

# Job stress and job satisfaction of physicians in private practice: comparison of German and Norwegian physicians

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## Abstract

**Purpose** This study examined job satisfaction and job stress of German compared to Norwegian physicians in private practice.

**Methods** A representative sample of physicians in private practice of Schleswig–Holstein, Germany ( $N = 414$ ) and a nationwide sample of Norwegian general practitioners and private practice specialists ( $N = 340$ ) were surveyed in a cross-sectional design in 2010. The questionnaire comprised the standard instruments “Job Satisfaction Scale (JSS)” and a short form of the “Effort-Reward Imbalance Questionnaire (ERI)”.

**Results** Norwegian physicians scored significantly higher ( $<0.01$ ) on all items of the job satisfaction scale compared to German physicians ( $M 5.57$ ,  $SD 0.74$  vs.  $M 4.78$ ,  $SD 1.01$ ). The effect size was highest for the items freedom to choose method ( $d = 1.012$ ), rate of pay ( $d = 0.941$ ), and overall job satisfaction ( $d = 0.931$ ). While there was no

significant difference in the mean of the overall effort scale between German and Norwegian physicians, Norwegian physicians scored significantly higher ( $p < 0.01$ ) on the reward scale. A larger proportion of German physicians (27.6%) presented with an effort/reward ratio beyond 1.0, indicating a risky level of work-related stress, compared to only 10.3% of Norwegian physicians. Working hours, effort, reward, and country differences accounted for 37.4% of the explained variance of job satisfaction.

**Conclusions** Job satisfaction and reward were significantly higher in Norwegian than in German physicians. An almost threefold higher proportion of German physicians exhibited a high level of work-related stress. Findings call for active prevention and health promotion among stressed practicing physicians, with a special focus on improved working conditions.

**Keywords** Physicians in private practice · Germany · Norway · Job satisfaction · Occupational stress · Effort-reward imbalance

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## Introduction

Job stress and job satisfaction of physicians are important indicators of the quality of health-care systems (for review McKinlay and Marceau 2011). Physicians' work strain and discontent may not only be harmful for the physicians themselves (Soler et al. 2008), but may also affect the quality of patient care (Firth-Cozens and Greenhalgh 1997; Shanafelt et al. 2002). Working conditions like high workload, long working hours, frequent disturbance by telephone, poor communication, infrequent feedback, or low job control were predictors for physicians' dissatisfaction or burnout (Businger et al. 2010; Keeton et al.

2007; Ripp et al. 2011; Scheurer et al. 2009). Physicians who were stressed, dissatisfied, or burned out were more likely to prescribe drugs with more side effects (Melville 1980) or were more often exposed to medical errors (Klein et al. 2011; Shanafelt et al. 2010; Williams et al. 2007). In addition, job satisfaction might be an important factor for career decisions like staying in or leaving the private practice, the profession or the country (Kopetsch 2009; Landon et al. 2006). While physicians' working conditions in hospitals have often been addressed in empirical studies (Rosta and Gerber 2008; Thomas 2004; Voltmer et al. 2007), there is a lack of respective studies on physicians in private practice up to now (Götz et al. 2010; Koch et al. 2011; McKinlay and Marceau 2011; Nylenna et al. 2005a; Voltmer et al. 2010). These physicians provide medical service for a majority of patients in western societies and, thus, play an important role in any health-care system. Due to increased bureaucratization, private physicians too are confronted with numerous regulations and administrative duties that limit or even threaten their professional autonomy and financial security. These conditions were shown to add to the physicians' level of work-related stress (McKinlay and Marceau 2011; Siegrist et al. 2010; Van Ham et al. 2006).

