

## RESEARCH ARTICLE

# Investigating work-related stress among health professionals at different hierarchical levels: A cross-sectional study

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## Abstract

**Aim:** To determine the extent of stress at work among health professionals working in upper-, middle- and lower-management positions and those not working in management positions.

**Design:** Cross-sectional design and randomly selected hospitals, nursing homes and home care organizations.

**Methods:** The study sample included nursing staff and midwives, physicians, medical-technical and medical-therapeutic professionals at all hierarchical levels ( $N = 8,112$ ). Data were collected using self-report questionnaires and analysed using multiple regression models.

**Results:** Health professionals in upper- and middle-management positions reported higher quantitative demands, severe work-private life conflicts ( $p < .05$ ) as well as less role clarity in middle-management positions ( $B = -1.58, p < .05$ ). In lower-management positions, health professionals reported higher physical ( $B = 3.80, p < .001$ ) and emotional demands ( $B = 1.79, p < .01$ ), stress symptoms ( $B = 1.81, p < .05$ ) and job dissatisfaction ( $B = -1.17, p < .05$ ). Health professionals without management responsibilities reported the poorest working conditions in relation to various stressors, job satisfaction ( $B = -5.20, p < .001$ ) and health-related outcomes (e.g. burnout symptoms:  $B = 1.89, p < .01$ ).

## KEYWORDS

nurses, nursing, stress, work, workforce

## 1 | INTRODUCTION

The workforce shortage among health professionals is an acute issue worldwide and has the potential to destabilize the availability and quality of care provided in individual countries (Aiken et al., 2012; WHO, 2016). As research indicates, a high level of work-related stress is a key reason for health professionals' increasing absenteeism (e.g. due to burnout), job dissatisfaction or their intention to leave the

profession prematurely (Aiken et al., 2013; Suadicani, Olesen, Bonde, & Gyntelberg, 2014). Work-related stress can be defined as "a pattern of reactions that occur when workers are confronted with demands or pressures that are not matched to their knowledge, abilities and skills and which challenge their ability to cope" (Eurofound, 2005; Leka & Jain, 2010). Health professionals are particularly affected as their daily work involves many stressors, such as high emotional and physical demands, working under time pressure, long working hours,

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work–private life conflicts, aggressive patients and visitors, as well as exposure to infectious diseases or hazardous substances (Aiken et al., 2013; Hämmig, 2018; NIOSH, 2008).

Leaders of healthcare organizations play a key role, as their behaviour has the potential to influence the perceived level of work-related stress among their employees (Kelloway & Barling, 2010; Skakon, Nielsen, Borg, & Guzman, 2010; Suadicani et al., 2014). Leadership is defined as “constituting a process of social influence that is enacted by designated individuals who hold formal leadership roles in organizations” (Kelloway & Barling, 2010). The literature review of Skakon et al. (2010) revealed that not only the behaviour of leaders (e.g. supportive, empowering) or their leadership style, but also their own perceived level of work-related stress can affect the well-being of their employees. More specifically, an association between leaders' and employees' burnout, as well as their experience of emotions (e.g. negative emotions were even more strongly experienced by employees than by their leaders), was identified (Glasø & Einarsen, 2006; Skakon et al., 2010). Additionally, a systematic review and meta-analysis on the association of leadership and well-being at work demonstrated that leadership has the potential to affect employee job satisfaction, well-being and sick leave (Kuoppala, Lamminpaa, Liira, & Vainio, 2008).

## 2 | BACKGROUND

To effectively reduce work-related stress, it is important not only to know the relevant associations between leaders and their employees, but also the extent of work-related stress at various management levels (Lundqvist, Reineholm, Gustavsson, & Ekberg, 2013). Previous study results revealed higher levels of demands at work, as well as higher degrees of control in decision-making, freedom at work and possibilities for development among leaders (Bernin & Theorell, 2001; Skakon, Kristensen, Christensen, Lund, & Labriola, 2011). In addition, studies have shown that leaders experienced fewer burnout symptoms as well as an improvement in perceived health status, in comparison to the colleagues they manage (Lundqvist et al., 2013; Marmot et al., 1991). However, little has been published regarding the extent of work-related stress among health professionals working at different hierarchical levels (Haggman-Laitila & Romppanen, 2018; Johansson, Sandahl, & Hasson, 2013). Therefore, this study aimed to investigate the extent of stress at work (stressors, stress reactions, long-term consequences) for health professionals working in upper-, middle- and lower-management positions, along with those not working in management positions in Swiss hospitals, nursing homes and home care organizations.

## 3 | METHODS

### 3.1 | Design

This was a prospective, cross-sectional study conducted in Swiss acute care hospitals, rehabilitation and psychiatric hospitals,

nursing homes and home care organizations. The study is part of the national STRAIN project, “work-related stress among health professionals in Switzerland.” The results presented in this study are based on the STRAIN baseline-measurement, which took place between September 2017–March 2018. The STRAIN project consists of a cluster randomized clinical trial (Clinical Trials registration: NCT03508596) and is based on three measurements (baseline, first and second). It also includes an intervention consisting of a 2-day education programme for health professional leaders between the first and second measurement.

