

Stress-Buffering and Health-Protective Effect of Job Autonomy, Good Working Climate, and Social Support at Work Among Health Care Workers in Switzerland

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Objective: The relationship between work stress, job resources, and health has not yet been investigated among health professionals in Switzerland. **Methods:** Cross-sectional survey data, collected among hospital employees in German-speaking Switzerland, have been used for this study. Established measures were used to assess work stress as the main predictor and self-rated health and work-related burnout as the outcome variables. Validated measures for job autonomy, work climate, and social support at work were used as intervening variables. **Results:** The studied job resources were all found to be quite strongly and negatively associated with the two health outcomes but only partly explained and reduced the extraordinary strong positive association and clear dose–response relationship between work stress and poor self-rated health or burnout. **Conclusion:** Job resources like these cannot completely prevent health professionals from negative health-related consequences of work stress.

Keywords: burnout, health professionals, job autonomy, job resources, self-rated health, social support, Switzerland, work climate, work stress

Gainful work in the modern, industrialized world has always involved serious physical health risks, and lead especially to accidents and occupational diseases. Nowadays and especially in service occupations including health professions, work is known as a potential source of psychosocial risk factors and particularly stress as well as stress-related illnesses and health problems such as musculoskeletal disorders,^{1,2} cardiovascular diseases,^{3–5} or burnout syndrome.^{6,7} But work not only involves different risk factors and stressors but also provides protective factors and resources which help to buffer against work-related stress and to cope with job stressors. In general and overall, having a job is demonstrably better for health than having no job and being unemployed which in turn carries an increased risk of disease and premature death.^{8–10} One reason for that—apart from a wide and generally observed selection process, also known as the so-called “healthy worker effect”¹¹ which

leads to a systematic underestimation of the true morbidity and mortality risk in the working population—may be the mentioned stress-buffering and health-protecting job resources. Among the most important, most often reported and best proven work-related health resources are job control or job autonomy,¹² social support at work,¹³ and a good work environment or positive work climate.^{14,15}

Current literature shows different models, which describe negative associations between work stressors and health via several different mechanisms.^{16–19} Apart from adverse mental health conditions due to work stress, such as burnout, research literature describes also adverse general and physical health conditions. Among the most commonly described physical health conditions are increased risks for type 2 diabetes and cardiovascular diseases.⁴ In contrast, the research describes different health protective factors, which can be subdivided roughly into organizational resources and personal resources.^{20–24}

A new concept in the scientific discourse—the antifragility—describes a convex relationship between stressors and diverse systems, also between stressors and health, among others.^{25,26} Applied in the context of the above-mentioned literature, this concept adds an important fact: certain types, amounts, and frequencies of stress do promote health. Physical stress, for example, weightlifting, temporarily causes some fatigue or vulnerability of those structures that were exposed to training (eg, muscles or bones). Physiological adaptations during the recovery time finally result in an “overcompensation,” which ultimately manifests in more muscle strength or stronger/less fragile bones.^{27,28} The same principle applies also to mental health: psychological challenges such as a heavy blow of fate may cause a post-traumatic stress disorder, but on the other hand may also cause post-traumatic growth.^{29,30} Even though the effects of convex relationships between stressors and physical/mental health find some application in the real world for a long time already, the implementation of the concept in the scientific discourse is revolutionary. Applied in the research field of interrelations between stress and health, the antifragile reaction seems to be a core feature of the salutogenesis and thereby a core feature of the mechanisms that increase resilience as well. However, current models that describe associations between work stress and health do not include potential convex relationships between stress and health.

This study focuses on health professionals which have been described as experiencing stress levels at work above average and consequently suffering health problems more frequently and/or more severe than average.^{31–34} In particular, health professionals are often confronted with decision-making pressure under uncertainty, heavy responsibility, long working days, night shifts, high work volume, high emotional burden being faced with strokes of fate, and an increasing bureaucracy. These work factors are all clear stressors that may cause chronic stress and subsequently stress-induced health problems, at least if they are continuous and not accompanied by job resources that help to cope with such stressors.

