

# Workload, Work Engagement and Job Size – How Physicians’ Decision to Work Less Is Influenced by the Work-Related State of Mind.

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## Research Article

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# Abstract

**Background:** According to new estimates, the health care sector will suffer a shortage of physicians in primary and specialty care. In this context, work engagement and burnout are two constructs that have gained attention recently. The aim of this study was to investigate how these constructs are related to job size preference.

**Method:** The present study is based on the baseline survey of the long-term study of physicians with different specialties, in which 1,001 physicians took part (response rate: 33.4%). Workload was measured using the Copenhagen Burnout Inventory adapted for health care professionals; work engagement was assessed using the Utrecht Work Engagement scale. Data analyses includes regression and mediation models.

**Results:** Overall, 297 out of 725 physicians plan to reduce their job size. Several reasons - such as workload - are discussed. Multiple regression analyses show that job size reduction is significantly linked to all three dimensions of workload ( $p < 0.001$ ) as well as work engagement ( $p = 0.001$ ). In addition, work engagement significantly mediates the relationship between workload on job size reduction (patient-related:  $b = -0.135$ ,  $p < 0.001$ ; work-related:  $b = -0.190$ ,  $p < 0.001$ ; personal:  $b = -0.133$ ,  $p < 0.001$ ).

**Discussion:** Physicians that tend to reduce working hours exhibit different levels of work engagement as well as workload (personal, patient- and work-related). Moreover, work engagement is acting as a mediator, influencing the relationship between workload and job size reduction. Therefore, interventions that increase work engagement may buffer negative effects of workload on job size changes.

## Introduction

Currently, the health care system is facing challenging times. Not only due to the presence of pandemics, such as the COVID-19-pandemic crisis, but also due to the fact that personal difficulties (i.e. lack of physicians) are threatening public health care by increasing workload for professionals working in health care. Going along, several studies suggest that burnout – resulting from workload - is common among physicians working in outpatient and inpatient care (Beschoner et al. 2019; Romani und Ashkar 2014; Silva et al. 2015). Burnout is associated with high emotional load, making health care professionals such as physicians especially vulnerable (Kristensen et al. 2005; Klein 2013). It may influence physician health by increasing depressive symptoms or chronic disease (Patel et al. 2018), but also affects quality of care, patient satisfaction and safety (DiMatteo et al. 1993; Shanafelt et al. 2002; Williams et al. 2020). Moreover, physician burnout has also been linked to physician turnover, the decision to leave the health care system or retirement plans (Pantenburg et al. 2016; Williams et al. 2010; Shanafelt et al. 2014). On the long-term, this may also hinder medical students from entering health care occupationally.

One aspect linked to the high prevalence of physician burnout is job size, hence the amount of work hours. Due to recent changes in legal regularities, physicians should not be working more than 48 hours per week and no longer than 12 hours per day. In addition, due to the introduction of the concept of “New

Work”, which suggests more flexibility for instance with regard to working hours, a greater number of health care professionals plan to reduce working hours in order to decrease overall workload, leaving more time for recovery , educational purpose, or care work. The questions remains, whether decreasing jobs size (i.e. working less hours per week) may decrease workload (by increasing time for recovery) or rather increase workload (by decreasing the work force). In this context, Richter et al. have demonstrated that the latter may be the case (Richter et al. 2014). It has also been shown that both high work load as well as unfavorable work schedules are linked to elevated somatic complaints in resident physicians (Fischer et al. 2016). Additionally, part-time work may reduce burnout, increase satisfaction and work control (Mechaber et al. 2008).

A variety of studies suggest that work engagement may positively influence the consequences of bworkload (Shanafelt 2009; Calvo et al. 2021). Work engagement has been described as the antithesis of burnout and refers to the relationship with ones work, including vigor, dedication and absorption (Schaufeli und Bakker 2004). It is linked to positive outcomes within the healthcare setting, including fewer medical errors, counterbalancing for job-related stress. Research concludes that while burnout was associated with self-perceived poorer patient care, work engagement on the other hand was linked to self-reported better care (Loerbroks et al. 2017). Moreover, work engagement has been shown to decrease turnover intention by mediating the relationship between jobs characteristics and turnover in nurses (Wan et al. 2018; Zhang et al. 2020). So far, there are no studies with regard to job size preferences.

Therefore, the aim of this study was to investigate reasons for reducing work size and how this may be related to workload as well as work engagement. We hypothesize that higher workload can be associated with the desire to reduce working hours and that a greater amount of work engagement may serve as a buffer by decreasing the desire for job size reduction.

