

Physician health, stress and gender at a university hospital

Bergman B, Ahmad F & Stewart DE.

"This is a non-final version of an article published in final form in

Bergman B, Ahmad F & Stewart DE. Physician health, stress and gender at a university hospital. *Journal of Psychosomatic Medicine* 2003; 54(2):171-178."

[https://doi.org/10.1016/S0022-3999\(02\)00484-1](https://doi.org/10.1016/S0022-3999(02)00484-1)

ABSTRACT

Objective: To determine personal and work related factors contributing to physician health and stress in men and women physicians in a university hospital.

Method: Mail survey of 161 hospital-based Canadian academic physicians (51 women, 110 men).

Results: Women compared to men, physicians were younger ($M = 43$ years, $S.D. = 7.4$ vs. $M = 48$ years, $S.D. = 8.64$; $P = .001$) and fewer had spouses (76% vs. 90%; $P = .01$) and children (76% vs. 91%; $P = .02$). A five-item scale measured somatic symptoms, the dependent variable. Among physicians of both gender, the somatic symptoms scale was significantly correlated with satisfaction with amount of time spent working and scales of mental health (five items), work satisfaction (five items), workload (five items), healthy lifestyle (five items), coping abilities (three items) and support-in-stress (two items). On stepwise regression analysis, for women physicians, 70% of the variance in somatic symptoms was explained by support from colleagues when stressed, and workload. For men, 42% of the variance was explained by healthy lifestyle, mental health, support from colleagues when stressed, and workload. Regardless of gender, the majority of physicians reported an excessive workload but the sources of support when stressed varied by gender.

Conclusion: Different strategies are needed for women and men physicians to reduce their stress levels.

Key words: academic, gender, physician stress

Introduction

Most physicians enjoy better than average physical health and lead satisfying and productive lives. However, medicine is an inherently stressful profession with long hours, pressing clinical problems, ethical dilemmas, difficult patients and conflicting demands [1]. Stresses of medical practice may influence men and women physicians differently as working women, in general, report more physical complaints [2,3] and more difficulty in unwinding after work [4] than their male counterparts. Similar trends were found in a study of Norwegian physicians, which reported a higher frequency of somatic complaints among women than men physicians [5]. However, it is unclear what factors are associated with the increase of somatic complaints among physicians of either gender.

Some authors have reported elevated rates of mental stressors, depression, anxiety, marital problems and higher suicide and addiction rates among female physicians compared to other women [6–9] while others have not [10]. Physicians' predisposing personality factors [11] and the stress of medical practice have been recurrently studied [12–17], but work-related determinants of physical health by gender remain under researched [14–17].

Are there special stresses for women physicians? Although women physicians are generally satisfied with their careers, Frank et al [18] found one-third would hesitate in becoming physicians again or would change specialties. Women physicians tend to be disproportionately clustered in specialties that are less prestigious and lower paying such as paediatrics and psychiatry, while they are conspicuously absent from higher status, high paying specialties such as surgery and cardiology [10]. In their personal life sphere, women physicians are also more likely to have spouses with similar occupational status, whereas male physicians benefit from “two career families” in which their spouses are more likely to have less demanding jobs. This may lead to more work–family

balance stress for women physicians. A recent study by Stewart et al. [19] found that high expectations, multiple roles and work environment were three major sources of stress for women physicians. However, little is known about gender similarities or differences in physicians' satisfaction with respect to work–family balance and its role in determining health.

Although some studies exist on physician's experiences of abuse at work [19], the health influence of verbal and physical abuse by gender is unknown for physicians. Likewise, little is known about the health influence of social support in women physicians, although studies of other working women suggest that social support influences their handling of workplace stress [20].

The primary objective of this study was to investigate stressors of men and women physicians that are associated with, or predict, somatic symptoms. We also investigated stressors by specialty: internal/family medicine, surgical specialties and others. It was hypothesized that (a) variability in somatic symptoms among physicians of either gender will be associated with workload, stress, support, mood, work satisfaction, work–family balance satisfaction and abuse at work; and (b) differences by specialty will exist for perceived workload, stress, support, mood and work satisfaction for physicians of either gender. Descriptive subanalyses were also conducted on questions about work–family balance satisfaction and abuse at work to further explore these topics.

Methods

Study design and participants

This study was conducted in a large teaching hospital in Toronto, Canada using a cross-sectional mail survey. In total, 474 active physicians (women 103, men 371) were invited by letter to participate in the 'physician stress and health' study by anonymously completing an enclosed two-page questionnaire. One reminder was sent to all physicians and a second reminder to women physicians. This differential sampling was intentional to facilitate examination of gender differences because of the smaller number of women physicians in the institution. Ethics approval was obtained from the institutional research board.

