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Children Lower the Probability of Burnout in Physicians

Nicole C. Buehrsch*1, Mewes AUJ², Knorr F³, Zoller T⁴, Kunkel J⁵, Urbanek C¹, Kleinjung F⁶, Guckelberger O⁷, Tegethoff K⁸ and Peters O¹

¹Department of Psychiatry and Psychotherapy CBF, Charité, University Medicine Berlin, Germany

²Department of Radiology, Charité, University Medicine Berlin, Germany

³Department of Veterinary Medicine, Free University Berlin, Germany

⁴Department of Infectious Diseases and Pulmonary Medicine, Charité, University Medicine Berlin, Germany

⁵Department of Gastroenterology and Renal Medicine, Charité, University Medicine Berlin, Germany

⁶Federal Institute for Risk Assessment, Berlin, Germany

⁷Department of General, Visceral and Transplantation Surgery, Charité, University Medicine Berlin, Germany

⁸Department of Anesthesia, Charité, University Medicine Berlin, Germany

Abstract

Object: Burnout is an increasing problem, and specifically physician burnout is widely discussed as a serious risk factor for mental and physical health disorders. Therefore in this study we investigated the prevalence of burnout in a large population of university physicians regardless of individual medical specialisations and searched for preventive factors that may reduce the risk for burnout.

Methods: A total of 702 physicians aged 25-68 (mean 36 yrs of age) at a university hospital were examined using the Maslach Burnout Inventory (MBI). Demographic data, increased workload during the past year, and the prevalence of sick leave due to stress as one additional indicator of burnout or moreover as a consequence of burnout symptomatology were collected by a computer-based online survey.

Results: Overall, 51.4% of physicians reported high emotional exhaustion (EE) and 53.8% reported high ratings of depersonalisation (DP) in spite of an overall high rate of personal accomplishment. Sick leave due to work overload was reported by 20.2%; Chi² tests reveal that physicians with high values of EE (values above or equal to 27) or high scores of DP (values above or equal to 10) reported a significantly higher rate of sick leave. T-tests indicate that physicians with children showed significantly lower levels of EE and DP. However, subgroup analysis revealed that only male physicians with children demonstrated significantly lower levels of EE while females did not. DP values were again lower for male and female physicians with children.

Conclusion: Burnout is a very common phenomenon in academic hospitals and physicians without children are at the highest risk.

Keywords: Burnout; Children; Gender; Physicians.

Introduction

Burnout is conceptualised as a syndrome of increased emotional and physical exhaustion as well as feelings of depersonalisation on the one hand and a decreased perception of personal work efficiency on the other hand. It differs from depression in several aspects; first of all, burnout is thought to be caused by objective and subjective workoverload. Second, the core symptoms of depression are depressed mood, anhedonia and a reduced interest in activities, hobbies or work with respect to almost all areas of life independent from the context. In contrast burnout symptomatology is at least in the beginning mostly related to the individual work life. However, on the other hand it is very reasonable to consider burnout symptomatology as a risk factor in development of a major depressive disorder [1]

In physicians burnout is widely discussed as a serious risk factor impairing physical health and well-being of medical doctors, and may also represent a secondary risk of impaired patient care. In particular, young physicians and residents and those working in fields considered to be very demanding were investigated [1-5]. In many university hospitals working conditions are characterized by a multitude of duties and responsibilities, such as research and education in addition to patient care. Over the past years, physicians have been faced with increasing administrative responsibilities and a rising workload. Adverse organizational issues like understaffing [6], inequity [7] decreased autonomy [8,9] and value incongruence [10] are shown to be associated with burnout symptomatology.

Various studies have reported the prevalence and factors impacting burnout. A few studies have examined the impact of having children on burnout symptomatology with conflicting results. No relationship was observed between children and burnout in faculty physicians from a department of internal medicine [11] or in a Swiss cross-sectional study of primary care physicians [12], while a study investigating a large number of US surgeons reported that those with children had a significantly lower burnout risk [13].

The aim of this study was to investigate the prevalence of burnout in a large population of university physicians regardless of individual medical specialisations and to search for preventive factors that may reduce the risk for burnout.

