significant events of the 21th century.

In France, by August 2020, ~ 100,000 severe cases had been hospitalized and ~ 30,000 deaths had occurred. To tackle the epidemic, the French government applied a strategy which was predefined after the 2009 H1N1 epidemic, and inspired by the Chinese and Italian management of COVID-19 (2). Several phases were organized, thanks to the Operational Coordination of Epidemic and Biological Risks (COREB), which promoted exchanges between numerous specialists, though excluding General Practitioners (GPs) from the decision process (3).

The first phase aimed to slow down the introduction of the SARS-COV-2 virus on the French territory. The second one consisted of preventing the virus from spreading throughout the country. To do this, it was

decided that any patient suspected of COVID-19 would have to be admitted to referral hospitals, through a dedicated unit of the emergency medical services (Service d'Aide Médical d'Urgence, SAMU) (4).

On 14th of March 2020, 4,500 patients had been diagnosed with COVID-19, the critical care units of eastern and northern France, and the Paris area, were being overwhelmed when the French government initiated a national lockdown (5, 6). In addition to the lockdown, a decision was made to switch the management of mild cases from hospitals to primary care in family practices (7). It was during this phase that GPs officially became part of the pandemic response organization and had to urgently adapt their practices and workflow.

The unique and unpredictable nature of this pandemic urged the WHO to warn about the possible occurrence of professional stress and psychological disorders (8).

Our hypothesis is that due to the lack of initial involvement of GPs in the crisis management and decision-making, GPs were not ready to manage COVID-19 patients and might have suffered from professional stress disorders.

In this study, we are looking at the self-perception of stress, and its determinants, during the COVID-19 pandemic among GPs from Auvergne-Rhône-Alpes, an administrative area in eastern France.

Material And Methods

Study design

We conducted an online cross-sectional survey of every GP registered in the Auvergne-Rhône-Alpes region, a 7,948,287 inhabitant's administrative area of. Over the study period, ~ 10% of French COVID-19 cases and deaths occurred in this area. This is also the area in which the first clusters of cases were reported (2 months before other areas) (9). To reach GPs in this area, we used the mailing list of the regional network of medical professionals (union régionale des professionnels de santé, URPS). This mailing list included 5,344 GPs. A first email was sent on 8th of April, with a reminder on 24th of April 2020. Data collection ended on 10th of May 2020. The national lockdown was in place throughout our study period. GPs working exclusively in hospitals were not included in the survey. The others were invited to fill an online self-questionnaire.

Self-perception of stress

The self-questionnaire was devised by the scientific study committee, involving: 2 residents in family medicine, 2 infectious diseases physicians, 3 specialists in epidemiological studies including prevention of stress at work, and 1 methodologist. The self-questionnaire was tested on 12 GPs in a pilot phase to ensure the comprehension and calibration of the questions. The self-questionnaire was assessing: socio-demographic characteristics, practice and workflow before and during the COVID-19 pandemic, and Perceived Stress Score (PSS) with 10 items (PSS-10) (10). PSS-10 ranks GPs under three categories: "not

stressed" ($PSS \leq 20$), "borderline" ($21 \leq PSS \leq 26$), and "stressed" ($PSS \geq 27$) (10). We also identified and analyzed a "very stressed" ($PSS \geq 30$) category (10).

Agreement-score and verbatim

We asked GPs respondents to express their agreement with 31 positive assertions (affirmations) developed by the scientific study committee to explore the root-causes of stress. The following dimensions were explored: workload, emotional requirements, conflict of values, economic insecurity, working relationships, social reports, material resources and information (11). For each affirmation, the agreement score (AS) was rated using 10-point numeric scale ranging from one ("I do not agree at all") to ten ("I totally agree"). An $AS \geq 6/10$ was considered as "agree" while an $AS < 6/10$ was considered as "not agree".

At last, an open-ended question was left to collect any remarks from the GPs, and we invited GPs to be followed in a prospective cohort.