From a broader perspective, poor health among health professionals is relevant for the quality of care as well. Treatment errors due to fatigue and knowledge drain owed to the fluctuation of employees point out this relationship.^{32,35,36}

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Clinical Significance: The study results underline the importance of job resources such as autonomy or job control, work climate, and social support as a buffer against work stress and its negative health effects among heavily affected and stressed health professionals. However, the findings have further shown that these resources cannot fully compensate for stress-induced poor self-rated health or burnout symptoms.

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To improve the health of permanently stressed or even burnt-out health professionals, the literature points out mainly two strategies: eliminating or reducing work stressors and establishing or strengthening work resources. In the latter case, efforts can be made on an individual or an organizational level.^{37,38} There is evidence to suggest that adaptations on an organizational level are more efficient than efforts on an individual level.³⁹

However, as health care systems and corporate cultures differ significantly between different countries, many findings from the international research literature cannot be readily applied to health professionals in Switzerland. Little data are available about the relationship between work stress, job resources, and the health status among health professionals in Swiss hospitals and rehabilitation clinics. Previous studies in Switzerland have addressed and confirmed the demanding working conditions (heavy responsibility, temporal work stressors, and growing bureaucracy), the stressful high effort/low reward situations at work, and particularly the increased burnout symptoms among hospital employees in Switzerland.^{7,40,41} However, it still remains partly unclear to what extent and under which circumstances stress at work affects the general and mental health of health care workers in Switzerland and what role specific job resources play in this regard. And if any differences in this regard can be observed among different health professions and particularly between the two main occupational groups of nurses and physicians.

From a public health perspective and a worksite health promotion point of view, we have a particular interest to investigate work-related resources which are potentially adaptable and modifiable by executive personnel in hospitals or rehabilitation clinics. Therefore, the primary goal of this paper was to investigate the

assumed stress-buffering and health-promoting or rather a health-protecting effect of three specific and proven health-related job resources with respect to self-rated health and burnout syndrome among health professionals (Fig. 1).

The following research questions were addressed by the present study:

- Which one of the work-related resources such as job autonomy, work climate, and social support at work has the strongest health-protective effect, and which one is the weakest among health care workers in German-speaking Switzerland?
- Do these job resources fully compensate for or at least partly reduce the negative effects of work stress on health?

METHODS

Data and Study Sample

A secondary analysis of cross-sectional data has been undertaken for this study. The data are based on a survey on “Work and Health in Hospital” among health care workers of four self-selected public hospitals and two rehabilitation clinics in German-speaking Switzerland, conducted in 2015/16. The main, original, and unspecific aim of the survey among hospital employees in general and health professionals, in particular, was to broadly study various possible associations of different job characteristics, occupational exposures, and working conditions (job stressors and resources) with a variety of physical and mental health conditions or outcomes.

Overall, 4497 hospital employees have been asked to participate in the survey. Finally, 1840 hospital employees (survey

