

Master's Thesis

Perceived Stress and Exposure to Work Stress Factors among General Practitioners: A Secondary Analysis of the Swiss QUALICOPC Study

Blandine Mooser

Co-tutor: Dre. Christine Cohidon

Department of Ambulatory Care and Community Medicine, University of Lausanne, Lausanne,
Switzerland

Institute of Family Medicine, University of Lausanne, Lausanne, Switzerland

Tutor: Prof. Nicolas Senn

Department of Ambulatory Care and Community Medicine, University of Lausanne, Lausanne,
Switzerland

Institute of Family Medicine, University of Lausanne, Lausanne, Switzerland

Expert: Dre. Dagmar Haller

Primary Care Unit, University of Geneva, Geneva, Switzerland

Lausanne, December 15, 2017

Abstract

Background:

Stress and exposure to work stress factors among general practitioners (GPs) are frequent and major issues, as chronic work stress may decrease mental or physical health and also potentially affect GP patient care quality. Little is known about the perception of stress and the factors associated with stress among Swiss GPs.

Methods:

This secondary analysis focuses on selected questions of the Swiss QUALIPOPC study, a multinational effort investigating primary care in its globality in order to inform and help governments with their primary health care system. A total of 199 GPs in Switzerland were asked, using a postal questionnaire, whether they felt stressed, and about five work stress factors associated with stress. Bivariate analyses and multivariate logistic regressions were performed to identify socio-demographic and practice characteristics associated with these factors.

Results:

Half of the GPs (48.5%) reported their work to be stressful. Although the vast majority of them (97%) were interested by their work, 80% complained about administrative overload, 33% about effort-reward imbalance, 35% about a lack of sense in their work and 30% about a lack of respect of their profession. The number of complaints averaged 1.8 out of 5. GP age was inversely associated with stress and positively associated with respect, and non-Swiss German speaking GPs complained more about effort-reward imbalance. Delays in GP reception of patient hospital discharge information was strongly associated with work stress factors. However, no effect of sex, organization of practice (solo versus group) or location (rural versus urban) on these variables was observed.

Conclusion

Stress perception is common among GPs in Switzerland, particularly within the non-Swiss German speaking and the younger age group. Exposure to work stress factors is frequent. Awareness of this condition shall help target these populations for education and prevention, and adopt better practices, particularly by reducing delays to reception of discharge information.

Keywords: General practitioners, primary care, Switzerland, QUALICOPC, stress

Abstract word count: 304

Total word Count: 3'871

Introduction

Health professionals, including general practitioners (GPs), are often exposed to major stress factors at work. These stress factors may stem from working conditions, for example heavy workload (1), administrative duties (2) or frequent disturbances (2), as well as from high patient expectations (3) and emotional demands (4). Which GP characteristics and working conditions expose to job stress and work stress factors? To date, research on this subject is scarce. The present analysis seeks answers to this interrogation by analyzing selected questions of the Swiss QUALICOPC (Quality and Costs of Primary Care in Europe) study, treating stress and work stress factors as two completely distinct concepts. The QUALICOPC study evaluates the country's primary health care system in its globality and does not focus solely on stress and work stress factors.

Several work stress factors have been identified in the literature. For example, stress may be engendered when there is a perceived mismatch between the effort spent at work and the reward received in return (money, esteem/recognition or career opportunities), which is demonstrated in Johannes Siegrist's effort-reward imbalance model (3,5–8). Stress may also result from the combination of high job demands and low control/decision latitude (for example, insufficient work possibilities or lack of freedom to make independent decisions), which is the subject of Robert Karasek's job strain model (6,7,9,10). Those two models are validated and complementary (6). In the medical field specifically, lack of clinical and administrative autonomy were also found to accentuate stress in primary care physicians (6,11). On the other hand, group practices were found to lessen job stress in GPs (12,10) and accentuate the positive relationships between physicians and their work establishment (13). Several studies have also indicated that freedom of working method, of practice location and of payment type lessened job stress in GPs (2,6,12,10,14,15).

Why care about increased work stress factors in the field of primary care? Chronic work stress can damage physical and mental health, leading to depression and/or burnout. The proportion of GPs reporting depression ranges from 17% in the UK (4) to 26% in Canada (16) and 32% in China (17). In Switzerland, a study investigating burnout, an ill-defined work-related state of mental exhaustion, uncovered that 33% of primary care practitioners suffered from a moderate degree of burnout and 4% from a high degree of burnout (3). This health problem is further reinforced by the fact that GPs do not seem ready to become patients. Less than a third of primary care physicians have their own regular doctor (18,19). Moreover, several studies agree that physicians have difficulty accepting their own vulnerabilities, especially when it comes to stigmatized diseases (16,18–21), for which they treat themselves differently than they would treat their patients suffering from the same illness (19).

GPs' decreased health may also have repercussions on the quality of patient care. In a cross-sectional Canadian study of over 3000 primary care practitioners, almost a third reported having in the past month mental health concerns that made it difficult for them to handle their workload (16). A longitudinal 3-year study of GPs and internists in the USA described that a greater likelihood of making errors and more frequent instances of suboptimal patient care were reported by physicians that were stressed, suffering from burnout or dissatisfied (22).

Because GPs are already lacking throughout Western Europe, the United Kingdom and the United States, an unfavorable GP situation can have wide-reaching consequences. Fears exist that there will not be enough GPs to take care of the aging population. Moreover, too few medical students wish to become GP, in part because of medical students' awareness of increased work stress factors on GPs, their high workload and income lower than specialists'.

Therefore, primary care is quickly becoming a prime target of health research, including of the QUALICOPC study. This article, stemming from the Swiss QUALICOPC study, aims to describe GPs' perceived stress and exposure to work stress factors, as well as to explore whether such exposure is associated with socio-demographic characteristics or general practice organization.

Methods

Directed by the Netherlands Institute for Health Services Research (NIVEL), QUALICOPC aims to inform governments about successful primary care systems and help with their management (23). The study compares the global performance of health care systems according to quality, costs and equity of primary care in 34 countries, including Switzerland (23). The QUALICOPC study was not designed to investigate solely stress and work stress factors.