Data, verbatim and statistical analysis

To ensure that the sampling obtained through the mailing was representative of the GP population, we compared the sample's demographic characteristics to the real demographic characteristics of GPs available from regional URPS' data in 2020 and from the national DREES' data in 2018 (Direction de la Recherche, des Etudes, de l'Evaluation et des Statistiques). In this cross-sectional study we use Student t-test, Pearson's correlation test and Chi-squared test for univariate comparison. We explored factors associated with stress defined as a $PSS \geq 27$, using a multivariate logistic regression adjusted for gender, age as continuous value, and practice location. The variable selection was made using a backward elimination based on the Akaike criterion. The associations are represented using odds ratio (OR) with their 95% confidence interval (95%CI). The level of significance was set at 5% bilateral. Statistical analysis was performed on complete cases, using the R software version.4.0.2. (the R foundation, Vienna, Austria). We also analyzed the answers of the open-ended question after double reading by triangulation method.

Results

General practitioner population

Over the study period, we collected 1,050 GPs' responses, of whom 5 worked exclusively in the hospital, 6 were not actually in the targeted administrative area, and 141 (13%) were incomplete. Therefore, the final set used for analysis was constituted of 898 GPs' responses (17% of the 5,344 emails sent, and 86% of the initial responses).

The sample was representative of the GP population in the area, with a small gap in gender (61% of women vs. 51–54% in the control data from URPS and DRESS) and age (47 on average vs. 48 to 52 in control data). Sample characteristics are detailed in Table 1.

Table 1
General Practitioners' characteristics

Characteristics	Overall		Men		Women		P-value
	N = 898		N = 355		N = 543		
	N / Mean	(%) / SE	N / Mean	(%) / SE	N / Mean	(%) / SE	
Age	47.7	± 11.4	51.9	± 11.4	44.9	± 10.6	< 0.001
Years of practice	14.9	± 11.5	19.3	± 12.2	12.1	± 10.1	< 0.001
Number of patients per week before the pandemic	95	± 37	110	± 41	85	± 30	< 0.001
Exercise localization							
Rural	146	(16%)	68	(19%)	78	(14%)	0.040
Semi rural	349	(39%)	129	36%)	220	(41%)	0.200
Urban	409	(46%)	158	(45%)	247	(46%)	0.700
Practice	898		355		543		< 0.001
Alone	222	(25%)	108	(31%)	111	(21%)	< 0.001
In an office, with other GPs	526	(59%)	183	(52%)	340	(63%)	< 0.001
In a multidisciplinary nursing home	156	(17%)	64	(18%)	92	(17%)	0.700

Overall, the average PSS score was 26.4 (± 6.4): 169 GPs (19%) were not stressed (PSS ≤ 20), 292 (33%) borderline (21 ≤ PSS ≤ 26), and 437 (49%) stressed (PSS ≥ 27). A total of 283 GPs (32%) were very stressed (PSS ≥ 30).

Impact of the epidemic on practice

The COVID-19 epidemic and the subsequent lockdown had a huge impact on GP's practice and workflow, as 880 (98%) adapted their practice and their facilities to implement barrier measures. Issues obtaining protective equipment were reported by 531 (59%) of them. Most of GPs (741, 83%) considered had less work over the study period, Table 2.

Table 2
General Practitioners' practice before and during the pandemic

	Before the pandemic	During the pandemic*	P-value
Number of patients per week	95.1 ± 37.3	45.2 ± 28.7	< 0.001
Daily hours spent on the phone with patients	1.3 ± 1.1	2.1 ± 1.4	< 0.001
Use of teleconsultation, yes	126 (14%)	765 (86%)	< 0.001
Perform home-visits, yes	815 (91%)	646 (72%)	< 0.001
*The answers are representative of the practices in the week before answering to the self-questionnaire.			

Factors associated to stress

Over the study period, GPs didn't feel abandoned: they had someone to talk to (556, 62%), they were supported by their family and friends (617, 69%), and very few had the willingness to withdraw from practice (46 in total, 7%).

Women were twice as stressed as men (OR = 1.88, 95%CI [1.31–2.72], $p < 0.001$). Other stressors included: making difficult decisions, being affected by patient anxiety and being overwhelmed by information. Feeling alone, heavy workload and the feeling that work time impacted on personal life, were also stressors, but concerned a minor proportion of GPs. Factors associated with lesser stress were: being in line with the job, feeling useful, having trust in the future and forgetting work at home. Associations are detailed in Table 3.