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^{*}Corresponding author: Nicole Buehrsch, Charité University Medicine Berlin, Campus Benjamin Franklin, Department of psychiatry and psychotherapy, Eschenallee 3.14050Berlin,Germany.Tel: +49 30 8445-8305, E-mail: nicole.buehrsch@charite.de

Methods

Participants and data collection

In a cross-sectional study all 2742 physicians employed in November 2010 at the Charité - Universitätsmedizin Berlin were invited per e-mail to anonymously answer a computer based survey with respect to burnout. Participation was voluntary. An e-mail including a short rationale and a link pointing to the online questionnaire was sent to a mailing list including all employed physicians. Of these 945 were employed as physician researchers and 1797 were employed as clinical physicians, who were the target group for the MBI for health care personnel presented in the survey. In the cover letter explicitly only the clinical physicians were invited to participate. Within two weeks the online survey was released at the homepage of the "Ärzteinitiative" at the Charité. Respondent names and affiliations were not assessed to ensure anonymity. To control for repeated submissions IP addresses and time point of completion were stored.

A total of 788 participants answered the questionnaire. In n=86 cases answers of the Maslach Burnout Inventory (MBI) were incomplete, resulting in missing data for one or more dimensions of the MBI. They were omitted from analysis. The remaining participants (N=702, 39,1%) reflect a representative sample of all employed physicians with respect to their job position: 57.1% were employed as residents and showed a response rate of 58.1%, 23.7% were attending physicians with a 21.7% response rate, and 19.1% were senior or head physicians with a 20.2% response rate.

Questionnaire on demographic and job-related parameters

In the first part of the survey, 10 items were administered to check for possible demographic and job-related impact factors. The impact of age, gender, civil status (single or partnership), children (Table 1) was investigated. Furthermore we asked for the occurrence of sick leave due to work overload during the past year (yes/no) as one additional indicator of work-overload and burnout symptoms or as a consequence of burnout.

For several reasons, medical specialisations were not integrated into the job related parameters. This was because we aimed to measure burnout among all physicians at a university hospital in general, to ensure anonymity, and to increase participation as well as validity by avoiding a competition between medical specialisations supposed to be associated with a higher or lower stress load.

Maslach Burnout Inventory

The Maslach Burnout Inventory (MBI, German MBI attached in the supplement) has been repeatedly demonstrated to be a valid and reproducible instrument for measuring burnout and is widely accepted as the gold standard tool [14-16]. The MBI consists of 22 items to be answered on seven point Lickert scales and results in the following three subscales: (1) Emotional Exhaustion (EE), (2) depersonalization (DP), and (3) Personal Accomplishment (PA). The internal consistency for the subscales vary between Cronbachs Alpha of 0.79 - 0.90 with respect to EE, 0.52 - 0.81 with respect to DP and 0.62 -0.87 with respect to PA. [15]. With regard to validity the German version of the MBI was significantly correlated to several other scales measuring psychosomatic complaints, testiness, fatigue and feelings of monotonicity. Correlation coefficients for the subscale EE were between r = 0.40 to r = 0.52 and in case of DP between r = 0.13 and r = 0.21 (all p < 0.01) [15]. High ratings of EE reflect feelings of being overextended, including both mental and physical exhaustion. Scores ≤27 points are considered elevated and indicate burnout symptoms. High DP scores reflect an insensitive, detached, and impersonal attitude towards patients, colleagues, and/or trainees. Scores ≥ 10 are interpreted as heightened DP. The PA subscale measures work-related feelings of competence and successful achievements; scores ≤ 33 reflect low subjective work-related competence and satisfaction while levels above 33 are considered to be associated with a lower risk of burnout [16]. "High" burnout was defined as high ratings of EE (≥ 27) and DP (≥ 10), "moderate" burnout levels as high ratings of EE or DP, and "no/ low" burnout as EE and DP ratings below the cut-offs [16].

Data analysis

To analyse gender differences in age and working hours, t-tests were computed. Chi² tests were performed to test distribution of civil status, parenthood, and sick leave between female and male participants.