The QUALICOPC questionnaires were developed in several steps. A framework of topics of interest was created and a search conducted on existing questionnaires (23). Next, the questionnaires were translated into the national languages, distributed, and all data was centrally processed in the Netherlands (23). All questionnaires have a uniform design, a closed answering format and are anonymous (23). Ethical approval for the study in Switzerland was acquired (24).

In Switzerland, a random sample of 2027 GPs was drawn from two primary care physicians' associations in order to form the SPAM (Swiss Primary Care Active Monitoring) network (25). Only one GP per practice was included to avoid repetition. A total of 200 GPs agreed to be recruited for the network, indicating a response rate of 10% (25). Of those, 199 participated in the QUALICOPC study. The representativeness of the sample in terms of sex, rural/urban implantation and age was cross-checked against national statistics and considered satisfactory (25).

In Switzerland, the data was collected in 2012. The GP sample answered the 60-question postal questionnaire investigating the organization and functioning of their practice. Socio-demographic characteristics, namely sex, age, country of birth, linguistic region of Switzerland and practice location, were investigated. Other questions in the survey explored organizational practice attributes, types of equipment available and meeting face-to-face with other healthcare professionals, either professionally or socially. Practice organization was characterized by the GP working alone, in shared accommodation with other GPs or with medical specialists, or with other disciplines.

Moreover, the questionnaire explored GP perceived stress through the statement "I have too much stress in my current job". Exposure to work stress factors was explored via five questions: loss of sense in the work, lack of interest in the work, administrative overload, effort-reward imbalance and lack of feeling respected as a GP. Those were the only questions directly investigating GPs' perceptions and feelings. In this study, stress and work stress factors are treated as two completely distinct concepts. Of note, the five work stress factors questions are proxies rather than validated work stress models. Only the effort-reward imbalance question can loosely approximate Siegrist's validated model. The loss of sense question may reflect the cynicism/depersonalization component of burnout, while the lack of respect question may reflect the "reward" component necessary to well-being at work. The administrative overload question pertains to a known stress factor that is currently being widely investigated in the literature and publicized in the nonmedical environment, while the lack of interest question explores a potential stimulator of well-being at work. In the QUALICOPC questionnaire, four different answer options were available for perceived stress and each of the work stress factors, ranging from "Strongly disagree" to "Strongly agree". During data analysis, the four answers were dichotomized into "Exposed to the work stress factor" and "Not exposed to the work stress factor".

In this study, the dependent variables were the perceived stress and the five work stress factors, while the independent variables were the socio-demographic characteristics (namely sex, age, location of practice, linguistic zone) and GP practice organization and attributes. First, descriptive analyses were conducted on socio-demographic characteristics and GPs' exposition to work stress factors to determine frequency and distribution. Variables that were not discriminating were not analyzed. Secondly, chi-squared tests and Student's t-tests were used to explore bivariate associations between work stress factors and socio-demographic characteristics as well as practice organization. Thirdly, multivariate logistic regression analyses explored multiple predictors of work stress factors simultaneously. Variables that were statistically significant with $p < 0.2$ in the bivariate associations were used, and introduced one at a time in the multivariate model. The interquartile range was chosen for continuous quantitative variables. The STATA software was used.

Results

The socio-demographic and practice characteristics of the GPs are described in Table 1. GPs in this sample were predominantly male and the age ranged from 35 to 74 years, with a median age of 56. A majority came from the German-speaking region of Switzerland, with the sample from the Italian-speaking part of the country being limited to $n = 21$ (11%). The distribution between rural/urban practice location and solo/group practice was equally split. The average list size contained 1'808 patients.

Figure 1 shows the proportion of GPs reporting being exposed to stress and to work stress factors. Almost 50% of GP reported that their work felt too stressful. Regarding average exposure to work stress factors, 31% of GPs complained that some parts of their work do not really make sense and 80% responded that their work was overloaded with administration. 67% reported that being a GP is a well-respected job and 65% that there is a good effort-reward balance. Nearly 97% answered that their work still interested them as much as it ever did. Because the "interest" variable, with its near consensus, was not discriminating, this variable was not further analyzed via multivariate modeling.

The cumulative sum of the "exposure" of GPs across the five work stress factors is shown in Figure 2 and ranged from a minimum score of 0 points (not at all exposed to stress and work stress factors) to a maximum of 5 points (very exposed). About 70% of the GPs reported being exposed to 1, 2 or 3 conditions. Over 10% of the GPs reported no such condition, whereas 1% of the GPs reported being exposed to all 5 conditions under investigation. The average exposition was 1.79 out of 5.

The results of the bivariate and multivariate analyses are described in Table 1. Because of multiple simultaneous associations, the probability of uncovering significant associations increased. However, the Bonferroni correction was not performed. Reporting stress at work was particularly less frequent among the older age quartiles (i.e. after age 56) and in the Italian-speaking part of Switzerland. Associated with GPs being more stressed were the long delay in obtaining discharge information from hospitals and night on-call duties. Also shown in the table is that GPs who have a side activity are significantly less susceptible to perceiving a loss of sense in their work compared to those without a side job. However, long delays for GP reception of patients' hospital discharge letters are associated with a higher risk of losing sense in the work, as well as with an administrative overload. Feeling respected as a GP was associated with higher GP age, doing weekend on-call duties, and meeting at least monthly with other GPs. Finally, effort-reward imbalance was negatively associated with meeting with hospital specialists at least monthly, having a lab assistant in the practice, and having a large patient list size.

Sex, practice location (rural versus urban) and practice organization (solo versus group) were not significantly associated with perceived stress or work stress factors throughout the multiple analyses.

Discussion

This cross-sectional study revealed some reassuring aspects of the Swiss GP work situation. Nearly all GPs are still interested by their work and two-thirds believe being a GP is a well-respected job. Those may be protective factors against work exhaustion or poor patient care. They may also encourage medical students to choose the general medicine career path in the future. Several studies have already pointed out that on some aspects, the work situation of GPs in Switzerland is favorable: For example, a study investigating the prevalence of burnout in Swiss primary care practitioners (PCPs) and comparing it to that of physicians in other Western countries showed that Swiss PCPs had lower burnout scores on the Maslach Burnout Inventory than other countries (3).