In a nationwide study of German physicians, including those working in private practices, physicians reported only medium scores of job satisfaction (Bestmann et al. 2004b), and a high proportion (37.1% of men and 31.8% of women) indicated that they would probably not or certainly not choose the profession again (Bestmann et al. 2004a). Götz et al. (2010) found that the least satisfaction of general practitioners in Germany was with income, working hours, and mental stress. This is in line with Van Ham et al. (2006, p 178) summarizing the reviewed evidence on the reasons for general practitioners' job discontent as follows: "Too much work and not enough income". In a recent international comparison of general practitioners between 11 countries including Germany and Norway, job satisfaction of German physicians ranked lowest, and more than 82% stated that the health-care system needs to be thoroughly or completely reformed. In Norway, the majority of general practitioners (56%) felt that the health-care system works well, and 89% (compared to 39% of German physicians) were satisfied or very satisfied with their professional situation (Koch et al. 2011). In line with these results, longitudinal data from Norwegian physicians working in or outside hospitals showed high levels of job satisfaction (Aasland et al. 2010). When comparing Norwegian and German physicians working in hospitals, Norwegian physicians had significantly higher life and job satisfaction than their German colleagues (Rosta et al. 2009).

International comparisons may be of value for health-care policy but also for the improvement of physicians' working conditions. They provide evidence about best practice and may help to identify adverse factors for physician's satisfaction and quality of care. Yet, comparative studies based on a clear theoretical and methodological framework are sparse (Siegrist et al. 2010). A model that has been widely used in different professional settings and that addresses relevant aspects of a stressful work environment has been proposed by Siegrist (1996), termed "effort-reward imbalance". According to this model, chronic stress at work results from a mismatch between high efforts spent at work and low rewards received in turn, where rewards include remuneration, esteem/appreciation, and career opportunities (e.g., promotion, job security). We applied this model to our sample of physicians because it captures relevant aspects of private physicians' work environment, including the specific efforts of dealing recurrently with clients (Bakker et al. 2000; Calnan et al. 2000). The model has been successfully applied to physicians before and was shown to be associated with reduced health and well-being (Calnan et al. 2000; Richter et al. 2007; Siegrist et al. 2010). Effort-reward imbalance in terms of high "cost" and low "gain" has been found to increase the risk of stress-related physical and mental disorders in several prospective epidemiological investigations (for review Kivimäki et al. 2006; Stansfeld and Candy 2006).

Siegrist et al. (2010) used this model in a comparison of primary care physicians of the UK, the US, and Germany. They found work stress levels to be highest in Germany and lowest in the UK, with the US in between. While the sample size especially for the German sample in this study was small ( $n = 64$ ), we aimed to improve the statistical power of respective analysis by surveying a representative sample of private practice physicians in a northern German state (Schleswig-Holstein). This sample was compared to a representative sample of Norwegian physicians working in primary care or as private practice specialists. While both the German and Norwegian health-care systems are publicly financed, working conditions in the Scandinavian countries are described as more attractive. This latter fact contributes to a sizeable migration of German physicians to Norway and Sweden (Kopetsch 2009). Against this background, the present study sets out to compare job satisfaction and job stress among German and Norwegian physicians, using two validated self-administered scales, the job satisfactions scale (Warr et al. 1979), and a psychometrically tested short form of the original questionnaire measuring the effort-reward imbalance model (Siegrist et al. 2009). In addition, we analyzed predictors of physicians' job satisfaction across the two countries.

## Method

### German and Norwegian health-care systems

Medical care in Germany is divided into an outpatient and an inpatient sector. Outpatient treatment is provided by physicians in private practice who refer patients to hospitals when ambulatory possibilities have been exhausted (Wörz and Busse 2005). The remuneration of physicians in private practice is mainly based on a fee-for-service system and organized in two steps. Physicians' associations receive a total payment by public health insurance funds, which they distribute among their members. After a fixed budget with a point system (1989, 1993), and individual practice budgets (1997) (Kroneman et al. 2009; Wörz and Busse 2005), remuneration is now (since 2009) mainly based on standard service volumes. Transgression leads to deduction (Kern and Kohnen 2010).

The Norwegian health-care system is predominantly tax-financed and mostly publicly provided (van den Noord et al. 1998). All Norwegian residents are insured by the National Insurance Scheme. Care comprises inpatient and outpatient, primary and specialized treatment including medication. Sick pay and disability benefits are also provided (Tanner 2008). Norwegian health-care services were reformed in 2001 into patient-list public general practitioners outside of hospital who are gate-keepers to more specialized services (Carlsen and Norheim 2003; Tanner 2008) and in 2002 into more cost and consumer-based "public enterprises" with respect to the hospital services.