## **Methods**

### Study Design and Sampling

The present study is based on the baseline survey of the long-term study of doctors working in the Federal State of Saxony (Germany), in which 1,001 physicians took part (response rate: 33.4%). The sampling and the (postal) dispatch of the questionnaires took place in February 2020. Participants were randomly selected, contacted via mail and asked to return the filled-in questionnaire. The data was pseudonymized for longitudinal use. The final analyzes includes physicians who have not yet reached the age of 67 (starting age of regular pension for physicians in Germany). In addition, participating physicians must be currently working in direct patient care – either in hospital or in an outpatient setting, employed or self-employed.

### Assessment

In addition to socio-demographic and job-specific aspects (e.g. working hours, institution, type of employment), questions about plans regarding jobs size were integrated. First, physicians were asked

whether they want to change their jobs size (reduce or increase working hours, do not want to change). In addition, those you stated that they prefer to reduce jobs size, were asked to give reasons (see Figure 1, allowing for multiple answers). Using the Utrecht Work Engagement scale (Sautier et al. 2015), perception of work was analyzed using nine items and a seven-point-scale. This scale is commonly used to measure engagement within health care settings.

Work load was investigated using the Copenhagen Burnout Inventory (Kristensen et al. 2005), that consists of 19 items and a five-point scale. The scale was adapted for professionals working in health care (Klein 2013) and can be structured into three subscales: personal load (e.g. "How often do you feel tired?", 100 = always/ 0 = never), work-related load (e.g. "Is your work emotionally exhausting?, 100 = to a very high degree/ 0 = to a very low degree) and patient-related load (e.g. "Are you tired of working with patients?" , 100 = to a very high degree/ 0 = to a very low degree).

### Data Analysis

Data was analyzed using STATA 13 SE statistical software. Apart from descriptive evaluations (independent t-tests for continuous variables and  $\chi^2$ -tests for categorical variables), regression analyses were part of the statistical analysis. In addition, causal mediation analysis was conducted using the *medeff* package (Hicks und Tingley). Effect sizes were calculated using Cohen's d (small effect:  $d= 0.2$ ; medium effect:  $d= 0.5$ ; large effect:  $d= 0.8$ ) as well as Cramer's V (small effect:  $V= 0.1$ ; medium effect:  $V= 0.3$ ; large effect:  $V= 0.5$ ).

Causal mediation analysis was performed using the command *medeff* in order to detect direct, indirect and overall effects. Mediation models examined these effects using the three dimensions of workload as independent variables, work engagement as mediating variable and job size reduction as the outcome variable. Adjustments were made for age, gender, presence of children and marital status.

Cases with missing values with regard to the survey instruments and variables under investigation were not included in the final analyzes. A significance level of 0.05 is assumed for all statistical evaluations.

## **Results**

Overall, 725 physicians with a variety of medical specialities could be included into analysis after removing cases with missing data. In addition, the overall sample was divided into two sub-groups (wanting to reduce working hours and not wanting to reduce working hours/wanting to increase working hours), as only 15 subjects (i.e. 2% of the sample) want to work more. Sociodemographic details on the sub-groups based on their decision to reduce working hours or not, summarized in table 1.

Physicians that want to reduce their current working hours are planning to reduce them by 11.5 hours on average and 85% in this group are not satisfied with their working time. In the group of physicians that do not want to work less, still 14.8 are not satisfied with their working time. Reasons for reduction of job size are summarized in Figure 2.

Additionally, regression analyses aimed to reveal the association between job size reduction and workload as well as work engagement (table 2), controlling for sociodemographic information (gender, age, having children and marital status).

The regression analyses that focus on all three dimensions of workload as the outcome show that physicians who plan to reduce their working hours exhibit significantly more workload with regard to all three constructs. In addition, female subjects exhibit more personal as well as work-related workload and younger physicians show greater levels of personal workload. Moreover, not having children significantly contributes to higher levels of both patient- and work-related workload.

Further analysis shows, that physicians who want to cut down their working hours show less work engagement. With regard to sociodemographic information, "having no children" is associated with lower levels of work engagement. In all regression models, there was no significant impact of marital status on workload or work engagement.