This study also revealed alarming elements of the Swiss GP work situation. As such, 80% of GPs reported an administrative overload, which corresponds to the prevalence found in the literature. In the Austrian branch of the QUALICOPC study, over 80% of GPs reported that their work was loaded with unnecessary administrative work (9). In a UK study conducted at the national level, 80% of the 3000 GPs surveyed felt that they were required to do unimportant administrative tasks, preventing their completion of more important ones (26). As administrative work is bound to increase over the years, with insurance restrictions, hyper-specialization of medicine and greater patient list size, this element needs to be tackled rapidly.

Moreover, more than 35% of GPs in this study felt they lacked a good effort-reward balance. The high percentage is worrisome because the effort-reward imbalance question in this study represents the most studied and validated concept, even though it is only a proxy of Siegrist's validated model and should be interpreted as such. If the validated ERI questionnaire had been used, the prevalence would probably be lower. In a recent longitudinal study of over 200 Swiss GPs, lack of reward increased emotional exhaustion (the core dimension of burnout) and sleep problems, decreased self-perceived health and engendered work-family conflicts. However, lack of reward was not found to have any significant effect on depersonalization and personal accomplishments, the other two dimensions of burnout. Therefore, it was presumed that GPs can still have high-quality relationships with their patients, but at their own cost (5).

Furthermore, almost 50% of GPs in this study report feeling stressed. The current literature does not indicate the prevalence of stress among Swiss GPs, but a survey study conducted in 2007 among a random sample of over 500 employees in a large public hospital near Zurich indicates that over 42% of the physicians interviewed have stress feelings (27). On the other hand, a study focusing on Swiss hospital residents revealed that 66% did not report high work stress (8). It can therefore be inferred that because stress is such a subjective, complex and labile feeling, hardly summed up by theoretical models, results from such studies need to be interpreted with caution.

This study revealed several significant associations that are worth noting. GPs who have a side job are less susceptible to perceiving a loss of sense in their work compared to those without a side job, even though the p-value borders the significance threshold. Several studies indicate that GPs appreciate the diversity in their work (12,10,28). However, one study focusing on Swiss GPs showed that their work variety had decreased between 1993 and 2012 because they nowadays exercise less pediatrics, gynecology, etc. (24). It can be hypothesized from this study that GPs' side job may compensate for the uniformity in their work.

It is also worth noting that receiving hospital discharges after four days (ie. not immediately) was associated with GPs reporting a loss of sense in work as well as an administrative overload. Possibly, GPs feel excluded from the medical network when obligated to wait for updates from their own patients, leading

to a sense of disrespect or lack of appreciation from the specialists. Moreover, having to update their patient's file when they are removed from the situation may be excessively time-consuming and overwhelming. Thus, the hospital discharge question at first sight might seem trivial, but in reality it may be a symbol of a larger problem.

Additionally, in this study older GPs tended to report feeling more respected and perceived less stress than their younger counterparts. One hypothesis is that in their generation, being a GP was by default admired and this sentiment continued throughout their career. Moreover, longstanding clinical experience, a familiar and trusting patient population, financial stability and long-term accommodation to stress could explain their diminished stress levels when compared to younger GPs. Nowadays, patients are more demanding and informed about medicine, which may be an additional stress factor for younger GPs.

Meeting face-to-face with other health professionals, either socially or professionally, was found to be associated with greater benefit. GPs who met more than once a month with other GPs felt respected and those who also met more than once a month with hospital specialists were less prone to experience an effort-reward imbalance. A study of over 700 German GPs showed that resilience to stress (in the study's case, alcohol use) was, among other things, determined by supportive relationships and help-seeking behavior (20). A study of over 800 GPs in Finland showed that GPs working alone without social support from colleagues or colleague consultations may suffer from distress and the solitude may potentiate the effects of high-demand and low control (7). Meeting with other health professionals may thus increase collaboration and positive outlook, even though in the present study no association was found between solo or group practices and work stress exposure.

The only significant associations found regarding linguistic region was that GPs originating from the Italian-speaking region of Switzerland reported to be less stressed than GPs originating from other linguistic regions. As they were underrepresented in the sample, however, these results need to be interpreted cautiously. Qualitative studies in the different regions of Switzerland could help find explanations for this. The present data could also be compared to similar data stemming from France or Italy.

This study did not find any significant associations between practice organization (solo versus group) and being stressed or exposed to work stress factors. The literature simultaneously analyzing practice organization and stress or work stress factors is scarce; however, several studies analyze practice organization and work satisfaction, an wholly different topic not analyzed in this study, yet which may be linked. Those studies' results contradict this study's findings. A systematic literature review of more than 400 articles found that for GPs, working with colleagues was a positive factor associated with their satisfaction at work (12). Another systematic literature review associated solo practices with decreased US physician satisfaction (11). In the present study, the sample size may have hindered the revelation of significant findings, or it may be that Swiss group practices operate as multiple solo practices housed under one roof, lacking real collaboration.

Surprisingly, urban versus rural practice location were not significantly associated with stress or work stress factors in this study. There is a dearth of literature on this particular pair of variables, but many studies examine the relationship between urban/rural practice location and working hours. The latter is a different work stress factor but one can hypothesize that long working hours would increase stress. The Austrian branch of the QUALICOPC study found that objective workload was significantly higher in rural areas, as rural GPs worked about seven hours more per week than their urban counterparts (9). A German study also revealed that single-handed practices in rural areas have significantly more working hours than single-handed practices in urban areas (30).

Therefore, in the present study, qualitative factors influence being stressed and exposed to work stress factors more than do quantitative factors such as working hours, duration of consultation and number of face-to-face contacts.

Although this study unveiled several positive aspects of the GP profession, the situation in Switzerland remains suboptimal. Administrative overload (including hospital discharges) must be tackled, for example with efficient electronic health records (EHR) (31). It has been shown that EHR can increase time efficiency and improve the quality of healthcare (32). They would also help reduce physicians' feelings of restrictive work policies and loss of autonomy (2). Additionally, GP income needs to be increased to diminish effort-reward imbalance. Federal programs should modify medical tariffs to pay consultations better and stop favoring technical acts. For GPs themselves, different interventions are necessary: implementation of support and stress management programs (3), team management lessons (4) and reduction of patient list size (7) are just a few examples. In two Australian studies, several hours of cognitive behavioral coaching reduced work-related distress and the intention to leave general practice, and improved the quality of work life and GP morale (21,33). In Switzerland, GP practices should also evolve towards group practices, perhaps also interprofessional ones (34). Transfers of non-medical tasks should be encouraged. This would allow better management of complex multimorbid patients and also relieve the physician of non-medical charges (7,34).