Self-reported measures

The survey instrument requested information on age, marital status, number and ages of children, full-time/part-time status, years in practice and specialty.

Information on the dependent variable (somatic symptoms) and independent variables (mood, workload, stress, health and work environment) were gathered by items and scales derived from published studies. Prior to hypothesis testing and planned analyses, these items were factor ana-

lysed (FA) with varimax Kaiser Normalization rotation [21] to re-confirm the structural relationship, as many of the source studies were not conducted with physicians. Seven factors were obtained, as discussed below, and accounted for 60% of the total variance.

From the work of Wallin and Wright [2] and Wright et al. [3] with white- and blue-collar industry workers, somatic symptoms were measured by a five-item scale consisting of gastrointestinal symptoms, upper and lower limb musculoskeletal symptoms, cardiovascular symptoms and non-specific symptoms (headache, chronic tiredness and trouble concentrating). Each item was rated on a four-point scale (often, sometime, seldom and never) and high scores indicate good health or fewer somatic symptoms. On FA, all items loaded on a single factor with a coefficient α of .82. This factor was named *somatic symptoms*.

The Mental Health Inventory, five-item scale [22] was used to measure mood and anxiety. The scale items (downhearted and blue, down in the dumps, been a very nervous person, been a happy person, calm and peaceful) were rated on six-point scale (all the time, most of the time, a good bit of the time, some of the time, a little bit of the time, none of the time). High scores indicate good mental health. The structural relationship of the items remained intact on FA. All items loaded on single factor with a coefficient α of .82. This factor was labelled *mental health*.

Founded on work by Wallin and Wright [2], Wright et al. [3] and Frankenhaeuser [4], the section on workload included five items (too much work, work pace too fast, psychologically demanding work, difficulty in unwinding and too tired after work to participate in other interests). Each item was rated on four-point scale (often, sometime, seldom, never). On the FA, the first four items loaded on one factor along with an item (feeling overwhelmed) drawn from the stress section (six-point scale). High scores indicate a heavy workload. The factor had a coefficient α of .67 and was named *workload*.

Based on Stress Screening SS 7 scale (S.G. Carlsson, personal communication, February 1999), the section on stress included five items rated on six-point scale (never to almost always); high scores indicate good coping. The FA revealed that the items represented more than one underlying conceptual construct by loading on two different factors. One factor consisted of two items (handled stressful situations, managed life as wished) from the original stress section along with the variable "knowledge and ability compared to other physicians, of same age and specialty" rated on a five-point scale (excellent, very good, good, fair, poor). This three-item factor was labelled *coping* and had a coefficient α of .67.

Two support related items (support from family or friends and support from work colleagues) from the original stress section loaded together to form a separate factor labelled *support-in-stress* with a coefficient α of .58. Despite its low coefficient, the factor was retained because of the conceptual importance suggested in other studies.

The work environment section included three items on relationships with superiors and colleagues, and work satisfaction from studies by Wallin and Wright [2] and Wright et al. [3] along with two items on economic reward and physical environment at work. Each item was rated on a five-point scale (excellent, very good, good, fair, poor) and high scores indicate a good work environment. The factor structure was confirmed as all items fell on a single factor with a coefficient α of .76. This factor was labelled *work satisfaction*.

Factor analysis also revealed that five health-related variables composed one unforeseen factor with a coefficient α of .74. This factor was labelled *healthy lifestyle* and included: one item on perceived physical health rated on five-point scale (poor, fair, good, very good, excellent); three items on healthy behaviours of exercise, diet and sleep rated on four-point scale (never, seldom, sometime, often); and one item “too tired after work to participate in other interests,” which originally belonged in the workload section. High scores indicate a healthy lifestyle.

Six factors *mental health*, *workload*, *coping*, *support-in-stress*, *work satisfaction* and *healthy lifestyle* were used subsequently by deriving the total score of items within each factor.

Exploratory independent variables included verbal and physical assault during medical training and work, satisfaction with amount of time spent on paid work and satisfaction with share of domestic work and childcare. The latter two variables assessed work–family balance. All of these variables were answered on a two-point scale.

Statistical analyses

In addition to the aforementioned FA, data analyses included descriptive statistics, Pearson’s product moment correlation, unpaired *t*-test, analysis of variance (ANOVA) with post-hoc comparisons (Scheffe), cross tabulations, chi-square tests of independence and stepwise regression analyses. The statistical software SPSS (Statistical Package for the Social Sciences, version 10.0; SPSS, Chicago) was used.