Table 3
Factors associated to a stress (PSS \geq 27) among GPs, multivariate analysis

Adjustment variables *	N	PSS* <27	PSS* \geq 27	Adjusted OR	95% Confidence Interval	P- value
Demographics	879 (100%)	455 (51.8%)	424 (48.2%)			
Age (per year increase), Mean (years) +/- SE	47.7 \pm 11.4	48.8 \pm 12.0	46.3 \pm 10.7	0.99	[0.98 to 1.01]	0.400
Sex, women	532 (60.5%)	232 (26.4%)	300 (34.1%)	1.88	[1.31 to 2.72]	< 0.001
Exercise locations						
Rural	139 (15.8%)	82 (9.3%)	57 (6.5%)	Ref		
Semi-rural	340 (38.7%)	161 (18.3%)	179 (20.4%)	1.32	[0.76 to 2.28]	0.300
Urban	400 (45.5%)	212 (24.1%)	188 (21.4%)	1.32	[0.77 to 2.29]	0.300
Workload						
<i>I have an inordinate amount of work.</i>						
1 \leq AS \leq 5	726 (82.5%)	410 (46.6%)	316 (36.0%)	ref		
6 \leq AS \leq 8	124 (14.1%)	36 (4.1%)	88 (10.0%)	2.06	[1.18 to 3.64]	0.012
9 \leq AS \leq 10	29 (3.4%)	9 (1.0%)	20 (2.3%)	1.81	[0.69 to 4.97]	0.200
<i>I feel like my work is taking up so much of my time that it's impacting my personal life.</i>						
1 \leq AS \leq 5	559 (63.5%)	339 (38.6%)	220 (25.0%)	ref		
6 \leq AS \leq 8	199 (22.6%)	85 (9.7%)	114 (13.0%)	1.19	[0.77 to 1.82]	0.400
9 \leq AS \leq 10	121 (13.9%)	31 (3.5%)	90 (10.2%)	2.15	[1.16 to 4.06]	0.020
Emotional requirement						

* Of the 31 positive assertions, only 10 remained in the multivariable model after backward selection.

Adjustment variables *	N	PSS* <27	PSS* ≥27	Adjusted OR	95% Confidence Interval	P- value
<i>I am affected by my patients anxiety or anguish</i>						
1 ≤ AS ≤ 5	451 (51.3%)	317 (30.1%)	134 (15.2%)	ref		
6 ≤ AS ≤ 8	314 (35.7%)	113 (12.9%)	201 (22.9%)	2.37	[1.64 to 3.44]	< 0.001
9 ≤ AS ≤ 10	114 (13.0%)	25 (2.8%)	89 (10.1%)	3.41	[1.87 to 6.36]	< 0.001
<i>When I get home, I can forget about my work.</i>						
1 ≤ AS ≤ 5	468 (53.2%)	176 (20.0%)	292 (33.2%)	ref		
6 ≤ AS ≤ 8	244 (27.8%)	150 (17.1%)	94 (10.7%)	0.5	[0.34 to 0.74]	0.003
9 ≤ AS ≤ 10	167 (19.0%)	129 (14.7%)	38 (4.3%)	0.3	[0.19 to 0.51]	< 0.001
Value conflict						
<i>I feel in line with what I do in my job.</i>						
1 ≤ AS ≤ 5	197 (22.4%)	56 (6.4%)	141 (16.0%)	ref		
6 ≤ AS ≤ 8	394 (44.8%)	197 (22.4%)	197 (22.4%)	0.56	[0.35 to 0.89]	0.020
9 ≤ AS ≤ 10	298 (32.8%)	202 (23.0%)	86 (9.8%)	0.3	[0.18 to 0.50]	< 0.001
<i>My work is useful to the community</i>						
1 ≤ AS ≤ 5	130 (14.8%)	44 (5.0%)	86 (9.8%)	ref		
6 ≤ AS ≤ 8	336 (38.2%)	171 (19.4%)	165 (18.8%)	0.55	[0.32 to 0.94]	0.030
9 ≤ AS ≤ 10	412 (47.0%)	240 (27.3%)	173 (19.7%)	0.54	[0.31 to 0.93]	0.030
Economic insecurity						

* Of the 31 positive assertions, only 10 remained in the multivariable model after backward selection.