In medical schools too, several things must change to prepare students for the demanding work ahead. A few examples include recognition and prevention of stress, burnout and the effort-reward imbalance in medicine (5), as well as the teaching of resilience (20), management and leadership (35). Students should also be encouraged early in their studies to choose general medicine, through hands-on practice in general medicine and by highlighting its global care of patients, its cross-disciplinary role and its position as a pivot point (1,4,16,18,20,5,8,30,36,37). A Swiss study showed that GP teachers' satisfaction with his/her job is correlated with medical students' satisfaction with the internship. In turn, students' satisfaction with the internship was correlated with their wish to become GP afterwards (38). Therefore, increasing GP job satisfaction is important in inspiring medical students to join the field, via both role modelling and marketing (38). Moreover, badmouthing of GPs in hospitals must be avoided at all costs (38,39). Medical students should also benefit from more stringent and specific health prevention programs, as they tend to use more tranquilizers and exhibit more suicidal thoughts than the general population (40).

This study has a few limitations. First, its cross-sectional nature prevents evaluation of causality. Its relatively small sample size may also be problematic, possibly causing a selection bias. Its reliance on self-administered scales and work stress concepts summarized in one unique question, especially for effort-reward imbalance, may introduce a mode of administration bias. Moreover, multiple simultaneous comparisons may have increased the probability of uncovering significant results. Lastly, even though the sample was cross-checked against national data and found to be representative of the GP population, there may be differences regardless.

However, the sample was nationally representative, the database contained only few missing values, and the study remains an asset to a country that does not have systematic GP data collection (24). More research is necessary, preferably longitudinal studies with a large sample size and multiple sources.

Conclusion

This nationally representative sample of GPs was found to be highly exposed to an administrative overload at work, an issue that needs to be tackled rapidly by healthcare systems. However, most GPs

indicated a continued interest in their work. No association was found between GPs' perceived stress or exposition to work stress factors and their sex, practice location or organizational practice type. This may indicate that GPs are free to choose their working preference and that their exposure to work stress factors is at least here mostly controlled by extrinsic, day-to-day factors such as patient hospital discharges, side jobs, and meeting with other specialists. By describing the situation in Switzerland, this study offers some clues for improving the exposure to stress and work stress factors among GPs in Switzerland.

Acknowledgments

We would like to thank the Swiss family physicians who participated in the QUALICOPC study. N.Senn is partly supported by the Leenards Foundation. The research summarized in this paper is part of the European QUALICOPC study which is coordinated by the NIVEL (The Netherlands Institute for Health Services Research) and funded as part of the European Commission's Seventh Framework Programme (FP7/ 2007–2013), under grant agreement 242141.

Competing Interests

The authors declare that they have no competing interests.

Table 1: Characteristics of participating GPs ($n = 199$) and of practice organization.

Socio-demographic characteristics	
Sex	
Male, n (%)	155 (78)
Female, n (%)	44 (22)
Age	
Mean (SD)	55.0 (8.0)
Min	35
Max	74
Median	56
Linguistic region, n (%)	
Swiss German	117 (59)
Swiss French	61 (31)
Swiss Italian	21 (10)
Practice location, n (%)*	
Rural	102 (52)
Urban	95 (48)
Practice organization	
Patient list size, mean (p25, p50, p75)	1808 (1000, 1400, 2000)
Type of practice, n (%)	
Group practice	104 (52)
Solo practice	95 (48)
Total working hours per week, mean (SD)	46.6 (11.6)
Duration of consultation (minutes)	19.6 (5.8)
Usual time necessary for receiving hospital discharge, n (%)	
1-4 days	60 (31)
5-14 days	80 (42)
15-30 days	38 (20)
> 30 days	14 (7)
GPs having a lab assistant in the practice, n (%)	22 (11)
Being GP as unique work activity, n (%)	67 (34)
Number of face-to-face patient contacts in a day, mean (SD)	24 (8)
Number of email patient contacts in a day, mean (p25, p50, p75)	1.5 (0, 1, 1)
Number of night on-call duties in the past 3 months, mean (p25, p50, p75)	4.4 (0, 2, 4)
Number of weekend on-call duties in the past 3 months, mean (p25, p50, p75)	2.1 (0, 1, 3)
Meeting face-to-face with other GPs, n (%)*	
≤1/month	76 (39)
>1/month	120 (61)
Meeting face-to-face with hospital specialists, n (%)*	
≤1/month	156 (79)
>1/month	42 (21)
Patient files sent to GP by previous GP, n (%)	
Always or usually	167 (84)
Occasionally or never	31 (16)

*: Data may not sum up to $n=199$ due to missing values

Table 2: Bivariate ($p \leq 0.2$) and multivariate analysis of socio-demographic and work characteristics predictors of GPs' perceived stress and exposure to work stress factors.