### 3.2 | Recruitment of healthcare organizations

Healthcare organizations were randomly selected from all hospitals, nursing homes and home care organizations registered from the Swiss Federal Statistical Office in 2016. Organizations which were too small (average number of beds <20, fewer than 7 employees), or which were specialized (e.g. in gynaecology or neonatology), were excluded. Computer-based randomization (randomizer.org) was conducted, and a total of 100 hospitals (acute, rehabilitation and psychiatric), 100 nursing homes and 100 home care organizations were invited to participate. Consideration was also given to ensuring a geographically representative sample for Switzerland (69% Swiss or Standard German-speaking, 23% French-speaking, 8% Italian-speaking).

The recruitment process initially consisted of providing the randomly selected organizations with information about the study by email or telephone. Afterwards, a flyer and a short film containing information about the study were sent directly to the CEO or the head of Human Resources. A total of 36 acute care, rehabilitation or psychiatric hospitals (23 German-speaking, 12 French-speaking, 1 Italian-speaking) took part in this study. Additionally, 86 nursing homes (56 German-speaking, 24 French-speaking, 6 Italian-speaking) and 41 home care organizations (36 German-speaking, 3 French-speaking, 2 Italian-speaking) participated.

### 3.3 | Study sample and management levels

The study included health professionals from several disciplines working in acute care hospitals, rehabilitation or psychiatric hospitals, nursing homes or home care organizations in Switzerland. The study sample consisted of nursing staff and midwives, physicians, medical-technical and medical-therapeutic professionals at all hierarchical levels. The term “hierarchical levels” in regard to management denotes that power or authority is delegated downwards, since leaders at a higher level have a greater scope of responsibility (Thompson, Buchbinder, & Shanks, 2012). Accordingly, the management levels for this study are divided as follows:

- upper-management level (e.g. directors, hospital directors, clinic directors)

- middle-management level (e.g. divisional managers, senior or leading physicians)
- lower-management level (e.g. team leaders, ward managers)
- health professionals without management responsibilities (e.g. registered nurses, physicians, physiotherapists).

### 3.4 | Ethics

The local Swiss ethical board in Bern confirmed that the study does not warrant a full ethical application and does not fall under the Swiss Federal Act on Research Involving Human Beings (Req-2016-00616). The study was on a voluntary basis for all organizations and health professionals participating; all participants were free to stop filling out the questionnaire at any time.

### 3.5 | Data collection

Data were collected using both an online version of the questionnaire (employees with or without a personal email-address) and a written version available in German, French and Italian. A contact person for each organization was involved in the distribution of the questionnaire in their organization and ensured that it was available to all health professionals. Participation by the organizations as well as health professionals was on a voluntary basis. They also received a reminder email or postcard 2 weeks later. Healthcare employees could complete the questionnaire between September 2017–March 2018. The questionnaire required 20–45 min to complete.

### 3.6 | Questionnaire

In the questionnaire, one section focused on identifying the hierarchical level of the participants and their manager-to-staff ratio. The STRAIN questionnaire was used to assess the extent of stressors at work (e.g. demands, role clarity, influence) and stress reactions (e.g. behavioural stress reactions), including their long-term consequences (e.g. burnout symptoms, intention to leave). The STRAIN questionnaire is based on the theoretical background of "causes and consequences of work-related stress" from Eurofound (2005). Therefore, the questionnaire is divided into scales assessing stressors at work (demands at work, work organization and job content, work-individual interface, social relations and leadership and home-work interface), employees' stress reactions and long-term consequences (job satisfaction, intention to leave and health-related outcomes). It consists of well-established, valid and reliable scales from the Copenhagen Psychosocial Questionnaire (COPSOQ) (Kristensen, Hannerz, Høgh, & Borg, 2005; Nübling et al., 2017), the questionnaire used in the "Nurses Early Exit Study" (NEXT) (Hasselhorn, Tackenberg, & Müller, 2003), the Sixth European Working Conditions Survey—EWCS (Eurofound, 2015), the self-rated general health status using EQ-5D-5L (Herdman et al., 2011), the Work Ability Index

(WAI) (Tuomi, Ilmarinen, Jahkola, Katajarinne, & Tulkki, 1998) and the Inability due to Spine Complaints from Von Korff, Ormel, Keefe, and Dworkin (1992). More information on the STRAIN questionnaire was published in Golz, Peter, and Hahn (2018).

### 3.7 | Data analysis

Data were analysed using SPSS 25<sup>®</sup>. All Items from the COPSOQ, EWCS and NEXT were transformed to having a value range from 0 (minimum value) - 100 points (maximum value) according to (Eurofound, 2015; Kristensen et al., 2005). If fewer than half of the questions in a scale had been answered, no average score was calculated (Kristensen et al., 2005). Further, the index for WAI and the score on the inability due to spine complaints were calculated according the original authors' method (Tuomi et al., 1998; Von Korff et al., 1992). Data analysis for the different management levels was performed using multiple linear regression analysis. A separate regression model was calculated using each scale (e.g. quantitative demands) as a dependent variable. Multicollinearity between the estimated regression coefficients was tested using the variance inflation factor (VIF) in each regression model. The four hierarchical levels, along with gender (male, female) and setting (acute care, rehabilitation and psychiatric hospitals, nursing homes, home care organizations), were used as dummy-coded independent variables. Hierarchical levels were the independent variable of interest, whilst gender and setting served as control variables, since previous study results determined branch/organizational and gender differences on different levels in working life (Bernin & Theorell, 2001; Eurofound, 2019). The dummy coding was organized so that the sum of the estimated coefficients was equal to zero (sum to zero contrasts) for each independent variable. The intercept (constant) of the model can be interpreted as an unweighted mean value of the independent variable, given the regression adjustment.