Causal mediation analysis was performed (described in Figure 2) to investigate effects of three dimensions of workload on the desire to reduce working hours and whether this effect may be mediated by work engagement. For all three dimensions of workload, significant direct effects of workload on the desire to work less as well as significant mediated effects of workload through work engagement were found (Fig. 2). For work engagement, significant direct effects of work load on working hour reduction was observed (patient-related:  $b = 0.003$ ,  $p < 0.05$ ; work-related:  $b = 0.005$ ,  $p < 0.05$ , personal:  $b = 0.004$ ,  $p < 0.05$ ), but also significant mediated effects of workload through work engagement on working hour reduction (patient-related:  $b = -0.135$ ,  $p < 0.001$ ; work-related:  $b = -0.190$ ,  $p < 0.001$ ; personal:  $b = -0.133$ ,  $p < 0.001$ ). However, only for patient-related workload the percentage of total effect through mediation was reasonable high (patient-related: 29.1%; work-related: 5.0% personal: 3.8%).

## Discussion

The aim of the study was to investigate job size preferences with regard to workload and work engagement in a sample of physicians working in different specialties. The impact of workload on the clinical population as well as on patient safety and quality of care is widely acknowledged and more and more physicians prefer to reduce their job size in order to reduce workload (Norman und Hall 2014; McMurray et al. 2005; Schmit Jongbloed et al. 2017).

Overall, approximately 41% of physicians in this sample are planning to reduce their job size. This is similar to another study, where 35% wanted to work less (Schmit Jongbloed et al. 2017), however, this study consisted of physicians starting medical training. In our sample, physicians deciding to work less are slightly older in comparison to physicians that aim to keep their working arrangements unmodified or prefer to work more. With regard to gender, 43% of all male physicians and 39 % of all women want to reduce their job size. This difference could be explained by the fact that women already work less compared to their male counterparts due to family commitments.

The main reasons for wanting to reduce the overall amount of working hours are having more leisure time, reducing workload or due to care-work. Apart from shortage of health care professionals, physician's dedication may often lead to increases in workload and burnout. However, Burnout has been shown to be a reason for physician's decision to resign from medical profession (Dyrbye et al. 2012; Shanafelt et al. 2014). Especially younger physicians see part-time work as a solution to reduce heavy workload, being able to find the balance between work and private life (Schmit Jongbloed et al. 2017).

Studies suggest, that work engagement and work motivation may positively impact (personal) burnout (Ferraro et al. 2020). In our study, multivariate analysis show that work engagement is significantly linked to all three dimensions of workload. Regression models show that work-engagement can reduce patient-related, work-related as well as personal workload. In addition, the desire to work less (i.e. reduce working hours) is linked to higher workload on all three dimensions. With regard to sociodemographic factors, being younger and being female was also significantly related to higher workload. Interestingly, having children was associated with less work-related and less patient-related workload. Previous studies suggest, that having children would increase the overall burden, leading to work-home-conflicts that also influence career decisions of physicians (Dyrbye et al. 2012). Another study has found a significant but inverse relationship between number of children and emotional exhaustion experienced by physicians (Keeton et al. 2007). Therefore, the relationship may depend on the type of burnout under investigation. In addition, future studies may focus on the relevance of the children's age (i.e. differences in intensity of care being necessary) and include whether this may also be influenced by the partner's labor situation if the physicians is in a relationship.

For work engagement, significant direct as well as mediation effects were found. In other words, physicians with high levels of workload (patient-related, work-related and personal) express less work engagement and are therefore more likely to plan to reduce their working time. Therefore, work engagement may influence whether high levels of workload and burnout observed in physicians of different specialties may lead to the desire to cut down jobs size. Since a shortage in health care professionals and physicians has been observed, this may increase the shortcoming even more and result in further increase of workload by their colleagues. The concept of work engagement may act as a buffer and should be enhanced by supervisors or health care institutions. Additionally, it has been suggested that interventions, that focus on reducing job demands (i.e. having sufficient time for work) and rather strength resources (i.e. values alignment) have the greatest potential to affect burnout and work engagement (Koranne et al. 2020).

The question remains whether reducing working time may decrease workload or rather increase workload, because physicians do not have sufficient time for their patients and administrative work. In comparison spending more time with the patient, but during less occasions (i.e. less visits by the patient) may also effect workload. Future research should therefore investigate how different working hour arrangements (also including home-office and telehealth) may be useful in decreasing workload and the risk to develop burnout and how interventions that aim to increase work engagement and to anticipate physician shortage.

## Limitation

Results of the work engagement scale show, that the overall scores are lower compared to other studies investigating physicians (Scheepers et al. 2017; Perreira et al. 2018) but goes align with findings from a similar study investigating burnout, work engagement and patient care (Loerbroks et al. 2017) . Even though, mediation analysis revealed significant direct as well as mediation effects, the total effect of work-related and personal workload was relatively low. Future research should therefore investigate whether additional factors may contribute and hence, influence this relationship.