Covariate	Crude				Adjusted		
	n	OR	95% CI	P	OR	95% CI	P
Stress at Work							
Sex							
Male	155	Ref.					
Female	43	1.15	0.58-2.25	0.69			
Age group							
<50	49	Ref.					
50-55	45	0.35	0.15-0.82	0.02	0.32	0.13-0.80	0.02
56-60	49	0.51	0.23-1.15	0.10	0.40	0.15-1.05	0.06
≥ 61	55	0.35	0.16-0.79	0.01	0.20	0.07-0.54	0.002
Linguistic region							
S. French	60	Ref.					
S. German	117	0.92	0.49-1.72	0.80	1.16	0.50-2.70	0.72
S. Italian	21	0.21	0.06-0.68	0.01	0.13	0.03-0.64	0.01
Practice location							
Rural	102	Ref.					
Urban	94	0.92	0.52-1.60	0.76			
Patient list size *							
		0.89	0.70-1.15	0.39			
Type of practice							
Group practice	103	Ref.					
Solo practice	95	0.72	0.41-1.26	0.25			
Working hours per week *							
		1.17	0.81-1.69	0.39			
Duration of consultation *							
		1.04	0.74-1.47	0.80			
Discharge information							
1-4 days	60	Ref.					
5-14 days	80	1.36	0.69-2.67	0.38	1.22	0.56-2.63	0.61
15-30 days	38	1.50	0.66-3.40	0.33	1.66	0.55-4.99	0.36
>30 days	14	3.75	1.05-13.34	0.04	5.26	1.18-23.42	0.03
Lab assistant							
No	174	Ref.					
Yes	22	0.47	0.18-1.20	0.11			
GP as unique work activity							
No	132	Ref.					
Yes	66	1.20	0.66-2.17	0.55			
Face-to-face contacts *							
		1.28	0.90-1.82	0.17	1.40	0.92-2.14	0.12
Email patient contacts							
		1.12	0.99-1.26	0.07			
Night on-call duties *							
		1.22	1.00-1.50	0.05	1.28	1.04-1.58	0.02
Weekend on-call duties *							
		1.65	1.01-2.68	0.04			
Meeting with other GPs							
<1x/month	76	Ref.					
>1x/month	120	0.80	0.45-1.65	0.63			
Meeting w/ hospital specialists							
<1x/month	155	Ref.					
>1x/month	42	0.85	0.44-1.65	0.63			
Patient files sent to GP							
No	166	Ref.					
Yes	31	1.19	0.55-2.56	0.67			
Loss of Sense in Work							
Sex							
Male	154	Ref.					
Female	44	1.38	0.68-2.80	0.37			
Age group							
<61	144	Ref.					
≥ 61	54	0.48	0.23- 1.01	0.05	0.53	0.24- 1.17	0.12
Linguistic region							

S. French	61	Ref.						
S. German	117	0.56	0.29-1.07	0.08				
S. Italian	20	0.66	0.22-1.96	0.45				
Practice location								
Rural	102	Ref.						
Urban	94	1.18	0.64-2.16	0.59				
Patient list size *		0.89	0.66-1.19	0.41				
Type of practice								
Group practice	104	Ref.						
Solo practice	94	0.83	0.45-1.52	0.55				
Working hours per week *		1.11	0.75-1.64	0.61				
Duration of consultation *		1.22	0.85-1.74	0.28				
Discharge information								
≤4 days	59	Ref.						
>4 days	132	2.16	1.05- 4.48	0.04	1.91	1.29- 2.81	0.001	
Lab assistant								
No	175	Ref.						
Yes	21	0.21	0.05-0.92	0.04	0.18	0.04- 0.85	0.03	
GP as unique work activity								
No	132	Ref.						
Yes	66	1.80	0.96- 3.37	0.07	2.09	1.03- 4.23	0.04	
Face-to-face contacts *		0.63	0.42- 0.95	0.03	0.67	0.42 - 1.08	0.10	
Email patient contacts		0.99	0.89-110	0.82				
Night on-call duties *		1.04	0.93-1.16	0.48				
Weekend on-call duties *		0.97	0.80-1.18	0.76				
Meeting with other GPs								
<1x/month	75	Ref.						
>1x/month	120	0.67	0.36-1.25	0.21				
Meeting w/ hospital specialists								
<1x/month	156	Ref.						
>1x/month	41	0.85	0.41-1.77	0.67				
Patient files sent to GP								
No	167	Ref.						
Yes	30	1.02	0.44-2.39	0.95				
Administrative overload								
Sex								
Male	155	Ref.						
Female	44	0.97	0.42-2.23	0.95				
Age								
<61	144	Ref.						
≥61	55	0.65	0.31-1.35	0.25				
Linguistic region								
S. French	61	Ref.						
S. German	117	0.41	0.17-1.01	0.05	0.44	0.18-1.11	0.08	
S. Italian	21	0.41	0.11-1.49	0.18	0.47	0.12-1.71	0.25	
Practice location								
Rural	102	Ref.						
Urban	95	0.81	0.40-1.62	0.55				
Patient list size *		1.15	0.80-1.65	0.45				
Type of practice								
Group practice	104	Ref.						
Solo practice	95	0.89	0.45-1.79	0.75				
Working hours per week *		1.24	0.79-1.94	0.34				
Duration of consultation *		1.22	0.78-1.90	0.38				
Discharge information								
≤4 days	60	Ref.						
>4 days	132	2.45	1.20-5.01	0.01	2.26	1.09-4.67	0.03	
Lab assistant								
No	175	Ref.						

Yes	22	1.67	0.47-5.96	0.43			
GP as unique work activity							
No	132	Ref.					
Yes	67	1.23	0.58-2.61	0.58			
Face-to-face contacts *		1.06	0.69-1.64	0.78			
Email patient contacts		1.03	0.90-1.17	0.70			
Night on-call duties *		1.08	0.88-1.31	0.47			
Weekend on-call duties *		1.11	0.76-1.61	0.59			
Meeting with other GPs							
<1x/month	61	Ref.					
>1x/month	95	0.93	0.46-1.91	0.85			
Meeting w/ hospital specialists							
<1x/month	156	Ref.					
>1x/month	42	0.61	0.28-1.33	0.22			
Patient files sent to GP							
No	167	Ref.					
Yes	31	0.94	0.36-2.47	0.90			
Lack of Respect							
Sex							
Male	153	Ref.					
Female	43	1.26	0.62-2.55	0.52			
Age group							
≤55	94	Ref.					
>55	102	0.48	0.26-0.88	0.02	0.39	0.19-0.81	0.01
Linguistic region							
S. French	59	Ref.					
S. German	116	0.85	0.44-1.64	0.63			
S. Italian	21	0.40	0.12-1.32	0.13			
Practice location							
Rural	101	Ref.					
Urban	93	1.50	0.82-2.73	0.19			
Patient list size *		0.72	0.51-1.00	0.05			
Type of practice							
Group practice	102	Ref.					
Solo practice	94	1.42	0.78-2.59	0.25			
Working hours per week *		1.00	0.68-1.48	0.99			
Duration of consultation *		1.28	0.90-1.83	0.17			
Discharge information							
1-4 days	60	Ref.					
5-14 days	80	1.41	0.65-3.03	0.38	1.06	0.46-2.46	0.89
15-30 days	38	2.39	0.99-5.76	0.05	1.64	0.60-4.52	0.33
>30 days	13	10.95	2.65-45.41	0.001	5.17	1.05-25.43	0.04
Lab assistant							
No	172	Ref.					
Yes	22	0.56	0.20-1.60	0.28			
GP as unique work activity							
No	131	Ref.					
Yes	65	0.85	0.45-1.61	0.62			
Face-to-face contacts *		0.69	0.47-1.03	0.07			
E-mail patient contacts		1.13	1.01-1.26	0.03	1.12	0.97-1.29	0.12
Night on-call duties *		0.89	0.74-1.07	0.21			
Weekend on-call duties *		0.60	0.34-1.05	0.07	0.55	0.28-1.07	0.08
Never/occasionally	165	Ref.					
Yes	30	0.42	0.19-0.93	0.03	0.26	0.09-0.74	0.01
Meeting with other GPs							
≤1x/month	75	Ref.					
>1x/month	119	0.54	0.30-1.00	0.05	0.42	0.21-0.85	0.02
Meeting w/ hospital specialists							