Inter-dependencies between demographic and work-related variables were tested by Spearman rank order correlations. Taking the significant correlations between these variables into account, ANCOVAs were performed with age, gender, parenthood, and partnership as independent variables to test the influence on overall burnout levels as well as on EE, DP, and PA as continous variables separately. Overall burnout was reflected by either a high, a moderate or a low burnout level indicating 0, 1 or 2 ratings above the cut-off levels. Work-related variables such as weekly working hours and job position were integrated as covariates. T-tests for independent samples were performed to analyse differences in EE, DP, and PA ratings with respect to gender and having children.

Chi² tests were computed to test distribution of sick leave between subgroups of physicians with no or low, medium, and high burnout ratings as well as to test the distribution of low, medium, or high burnout symptomatology between males and females and physicians with and without children. Values are given as mean (SD).

Results

Prevalence of burnout and sick leave

A total of 702 (39.1%) participants answered the questionnaire completely. Table 1 reports demographic and work-related variables of survey participants. A total of 361 (51.4%) physicians showed high ratings of EE and 378 (53.8%) demonstrated high values of DP. Two hundred fifty-nine (37%) physicians had low values for PA (Figure 1). Assuming no or low burnout to correspond to low scores on EE and DP, only 228 (32.5%) participants did not have burnout symptoms compared to 474 (67.5%) reporting moderate (high scores on EE or DP: N=209; 29.8%) or high (high scores on EE and DP: N= 265; 37.7%) burnout levels.

Overall, 142 (20.2%) physicians reported sick leave during the last year due to work overload. As depicted in Figure 2, the proportion

	Total (N=702)	Females (N=302)	Males (N=400)	
Age	36.2 (6.9)	35.3 (6.8)	36.9 (7.0)	t= 3.1**
Civil status (partnership)	528 (75%)	196 (65%)	332 (83%)	chi2=30.2***
Having children (yes)	319 (45%)	101 (33%)	218 (55%)	chi2=30.8***
Weekly hours	55.8 ± 0.4	52.8 ± 0.7	58.3 ± 0.5	t= 6.5***
Sick leave (yes)	142 (20%)	73 (24%)	69 (17%)	chi2=5.1*

T-values and chi2-values reflect differences between women and men. * p<0.05, ** p<0.01, *** p<0.001

 Table 1: Demographic variables.

of physicians with sick leave due to work overload was significantly connected with low (21.1%; N=30), medium (28.9%; N=41), or high (50.0%; N=71) (chi² (2) = 14.2; p<0.001) burnout symptomatology. In the group of physicians reporting no sick leave due to work overload, no differences in the frequency of low (35.4%; N=198), medium (30.0%; N=168), or high burnout (34.6%; N=194) were observed. Both high EE (chi² (1) = 15.6; p<0.001) and high DP (chi² (1) = 5.6; p<0.018) ratings were associated with a higher rate of sick leaves.



Figure 1: Distribution of ratings of EE, DP, and PA; dashed lines reflect cut-off values.



Analysis of demographic variables with additional control for position, shift, and weekly working hours

First, spearman rank-order correlations were computed to test whether the potential impact parameters were independent from each other. According to Cohen's classification, only the correlation between "position" and "age" (r = 0.73) was high, whereas the correlation between "age" and "children" (r = 0.42) and that between "position" and "children" (r = 0.53) were moderate. Therefore "position" was not integrated into the following analysis to avoid invalidation of the ANCOVA assumptions. All other correlation-coefficients are below r = 0.24.

An ANCOVA integrating shift model and weekly working hours (impact factors along with working position, investigated in a second currently submitted paper) as covariates and analysing age, gender, parenthood, and civil status as primary factors simultaneously and burnout level as an dependent variable showed the following results. In this model, only the main effect children ($F_{(1)} = 10.7$; p<0.001) was independently associated with an altered burnout level (low, medium, or high). Having children correlated significantly with a lower burnout level. The main effects age ($F_{(1)} = 1.2$; p=0.2), gender ($F_{(1)} = 1.3$; p=0.3), and civil status ($F_{(1)} = 0.7$; p= 0.4) did not differ significantly between physicians with no, low, or high burnout. However, when performing the same analysis with respect to EE and DP as independent variables, ANCOVA's revealed the following results: with respect to EE, the main effects "children" ($F_{(1)} = 6.8$, p<0.01) and "gender" ($F_{(1)} = 4.9$, p<0.03) were independently and significantly connected to burnout symptomatology. In the case of DP, the main effect "children" showed a trend towards lower levels of DP among physicians with children (F(1) = 3.1, p=0.08).