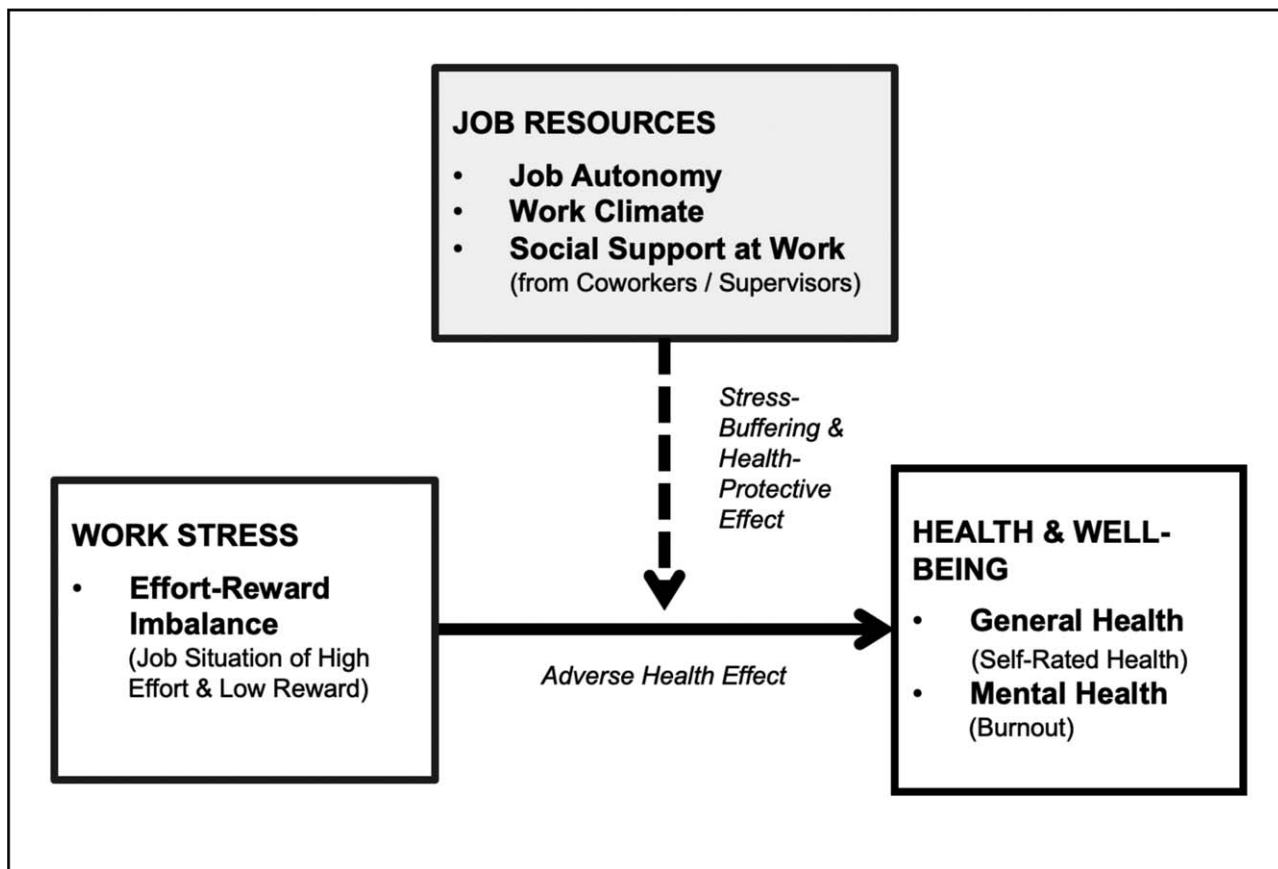


FIGURE 1. Path model showing the used indicators and hypothesized and studied relationships between exposure, outcome, and intervening variables.

population) and therefrom 1441 health professionals (study sample) have attended. The response or return rate was about 41%. The study focused on health professionals only. Hospital employees from other than health care professions were included in the survey and descriptive statistics but excluded from the study and the association analyses. Approximately 85% of the survey participants or rather hospital employees were female, within the studied health professionals the proportion of women was nearly 88%. Among nurses only the female share was 94%, and among the physicians the proportion of women was 64%.

The study sample consists of six occupational groups of very different sizes: 861 nurses (59.8% of the sample), 21 midwives (1.5%), 235 physicians (16.3%), 158 therapists (11.0%), 95 medical-technical staff members (6.6%), and 71 other academic/scientific staff members (4.9%).

Measures

Work Stress

Stress at work was assessed with an established and well-validated multiple-item job stress measure, the so-called effort-reward imbalance (ERI) questionnaire.⁴² This stress model or measure consists of two subscales on the perceived effort put into work (10-item scale) and the self-assessed reward received from work (6-item scale). A ratio between the total scores of the two subscales was then calculated and corrected for the different numbers of items of the subscales.⁴² An ERI ratio of 1 or below indicates a sufficiently rewarded job and work effort. And an ERI ratio of above 1 indicates an imbalanced relationship between effort and reward at work, that is, a stressful job situation with a certain reward frustration or more precisely an under-rewarded work effort.