Results

Descriptive

One hundred and sixty-one physicians (51 women and 110 men) responded to the mailed survey for an overall response rate of 34%. The women’s response rate (approximately 50%) was higher than that of the men (30%), as expected due to differential sampling. Considering gender, age and specialty representation, the respondents were similar to the eligible group of physicians. For example, the mean age of eligible women was 44.3 years (S.D. = 7.9; range 28–65 years) and of respondent women 42.8 years (S.D. = 7.4; range 28–62 years). Likewise, eligible men had

mean age of 47.9 years (S.D. = 8.7; range 28–68 years) and respondent men 47.8 years (S.D. = 8.6; range 32–69 years).

More men (90%) than women (76%) physicians were married ($\chi^2 = 10.2$, $df = 2$, $P = .01$). The respondents had been in practice for a mean of 16 years and there was no gender difference. More men (90.7%) than women (76.1%) had children at home ($\chi^2 = 15.1$, $df = 7$, $P = .04$). The mean number of children was 2.4 for men and 1.9 for women. The mean age of the youngest child was 8.2 years for women and 11.8 years for men physicians ($t = -2.25$, $df = 131$, $P = .03$). No gender difference was found in the number of children living at home (women: 2.0 and men: 1.8 children). Four women were single mothers who worked full-time. No man was a single father.

Most women’s spouses (92%) worked full-time, compared to men’s spouses (52%) ($\chi^2 = 18.36$, $df = 1$, $P = .00$). All men physicians worked full-time while 8% of women physicians were part-time. For details on specialties of the physicians, see Table 1. Forty-one percent of the women and 27% of the men were satisfied with the amount of time that they spent in paid work; there was no significant gender difference. Similar numbers of men (75%) as women (79%) physicians were satisfied with their share of domestic work and childcare in their family. Over three-quarters of physicians (82% women, 75% men) felt too tired after work to participate in other interests.

Although about 80% of physicians of both sexes ranked their knowledge and ability as “good or excellent,” men reported their knowledge and ability as significantly higher than women. More women (67%) than men physicians (46%) reported abuse (verbal abuse, harassment, discrimination or intimidation) in the course of medical training or work ($\chi^2 = 5.76$, $df = 1$, $P = .02$). Abuse in the last year was reported by 59% of women and 45% of men and 26% of both sexes reported physical assault during their work careers. Women and men physicians respectively reported patients (32% vs. 22%), patients’ families (18% vs. 22%), supervisors (28% vs. 17%), staff (22% vs. 16%) and strangers (6% vs. 1%) as perpetrators of abuse at work; gender differences were not significant.

Table 1
Physician participants’ specialty ($N = 161$)

Specialty	Women, $n = 51$ (%)	Men, $n = 110$ (%)
Internal medicine	19 (39.6)	33 (31.7)
Surgery	3 (6.3)	28 (26.9)
Anaesthesia	7 (13.7)	10 (9.6)
Family medicine	2 (4.2)	1 (1.0)
Medical imaging	0 (0.0)	3 (2.9)
Radiation oncology	4 (8.3)	5 (4.8)
Psychiatry	4 (8.3)	2 (1.9)
Obstetrics and gynaecology	4 (8.3)	2 (1.9)
Pathology	2 (4.2)	4 (3.9)
Emergency	0 (0.0)	4 (3.8)
Ophthalmology	2 (4.2)	5 (4.8)
Otorhinolaryngology	0 (0.0)	6 (5.8)
Others	1 (0.2)	1 (1.0)

Table 2
Factor scores by sex norm table ($N=104$)

Indices	Women		Men	
	Mean	S.D.	Mean	S.D.
Somatic symptoms	2.82	0.73	2.83	0.71
Mental health	4.45	0.85	4.50	0.79
Work satisfaction	3.63	0.73	3.46	0.71
Workload	3.36	0.57	3.34	0.55
Healthy lifestyle	3.02	0.61	2.98	0.60
Coping	3.62	0.87	3.74	0.66
Support when stressed *	3.15	1.02	2.75	1.11

* $P < .05$.

Factor scales by gender

A comparison of means by gender of physician for the scales of *somatic symptoms* (dependent variable), *mental health*, *workload*, *coping*, *support-in-stress*, *work satisfaction* and *healthy lifestyle* (Table 2) revealed a statistically significant difference for *support-in-stress*. Women physicians rated their social support when stressed better than men ($t=2.2$, $df=159$, $P=.03$). A higher degree of social support was reported by 64% of women compared to 50% of men.