## 4 | RESULTS

### 4.1 | Study sample description

A total of 8,112 health professionals participated in the study, with 84% from the German-speaking, 14% from the French-speaking and 2% from the Italian-speaking region of Switzerland. The overall response rate of participants was 43% (acute care, rehabilitation or psychiatric hospitals: 37%, nursing homes: 52%, home care organizations: 40%). A total of 42% of participating health professionals worked in acute or rehabilitation hospitals, 26% in psychiatric hospitals, 21% in nursing homes and 11% in home care organizations (see Table 1). Most participants were female (82%), the mean age of the same was 42 years (*SD* 12), and the mean years of professional experience were 17 (*SD* 11). Health professionals included nurses and midwives (75%), medical-therapeutic professionals (9%), or physicians (7%) and many of

them were highly educated (68% had a higher vocational training and above). Regarding the different hierarchical levels, 83% of the participating healthcare employees had no management responsibilities, whilst 11% of them worked at the lower-management level, 4% at the middle-management level and 2% at the upper-management level. Among all leaders, the manager-to-staff ratio for direct subordinate employees was 12 (median) and for overall subordinate employees 19 (median).

## 4.2 | Results on stress at work at different management levels

Results of the multiple linear regression analysis are presented in Tables 2 and 3. Table 2 presents the results from the four hierarchical levels for demands at work, work organization and job content, work-individual interface and social relations and leadership. In Table 3, further results regarding home-work interface, stress reaction and long-term consequences are shown.

### 4.2.1 | Demands at work

Results revealed significantly higher reported quantitative demands (e.g. working at a high pace, overtime) among leaders in the upper- (mean = 66.02,  $B = 5.60$ ,  $p < .001$ ) and middle-management positions (mean = 63.87,  $B = 3.44$ ,  $p < .001$ ), than among health professionals without management responsibility (mean = 51.73,  $B = -8.70$ ,  $p < .001$ ). Also, significantly higher cognitive demands at work (e.g. knowledge required, remembering multiple things, making quick decisions) were identified for health professional leaders' working in upper (mean = 81.25,  $B = 4.54$ ,  $p < .001$ ) and middle management (mean = 78.83.25,  $B = 2.12$ ,  $p < .01$ ) than for employees without management responsibilities (mean = 70.45,  $B = -6.26$ ,  $p < .001$ ). In contrast, health professionals without management responsibilities (mean = 82.49,  $B = 3.78$ ,  $p < .001$ ) or in lower-management positions (mean = 81.56,  $B = 2.85$ ,  $p < .001$ ) reported higher sensory demands (e.g. precision, vision, attention) than leaders in upper-management positions (mean = 72.73,  $B = -5.98$ ,  $p < .001$ ). Also, physical demands (e.g. tiring or painful body positions, lifting or moving people/heavy loads) were significantly higher among health professionals without management responsibilities (mean = 37.53,  $B = 8.08$ ,  $p < .001$ ) or in lower management (mean = 33.24,  $B = 3.80$ ,  $p < .001$ ) than among leaders in middle (mean = 25.10,  $B = -4.35$ ,  $p < .001$ ) and upper (mean = 21.91,  $B = -7.53$ ,  $p < .001$ ) management. In addition, higher demands regarding work environment (e.g. noise, chemicals, extreme temperatures, risk of infection) were also reported by employees without management responsibilities (mean = 33.97,  $B = 7.14$ ,  $p < .001$ ) or in lower management (mean = 32.88,  $B = 6.06$ ,  $p < .001$ ) than by employees in middle (mean = 22.74,  $B = -4.08$ ,  $p < .001$ ) and upper management (mean = 17.71,  $B = -9.12$ ,  $p < .001$ ). Employees without management responsibilities also reported having higher

emotional demands (e.g. confrontation with death, suffering, aggressive patients) (mean = 60.85,  $B = 3.12$ ,  $p < .001$ ) and having to hide their emotions more (mean = 40.01,  $B = 2.81$ ,  $p < .001$ ) than employees working in the upper-management level.

### 4.2.2 | Work organization and job content

Results on work organization and content revealed that leaders at an upper-management level had significantly higher opportunities for development (mean = 85.17,  $B = 7.42$ ,  $p < .001$ ) and influence at work (e.g. degree of influence concerning work, amount of work, duties) (mean = 73.36,  $B = 11.11$ ,  $p < .001$ ) than health professionals without management responsibilities. Further, results showed a greater influence on breaks and holidays among leaders in upper- (mean = 75.95,  $B = 5.31$ ,  $p < .001$ ) and middle-management positions (mean = 74.83,  $B = 4.19$ ,  $p < .001$ ) than employees without a management position (mean = 61.30,  $B = -9.33$ ,  $p < .001$ ). Leaders in upper management perceived their work as being more meaningful (mean = 88.24,  $B = 2.46$ ,  $p < .05$ ) and as having more of a bond with the organization (mean = 72.34,  $B = 5.26$ ,  $p < .01$ ) than employees without management responsibilities.