Despite such conceptualization the ERI ratio in this study—as usual—is treated as a continuous (and not dichotomous) variable and categorized into four ordinally scaled levels of work stress: low (ERI ratio ≤ 0.8), moderate ($>0.8-1.0$), high ($>1.0-1.5$), and very high (>1.5).

Job Resources

- **Job autonomy:** To assess job autonomy, an 8-item scale consisting of two 4-item subscales on the influence and the degree of freedom at work was used. The two subscales originate from the German version of the Copenhagen Psychosocial Questionnaire (COPSOQ)^{43,44} and include questions on the decision latitude about when to take a break or to take holidays or with whom one is working. Response options include frequency data from «always» (score 4) over «often» (3), «sometimes» (2), and «seldom» (1) to «never or hardly ever» (0). The sum score of the full scale ranges from 0 to 32 with scores up to 8 indicating a comparably low level of job autonomy and scores of 17 and higher indicating a high or very high level of job autonomy.
- **Work climate:** Work climate was measured by a scale of three items from the COPSOQ on the sense of community, the work atmosphere, and the quality of collaboration among coworkers with possible answers again from «always» (score 4) to «never or hardly ever» (0). This 3-item scale was completed with an additional question from the COPSOQ on the frequency of feeling unfairly criticized, bullied, or exposed in front of others and given equal response options (and scores). The scores of the four single items were summed up to a scale with a maximum total score of 16. A total score of 10 or below was categorized as a relatively «poor working climate» and a score of 13 and above as a fairly or very «good working climate».
- **Social support at work:** Social support at work was measured by three items—taken and adapted from the Stress Study of 2000 of the State Secretariat for Economic Affairs Seco⁴⁵—on the frequency of availability of help, assistance, and understanding

from direct supervisor(s), closest colleague(s) at work, and other co-workers in case of experienced difficulties at work. Response options for each item ranged from «never» (0) to «sometimes» (1), «often» (2) and «very often» (3), and the total score of the sum scale was classified into four categories: no or only «weak support» (score 0–2), «moderate support» (3–4), «strong support» (5–6), and «very strong support» (7–9).

Health and Well-Being

- **General health:** General health was assessed by the following widely used single-item measure: «How is your health in general?» (very good, good, moderate, bad, or very bad). The 5-point Likert-scaled variable was then dichotomized whereby moderate to very bad self-rated health was categorized as «poor».
- **Mental health:** Mental health was measured by the German version of the 6-item personal burnout subscale of the Copenhagen Burnout Inventory (CBI).^{46,47} The scale contains the following questions:
 - How often do you feel tired?
 - How often do you feel physically exhausted?
 - How often do you feel emotionally exhausted?
 - How often do you think: «I can't take it anymore»?
 - How often do you feel worn out?
 - How often do you feel weak and susceptible to illness?
 Response options were the following: «always» (score 4), «often» (3), «sometimes» (2), «seldom» (1), and «never/hardly ever» (0). Total scores of 16 up to a maximum of 24 were categorized as «increased burnout symptoms» and newly valued or scored with 1. Sum scores of below 16 were classified as «not increased» and newly scored with 0 to get a binary coded dummy variable.

Analyses

Descriptive statistics were calculated for nurses and midwives, physicians, other health professionals, as well as all hospital employees. Statistical association analyses in this study were restricted to health professionals. Multivariate logistic regression analyses were performed to study associations between job resources and health outcomes on the one hand and between work stress and health outcomes on the other. Odds ratios were calculated as measures of association and proxies for the relative risk. All studied associations were adjusted for sex, age, and education. The outcome variables of poor self-rated health (general health) and increased burnout symptoms (mental health) were dichotomized by dummy coding.