Bivariate correlations

For men and women a separate bivariate correlation matrix was constructed between *somatic symptoms* and the

variables of age, number of children living at home, age of youngest child, satisfaction with time spent on paid work, satisfaction with share of domestic work and childcare, abuse at work and six factor scales of *mental health*, *workload*, *coping*, *support-in-stress*, *work satisfaction* and *healthy lifestyle* (see Table 3). For both women and men, the variables satisfaction with amount of time spent working and the six factor scales were significantly correlated with *somatic symptoms*. In addition for men, *somatic symptoms* was significantly correlated to satisfaction with share of domestic work and childcare, and experiences of abuse.

Multivariate analysis: prediction of somatic symptoms

Our hypothesis that the variability in *somatic symptoms* would be associated with work-related problems was tested by within group stepwise regression analyses with independent variables, mentioned above in the bivariate analyses. Separate gender analyses were conducted because of different correlational patterns. A priori predictions were that the *somatic symptoms* would be negatively affected by perceived severity of work-related problems. Our work-related focus led us to use the item support from work colleagues when stressed instead of the *factor support-in-stress*, but inclusion of either had similar influence on outcome variance. Dummy variables were entered for dichotomous variables of satisfaction with time spent on paid work,

Table 3
Pearson's correlations between the predictor variables and the dependent variable physical health and its component variables for women ($n=51$) and men ($n=110$)

	Somatic symptoms		Gastrointestinal symptoms		Lower back ache		Upper back ache		Chest pain or discomfort		Headache	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
<i>Predictors</i>												
Age	-.04	.10	.11	.15	-.02	.02	.02	.02	.02	-.01	-.04	.19
Number of children	.003	-.00	.05	.08	.01	-.07	.04	.01	-.21	-.10	.07	.03
Number of children at home	-.01	.04	.12	.01	.02	.04	-.01	.15	-.24	-.02	.04	-.07
Age of youngest child	.21	.10	-.07	.10	.21	.07	.24	-.02	.35 ^a	.08	.16	.18
Years in practice	-.05	.07	-.18	.16	.04	.00	.06	.07	-.04	-.07	-.07	.08
Satisfaction with amount of time working	.39 ^b	.25 ^b	.21	.13	.16	.12	.32 ^a	.24 ^b	.37 ^b	.23 ^a	.44 ^b	.28 ^b
Satisfaction with share of domestic work	.17	.23 ^a	.10	.09	.24	.24 ^a	.22	-.26 ^b	.10	.14	.01	.18
Experience of abuse	-.19	-.25 ^b	-.21	-.28 ^b	-.13	-.13	-.03	-.27 ^b	-.22	-.22 ^a	-.17	-.09
<i>Factor scales</i>												
Mental health	.56 ^c	.55 ^c	.35 ^b	.38 ^c	.46 ^c	.37 ^c	.42 ^b	.36 ^c	.46 ^c	.46 ^c	.45 ^c	.41 ^c
Work satisfaction	.52 ^c	.28 ^b	.26	.16	.53 ^c	.21 ^a	.52 ^c	.24 ^b	.37 ^b	.18 ^a	.29 ^a	.29 ^b
Workload	.70 ^c	.49 ^c	.52 ^c	.45 ^c	.48 ^c	.36 ^c	.54 ^c	.35 ^c	.44 ^c	.30 ^b	.68 ^c	.44 ^c
Healthy lifestyle	.48 ^c	.49 ^c	.18	.37 ^c	.40 ^c	.39 ^c	.43 ^b	.30 ^c	.45 ^c	.32 ^c	.40 ^b	.49 ^c
Coping	.48 ^b	.25 ^b	.30	.16	.38 ^b	.13	.38 ^b	.15	.32 ^a	.20 ^a	.47 ^b	.37 ^c
Support-in-stress	.49 ^c	.26 ^b	.32 ^a	-.20 ^a	.38 ^b	-.23 ^b	.33 ^a	-.11	.54 ^c	-.18	.34 ^a	-.28 ^b

^a Correlation is significant at the .05 level (two-tailed).

^b Correlation is significant at the .01 level (two-tailed).

^c Correlation is significant at the .001 level (two-tailed).

satisfaction with share in domestic work and childcare, and abuse at work.

Women

Eight predictors (satisfaction with amount of time spent working, support from work colleagues when stressed, *mental health*, *workload*, *coping*, *work satisfaction* and *healthy lifestyle*, and age of youngest child) were included in a stepwise linear regression analysis. Two of these variables, i.e., support from work colleagues when stressed and *workload*, contributed significantly to the explained variance in the dependent variable, *somatic symptoms*. These predictors explained 70% of the variance (multiple $R=.84$) in *somatic symptoms* (see Table 4).