### 4.2.3 | Work-individual interface

Health professionals without a management position reported having a higher level of job insecurity (e.g. worried about becoming unemployed) (mean = 19.75,  $B = 5.02$ ,  $p < .001$ ) as well as insecurity regarding their work environment (e.g. unforeseen changes in shift schedules, working times) (mean = 31.60,  $B = 8.93$ ,  $p < .001$ ) than did health professionals working in an upper-management position.

### 4.2.4 | Social relations and leadership

Results on social relations and leadership indicated higher levels of predictability at work (e.g. being informed in advance about important decisions, changes or plans) for leaders in upper-management positions (mean = 74.02,  $B = 6.89$ ,  $p < .001$ ) than for employees working in lower management (mean = 64.43,  $B = -2.71$ ,  $p < .001$ ) or without a management position (mean = 64.11,  $B = -3.02$ ,  $p < .001$ ). Furthermore, leaders in upper- (mean = 69.59,  $B = 4.89$ ,  $p < .05$ ) and middle-management positions (mean = 67.60,  $B = 2.90$ ,  $p < .05$ ) reported receiving more rewards at work than employees without a leading position (mean = 57.72,  $B = -6.98$ ,  $p < .001$ ). Role clarity (e.g. clear work tasks, objectives, expectations and areas of responsibility) was lowest among leaders in middle-management positions (mean = 76.42,  $B = -1.58$ ,  $p < .05$ ); however, it was highest among leaders in upper-management positions (mean = 81.19,  $B = 3.19$ ,  $p < .01$ ). The perceived quality of leadership regarding

**TABLE 1** Sample description

	Total	Acute care and rehabilitation hospitals	Psychiatric hospitals	Nursing homes	Home care org.
Number of participants, <i>n</i> (%)	8,112	3,398 (42%)	2,075 (26%)	1,693 (21%)	946 (11%)
Health professionals, <i>n</i> (%)					
Nurses and midwives	4,925 (75%)	1,905 (70%)	952 (58%)	1,317 (92%)	751 (91%)
Physicians	463 (7%)	229 (8%)	204 (13%)	30 (2%)	0
Medical-therapeutic professionals	628 (9%)	237 (9%)	319 (19%)	72 (5%)	0
Medical-technical professionals	241 (4%)	241 (9%)	0	0	0
Others (e.g., administration, social services)	346 (5%)	103 (4%)	158 (10%)	13 (1%)	72 (9%)
Gender, <i>n</i> (%)					
Female	6,521 (82%)	2,724 (82%)	1,477 (73%)	1,441 (86%)	879 (95%)
Male	1,446 (18%)	615 (18%)	549 (27%)	233 (14%)	49 (5%)
Education, <i>n</i> (%)					
No educational qualification	284 (3%)	62 (2%)	33 (2%)	153 (9%)	36 (4%)
Secondary school level II	2,270 (29%)	646 (19%)	324 (16%)	878 (54%)	422 (45%)
Tertiary level (higher vocational training)	3,219 (41%)	1,511 (45%)	862 (43%)	433 (26%)	413 (44%)
Bachelor's degree	1,128 (14%)	667 (20%)	284 (14%)	134 (8%)	43 (4%)
Master's degree	569 (7%)	194 (6%)	328 (16%)	33 (2%)	14 (2%)
Doctorate/PhD	445 (6%)	251 (8%)	184 (9%)	8 (1%)	2 (1%)
Management level, <i>n</i> (%)					
Higher-management level	113 (2%)	40 (1%)	35 (2%)	10 (1%)	28 (3%)
Middle-management level	318 (4%)	119 (4%)	132 (7%)	48 (3%)	19 (2%)
Lower-management level	831 (11%)	341 (10%)	209 (11%)	211 (13%)	70 (8%)
No management responsibilities	6,495 (83%)	2,740 (85%)	1,564 (80%)	1,300 (83%)	801 (87%)
Manager-to-staff ratio (median)					
Direct subordinates (median)	12	15	8	13	12
Overall subordinates (median)	19	24	15	16	25

one's leader (mean = 64.67,  $B = -2.17$ ,  $p < .01$ ) and the feedback one received (mean = 50.08,  $B = -2.65$ ,  $p < .001$ ) was lowest among employees without management responsibilities. Moreover, social relations (e.g. possibility to talk to colleagues during work) were revealed as being the lowest among leaders in middle-management positions (mean = 56.52,  $B = -3.58$ ,  $p < .01$ ) and highest among those in upper-management positions (mean = 64.62,  $B = 4.52$ ,  $p < .05$ ). However, health professionals without management responsibilities reported experiencing unfair behaviour more often (mean = 13.97,  $B = 2.51$ ,  $p < .001$ ) than health professionals working at the upper-management level (mean = 7.74,  $B = -3.72$ ,  $p < .05$ ).

#### 4.2.5 | Home-work interface

Work-private life conflicts were reported more often by health professionals working at upper- (mean = 37.41,  $B = 3.92$ ,  $p < .05$ ) and middle-management levels (mean = 37.05,  $B = 3.57$ ,  $p < .01$ ) than from health professionals working at lower-management levels (mean = 29.72,  $B = -3.76$ ,  $p < .001$ ) or without management responsibilities (mean = 29.77,  $B = -3.72$ ,  $p < .001$ ). Difficulties with demarcation (e.g. being available for work issues during leisure time) were also significantly higher among leaders in upper-management positions (mean = 58.88,  $B = 16.71$ ,  $p < .001$ ) than among employees in lower-management positions (mean = 36.43,  $B = -5.75$ ,  $p < .001$ ).