There are three components of the remuneration of GPs with municipals contract working within the patient-list system: fee-for-service (60%), capitation according to the number of patients on the list from the municipalities (40%), and a relatively small out-of-pocket payment from the patients (Aasland et al. 2010). It is also possible for a GP to have a fixed-salary agreement with the local municipality as an alternative to the combined fee-for-service and capitation contract, and 7% of the general practitioners choose this option (NAV 2008). Private practice specialists are organized within the specialist health-care sector and must have a practice slot from the appropriate regional health enterprise. The service fees are negotiated every year between the Norwegian Medical Association and the government (NMA 2011).

### Sample description

For the German sample, we used data from the second wave (T2) of a longitudinal study. Initially a stratified, random sample of physicians was drawn from the Medical Association of Schleswig–Holstein. From a population of 3935 physicians, a sample of 900 was randomly

selected. At T2, 770 participants were still active and were included in the survey in 2010. Reminders were sent after 4 and 8 weeks. To ensure anonymity, a random bar code was used to identify non-responders. Because the study carried minimal risk and complied with data protection rules, it was approved by the Ethical Committee of the Medical Faculty of the University of Freiburg in a minimal risk review and was exempted from full formal evaluation.

In Norway, physician's health and working conditions have been studied in an extensive research program by the Norwegian Medical Association starting in 1992 (Aasland et al. 1997). As part of this program, a representative sample of approximately 1,200 active doctors has been followed with mailed questionnaires bi-annually since 1994. The panel was supplemented with approximately 400 young doctors in 2000 and with another 250 in 2008. Over the whole period, 436 doctors have left the panel, due to death, retirement or voluntary withdrawal. Hence, the number of panelist in the actual survey in 2010 analyzed here was 1521.

### Measures

Overall job satisfaction and satisfaction with several aspects of working conditions among doctors were measured with the ten items of the job satisfaction scale (JSS; (Warr et al. 1979). Each item is rated on a seven-point Likert scale from 1 "extremely dissatisfied" to 7 "extremely satisfied". The mean score is calculated without any weighting.

Work stress of physicians was measured by a short form of the effort-reward questionnaire (Siegrist et al. 2004). It comprises four items (out of six in the original version) for the effort scale and five (out of eleven) items for the reward scale. Estimations were given on a five-point Likert scale ranging from 1 "item does not apply", and 2 "item does apply, but not distressed" to 5 "item does apply, and very distressed". After appropriate recoding, high scores indicated high perceived effort and high perceived reward. A ratio of effort and reward was calculated to quantify the core theoretical notion of this model, the mismatch between effort and reward. To this aim, a ratio of the sum score of the "effort" items (nominator) and of the sum score of the "reward" items (adjusted for number of items; denominator) was constructed with scores beyond 1.0, indicating a critically high level of work-related stress. The third scale of this model, measuring a critical pattern of coping with job demands, termed "overcommitment", was not included in this survey. This short version was tested previously in different samples and proved to be a reliable and economic indicator of the original measure (Siegrist et al. 2009).

## Statistical analysis

Data analyses were conducted with SPSS for windows Version 15.0 (SPSS Inc., Chicago, IL, USA). We report univariate statistics as means and standard deviations for continuous variables and percentages for categorical variables. For categorical variables, data were analyzed using  $\chi^2$ -tests. For continuous variables, data were analyzed using two-tailed *t* tests and analyses of variance in a general linear model. Analyses of variance were adjusted for age and gender. For ANOVA in the GLM, we used Cohen's *d* as measure of effect size. The influence of demography, work-related factors, and work stress on the physicians' satisfaction was analyzed with forced entry linear regression models with cut-off scores of  $p < 0.05$  for inclusion and  $p > 0.10$  for exclusion.

## Results

The response of German physicians was 53.8% (414/770) valid responses. There were no significant differences in age and specialty between responders and non-responders, but a higher percentage of female physicians (61.3% vs. 47.3% male) participated ( $p < 0.01$ ). For the Norwegian physicians, the response was 67.1% (1,020/1,521). We only included Norwegian physicians in private practice ( $n = 340$ ), of which 69.3% were general practitioners and 24.7% were specialists. Table 1 displays the sample characteristics. Mean age was 53.7 (SD 7.3) in Germany and 52.4 (SD 9.9) in Norway (difference not significant). Norwegian physicians worked significantly less hours per week than their German colleagues.