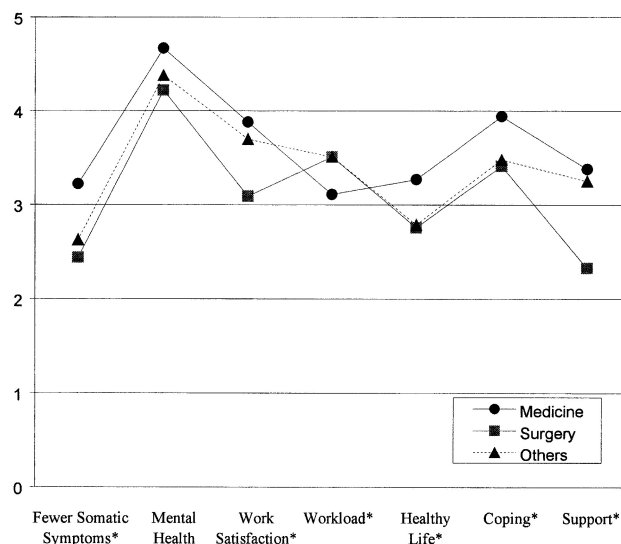
Men

In addition to eight predictor variables included for women, abuse at work was also included in a stepwise linear regression analysis. Four of these variables, i.e., *healthy lifestyle*, *mental health*, *workload* and support from work colleagues when stressed contributed significantly to the explained variance in the dependent variable *somatic symptoms*. These predictors explained 42% of the variance (multiple $R=.65$), see Table 4.

Specialties by factor scales

Our hypothesis that differences by specialties would exist for workload, stress, support, mood and work dissatisfaction was tested by ANOVA within gender by specialty. The 12 physician specialties and subspecialties (Table 1) were divided into three groups: (a) *medicine* (internal medicine and family medicine; $n=55$; 21 women, 34 men), (b) *surgical specialties* (surgery, obstetrics and gynaecology, ophthalmology and otorhinolaryngology; $n=50$; 9 women, 41 men) and (c) *others* (see Table 1; $n=56$; 21 women, 35 men).

Analysis of variance indicated that female physicians in all three groups were similar in all demographic characteristics. Women in *medicine* felt most comfortable and



* Significant correlation, Kruskal Wallis Test

Fig. 1. Female physicians in three specialty groups in relation to the indices ($n=51$). (Medicine, $n=21$; surgical specialties, $n=9$; others, $n=18$.)

reported fewer *somatic symptoms* than women in *surgical specialties* or *others* ($F=5.91$, $P=0.01$), see Fig. 1. Women in *surgical specialties* reported a heavier *workload* ($F=3.27$, $P=.05$), less *work satisfaction* ($F=4.04$, $P=.02$) and less support from work colleagues when stressed ($F=3.77$, $P=.03$) than women in *medicine* or *others*.

Men in *surgical specialties* reported similar social support from work colleagues when stressed as men in *medicine* and *other* specialties. Men in *medicine* were significantly less likely to report *mental health* problems ($F=3.1$, $P=.05$) compared to men in *surgical specialties* or *others*.

Work-family balance by factor scales

Within each gender, comparative analyses of means of the factor scales were carried out for work-family balance.

Satisfaction with time spent working

Compared to 41% of women physicians who were satisfied with the time they spent working, the 59% of women physicians who were not satisfied reported worse *somatic symptoms* ($t=2.81$, $df=44$, $P=.01$), worse *mental health* ($t=2.64$, $df=44$, $P=.01$), heavier *workload* ($t=-4.07$, $df=44$, $P=.00$), worse *coping* ($t=2.08$, $df=44$, $P=.04$) and less *support-in-stress* from colleagues ($t=2.33$, $df=44$, $P=.03$).

Compared to the 25% of men physicians who were satisfied with the time they spent working, the 67% of men who were not satisfied reported worse *somatic symptoms* ($t=2.61$, $df=99$, $P=.01$), worse *mental health* ($t=3.19$, $df=99$, $P=.002$), poorer *work satisfaction* ($t=3.30$, $df=99$, $P=.001$), heavier *workload* ($t=-3.09$, $df=99$, $P=.003$), less *healthy lifestyle* ($t=3.42$, $df=99$,

Table 4
Stepwise regression analysis: predictive variables of self-reported somatic symptoms

Step	Predictor variable	Standardized coefficients	t	P value	R ²
<i>Women</i>					
1	Support from work colleagues when stressed	-.531	-4.528	.00	.55
2	Workload	.444	3.792	.00	.70
<i>Men</i>					
1	Healthy lifestyle	-.260	-2.696	.008	.26
2	Mental health	-.219	-2.164	.003	.33
3	Support from work colleagues when stressed	-.203	-2.343	.02	.39
	Workload	.207	2.155	.03	.42

$P=.001$) and less *support-in-stress* from family and friends ($t=2.3$, $df=99$, $P=.02$).