Adjustment variables *	N	PSS* <27	PSS* ≥27	Adjusted OR	95% Confidence Interval	P- value
<i>I am confident in the future / able to project myself in the coming weeks</i>						
1 ≤ AS ≤ 5	333 (50.2%)	160 (18.2%)	281 (32.0%)	ref		
6 ≤ AS ≤ 8	268 (30.5%)	158 (18.0%)	110 (12.5%)	0.64	[0.43 to 0.95]	0.020
9 ≤ AS ≤ 10	170 (19.3%)	137 (15.6%)	33 (3.7%)	0.31	[0.18 to 0.51]	< 0.001
Social reports						
<i>I feel lonely in my work</i>						
1 ≤ AS ≤ 5	633 (72.0%)	369 (42.0%)	264 (30.0%)	ref		
6 ≤ AS ≤ 8	150 (16.1%)	60 (6.8%)	90 (10.2%)	1.56	[0.98 to 2.47]	0.060
9 ≤ AS ≤ 10	96 (10.9%)	26 (3.0%)	70 (8.0%)	2.18	[1.18 to 4.11]	0.010
Information						
<i>I feel overwhelmed by the amount and variety of information I receive.</i>						
1 ≤ AS ≤ 5	277 (31.5%)	192 (21.8%)	85 (9.7%)	ref		
6 ≤ AS ≤ 8	335 (38.2%)	168 (19.1%)	167 (19.0%)	1.4	[0.92 to 2.13]	0.100
9 ≤ AS ≤ 10	267 (29.3%)	95 (10.8%)	172 (19.6%)	2.21	[1.40 to 3.50]	< 0.001
Others						
<i>I have some tough decisions to make</i>						
1 ≤ AS ≤ 5	503 (57.2%)	321 (36.5%)	182 (20.7%)	ref		
6 ≤ AS ≤ 8	276 (31.4%)	106 (12.1%)	170 (19.3%)	2.07	[1.41 to 3.06]	< 0.001

* Of the 31 positive assertions, only 10 remained in the multivariable model after backward selection.

Adjustment variables *	N	PSS* <27	PSS* ≥27	Adjusted OR	95% Confidence Interval	P- value
$9 \leq AS \leq 10$	100 (11.4%)	28 (3.2%)	72 (8.2%)	2.45	[1.35 to 4.51]	0.003
* Of the 31 positive assertions, only 10 remained in the multivariable model after backward selection.						

Qualitative analysis

The qualitative analysis of verbatims showed that GPs received information on COVID-19 by 3 distinct channels. The first channel was a one-way flow from health authorities to GPs. Information was sent through a composite network, which was estimated to lack consensus due to numerous information channels. They described a real difficulty to assimilate knowledge as guidelines were frequently modified. One of the remarks was that they had the same type and level of information as their patients. The second channel was a two-way flow between hospitals and GPs. This channel was varied depending on the location and was sometimes non-existent. This lack of cooperation has led to feelings of frustration and sometimes even guilt. This last channel is a two-way flow between GPs themselves. It has been in many places a source of mutual help. Finally, one of the main feelings was that GPs were standing alone in the response to the pandemic, were neglected, not taken seriously, and not fully considered by the health authorities.

Discussion

Our survey reveals that the level of stress was very high in GPs during the first wave of the COVID-19 pandemic within lockdown phase in France, as half of the GPs were stressed ($PSS \geq 27$), and a third very stressed ($PSS \geq 30$).

A Danish study conducted on 3,350 GPs in a non-pandemic period, also using PSS-10, showed that the baseline level of stress can be as high as 21% of GPs, which is much lower than the 49% observed in our study (12). Though French and Danish GPs are likely to be not comparable, it is estimated that in Europe, 25% of workers are presenting a stress related to work, which is also much lower than the rate we observed (13, 14).