<1x/month	154	Ref.						
>1x/month	42	0.55	0.56-1.18	0.12				
Patient files sent to GP								
No	165	Ref.						
Yes	30	0.42	0.19-0.93	0.03	0.26	0.09-0.74	0.01	
Effort-Reward Imbalance								
Sex								
Male	155	Ref.						
Female	43	0.75	0.36-1.54	0.43				
Age								
<61	143	Ref.						
≥61	55	0.85	0.44-1.64	0.63				
Linguistic region								
S. French	60	Ref.						
S. German	117	2.82	1.39-5.67	0.004	2.16	0.97-4.83	0.06	
S. Italian	21	0.35	0.07-1.67	0.19	0.52	0.09-2.79	0.45	
Practice location								
Rural	101	Ref.						
Urban	95	0.80	0.45-1.45	0.47				
Patient list size *								
		0.57	0.38-0.83	0.004	0.58	0.37-0.91	0.02	
Type of practice								
Group practice	103	Ref.						
Solo practice	95	0.95	0.53-1.70	0.86				
Working hours per week *								
		1.18	0.80-1.73	0.40				
Duration of consultation *								
		0.95	0.66-1.36	0.78				
Discharge information								
1-4 days	60	Ref.						
5-14 days	80	1.30	0.65-2.61	0.45				
15-30 days	38	0.58	0.23-1.44	0.24				
>30 days	13	1.16	0.34-4.00	0.81				
Lab assistant								
No	174	Ref.						
Yes	22	0.07	0.01-0.55	0.01	0.12	0.01-1.00	0.05	
GP as unique work activity								
No	131	Ref.						
Yes	67	0.85	0.45-1.57	0.60				
Face-to-face contacts *								
		1.12	0.78-1.61	0.54				
Email patient contacts								
		1.01	0.92-1.12	0.80				
Night on-call duties *								
		1.08	0.96-1.21	0.20				
Weekend on-call duties *								
		0.74	0.46-1.18	0.21				
Meeting with other GPs								
<1x/month	76	Ref.						
>1x/month	119	0.75	0.41-1.36	0.34				
Meeting w/ hospital specialists								
≤1x/month	155	Ref.						
>1x/month	42	0.36	0.16-0.80	0.01	0.33	0.13-0.79	0.01	
Patient files sent to GP								
No	166	Ref.						
Yes	31	1.38	0.60-3.20	0.45				

*: Interquartile range

** Data may not always sum up to n=199 due to missing values

Figure 1: Proportion of GPs reporting a perceived stressful situation at work (left column) and proportion being exposed to work stress factors.

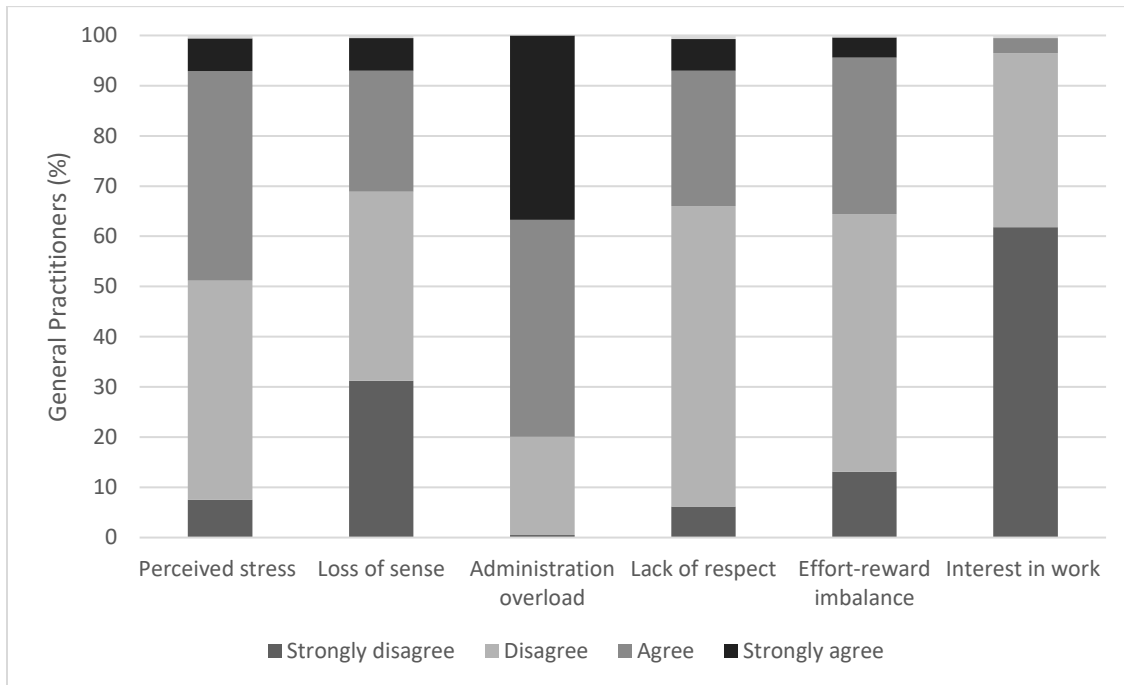
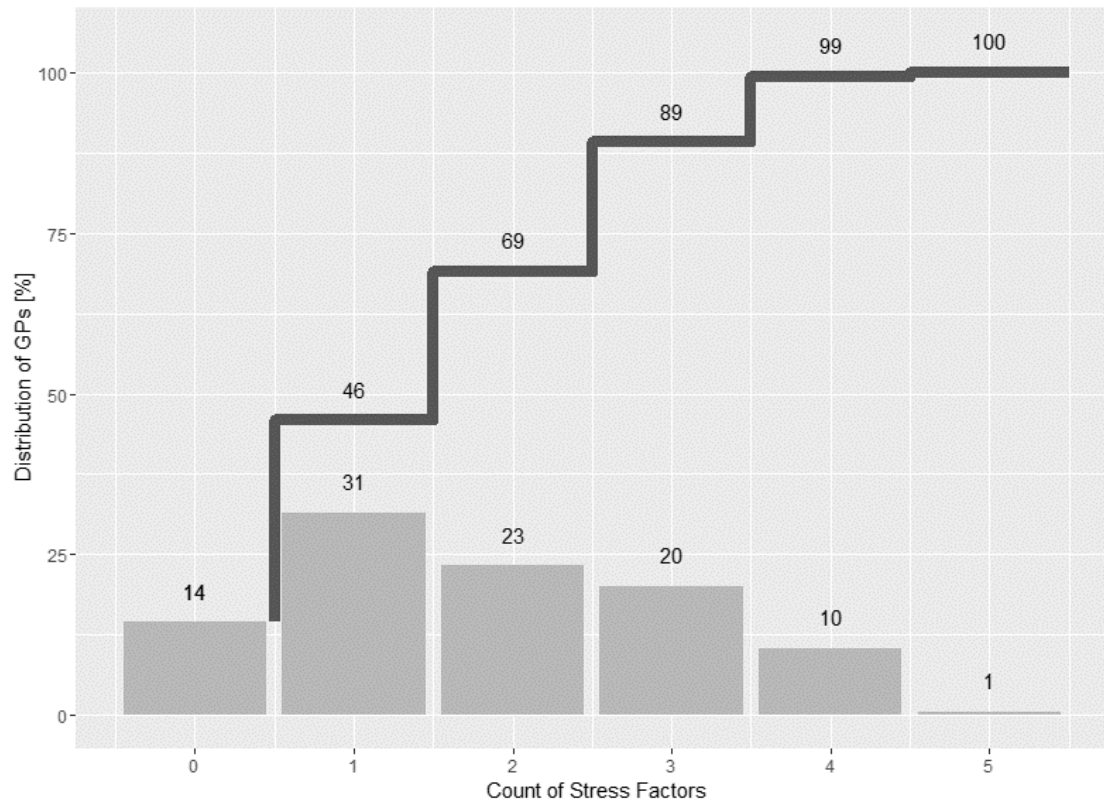