Due to insufficient statistical power and fairly low case numbers of most occupational groups (except for nurses), multivariate statistical analyses have not been stratified and adjusted odds ratios were not calculated separately for individual occupations or specific health professions but were only performed for the total of health professionals participating in the survey.

RESULTS

Descriptive Statistics

Descriptive statistics are presented in Table 1. Large proportions, namely two-thirds of all health professionals and even more than 70% of the nurses and midwives show high levels of work stress. At the same time, approximately 80% of the nurses and midwives and still 60% of the physicians have only a little or moderate job autonomy. In contrast, almost three-fifth of the physicians and even two-thirds of the nurses and other health professionals report high levels of social support. The work climate seems to be fairly good for the majority of all health professionals. Nevertheless, every ninth health professional reports a poor working climate.

TABLE 1. Work Stress, Job Resources, And General And Mental Health Outcomes Among Survey Participants (N = 1,840) And Subgroups

	Nurses (incl. midwives) (n = 882)	Physicians (n = 235)	Other health professionals (n = 324)	All health professionals (n = 1,441)	All hospital employees (N = 1,840)
	%	%	%	%	%
Work stress (ERI ratio)					
Low (<= 0.8)	6.5	11.3	18.1	10.3	12.5
Moderate (>0.8–1.0)	22.0	23.6	25.4	23.0	23.9
High (>1.0–1.5)	57.2	53.2	44.9	53.5	51.1
Very high (>1.5)	14.3	11.8	11.6	13.3	12.6
Job autonomy					
Low (0–8)	21.9	13.1	8.0	16.2	15.6
Medium (9–16)	57.7	47.4	40.2	53.5	50.0
High (17–24)	18.7	32.4	43.0	26.1	28.7
Very high (25–32)	1.7	7.0	8.7	4.2	5.7
Social support at work					
Weak (0–2)	6.3	8.8	8.0	7.2	8.6
Moderate (3–4)	26.8	33.3	27.8	29.5	29.7
Strong (5–6)	41.5	40.3	37.8	39.7	38.5
Very strong (7–9)	25.4	17.6	26.4	23.6	23.2
Work climate					
Poor (0–10)	9.0	11.0	11.9	11.0	12.2
Moderate (11–12)	31.3	32.9	26.7	30.8	29.3
Good (13–14)	37.4	34.2	35.1	35.3	34.6
Very good (15–16)	22.3	21.9	26.3	22.9	23.9
Self-rated health					
Very good (1)	36.4	51.4	39.2	38.9	38.8
Good (2)	52.9	42.8	46.0	49.9	49.6
Moderate (3)	10.3	5.0	13.4	10.4	10.8
Bad/very bad (4–5)	0.4	0.9	1.4	0.8	0.8
Burnout symptoms					
No/little (0–11)	67.7	63.5	68.1	68.7	69.6
Several (12–15)	24.1	23.3	22.9	22.9	22.2
Many (16–24)	7.3	13.2	9.0	8.4	8.2

Regarding the general and mental health status of health professionals, two findings are noticeable. On the one hand, every ninth nurse or midwife and every seventh other health professionals in the study population, but only every 17 physicians show poor self-rated health. On the other hand, “only” 7% of the nurses and midwives and 9% of other health professionals, but at least 13% or more than every eighth out of the physicians report many burnout symptoms and therefore show an increased risk of burnout syndrome.

Multivariate Analyses

Table 2 clearly shows the expected health-protective effects of the three studied job resources, independent of sex, age, and education. Adjusted odds ratios and prevalence rates of poor self-rated health and increased burnout symptoms by levels of job autonomy, social support at work and work climate show almost without exception clear dose-effect relationships (Table 2). Having only low job autonomy is associated with a significantly increased risk of being in poor self-rated health (+84%) and showing increased burnout symptoms (+163%) compared to those health professionals with medium-level job autonomy. A good or very good working climate goes along with approximately half or even one-third of the risk for poor self-rated health and increased burnout symptoms compared to health care workers who report a moderate work climate. The strongest association was found for social support and the two studied health outcomes. The relative risk for poor general health and burnout is between four and five times smaller among those health professionals with very strong social support at

work compared to the reference group of the ones with an average or moderate level of support.