**TABLE 2** Results of the regression analysis: demands at work, work organization and job content, work–individual interface, social relations and leadership

Dependent variables	Coefficients								
	Mean all levels (intercept)	Upper-management level				Middle-management level			
		Mean	Beta unst.	Beta std.	t-value	Mean	Beta unst.	Beta std.	t-value
<b>Demands at work<sup>a</sup></b>									
Quantitative demands	60.43	66.02	5.60	0.14	<b>4.53***</b>	63.87	3.44	0.10	<b>4.17***</b>
Cognitive demands	76.72	81.25	4.54	0.14	<b>4.36***</b>	78.83	2.12	0.08	<b>3.05**</b>
Sensory demands	78.70	72.73	-5.98	-0.17	<b>-5.70***</b>	78.05	-0.66	-0.01	-0.94
Physical demands	29.45	21.91	-7.53	-0.14	<b>-4.89***</b>	25.10	-4.35	-0.09	<b>-4.24***</b>
Work environment	26.82	17.71	-9.12	-0.20	<b>-6.40***</b>	22.74	-4.08	-0.10	<b>-4.29***</b>
Emotional demands	57.73	53.90	-3.83	-0.10	<b>-3.34**</b>	56.64	-1.09	-0.03	-1.42
Hiding emotions	37.20	32.46	-4.75	-0.09	<b>-2.77**</b>	39.36	2.16	0.05	1.89
<b>Work organization and job content<sup>a</sup></b>									
Possibilities for development	77.75	85.17	7.42	0.20	<b>6.34***</b>	78.95	1.20	0.04	1.54
Influence at work	62.26	73.36	11.11	0.23	<b>7.62***</b>	64.14	1.88	0.05	1.93
Scope for breaks/holidays	70.63	75.95	5.31	0.11	<b>3.52***</b>	74.83	4.19	0.10	<b>4.15***</b>
Meaning of work	85.79	88.24	2.46	0.06	<b>2.06*</b>	86.48	0.70	0.01	0.87
Bond with the organization	67.08	72.34	5.26	0.11	<b>3.34**</b>	66.68	-0.40	-0.01	-0.38
<b>Work–individual interface<sup>a</sup></b>									
Job insecurity	14.74	10.86	-3.88	-0.09	<b>-2.77**</b>	13.57	-1.17	-0.03	-1.25
Work environment insecurity	22.67	11.81	-10.85	-0.18	<b>-5.84***</b>	22.19	-0.48	-0.01	-0.39
<b>Social relations and leadership<sup>a</sup></b>									
Predictability	67.13	74.02	6.89	0.15	<b>4.66***</b>	65.97	-1.16	-0.03	-1.17
Rewards	64.69	69.59	4.89	0.08	<b>2.49*</b>	67.60	2.90	0.06	<b>2.23*</b>
Role clarity	78.00	81.19	3.19	0.09	<b>2.89**</b>	76.42	-1.58	-0.05	<b>-2.15*</b>
Quality of leadership	66.84	70.16	3.33	0.06	1.83	66.43	-0.40	-0.01	-0.35
Feedback	52.73	54.79	2.05	0.04	1.23	50.88	-1.85	-0.05	-1.73
Social relations	60.10	64.62	4.52	0.07	<b>2.24*</b>	56.52	-3.58	-0.07	<b>-2.72**</b>
Unfair behaviour	11.46	7.74	-3.72	-0.07	<b>-2.14*</b>	12.64	1.17	0.03	1.06

<sup>a</sup>All scales are scored from 0–100, estimated beta-values (unstandardized and standardized), t-value and significance level (values in bold) \* $p \leq .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ , all models are controlled for “gender” and “setting,” no significance for the scale on “role conflicts,” “social support at work,” “social community at work”.

or those without management responsibilities (mean = 29.99,  $B = -12.18$ ,  $p < .001$ ).

#### 4.2.6 | Stress reaction

Results on behavioural stress symptoms (e.g. lack of time for relaxation or leisure) revealed that health professionals not working in a management position were more strongly affected (mean = 25.57,  $B = 1.40$ ,  $p < .05$ ). Also, more cognitive stress symptoms were identified for health professionals working in a lower-management position (mean = 26.74,  $B = 1.81$ ,  $p < .05$ ) or non-management position (mean = 26.57,  $B = 1.64$ ,  $p < .01$ ).