Children and burnout

Physicians with at least one child reported significantly lower ratings of EE compared to colleagues without children (25.3 (±10.6) vs. 27.9 (±9.8); t= -3.4, p<0.001), as well as lower ratings of DP (10.1 (± 6.8) vs. 11.7 (± 6.5); t= -3.3, p=0.001) and PA (34.8 (± 7.8 vs. 33.6 (± 7.3); t=4.0, p=0.042). Table 2 shows the distribution of high vs. low ratings of EE, high vs. low DP, and high vs. low PA ratings among physicians with and without children. In physicians without children, EE and DP scores were significantly more likely to be above the cut-

	Children (N=320)	No children (N=383)	chi²
EE ≥ 27 (%)	44.8	56.9	10.2***
DP ≥ 10 (%)	44.8	61.4	19.2***
PA ≥ 33 (%)	66.1	60.6	2.3

200 Low BO Medium BO High BO Fig 100 50 0 no children has children

Table 2: EE, DP, and PA levels in physicians with and without children.

without children.

off levels. Additionally, the frequency of low, medium, or high levels of burnout were significantly associated with having children or not having children (Figure 3) (chi² $_{(2)} = 20.8$; p<0.001). However, having children or not having children was not associated with the frequency of sick leave (chi² $_{(1)} = 1.5$; p=0.22).

Gender and burnout

Female physicians reported significantly higher scores on EE compared to their male colleagues (27.7 (± 10.1) vs. 25.9 (± 10.4); t= -2.3, p=0.023), while males tended to show higher scores for DP (11.4 ± (6.7) vs. 10.4 (± 6.6); t= 1.9, p=0.055). No gender differences were observed in PA scores (34.4 (±7.8) vs. 33.8 (± 7.2); t=1.1, p=0.33). With respect to the proportion of low, medium, or high levels of burnout, no differences could be observed between males and females (chi² (2) = 1.1; p=0.61). However, female physicians reported significantly more sick leave due to increased workload (24.2% vs. 17.3%; chi² (1) = 5.1; p=0.024).

Gender, children, and burnout

To examine the interaction of gender and children, the influence of having children separately for female and male physicians was investigated. Male physicians with children reported lower scores for EE compared to males without children (24.7 (\pm 10.7) vs. 27.4 (\pm 9.8); t= -2.5, p=0.011), while female physicians with children did not report lower EE ratings compared to their colleagues without children (26.4 (\pm 10.4) vs. 28.4 (\pm 9.9); t= -1.6, p=0.1). With respect to DP ratings, having children was associated with lower symptomatology in both sexes (males: 10.6 (\pm 6.9) vs. 12.3 (\pm 6.4); t= -2.5, p=0.013; females: 8.9 (\pm 6.5) vs. 11.2 (\pm 6.5); t= -2.9, p=0.004). PA was not affected by the presence or absence of children for either gender (both t< 1.32; p>0.21). Additionally, the frequency of low, medium, or high levels of burnout was significantly associated with the presence or absence of children

for both male (chi² $_{(2)}$ = 15.1; p<0.001) and female physicians (chi² $_{(2)}$ = 8.7, p=0.013).

Discussion

The present study investigated burnout in physicians working in various medical branches at a large university hospital. We observed a strong rate of burnout (67%) as indicated by high scores for Emotional Exhaustion (EE) and/or depersonalisation (DP) in a questionnaire. This rate is higher than some earlier reported burnout scores ranging from 30% to 45% [12,17]. At an academic faculty, burnout rates around 34% having high scores on EE and/or DP subscales observed by Shanafeld et al. [13] are considerable lower than those in our study group. A higher proportion of physicians with a burnout rate of 76% was detected in a group of first and second year internal medicine residents [1]. However, we used the cut-off values that are based on US surveys and therefore maybe not be totally comparable with respect to a German population.