## Declarations

### Ethics Approval and consent to participate

The study was approved by the Ethical committee (Medical Faculty, University of Leipzig, reference number: 478/19-ek). Participants have given consent for their data to be used.

### Acknowledgement

We would like to thank the State Chamber of Physicians of Saxony for helping us collecting the data.

### Consent for publication

Not applicable

### Availability of data and materials

The data set and materials supporting the results are available from the corresponding author upon reasonable request.

### Competing interests

The authors declare that they have no competing interests.

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### Authors' contributions

FUJ, SRH and EB were responsible for data collection. FUJ analysed and interpreted the data and wrote the manuscript. Additional amendments were given by SRH, EB, MB and FH. All authors read and approved the final manuscript.

## Authors' information

Not applicable

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# Tables

Table 1: Descriptive information with regard to desired changes in working hours

	Reduction of working hours (n = 297)	No reduction of working hours (n = 428)	p-value
Age	Ø 44.9	Ø 43.6	n.s.
Gender			
female	40.7%	37.6%	n.s.
male	59.3%	62.4%	
Care work for children ("yes")	75.8%	74.8%	n.s.
Marital status			
married	64.0%	60.5%	n.s.
in a relationship	22.6%	21.3%	
single	13.5%	18.2%	
Working hours (including on-call duty and overwork)	Ø 52.6	Ø 46.5	p < 0.001, d = -0.529
Leading position („yes") <sup>1</sup>	25.0%	24.9%	n.s.
Medical setting			
outpatient	35.4%	34.8%	n.s.
inpatient	64.6%	65.2%	
Workload <sup>3</sup>			
Personal	50.8	42.0	p < 0.001, d = -0.474
Patient-related	26.4	21.3	p < 0.001, d = -0.278
Work-related	40.9	34.6	p < 0.001, d = -0.440
Utrecht Work Engagement Scale <sup>4</sup>	3.5	3.8	p < 0.001, d = 0.258

Satisfaction with working time schedule			
Satisfied			
Dissatisfied	31.6%	85.5	p < 0.001, V = 0.550
	68.4%	14.5%	

Note: <sup>1</sup>= senior or chief physician; n.s. = not significant; <sup>3</sup>= range: 0-100, higher score means greater workload; <sup>4</sup>= possible range: 0.33-6.0, higher score means greater engagement; n.s. = not significant; d = Cohen's d effect size; V = Cramer's V effect size

**Table 2: Multiple regression analyses with "Job Size reduction" as a predictor of the three dimensions of workload, work engagement**

	Patient-related WL	Personal WL	Work-related WL	UWES
Job Size (no reduction <sup>a</sup> )	5.05***	9.31***	6.69***	-1.39**
Age	0.02	-0.27***	-0.04	0.03
Gender (male <sup>b</sup> )	-0.54	5.20***	4.15***	-0.07
Children (yes <sup>c</sup> )	5.33**	2.79	4.78**	-1.32*
Marital status (married <sup>d</sup> )				
in a relationship	0.69	-1.99	-2.04	0.01
single	-0.75	-0.79	-0.56	0.99
constant	19.42	50.57	33.22	21.44
R <sup>2</sup>	0.03	0.11	0.09	0.04

Note: UWES= Utrecht Work Engagement Scale; <sup>a</sup>reference category coded as "0" = no reduction in working hours, "wanting to reduce" was coded as "1"; <sup>b</sup>reference category coded as "0" = male subjects; <sup>c</sup>reference category coded as "0" = having children; <sup>d</sup>reference category coded as "0" = married; \*p ≤ 0.05; \*\*p ≤ 0.01; \*\*\*p ≤ 0.001