#### 4.2.7 | Job satisfaction and intention to leave

Results on health professionals' job satisfaction showed the highest levels among leaders working in upper-management positions (mean = 80.00,  $B = 5.25$ ,  $p < .001$ ). Lower levels of satisfaction were reported for employees working in lower-management positions (mean = 73.58,  $B = -1.17$ ,  $p < .05$ ) or for those in a non-management position (mean = 69.55,  $B = -5.20$ ,  $p < .001$ ). Moreover, health professionals' intention to leave was lower when working in upper management (mean = 10.82,  $B = -5.94$ ,  $p < .01$ ) and higher when working in lower management (mean = 18.73,  $B = 1.97$ ,  $p < .05$ ) or with no management responsibilities (mean = 19.08,  $B = 2.32$ ,  $p < .01$ ). Health professionals' intention to leave their profession was

Lower-management level				No management responsibilities			
Mean	Beta unst.	Beta std.	t-value	Mean	Beta unst.	Beta std.	t-value
60.09	-0.34	-0.01	-0.53	51.73	-8.70	-0.21	-16.86***
76.32	-0.39	-0.02	-0.73	70.45	-6.26	-0.19	-14.39***
81.56	2.85	0.07	5.26***	82.49	3.78	0.11	8.63***
33.24	3.80	0.11	4.78***	37.53	8.08	0.15	12.58***
32.88	6.06	0.20	8.21***	33.97	7.14	0.15	11.99***
59.53	1.79	0.07	3.03**	60.85	3.12	0.08	6.53***
36.98	-0.23	-0.01	-0.25	40.01	2.81	0.05	3.91***
76.62	-1.13	-0.05	-1.87	70.27	-7.48	-0.20	-15.34***
61.31	-0.95	-0.03	-1.26	50.22	-12.04	-0.25	-19.75***
70.46	-0.17	-0.01	-0.22	61.30	-9.33	-0.19	-14.77***
85.39	-0.40	-0.01	-0.64	83.03	-2.76	-0.07	-5.53***
66.56	-0.52	-0.01	-0.63	62.73	-4.35	-0.09	-6.61***
14.77	0.04	0.00	0.05	19.75	5.02	0.11	8.55***
25.07	2.40	0.06	2.49*	31.60	8.93	0.15	11.47***
64.43	-2.71	-0.09	-3.53***	64.11	-3.02	-0.07	-4.89***
63.87	-0.82	-0.02	-0.81	57.72	-6.98	-0.11	-8.53***
77.12	-0.88	-0.04	-1.53	77.26	-0.74	-0.02	-1.59
66.08	-0.75	-0.02	-0.83	64.67	-2.17	-0.04	-2.92**
55.18	2.45	0.08	2.92**	50.08	-2.65	-0.05	-3.87***
60.44	0.34	0.01	0.33	58.81	-1.29	-0.02	-1.54
11.50	0.04	0.00	0.04	13.97	2.51	0.05	3.53***

also higher among employees without management responsibilities (mean = 15.77,  $B = 2.75$ ,  $p < .001$ ).

#### 4.2.8 | Health-related outcomes

Health professionals working in a non-management position had the lowest ratings on both their general health status (mean = 78.55,  $B = -1.69$ ,  $p < .01$ ) and work ability (mean = 37.01,  $B = -0.89$ ,  $p < .001$ ). However, severe burnout symptoms were reported by health professionals working in middle-management positions (mean = 43.07,  $B = 2.64$ ,  $p < .05$ ) and no management responsibilities (mean = 42.32,  $B = 1.89$ ,  $p < .01$ ). Symptoms of burnout were less prevalent among

leaders at upper-management levels (mean = 35.68,  $B = -4.75$ ,  $p < .01$ ). Moreover, more inabilities due to spinal complaints (mean = 11.11,  $B = 3.22$ ,  $p < .001$ ) as well as poorer quality of sleep (mean = 67.36,  $B = -1.26$ ,  $p < .05$ ) were reported by health professionals working without management responsibilities. Figure 1 summarizes all results of the multiple linear regression models for the four different hierarchical levels amongst management.

## 5 | DISCUSSION

This study presents important results on the extent of work-related stress among Swiss health professionals working at four different

**TABLE 3** Results of the regression analysis on home-work interface, stress reaction and long-term consequences

Dependent variables	Coefficients								
	Mean all levels (intercept)	Upper-management level				Middle-management level			
		Mean	Beta unst.	Beta std.	t-value	Mean	Beta unst.	Beta std.	t-value
Home-work interface <sup>a</sup>									
Work-private life conflict	33.49	37.41	3.92	0.08	<b>2.47*</b>	37.05	3.57	0.09	<b>3.38**</b>
Demarcation	42.17	58.88	16.71	0.32	<b>10.22***</b>	43.40	1.22	0.03	1.12
Stress reaction <sup>a</sup>									
Behavioural stress symptoms	24.18	21.87	-2.30	-0.05	-1.55	24.92	0.74	0.02	0.75
Cognitive stress symptoms	24.93	21.74	-3.19	-0.07	<b>-2.12*</b>	24.67	-0.26	-0.01	-0.26
Job satisfaction and intention to leave									
Job satisfaction <sup>a</sup>	74.75	80.00	5.25	0.15	<b>4.73***</b>	75.88	1.13	0.04	1.52
Intention to leave the organization <sup>a</sup>	16.76	10.82	-5.94	-0.11	<b>-3.42**</b>	18.43	1.66	0.02	1.43
Intention to leave the profession <sup>a</sup>	13.02	10.87	-2.15	-0.04	-1.33	11.80	-1.22	-0.03	-1.13
Health-related outcomes									
Self-rated general health <sup>a</sup>	80.23	82.05	1.81	0.05	1.38	80.52	0.29	0.01	0.33
Ability to work <sup>b</sup>	37.90	38.45	0.55	0.04	1.37	38.34	0.45	0.04	1.66
Burnout symptoms <sup>a</sup>	40.43	35.68	-4.75	-0.10	<b>-2.92**</b>	43.07	2.64	0.06	<b>2.43*</b>
Inability due to spinal complaints <sup>a</sup>	7.89	5.63	-2.26	-0.05	-1.38	5.79	-2.09	-0.05	-1.91
Quality of sleep <sup>a</sup>	68.62	70.04	1.42	0.03	0.98	67.85	-0.77	-0.02	-0.79

Estimated beta-values (unstandardized and standardized), t-value and significance level (values in bold) \* $p \leq .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ , all models are controlled for "gender" and "setting".