### Job satisfaction

Norwegian physicians scored significantly higher ( $<0.01$ ) on all items and the sum score of the job satisfaction scale than German physicians (Table 2). The effect size was strong, with the highest scores for the item "freedom to choose method" ( $d = 1.012$ ), followed by "rate of pay" ( $d = 0.941$ ) and "overall job satisfaction" ( $d = 0.931$ ). Adjustment for age, sex, and specialty did not change these results.

JSS sum scores did not differ significantly between male and female physicians or different specialties in both countries (data not shown).

### Effort-reward imbalance

Except for the item "increasing job demands", there was no significant difference between German and Norwegian physicians in responses to the other items and in mean scores

of the effort scale (Table 3). In contrast, in all, except one, item ("job security") of the reward scale, Norwegian physicians scored significantly higher ( $p < 0.01$ ). The strongest effect size was seen for the items measuring "income" ( $d = 0.819$ ) and "esteem" ( $d = 0.787$ ). Adjustment for age, sex, and specialty did not change these results.

In addition, the box-plot diagram in Fig. 1 shows that the distributions of reward scores in German physicians were wider and more shifted toward lower scores.

The effort/reward ratio of the Norwegian physicians was significantly lower than that of the German physicians. A larger proportion of the German physicians (27.6%) presented with an effort/reward ratio beyond 1.0, compared to only 10.3% of the Norwegian physicians. German and Norwegian physicians with an effort-reward score  $>1$  scored lower on all items of the job satisfaction scale in both countries. Except the two items "satisfaction with colleagues and fellow workers" (NOR, GER) and "amount of responsibility given" (GER), these differences were significant.

Effort and reward scores did not differ between male and female physicians in the two countries. German physicians in a conservative specialty (e.g. internal medicine, neurology) had a significantly lower effort/reward ratio than their colleagues in general medicine or with a surgical specialty. In Norwegian physicians, there was no difference between specialties.

In the regression analysis, age, sex, and specialty had no significant impact on the explained variance of job satisfaction, but working hours per week, effort, reward, and country difference accounted for 37.4% of the explained variance (Table 4).

## Discussion

In this study, we compared job stress and job satisfaction of German and Norwegian physicians in non-hospital practice. Job satisfaction was significantly higher among Norwegian compared to German physicians. Differences in effort-reward imbalance were mainly due to significantly higher scores of Norwegian physicians on the reward scale. A much lower proportion of Norwegian physicians had an effort-reward imbalance at risk for mental and physical health problems. Age, gender, and specialty had no influence on job satisfaction. But weekly working time, effort, reward, and country differences accounted for 37.4% of the explained variance.

Job satisfaction is an important predictor not only for mental health but also for the quality of care (Renzi et al. 2005; van den Hombergh et al. 2009). Norwegian physicians did not only score significantly higher in the mean of the total scale but in every single item covering a broad

**Table 1** Sample characteristics of German and Norwegian physicians

	GER ( <i>n</i> = 414)	NOR ( <i>n</i> = 340)
Age		
<i>M</i> (SD)	53.7 (7.3)	52.4 (9.9)
Age groups		
<40	1.7	12.5
40–49	31.6	23.7
50–59	43.5	38.3
≥60	23.2	25.5
Gender		
Female (%)	40	31.4
Male (%)	60	68.6
Specialty		
General medicine	35.5	69.3
Conservative specialty (e.g. internal medicine and neurology)	35.5	11.9
Surgical specialty	29	12.8
Working hours/week		
<i>M</i> (SD)	47.8 (12.2)	43.6 (11.1)
Working hours/week (groups)		
<40	19.8	27.2
40–49	25.1	47.6
50–59	27.5	17.5
≥60	27.5	7.7
Patient/quarter (GER)	1,057.77 (624.70)	
Enrolled patients (NOR)		1,238.45 (349.60)
Patient/quarter (GER)		
Enrolled patients (NOR) (groups)		
<500	14	0.4
500–999	27.1	19.2
1,000–1,499	32.6	57.1
1,500–1,999	9.7	20.1
≥2,000	16.7	3.1