Further analyses revealed that these job resources at least partly reduce the strong negative effects of work stress on general and mental health found for health professionals in this study (Table 3). Associations between levels of work stress and relative risks for negative health outcomes (poor self-rated health and increased burnout symptoms) show for the basic model the extraordinary strong effect of an effort-reward imbalance on general and particularly mental health. Crude prevalence rates as well as multiple adjusted odds ratios turned out to be 4 up to 19 times higher for those study participants with the highest level of work stress compared to the reference group showing only a moderate level of work stress. When including the three job resources in the extended model they did not eliminate but substantially reduced this strong effect of work stress on the two studied general and mental health outcomes by around one-third of the original value.

DISCUSSION

This study was performed to unravel the possible health-protective and potential stress-buffering effect of a well-founded selection of job resources (high job autonomy, good working climate, and strong social support at work) among health care workers in general and for different health professions (nurses, physicians, and other health professionals) in particular. This has not been studied and published so far in this specific form and in this setting for Switzerland.

TABLE 2. Health-Protective Effect Of Job Resources Among Health Professionals (N = 1,441)

	Poor self-rated health (3–5)			Increased burnout symptoms (16–24)		
	%	aOR*	95% CI	%	aOR*	95% CI
Total study population	11.2			8.4		
Job autonomy						
Low (0–8)	17.7	1.84	1.21–2.79	17.5	2.63	1.68–4.11
Medium (9–16)	10.5	1		7.9	1	
High (17–24)	8.8	0.82	0.53–1.29	5.0	0.51	0.29–0.90
Very high (25–32)	5.1	0.49	0.15–1.62	3.4	0.31	0.07–1.33
No. of cases in model	1,363			1,347		
Social support at work						
Weak (0–2)	13.7	0.75	0.40–1.40	17.2	1.87	1.01–3.49
Moderate (3–4)	17.9	1		11.2	1	
Strong (5–6)	9.3	0.47	0.32–0.61	7.2	0.57	0.36–0.90
Very strong (7–9)	4.5	0.22	0.12–0.39	3.7	0.24	0.12–0.47
No. of cases in model	1,380			1,363		
Work climate						
Poor (0–10)	16.0	1.15	0.68–1.93	18.8	1.83	1.09–3.07
Moderate (11–12)	13.8	1		11.7	1	
Good (13–14)	9.5	0.66	0.43–0.99	3.9	0.31	0.18–0.53
Very good (15–16)	7.8	0.54	0.33–0.88	5.7	0.44	0.25–0.78
No. of cases in model	1,377			1,358		

Figures (aOR) in bold = significant on a 5% or lower level ($P \leq .05$).
 *Odds ratios adjusted for control variables (sex, age, and education).

Main Findings

- Each of the mentioned three studied job resources was significantly negatively associated with poor self-rated health and increased burnout symptoms. Job autonomy and particularly social support at work turned out to be the resources with the individually strongest health-protective effect.
- All considered job resources together substantially reduced the strong association observed between work stress and general and mental health outcomes.
- However, these job resources only partly reduced and not completely compensated the negative health effects of work-related stress among health professionals.

Integration of the Findings to Pre-Existing Data

The health-protective effect of the job resources in this study was in tendency stronger than anticipated considering the pre-existing literature.^{12,38,48} The stronger associations in our study are probably due to real differences in the health care systems and the study populations. Factors such as different measures, different models, or different study designs may alternatively explain the differences of the effect sizes as well.