<sup>a</sup>Scored from 0–100.

<sup>b</sup>Scored from 11–49.

management levels. The main finding indicates that work stressors, along with their long-term consequences, are experienced to a larger extent among health professionals at lower-management levels and especially among those without management responsibilities. This overall tendency corroborates previous study results (Skakon et al., 2011) and might be explained by the fact that leaders reported having a higher degree of control and, in general, had a more positive perception of their working conditions than did their employees.

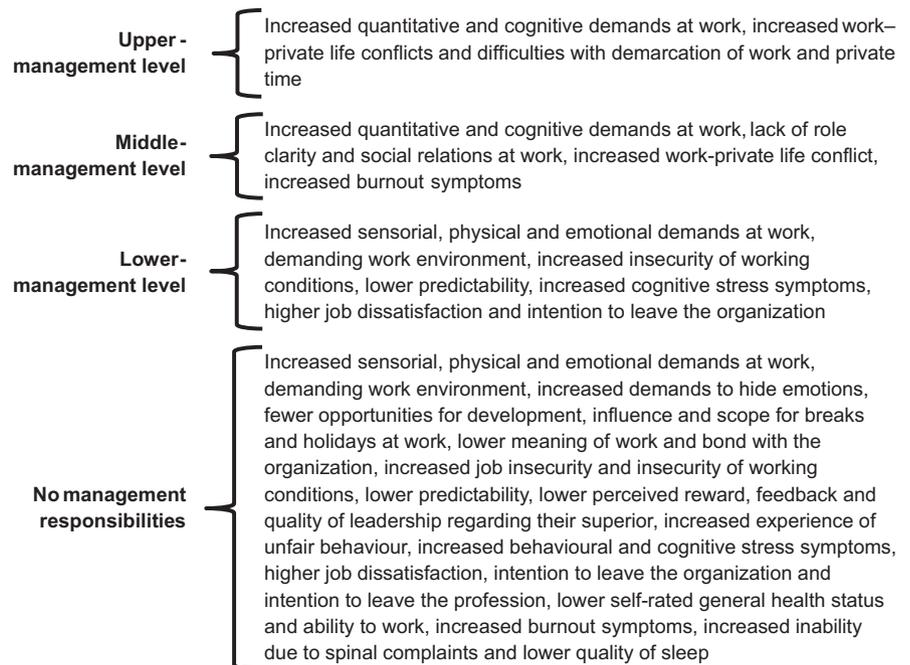
In particular, some individual stressors and long-term consequences were pronounced at certain management levels. The main findings on health professionals working in upper-management positions revealed severe quantitative demands at work, work-private life conflicts and difficulties with work/life demarcation. Among health professionals in middle-management positions, severe work-private life conflicts and quantitative demands, lack of role clarity, poor social relations at work and severe burnout symptoms were pronounced. Health professionals working in lower-management positions experienced significantly greater physical and emotional demands, less predictability at work, more severe stress symptoms and higher job dissatisfaction and intention to leave the organization. Additionally, health professionals working without management responsibilities appeared to have

the poorest working conditions, job satisfaction and health-related outcomes. They reported being affected by higher demands at work (physical, emotional, having to hide emotions), fewer possibilities for development, a lack of influence and predictability, fewer rewards, a lack of feedback and a lack of quality leadership. In addition, decreased job satisfaction, the intention to leave, burnout symptoms, inability to work due to back pain, reduced quality of sleep as well as a lower self-rated general health and work ability were reported.

Previous study results also identified severe work-private life conflicts for leaders working in higher-management positions, although they had a higher degree of authority relating to decision-making and more control and flexibility in comparison to their employees (Bernin & Theorell, 2001; Kossek & Lautsch, 2017; Lundqvist et al., 2013). Moreover, previous results indicated higher levels of demands and conflicts at work among leaders (Johansson et al., 2013; Skakon et al., 2011). With regard to the extent of demands at work among leaders in upper- and middle-management positions, the results of this study corroborate those of previous studies concerning the severe workload (Skakon et al., 2011). However, they do not match with previous findings regarding high emotional, sensorial and physical demands on upper and middle management. In contrast, the results of this