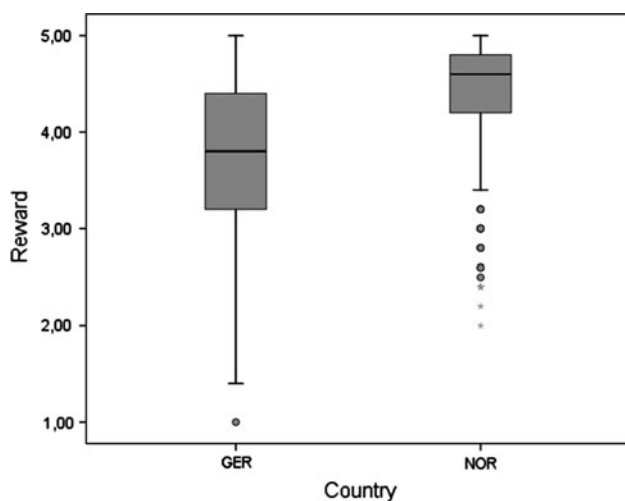
**Table 2** Differences between German and Norwegian physicians in job satisfaction scale (JSS)

Satisfaction with...	GER ( <i>N</i> = 414) <i>M</i> (SD)	NOR ( <i>N</i> = 340) <i>M</i> (SD)	<i>p</i>	<i>d</i>
1. Amount of responsibility given	5.24 (1.42)	5.50 (1.25)	0.006	0.194
2. Opportunities to use abilities	5.16 (1.44)	5.91 (0.98)	<0.001	0.609
3. Variation in work	5.18 (1.37)	5.70 (1.07)	<0.001	0.423
4. Freedom to choose method	4.43 (1.50)	5.74 (1.05)	<0.001	1.012
5. Colleagues and fellow workers	5.43 (1.40)	5.81 (1.04)	<0.001	0.308
6. Recognition for good work	5.08 (1.51)	5.40 (1.19)	0.002	0.235
7. Rate of pay	4.00 (1.74)	5.41 (1.21)	<0.001	0.941
8. Work hours	4.00 (1.68)	4.83 (1.48)	<0.001	0.524
9. Physical working conditions	4.52 (1.63)	5.54 (1.20)	<0.001	0.713
10. Overall job satisfaction	4.81 (1.39)	5.90 (0.90)	<0.001	0.931
Overall mean score	4.78 (1.01)	5.57 (0.74)	<0.001	0.892

**Table 3** Comparison of effort and reward between German and Norwegian physicians

	GER (N = 414)	NOR (N = 340)	p	d
<b>Effort<sup>a</sup></b>				
I have constant time pressure due to a heavy workload	3.16 (1.14)	3.07 (1.14)	0.277	0.079
I have many interruptions and disturbances in my job	2.65 (1.23)	2.63 (1.10)	0.771	0.017
I have a lot of responsibility in my job	2.80 (0.96)	2.93 (0.90)	0.065	0.140
Over the past few years, my job has become more and more demanding	2.90 (1.27)	2.53 (1.24)	<0.001	0.295
<b>Reward (recoded<sup>a</sup>)</b>				
The prospects of my further job development are poor	3.98 (1.05)	4.22 (1.00)	0.002	0.234
I have experienced or I expect to experience an undesirable change in my work situation	3.35 (1.42)	4.03 (1.26)	<0.001	0.507
My job security is poor	4.53 (1.05)	4.67 (0.85)	0.059	0.147
Considering all my efforts and achievements, I receive the respect and prestige I deserve for my work	3.87 (1.12)	4.63 (0.78)	<0.001	0.787
Considering all my efforts and achievements, my income is adequate	3.28 (1.22)	4.22 (1.07)	<0.001	0.819