Satisfaction with share of domestic work and childcare

Women who were not satisfied with their share of domestic work and childcare (21%) differed significantly from those who were satisfied in reporting worse *mental health* ($t=2.48$, $df=40$, $P=.02$) and lower *work satisfaction* ($t=3.19$, $df=40$, $P=.003$). These results need to be considered tentative due to the small number of women who were not satisfied.

Men who were not satisfied with their share of domestic work and childcare (25%) reported worse *somatic symptoms* ($t=2.34$, $df=99$, $P=.02$), worse *mental health* ($t=3.77$, $df=99$, $P=.001$), lower *work satisfaction* ($t=3.15$, $df=99$, $P=.002$) and heavier *workload* ($t=-2.32$, $df=99$, $P=.02$) than those who were satisfied.

Women with children exercised less often than women without children ($t=-2.00$, $df=48$, $P=.04$). However, these results have to be looked upon as tentative considering the small number of women without children.

Married/living together men did not differ from single/separated men concerning the above mentioned factors. However, men with children reported worse *somatic symptoms* ($\chi^2=24.7$, $df=15$, $P=.05$).

Abuse at work by factor scales

Gender-specific comparison by abuse status found that physicians of either gender who reported abuse at work also reported statistically worse *mental health* than their non-abused counterparts (males: $t=-2.45$, $df=108$, $P=.02$; females: $t=-2.11$, $df=49$, $P=.04$). In addition, men physicians who reported abuse at work also reported worse *somatic symptoms* ($t=-2.72$, $df=108$, $P=.01$), less *work satisfaction* ($t=-3.41$, $df=108$, $P=.00$) and heavier *workload* ($t=2.62$, $df=108$, $P=.01$).

Discussion

The study participants accurately reflected the demographic characteristics of active staff in the university hospital from which they were recruited with respect to age, sex, practice years and specialty. Although women participants were younger than their male colleagues, there was no significant difference in the mean length of time they had been in medical practice. However, more men than women physicians were married, had spouses that did not work full time, and had children that were a little older and entering adolescence.

It is obvious to physicians working in current hospital environments that patient acuity and expectations have escalated in the last decade, coinciding with fewer resources, shorter hospitalization and less tolerance for poor outcomes. These factors likely contribute to physicians feeling

stressed, time pressured and overworked. In this study, 68% of women and 73% of men physicians were not satisfied with the amount of time they spent in paid work. Not only did they feel they worked too many hours, 82% of women and 75% of men had trouble unwinding after work or finding time or energy to pursue other interests. Physicians of both sexes in this study who reported the least satisfaction with the amount of time they spent working reported significantly worse physical symptoms, mental health and workloads than their colleagues who were satisfied with their working hours.

In the regression analysis, 70% of the variance in physical symptoms in women physicians was explained by the two significant predictions of workload and support from work colleagues when stressed. For men physicians, healthy life style, mental health, support from work colleagues when stressed and workload were significant predictors of, and explained, 42 % of the variance. These differences between the sexes concerning the factors explaining physical symptoms suggest different strategies for women and men to reduce their levels of stress, thereby enabling physicians to provide care without prejudicing their own health.

Social support from colleagues, family and friends, is known to ameliorate stress by acting as a buffer between demands at work and perceived personal resources [4,23,24]. Other investigators have shown that social support at work has an impact on work-related musculoskeletal symptoms in the presence of high psychological stress and low decisional latitude [25]. Overall, women physicians reported more social support when stressed than men physicians. However, within gender analysis for satisfaction with time spent in paid work revealed that less satisfied men and women physicians reported different sources of deficits in support. Less satisfied women physicians reported less support from work colleagues when stressed while less satisfied men reported less support from family or friends when stressed. It is possible that support expectations may vary with availability of possible support resources. In this study, 90% of men were married, compared to 70% of women, and deficits in support from family or friends were reported by men who were less satisfied with time spent in paid work. Deficits in support from colleagues were reported by women who were less satisfied with time spent in work. Satisfaction with paid work did not vary by the full-time or part-time status of women physicians; all men physicians worked full-time.