This significantly different rate of stress is likely to be due to the context of the pandemic and the lockdown, though no baseline evaluation of stress in GPs was performed prior to these events. It was reported that the pandemic was a source of stress in the general population and among hospital medical staff, and there is no reason to consider that GPs were spared (15, 16, 17).

Besides this stressful context, we identified independent determinants of stress. Contrary to popular belief, one of these determinants was not the workload, but rather the change in practice which corroborates results from a flash survey conducted by the French government in April 2020 (18). Previous studies showed that GPs aren't sufficiently trained and prepared for health crises (19, 20). Although there

were pre-defined plans to respond to a pandemic, we believe it is important to highlight that there was a lack of collaboration between GPs and the health care authorities (21). It was not limited to the French context, and this appears to be a root-cause of professional stress (21). In addition, in a context of shortage of protective equipment, GPs had to quickly modify their practices and constantly adapt their local organization as they received multiple conflicting and late information from the health authorities.

To summarize, GPs suffered from a health policy considered as too hospital-based. This pre-existing lack of communication and collaboration between GPs and hospitals was revealed by the pandemic (22). To assist GPs and minimize their likelihood of stress in a health crisis, it might be beneficial to improve their level of information. Health authorities and the media are playing a crucial role in crisis situations and effective communication strategies have shown to improve dissemination of accurate and appropriate information (23, 24). As highlighted by Desborough J et al., our results urge that in time of crisis a single source of reliable information from health authorities is needed, both for clinicians and the public (25).

As we conducted our study in real-time, GPs were questioned at the heart of the first pandemic wave and during the lockdown in France. This means that GPs answers might have been more spontaneous and closer to their feelings about the health crisis. This also biased the analysis of the determinant of stress, as no baseline evaluation was available. In France, women are more representative of the young generation of GPs (26). As the census was held online, the young generation were likely to be prompt for answer (27). This could explain the biased selection of women in our study. Women appeared more stressed, which could increase the mean PSS score. But this trend is well known and described for the PSS score (28). We used the PSS score, as it has the advantage of being short and quick to fill, while it provides a quantitative measurement of the subjective dimension of stress. Some studies prefer other tools, often associated, to explore different dimensions of well-being, of which we inspired to construct our agreement items (29, 30). In this singular context, some stress scale have been created to better understand and specifically assess COVID-19-related distress (31). But this stress scale were validated after the beginning of our study (31). As we used a mixed method for data analysis, we were able to discuss the associations founded.

In conclusion, the COVID-19 pandemic was very stressful for GPs at time of first wave, during the lockdown. A structured and non-controversial chain of communication from the health authorities is important to ensure GP's confidence. The pandemic underlines the importance of GPs and the liberal network in a health crisis, to provide an ambulatory follow-up of patients with continuity of care. It is therefore crucial to fully integrate GPs in the management and decision process of a health crisis. Links with local hospitals should be developed. A prospective follow-up of GP's stress during the different phases of the epidemic is needed to strengthen the identification of stress determinants and their evolution.

Abbreviations

Agreement Score (AS), Auvergne-Rhône-Alpes region (AURA region), Direction de la Recherche, des Etudes, de l'Evaluation et des Statistiques (DREES), General Practitioners (GP), Odds Ratio (OR), Operational Coordination of Epidemic and Biological Risks (COREB), Perceived Stress Score (PSS), Union Régionale des Professionnels de Santé (URPS), World Health Organization (WHO)

Declarations

Ethics approval and consent to participate

This study has been conducted according to the Regulation (EU) 2016/678 (General Data Protection Regulation). Ethics approval was not required according French Law.

Consent for publication

Not applicable

Availability of data and materials

The datasets used to conduct the analysis are not deposited in a public repository. They can be made available to academic researchers upon request to the study scientific committee. Requests have to be addressed to the corresponding author.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

All authors contributed substantially to the design of the study. MD and AK conducted the survey with the assistance of SM, HC and SLA. MD and AK wrote the draft of the article. MAD performed the statistical analyses in consultation with MD, AK, and TD. CJ, EP and TD supervised the work and revised the manuscript. All authors had read and approved the final manuscript.

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Authors' information

MD and AK are general practitioners' residents in Grenoble University. This work is part of their doctoral thesis.

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