<sup>a</sup> High values indicate high effort/reward



**Fig. 1** Box-plot of country differences between Germany and Norway in reward scale (recoded: high values = high reward, lower whisker: lowest score, upper whisker: highest score, vertical line in box: median, lower box limit: lower quartile, upper box limit: upper quartile, circles and asterisks: extreme scores)

field of job-related issues. In addition to the overall job satisfaction, the strongest effect size was observed for the items “clinical autonomy (freedom to choose method)” and “remuneration (rate of pay)”. In Norway, this has been stable or even increasing over the last decade (Aasland et al. 2010; Nylenna et al. 2005b). In agreement with these findings, higher job satisfaction among Norwegian physicians was observed in a former study comparing German and Norwegian doctors working in hospitals (Rosta et al. 2009). Overall means of job satisfaction of these doctors were lower in both countries compared to physicians in private practice reported here. Compared with a series of surveys among GPs in the UK from 1998 to 2004 which

used the same scale, overall job satisfaction in Germany and Norway was higher than in the UK (Whalley et al. 2006), but in a recent international comparison of general practitioners among 11 countries including Germany and Norway, job satisfaction of German physicians scored lowest (Koch et al. 2011). Similar to our study, Rosta et al. (2009) did not find significant gender differences in job satisfaction in physicians working in hospitals, although some other reports contradict this finding (Götz et al. 2010; Sibbald et al. 2000; Whalley et al. 2006).

Norwegian physicians also scored significantly higher on the reward scale (but not on the effort scale) than German physicians. Besides remuneration, this scale includes aspects of career development, job stability, and security, as well as respect and prestige. Except for job security, the estimations of Norwegian physicians were significantly higher than those of their German colleagues. Siegrist et al. (2010) surveyed physicians in three countries (US, UK, and Germany) and also found that the main difference was not seen on the effort but on the reward scale. German physicians had the highest work-related stress levels, followed by the US and the UK.

Compared to international data, the proportion of 28% of German physicians in our study with a critically elevated level of work stress (the effort-reward ratio >1.0) was quite high. A recent report summarized data on working populations from six European countries and found proportions of effort-reward ratios greater than one to be 3.2% for the UK, 8.7% for Germany, 16.5% for Poland, and 19% for Hungary (Salavec et al. 2010). From a cohort of young Swiss doctors working in hospitals, proportions of 18% for men and 14% for women have been reported (Buddeberg-Fischer et al. 2005). Quite similar to our German sample were the proportions of surgeons working in German

**Table 4** Regression analysis for job satisfaction as dependent variable

Blocks entered in the multivariate analyses (forced entry)	Univariate analysis		Multivariate analysis				
	Crude B	95% CI	Adjusted B	95% CI	<i>t</i>	<i>p</i>	Adjusted cumulative <i>r</i> <sup>2</sup>
Block 1:							
Age	0.001	−0.007 to 0.009	−0.006	−0.013 to 0.001	−1.751	0.080	−0.002
Gender (1 = male, 2 = female)	0.015	−0.132 to 0.163	0.070	−0.057 to 0.196	1.081	0.280	
Block 2: specialty (1 GP, 2 conservative, 3 surgical)	0.000	0.000 to 0.001	0.000	−0.001 to 0.000	−1.194	0.233	−0.003
Block 3: working time/week	−0.024	−0.030 to −0.018	−0.011	−0.017 to −0.006	−3.998	<0.001	0.086
Block 4:							
Effort (five-point Likert scale 1 low to 5 high effort)	−0.379	−0.455 to −0.302	−0.153	−0.231 to −0.075	−3.844	<0.001	0.329
Reward (recoded; five-point Likert scale 1 low to 5 high reward)	0.630	0.556–0.704	0.449	0.367–0.531	10.745	<0.001	
Block 5: country (Germany 0, Norway 1)	0.788	0.657–0.919	0.463	0.336–0.590	7.159	<0.001	0.374

hospitals (ERI >1 men 25.8%, women 23.9%) (Klein et al. 2010). Like in our study, the effort-reward ratio showed no significant gender differences in these two studies of Swiss and German doctors.

Searching for explanations for these results, one may notice that in Germany, a long series of health-care legislation amendments aimed at reducing costs has increased the physicians' financial pressure, their administrative workload, and their feelings of restricted professional autonomy (Hoppe 2007; Lisac et al. 2010; Scheffler 2010; Stock et al. 2007). While there were also comprehensive reforms in the Norwegian health-care system, the results and the impact on physicians seem to be less severe and did not reduce the physicians' job satisfaction (Aasland et al. 2010). A better work atmosphere in Norwegian hospitals, with lower physical burden, better collegial environment, more professional autonomy, more control over clinical work, and shorter work hours were suggested as reasons for the higher job satisfaction in Norwegian physicians working in hospital compared to their German colleagues (Rosta et al. 2009). In our study, the differences of effort and reward and the country differences were the strongest predictors of job satisfaction.