## Figures

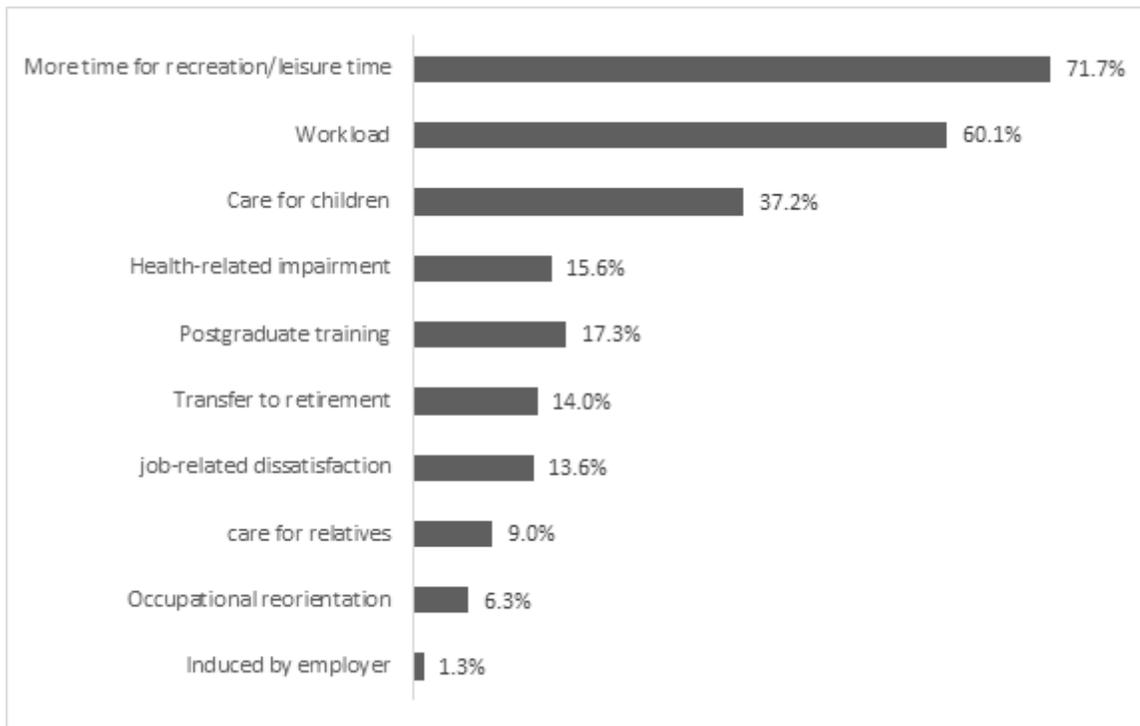


Figure 1

Reasons for wanting to reduce working hours (in %)

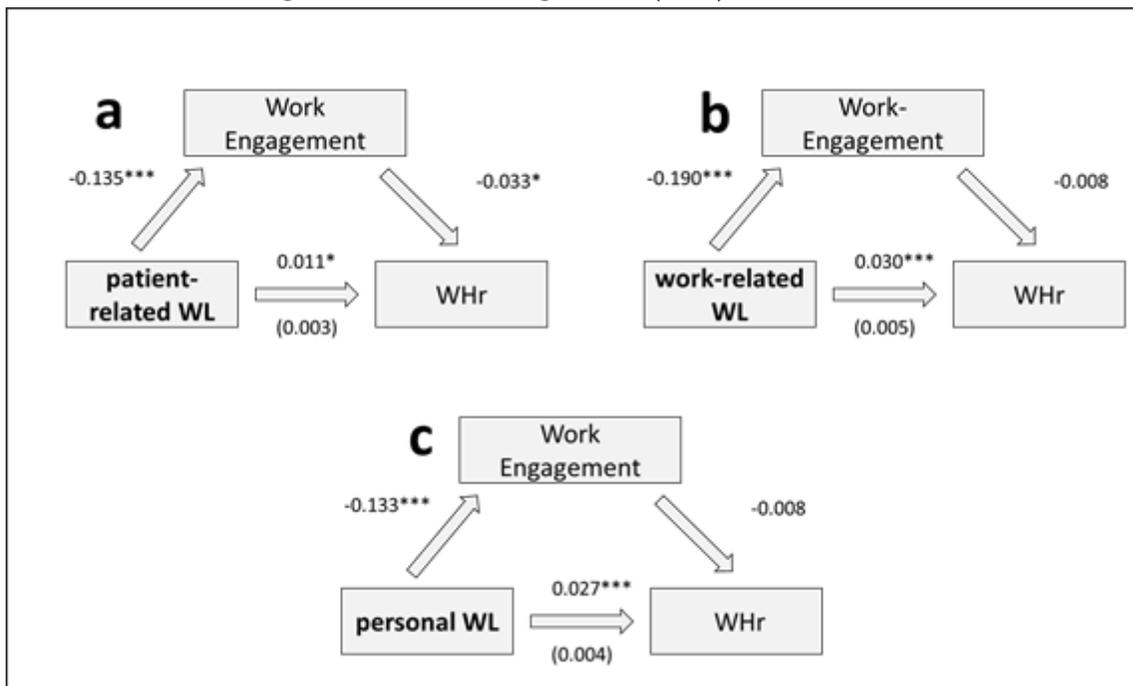


Figure 2

Causal mediation analysis with work engagement as the mediator between workload and changes in working time Note: a = mediation between patient-related workload and change in working time; b = mediation between work-related workload and change in working time; c = mediation between personal workload and change in working time; WL = workload; WHr = working hours (reduction vs. no change)