Figure 2: GPs by number of work stress factors to which they are exposed.



References

1. Firth-Cozens J. Interventions to improve physicians' well-being and patient care. *Soc Sci Med*. 2001 Jan;52(2):215–22.
2. Voltmer E, Rosta J, Siegrist J, Aasland OG. Job stress and job satisfaction of physicians in private practice: comparison of German and Norwegian physicians. *Int Arch Occup Environ Health*. 2012 Oct;85(7):819–28.
3. Goehring C, Bouvier Gallacchi M, Künzi B, Bovier P. Psychosocial and professional characteristics of burnout in Swiss primary care practitioners: a cross-sectional survey. *Swiss Med Wkly*. 2005 Feb 19;135(7-8):101–8.
4. Firth-Cozens J. Individual and organizational predictors of depression in general practitioners. *Br J Gen Pract J R Coll Gen Pract*. 1998 Oct;48(435):1647–51.
5. Meier LL, Tschudi P, Meier CA, Dvorak C, Zeller A. When general practitioners don't feel appreciated by their patients: prospective effects on well-being and work-family conflict in a Swiss Longitudinal Study. *Fam Pract*. 2015 Apr 1;32(2):181–6.
6. Siegrist J, Shackelton R, Link C, Marceau L, von dem Knesebeck O, McKinlay J. Work stress of primary care physicians in the US, UK and German health care systems. *Soc Sci Med* 1982. 2010 Jul;71(2):298–304.
7. Elovainio M, Salo P, Jokela M, Heponiemi T, Linna A, Virtanen M, et al. Psychosocial factors and well-being among Finnish GPs and specialists: a 10-year follow-up. *Occup Environ Med*. 2013 Apr 1;70(4):246–51.
8. Buddeberg-Fischer B, Klaghofer R, Stamm M, Siegrist J, Buddeberg C. Work stress and reduced health in young physicians: prospective evidence from Swiss residents. *Int Arch Occup Environ Health*. 2008 Oct;82(1):31–8.
9. Hoffmann K, Wojczewski S, George A, Schäfer WLA, Maier M. Stressed and overworked? A cross-sectional study of the working situation of urban and rural general practitioners in Austria in the framework of the QUALICOPC project. *Croat Med J*. 2015 Aug;56(4):366–74.
10. Kuusio H, Heponiemi T, Sinervo T, Elovainio M. Organizational commitment among general practitioners: A cross-sectional study of the role of psychosocial factors. *Scand J Prim Health Care*. 2010 Jan;28(2):108–14.
11. Scheurer D, McKean S, Miller J, Wetterneck T. U.S. physician satisfaction: a systematic review. *J Hosp Med*. 2009 Nov;4(9):560–8.
12. Le Floch B, Bastiaens H, Le Reste JY, Lingner H, Hoffman RD, Czachowski S, et al. Which positive factors determine the GP satisfaction in clinical practice? A systematic literature review. *BMC Fam Pract* [Internet]. 2016 Dec [cited 2017 May 22];17(1). Available from: <http://bmcfampract.biomedcentral.com/articles/10.1186/s12875-016-0524-x>
13. Ahnfeldt-Mollerup P, dePont Christensen R, Halling A, Kristensen T, Lykkegaard J, Nexøe J, et al. Medical engagement and organizational characteristics in general practice. *Fam Pract*. 2016 Feb;33(1):69–74.
14. Goetz K, Jossen M, Szecsenyi J, Rosemann T, Hahn K, Hess S. Job satisfaction of primary care physicians in Switzerland: an observational study. *Fam Pract*. 2016 Oct 1;33(5):498–503.
15. Nylenna M, Gulbrandsen P, Førde R, Aasland OG. Unhappy doctors? A longitudinal study of life and job satisfaction among Norwegian doctors 1994 – 2002. *BMC Health Serv Res*. 2005 Jun 8;5:44.
16. Compton MT, Frank E. Mental health concerns among Canadian physicians: results from the 2007-2008 Canadian Physician Health Study. *Compr Psychiatry*. 2011 Oct;52(5):542–7.
17. Shen L-L, Lao L-M, Jiang S-F, Yang H, Ren L-M, Ying DG-C, et al. A survey of anxiety and depression symptoms among primary-care physicians in China. *Int J Psychiatry Med*. 2012;44(3):257–70.
18. Schneider M, Bouvier Gallacchi M, Goehring C, Künzi B, Bovier PA. Personal use of medical care and drugs among Swiss primary care physicians. *Swiss Med Wkly*. 2007 Feb 24;137(7-8):121–6.
19. Gardner M, Ogden J. Do GPs practice what they preach? *Patient Educ Couns*. 2005 Jan;56(1):112–5.
20. Unrath M, Zeeb H, Letzel S, Claus M, Escobar P. Identification of possible risk factors for alcohol use disorders among general practitioners in Rhineland-Palatinate, Germany. *Swiss Med Wkly* [Internet]. 2012 Aug 22 [cited 2017 May 22]; Available from: <http://doi.emh.ch/smw.2012.13664>
21. Gardiner M, Kearns H, Tiggemann M. Effectiveness of cognitive behavioural coaching in improving the well-being and retention of rural general practitioners. *Aust J Rural Health*. 2013 Jun;21(3):183–9.
22. Williams ES, Manwell LB, Konrad TR, Linzer M. The relationship of organizational culture, stress, satisfaction, and burnout with physician-reported error and suboptimal patient care: results from the MEMO study. *Health Care Manage Rev*. 2007 Sep;32(3):203–12.
23. Schäfer WLA, Boerma GWG, Kringos DS, De Maeseneer J, Gress S, Heinemann S, et al. QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care. *BMC Fam Pract*. 2011;12:115.
24. Cohidon C, Cornuz J, Senn N. Primary care in Switzerland: evolution of physicians' profile and activities in twenty years (1993–2012). *BMC Fam Pract*. 2015;16:107.