Given the traditional role of women in assuming more domestic work and childcare than men [4], one can probably assume women physicians undertook more work in the home but a similar majority (over 75%) of both women and men reported satisfaction with their share of domestic work and childcare. However, men and women who were not satisfied had lower mental health and less work satisfaction than their satisfied counterparts. In addition, men who were dissatisfied with their share of domestic work and childcare

reported a heavier workload and more physical symptoms than satisfied men. Women with children were less likely to participate in formal exercise activity (which might have helped ameliorate their stress) than their childless women colleagues. Juggling between professional work and domestic responsibilities is especially taxing since it may demand exceeding personal capacity with fewer buffering resources [26,27].

Verbal and physical abuse, harassment and intimidation of physicians at work has only recently received attention. Although more women than men physicians in this study reported these events, both sexes reported significantly worse mental health than nonabused colleagues. Abused men physicians also reported worse physical symptoms, heavier workload and less work satisfaction than non-abused men colleagues. A similar association was not found for women physicians probably due to the skewness of data as two-thirds of them reported being abused. Continued efforts are essential to reducing abusive language and behaviour by supervisors, hospital staff, and patients and their families. It may be helpful to have publicly posted hospital notices and policies about the unacceptability of abusive language and behaviour. Physicians and other staff should be trained in strategies to reduce, manage, report and cope with abuse.

Although about 80% of both sexes rated their knowledge and ability higher than that of physicians of the same age and specialty, women rated their knowledge and ability lower than men. Although similar results have been reported in other studies [28], this need not mean that women physicians are less knowledgeable or able as this self-rating may reflect lower self esteem, higher standards or social conditioning. Women in general are taught and expected to be more modest and deferential than men.

Comparing women in different specialty groups showed differences concerning physical symptoms, work satisfaction, work load and support when stressed. Women in *medicine* specialties felt most comfortable. Although the number of women in *surgical specialties* was relatively small, they experienced more physical symptoms, less work satisfaction and less support. Traditionally this group is more male-dominated [10] and women surgeons may still have less power and confront more gender-related problems than other specialties. However, men in *surgical specialties* were also more likely than any other specialty group to report that their work was more psychologically demanding, possibly reflecting pressures inherent in this specialty (results not shown). In one study of women in different work positions, 35% of the variance of self-reported health was explained by gender-related workplace issues [29] suggesting that sexual division of labor is maintained and reproduced, through the normative expectations of colleagues and patients [30]. Other Canadian investigators have recommended a specific and intense effort to identify and address discrimination problems for women surgeons [31].

Limitations of our study include a relatively low response rate, and recruitment of academic physicians solely from Canada's largest university hospital complex. As the responders matched the hospital's active staff for demographics and specialty, this was somewhat reassuring; however a responder bias remains possible. The generalizability of our finding to other physician populations requires further study. It is acknowledged that definite causality cannot be established because of the cross-sectional design. It is possible that negative emotions associated with somatic symptoms may cause physicians to perceive or report higher workload and lower support from colleagues when stressed. In addition, the interpretation of the multivariate regression analysis to predict somatic symptoms must be considered in light of the predictors entered in the regression equation, which did not constitute an exhaustive list.

One of the most striking findings was, that despite gender differences in some predictors of somatic symptoms, the majority of physicians of both sexes reported an excessive workload. As one reason given for nonresponse was that they didn't find time to complete the questionnaire, it seems urgent to develop systematic interventions to reduce physician workload and increase their supports!

Acknowledgments

This study was supported by grants from The Swedish Institute, Sweden and the University Health Network, Women's Health Program, Canada.

References

- [1] Baird N, Fish JS, Dworkind M, Steinert Y. Physician, heal thyself. Developing a hospital-based physician well-being committee. *Can Fam Physician* 1995;41:259–63.
- [2] Wallin L, Wright I. Psychosocial aspects of the work environment: a group approach. *J Occup Med* 1986;28:384–93.
- [3] Wright I, Bengtsson C, Frankenberg K. Aspects of psychological work environment and health among male and female white-collar and blue-collar workers in a big Swedish industry. Psychosocial aspects of the work environment: a group approach. *J Organ Behav* 1994;15:83.
- [4] Frankenhaeuser M. Stress and gender. *Eur Rev* 1996;4:313–27.
- [5] Aasland OG, Olff M, Falkum E, Schweder T, Ursin H. Health complaints and job stress in Norwegian physicians: the use of an overlapping questionnaire design. *Soc Sci Med* 1997;45:1615–29.
- [6] Frank E, Dingle AD. Self-reported depression and suicide attempts among US women physicians. *Am J Psychiatry* 1999;156:1887–94.
- [7] Hawton K, Clements A, Sakarovitch C, Simkin S, Deeks JJ. Suicide in doctors: a study of risk according to gender, seniority and specialty in medical vacationers in England and Wales. *J Epidemiol Community Health* 2001;55:296–330.
- [8] Lindeman S, Laara E, Hakko H, Lonnqvist J. A systematic review of gender-specific suicide mortality in medical doctors. *Br J Psychiatry* 1996;168:274–9.
- [9] Pilowski L, Sullivan O'G. Mental illness in doctors. *BMJ* 1989;298:269–70.