Colin West recently demonstrated in his study for the United States that physicians exhibited higher levels of resilience than the general working population and that resilience was inversely associated with burnout symptoms. Despite this fact, burnout rates were

TABLE 3. Stress-Buffering Effect Of Job Resources Among Health Professionals (N = 1,441)

	Poor self-rated health (3–5)			Increased burnout symptoms (16–24)		
	%	aOR	95% CI	%	aOR	95% CI
Total study population	11.2			8.4		
<i>Basic model*</i>						
Work stress (ERI ratio)						
Low (≤ 0.8)	5.1	0.68	0.28–1.64	–	–	
Moderate ($>0.8-1.0$)	7.2	1		2.3	1	
High ($>1.0-1.5$)	11.4	1.66	1.01–2.72	7.3	3.52	1.57–7.87
Very high (>1.5)	24.4	3.90	2.23–6.82	29.1	18.56	8.11–42.48
No. of cases in model	1,301			1,285		
<i>Extended model†</i>						
Work stress (ERI ratio)						
Low (≤ 0.8)	5.1	0.81	0.33–1.99	–	–	
Moderate ($>0.8-1.0$)	7.2	1		2.3	1	
High ($>1.0-1.5$)	11.4	1.51	0.89–2.56	7.3	2.77	1.21–6.34
Very high (>1.5)	24.4	2.83	1.52–5.27	29.1	11.21	4.69–26.77
No. of cases in model	1,238			1,225		

Figures (aOR) in bold = significant on a 5% or lower level ($P \leq .05$).
 *Odds ratios adjusted for control variables (sex, age, and education).

†Odds ratios additionally adjusted for intervening variables (job autonomy, social support at work, and work climate).

found to be substantial even among the most resilient physicians.⁴⁹ As traditional models fail to explain the higher level of resilience among the physicians in that study, the antifragile reaction delivers an additional plausible explanation. However, the fact that burnout rates were substantial even among the most resilient physicians in West study highlights the need for action to improve the working conditions among health professionals.

Implications

By describing the mechanisms and by studying the relationship between work stress, job resources, and health, and by estimating the magnitude of this relationship among employees and occupational groups in a health care setting in Switzerland, this study added an important piece of information. From a practical point of view, the findings of the study set the ground for evidence-based adaptations and improvements of job resources among health professionals in health care institutions in Switzerland. And this in turn is likely to improve the general and mental health status of health professionals and to prevent them from frequently observed absences from work, job changes, or career endings, that is, from inner resigning, changing, and/or leaving the profession.

Strengths and Limitations

Strengths

- Even though cross-sectional designs do not permit causal conclusions, several indicators for a causal relationship can be found, among them the strength of the presented associations, consistent dose–response relationship across different health outcomes and health professions, the plausibility of the relations in the used model and the conformity of the results with the results of foreign studies.
- For the measures, established and validated and widely used instruments were used.
- The main research questions showed highly significant results.

Limitations

- Due to the cross-sectional design of the study, only associations can be demonstrated and no causal conclusions can be drawn and no cause–effect relationships can be deduced.
- Due to the use of non-representative data and a non-randomly selected but rather self-selected study population, study findings cannot be generalized to the Swiss working or employed population or even the health care workers in general.
- The path model used to study the assumed associations is, as usual, a simplification and not fully specified. Some of the relations may be bi- or multidirectional in reality, and the list of the resources is not complete. Other potentially contributing or confounding factors like personal resources or additional job characteristics have not been considered and included in our analyses. Possible non-linear relationships have not been considered and have not been taken into account in the model.
- In general, the use of questionnaires and survey data has a potential for error and systematic bias. The self-selection of the participating hospitals and clinics and the voluntary survey participants from the workforces of these hospitals and clinics as well as the rather low even though not unusual response rate in the survey of 41% cannot be ruled out as potential sources of bias.

CONCLUSION

The promotion of specific resources in the workplace such as high job autonomy, strong social support at work, or good working climate seems to be a promising approach or strategy to reduce

negative health effects of job stress among health care workers, and to partly avoid further negative outcomes and consequences such as changing the job or leaving the profession which are often associated with work stress or burnout symptoms.⁶ However, such job resources are doubtless health-protective but obviously and by far not stress-buffering enough to completely prevent stress-related and -associated health problems.

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