Lower-management level				No management responsibilities			
Mean	Beta unst.	Beta std.	t-value	Mean	Beta unst.	Beta std.	t-value
29.72	-3.76	-0.12	-4.58***	29.77	-3.72	-0.08	-5.62***
36.43	-5.75	-0.17	-6.78***	29.99	-12.18	-0.23	-17.83***
24.34	0.16	0.01	0.21	25.57	1.40	0.03	2.24*
26.74	1.81	0.06	2.33*	26.57	1.64	0.04	2.61**
73.58	-1.17	-0.05	-2.04*	69.55	-5.20	-0.15	-11.21***
18.73	1.97	0.03	2.18*	19.08	2.32	0.04	3.18**
13.64	0.62	0.02	0.74	15.77	2.75	0.06	4.07***
79.82	-0.42	-0.02	-0.61	78.55	-1.69	-0.04	-3.05**
37.78	-0.11	-0.01	-0.54	37.01	-0.89	-0.07	-5.24***
40.65	0.22	0.01	0.26	42.32	1.89	0.04	2.78**
9.02	1.14	0.03	1.33	11.11	3.22	0.06	4.68***
69.22	0.60	0.02	0.80	67.36	-1.26	-0.03	-2.06*

**FIGURE 1** Extent of work-related stress at four hierarchical levels



study showed higher stress scores among health professionals working in lower- or non-management positions. In addition, contradictory results were found regarding leaders' perceived

managerial support and support from peers, which were reported as both higher and lower (Johansson et al., 2013; Lundqvist et al., 2013; Skakon et al., 2011).

Comparability with other study results is, however, limited, as many studies presented results for managers in total and did not distinguish between different management levels or different demands at work. Moreover, most potentially comparable studies were conducted among leaders in various industries and are not specific to health professionals. Health professionals are more affected by certain stressors, such as emotional demands in their daily work, which could account for many differences. Moreover, it is clear that surveying different healthcare management levels revealed a poorer working environment among health professionals at the lowest levels. It is also possible that personality factors (e.g. self-confidence) or individual resilience differ among employees at the different management levels and that leaders may have more personal resources to deal with the various stressors present at work (Lundqvist et al., 2013; Skakon et al., 2011).

Several studies also indicated that leaders' behaviour and their leadership style could affect the extent to which their employees perceive stress at work (Kelloway & Barling, 2010; Kelloway, Turner, Barling, & Loughlin, 2012; Shirey, 2017). Health professionals in leadership positions not only have a key role in preventing and reducing stress at work but are also role models for their employees. They set an example as to how to deal with stressors at work, or how to develop safe work practices (Kelloway & Barling, 2010). However, the question remains as to how leaders should be aware of and reduce certain stressors at work among their subordinates when they themselves are greatly affected by it (e.g. by severe work-private life conflicts or quantitative demands at work). Therefore, it seems essential that leaders first reduce the most salient stressors in their own field of work and set a good example when it comes to balancing their work and private life or managing the high quantitative demands at work. At the same time, it is essential to enhance the working conditions for health professionals working without management responsibilities. Our study indicates how severely health professionals not working in a management position are affected by stressors at work. It reveals serious consequences for their health and job satisfaction and shows how important it is to implement effective top-down strategies to enhance their conditions at work.

## 5.1 | Strengths and limitations

One strength of this study is that it presents its results on four separate management levels, which has not been done in many previous studies (where often only employee versus manager levels are investigated). This provides a more differentiated picture of the stressors and the consequences of stress at work, revealing the necessity for interventions targeting the management level as well. In addition, the study focuses exclusively on the healthcare sector with a sufficiently large study sample and does not include participants from different labour segments, as most other studies do. This is advantageous, as it provides both broad and in-depth results on the topic of stress at work among health professionals in Switzerland. Moreover, the use of sophisticated statistical analysis software allowed relevant results for each hierarchical level to be analysed separately.

The study also has limitations. First, the cross-sectional design does not allow causal conclusions to be drawn. In addition, the results (e.g. working hours) are influenced by Swiss labour law; therefore, results from other countries might differ. Moreover, the study sample is not exactly representative for Switzerland, since the German-speaking part was somewhat overrepresented. Also, participation was fully voluntary for organizations as well as for health professionals, which probably led to a certain selection bias. It is, for example, possible that more health professionals with low job satisfaction participated, which could have led to an overestimation of stress at work. Conversely, some health professionals with a high level of stress may not have filled out the questionnaire due to lack of time, which could have led to an underestimation. These possibilities should be considered when interpreting the results.

## 6 | CONCLUSIONS

Our results imply that effective prevention and reduction of stress at work is important at all management levels. However, since individual stressors at work seem to differ markedly between the hierarchical levels, it is essential to look at each management level separately, to develop and implement appropriate interventions. For example, at the upper-management level, interventions to reduce work-private life conflicts would be beneficial. In regard to the middle-management level, an increase in role clarity would be advantageous. At the lower-management level, a reduction in physical and emotional demands on workers would be valuable. Furthermore, our results indicate that to effectively enhance the compatibility of health professionals' work and private lives, there is a need to intervene at the management level. This would facilitate health professionals in leadership positions in being good role models for their employees. Moreover and perhaps most importantly, since health professionals without management responsibilities seem to be most affected by stress at work, leaders must ensure the reduction of stress among these employees to enhance their ability to function optimally in the healthcare work environment.

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## CONFLICT OF INTEREST

No conflict of interest has been declared by the author(s).

## AUTHOR CONTRIBUTIONS

KP and SH: designed the questionnaire and recruited the participating health organizations. KP: collected and analysed the data. RH and JS: made substantial contributions to the interpretation of data and in writing the manuscript. All authors read and approved the final manuscript.

## DATA AVAILABILITY STATEMENT

The raw data set analysed in the current study is available from the corresponding author (Karin Anne Peter) on reasonable request.

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