25. Selby K, Cornuz J, Senn N. Establishment of a Representative Practice-based Research Network (PBRN) for the Monitoring of Primary Care in Switzerland. *J Am Board Fam Med.* 2015 Sep 1;28(5):673–5.
26. Gibson J, Checkland K, Coleman A, Hann M, McCall R, Spooner S, et al. Eighth National GP Worklife Survey. 2015 [cited 2017 May 22]; Available from: [https://www.research.manchester.ac.uk/portal/en/publications/eighth-national-gp-worklife-survey\(a76ed99e-c54e-4ba4-a20e-ce432322689e\).html](https://www.research.manchester.ac.uk/portal/en/publications/eighth-national-gp-worklife-survey(a76ed99e-c54e-4ba4-a20e-ce432322689e).html)
27. Hämmig O, Brauchli R, Bauer G. Effort-reward and work-life imbalance, general stress and burnout among employees of a large public hospital in Switzerland. *Swiss Med Wkly* [Internet]. 2012 May 31 [cited 2017 Nov 13]; Available from: <http://doi.emh.ch/smw.2012.13577>
28. Goetz K, Musselmann B, Szecsenyi J, Joos S. The influence of workload and health behavior on job satisfaction of general practitioners. *Fam Med.* 2013 Feb;45(2):95–101.
29. DeVoe J, Fryer Jr GE, Hargraves JL, Phillips RL, Green LA. Does career dissatisfaction affect the ability of family physicians to deliver high-quality patient care? *J Fam Pract.* 2002 Mar;51(3):223–8.
30. Steinhaeuser J, Joos S, Szecsenyi J, Miksch A. A comparison of the workload of rural and urban primary care physicians in Germany: analysis of a questionnaire survey. *BMC Fam Pract.* 2011;12:112.
31. Varner DF, Foutch BK. Depression and burnout symptoms among Air Force family medicine providers: *J Am Acad Physician Assist.* 2014 May;27(5):42–6.
32. Campanella P, Lovato E, Marone C, Fallacara L, Mancuso A, Ricciardi W, et al. The impact of electronic health records on healthcare quality: a systematic review and meta-analysis. *Eur J Public Health.* 2016 Feb;26(1):60–4.
33. Gardiner M. Physician you can heal yourself! Cognitive behavioural training reduces stress in GPs. *Fam Pract.* 2004 Oct 1;21(5):545–51.
34. Senn N, Tiaré Ebert S, Cohidon C. La médecine de famille en Suisse - perspectives: Analyse et perspectives sur la base des indicateurs du programme SPAM (Swiss Primary Care Active Monitoring). Neuchâtel: Observatoire suisse de la santé; 2012.
35. Spurgeon P, Barwell F, Mazelan P. Developing a medical engagement scale (MES). *Int J Clin Leadersh.* 2008;16(4):213–23.
36. Netgen. Généralisme : faire envie aux étudiants [Internet]. *Revue Médicale Suisse.* [cited 2017 Nov 10]. Available from: <https://www.revmed.ch/RMS/2017/RMS-N-581/Generalisme-faire-envie-aux-etudiants>
37. Bovier PA, Arigoni F, Schneider M, Gallacchi MB. Relationships between work satisfaction, emotional exhaustion and mental health among Swiss primary care physicians. *Eur J Public Health.* 2009 Dec 1;19(6):611–7.
38. Meli DN, Ng A, Singer S, Frey P, Schaufelberger M. General practitioner teachers' job satisfaction and their medical students' wish to join the field - a correlational study. *BMC Fam Pract.* 2014;15:50.
39. Natanzon I, Ose D, Szecsenyi J, Campbell S, Roos M, Joos S. Does GPs' self-perception of their professional role correspond to their social self-image?--a qualitative study from Germany. *BMC Fam Pract.* 2010;11:10.
40. Santé des étudiants et jeunes médecins [Internet]. [cited 2017 Sep 17]. Available from: <https://www.conseil-national.medecin.fr/print/1726>