The major finding of the present study is that having children was associated with lower EE and DP scores and by this obviously represents a protective factor lowering the risk to suffer from burnout. In our study having children resulted in significantly lower burnout independently from other demographic or work-related parameters.

Similar to our results, Woodside et al. [18] observed lower scores on the MBI DP and EE scales among physicians with children in a smaller study investigating 155 family medicine physicians and psychiatry residents. Shanafelt et al. [13] reported partially contradictory results. According to the authors, having children is considered to be independent from other demographic and work-related factors associated with a lowered risk of burnout; however, physicians who have a child under the age of 21 have a higher burnout risk. No impact of children or being in a stable partnership was observed by the similar authors in a study on burnout among academic faculty physicians [11] or in the Northern Sweden Monica Study investigating burnout, working conditions, and gender [19]. However, the latter study was not limited to physicians, and found a considerably lower rate of burnout, 13%, compared to our study population.

In the present study in male physicians, having children was protective regarding both EE and DP. In female physicians, having children was slightly less beneficial, with ratings only lower for DP. Similar to others, we found that women scored higher on the exhaustion dimension of burnout and lower on the depersonalisation dimension of the MBI compared to men [20,18]. One may speculate that one reason for these lower benefits of children on burnout in female physicians is that women often carry a greater responsibility for home demands, possibly defined a higher amount of total demands and therefore resulting in higher burnout symptomatology. In a review comprising fifteen studies only four investigated gender effects on burnout. None of these studies verified a higher risk of burnout among women [3]. However, very recent data by Dyrbye et al. [21] reported higher rates of burnout in female than male physicians in a large group of surgeons, with women being less satisfied with the work-life balance.

As numerous reports have shown a high risk of physician burnout from excessive demands on the one hand and difficulties maintaining a sustainable work-life balance on the other [22,23], a possible mechanism as to why children seem to prevent burnout symptomatology may be a "forced" balance of work-related demands and non-work-related responsibilities. We hypothesize that there appear to be two possible mechanisms reducing job-related EE and DP: First, physicians with

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no children has children Figure 3: Low, medium, and high burnout levels among physicians with or

children leave work and patients behind physically as well as mentally earlier, and focus their thoughts on topics other than work. Second, physicians who are parents spend more leisure time with their children, and therefore have more positive activities to compensate for work related stress. This may fit also in the theoretical framework of the burnout concept which is thought to be a predominantly work-related symptomatology and is at least in earlier stages not generalized to all life areas.

In a couple of studies, a negative correlation was observed between age and burnout [13,18,19]. However, in our study, age was not independent from factors such as children, job position, and working shift model. With respect to civil status, living in a stable partnership resulted in a higher rating for PA, which is assumed to prevent burnout symptoms. However, having a partner is not an independent parameter preventing burnout in physicians.

The strength of this investigation is that data were collected from a very large group within one university hospital, and therefore possible confounding variables due to structural working conditions are minimized.

One weakness of the survey is the total response rate of 39% and despite work-position we have no information on the refusers with respect to demographic or other work-related data. However, with respect to the distribution of response rates between different career positions, our survey is representative and especially in the younger physicians which represent the largest proportion of the employed and investigated physicians, the response rate was 58%.

Self-reports on psychological symptoms like we asked for are always to be considered cautiously with respect to an overestimation of symptomatology. One possible bias can be that physicians that are affected by burnout symptoms are more likely to take part on such an investigation and the less affected are not interested. However, there is a substantial part of participants reporting low or no burnout symptoms and the subjective rating of personal accomplishment is within a normal range (e.g. not below the cut -off) in more than 60% of participants.

An additional limitation is the single-center, cross-sectional design of the study, that restrict conclusions for non-academic hospitals or causal relationships. However, on the other hand with the single-center design possible other work-related impact factors are the similar for all participants and by this systematic covariants are controlled.

In a variety of studies, physician burnout was associated with work or reward satisfaction and work environment [11,17,24,25]. Our data show that in addition to these self-evident work-related effects on burnout symptomatology, job-unrelated circumstances such as having children or not are independently associated with burnout.

With respect to the impact of children, further research should focus on the circumstances leading to the beneficial impact of children and explore the underlying mechanisms.

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