- [10] Gross EB. Gender differences in physician stress: why the discrepant findings? *Women Health* 1997;26:1–14.
- [11] Vaillant GE, Sobowale NC, McArthur C. Some psychologic vulnerabilities of physicians. *N Engl J Med* 1972;287:372–5.
- [12] Arnetz BB. Physicians' view of their work environment and organisation. *Psychother Psychosom* 1997;66:155–62.
- [13] Breslau N, Novack AH, Wolf G. Work settings and job satisfaction: a study of primary care physicians and paramedical personnel. *Med Care* 1978;16:850–62.
- [14] Cartwright LK. Occupation stress in women physicians. In: Payne R, Firth-Cozens J, editors. *Stress in health professionals*. New York: Wiley, 1987. pp. 71–87.
- [15] Howie JG, Hopton JL, Heaney DJ, Porter AM. Attitudes to medical care, the organization of work, and stress among general practitioners. *Br J Gen Pract* 1992;42:181–5.
- [16] Murray JP. Physician satisfaction with capitation patients in an academic family medicine clinic. *J Fam Pract* 1988;27:108–13.
- [17] Weisman CS, Nathanson CA. Professional satisfaction and client outcomes. A comparative organizational analysis. *Med Care* 1985;23:1179–92.
- [18] Frank E, McMurray JE, Linzer M, Elon L. Career satisfaction of US women physicians: results from the Women Physicians' Health Study. Society of General Internal Medicine Career Satisfaction Study Group. *Arch Intern Med* 1999;159:1417–26.
- [19] Stewart DE, Ahmad F, Cheung AM, Bergman B, Dell DL. Women physicians and stress. *J Women's Health Gend-Based Med* 2000;9:185–90.
- [20] Bergman B, Hallberg LR. Women in a male-dominated industry: a qualitative study of gender-related problems. *J Gend Cult Health* 1997;2:45–63.
- [21] Tabachnick BG, Fidell LS. Principal components and factor analysis. In: Tabachnick BG, Fidell LS, editors. *Using multivariate statistics*. 4th ed. Boston, MA: Allyn and Bacon, 2001. pp. 582–652.
- [22] McDowell I, Newell C. Psychological well-being. In: McDowell I, Newell C, editors. *Measuring health: a guide to rating scales and questionnaires*. Oxford: Oxford Univ. Press, 1996. pp. 177–237.
- [23] Repetti RL, Matthews KA. Employment and women's health: effects of paid employment on women's mental health and physical health. *Am Psychol* 1989;44:1394–401.
- [24] Orth-Gomér K, Chesney M, Wenger NK. *Women, stress and heart disease*. Mahwah, NJ: Lawrence Erlbaum Associates, 1998.
- [25] Karasek RA, Theorell T. *Healthy work: stress, productivity and the reconstruction of working life*. New York: Basic Books, 1990.
- [26] Frankenhaeuser M, Lundberg U, Fredrikson M, Melin B, Tuomisto M, Myrsten A-L, Hedman M, Bergman-Losman B, Wallin L. Stress on and off the job as related to sex and occupational status in white-collar workers. *J Organ Behav* 1989;10: 321–46.
- [27] Lundberg U, Mardberg B, Frankenhaeuser M. The total workload of male and female white collar workers as related to age, occupational level, and number of children. *Scand J Psychol* 1994;35: 315–27.
- [28] Collins KS, Schoen CA, Khoransanizadeh F. Practice satisfaction and experiences of women physicians in an era of managed care. *J Am Med Women's Assoc* 1997;52:52–6.
- [29] Bergman B, Wright I. Self-reported health in relation to medical health and gender-specific problems in women. *J Occup Environ Med* 2000; 42:311–7.
- [30] Brooks F. Women in general practice: responding to the sexual division of labour. *Soc Sci Med* 1998;47:181–93.
- [31] Ferris LE, Mackinnon SE, Mizgala CL, McNeill I. Do Canadian female surgeons feel discriminated against as women? *CMAJ* 1996;154: 21–7.