In terms of physician remuneration, an OECD working paper showed that with an income of 112,000 USD (2004, adjusted for the economy-wide purchasing power parity (PPP)) German GPs ranked fourth in selected OECD countries. The ratio to the average wage of all workers per capita in 2006 was 3.6 for GPs and 4.5 for specialists (Fujisawa and Lafortune 2008). Data for Norway were not included in this study. There is some evidence that wages of doctors working in hospitals might be higher in Norway than in Germany (Bausch 2004; Möhlmann 2009; Walger and Köpf 2005), but a recent report of the German hospital

society disputes if, adjusted for purchasing power, this holds true especially for older and specialized physicians (DKG 2011). Selected data for Norwegian physicians in practice are not available. So it remains unclear, if the German discontent with the rate of pay is due to a real disadvantage (connected with the higher working time per week addressed below) or enhanced expectations.

A reason for discontent may also be the physicians' perception that under fixed budget conditions, i.e. once their budget has been exhausted, they have to provide services free of charge (Dannecker et al. 2009; Tschuschke 2003).

Another important predictor of job satisfaction was the working time per week. German physicians in our study had a significantly higher working time per week than their Norwegian colleagues. Koch et al. (2011) also reported that out of eleven countries studied, German physicians reported by far the highest number of working hours per week (50.8 h vs. 47.6 US, 42.2 UK, 40.5 Norway, and 37.8 Sweden), and the most patient contacts (242 vs. 96 US, 130 UK, 81 Norway, and 53 Sweden) with the shortest time per patient (9.1 min. vs. 22.5 min. US, 13.3 min. UK, 20.6 Norway, and 28.8 Sweden). More than half (54%) of German physicians in this study complained that the amount of time for administration was "very" problematic, compared to only 13% in Norway. A recent investigation of time allocation in three different countries also showed that German and British physicians scheduled less time for new patient appointments (32 min US vs. 16 GER, 11 UK), routine visits (18/6/10), or a complete physical (36/12/20) compared to their US colleagues (Konrad et al. 2010).

Low job satisfaction and an effort-reward imbalance have been described as risk factors for physical and mental health symptoms and illness in various occupational groups

including nurses and physicians (Buddeberg-Fischer et al. 2008; Schulz et al. 2009; Tsutsumi et al. 2001; Unterbrink et al. 2007). The high proportion of German physicians with an explicit effort-reward imbalance may also be one explanation for the factual emigration of German physicians to Austria, Switzerland, UK, and not least the Scandinavian countries (Kopetsch 2009; Landon et al. 2006). This drainage is of concern since especially in the eastern parts of Germany (Hibbeler 2011; Osterloh 2010), but also for example in Schleswig–Holstein (Hartz 2009), it is hard to fill in vacancies in hospitals or practice locations. Since stress and job satisfaction are also related to quality of care, our results emphasize the need for interventions in Germany to foster physicians' well-being, job satisfaction and thus the quality of patient care.

### Limitations

Several limitations of this study must be noted. Although the response rate was satisfactory, the risk of selection bias cannot be ruled out. A gender bias regarding the higher percentage of female responders was ruled out by unchanged results after adjustment for gender. Cross-sectional data do not allow causal interpretations. Because the data needed for the mailing procedure were drawn from the Medical Association of Schleswig–Holstein, it is unlikely that the reported results are representative of all physicians in private practice in Germany. In contrast to the German sample, the Norwegian sample represents a nationwide selection, and the proportion of doctors working in and out of hospitals is comparable with the whole population of Norwegian physicians. The Norwegian sample comprises a larger proportion of younger and male doctors and of physicians working in general medicine. However, the age difference between the samples was not significant, and adjusting for age, sex, and specialty did not change the main results. Sample differences are therefore not likely to influence the reported results.

### Conclusion

Job satisfaction and reward were significantly higher in Norwegian than in German physicians. An almost threefold higher proportion of German physicians at risk for mental and physical health problems call for active prevention and health promotion, especially with respect to reward, work hours, and clinical autonomy.

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