Marital-Role Quality and Stress-Related Psychobiological Indicators

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ABSTRACT

Background: The quality of one's marital relationship is gaining recognition as a potential stressor associated with negative health outcomes. Purpose: In this study, we estimated the relationship between marital-role quality and three psychobiological stress indicators (self-reported stress, cortisol levels, and ambulatory blood pressure). Method: Participants were 105 middle-age adults (67 men, 38 women) who had previously taken part in the Whitehall psychobiology study. Ambulatory monitoring and saliva sampling were carried out over a working day, and marital relationships were assessed with the Marital/Partner Role Quality scales. Results: We found that marital-role concerns (but not marital-role rewards) were related to all three psychobiological stress indicators; results did not vary by gender. Specifically, participants with more marital concerns reported greater stress throughout the day (p = .014), showed an attenuated cortisol increase following waking (p = .042) and a flatter cortisol slope over the day (p = .010), and had elevated ambulatory diastolic blood pressure over the middle of the workday (p = .004), with a similar trend in systolic pressure (p = .069). Conclusions: The results suggest that in addition to the carryover of work stress into domestic life that has been evident for many years, there are also influences of domestic strain on biological function over the working day and evening. Previous research suggests that a possible mechanism linking troubled marriages to health outcomes is depressed immune functioning. This study suggests a second mechanism—poorer stress-related biological response.


INTRODUCTION

The mainstream job stress/illness relationship literature builds largely on the Job-Strain Model (1) and thus focuses primarily on workplace factors, especially job demands and job control, as predictors (2,3) of stress-related biological responses, over the workday and over longer periods of time (4,5). This set of workplace predictors has been expanded by some researchers to include social support on the job (6–8) and alternative models of work stress such as effort-reward imbalance (9). Another trend is the inclusion of such objective nonworkplace factors as socioeconomic status (5,10) and marital status (11). Only recently have researchers begun to consider the predictive power of subjective indicators such as the quality of employees' relationship with their spouses/partners. Poor marital-role quality has been related, cross-sectionally and longitudinally, to psychological distress (12,13), depressed immunologic response (11), and increased systolic blood pressure and heart rate response (14). In this analysis, we estimate the relationship between marital-role quality and three psychobiological stress indicators (self-reported stress, cortisol levels, and ambulatory blood pressure) in a sample of 105 participants (67 men, 38 women). These individuals represent a subgroup of men and women who had previously taken part in the Whitehall psychobiology study (5).

Background

Several studies suggest that with stress-related mental health indicators as the outcomes, subjective indicators of social role experience such as role quality (i.e., positive and negative aspects of roles) are more powerful predictors than objective indicators such as role occupancy (e.g., marital status) (15,16). Previous studies suggest that with physical health outcomes, role concerns alone are a more powerful predictor than are rewards alone or overall role quality (usually operationalized as rewards minus concerns) (18).

Several theorists argue that the quality of the spouse/partner relationship is more central to the psychological well-being of women than of men (19–22). Thus, women should be more reactive (in terms of psychobiological stress indicators) to marital concerns than men. Others argue that marital quality is equally important to the health and well-being of men and women (23,24); therefore, there should be no moderating effect of gender on the relationship between marital concerns and stress indicators. In a major review of the linkages between marital functioning and both objective physical health and self-reported health, Kiecolt-Glaser and Newton (14) found that some studies suggested sex differences in links between marital functioning and health status, whereas others did not.
Psychobiological Indicators

This study was based on the notion that psychobiological stress indicators monitored over the working day and evening might provide objective evidence of the impact of marital quality on physical functioning and potentially mediate links with health risk. Three indicators were included in this investigation. The first was subjective stress, obtained from ratings obtained every 20 min throughout the day and evening. Momentary experience sampling, in which participants are prompted to record their current feelings on several occasions over 1 or more days, is less prone to biases such as memory distortion and recall bias than are single global evaluations of subjective state (25).

Second, we assessed two aspects of the daily salivary cortisol profile: cortisol increase following waking and slope of cortisol reduction over the day. Many studies have indicated that cortisol increases following waking are greater in people experiencing work stress (26) and depressive symptoms (27,28). By contrast, reduced cortisol increases following waking have been associated with burnout (28) and chronic fatigue (29). "Flatter" cortisol slopes over the day have been associated with earlier mortality in women with breast cancer (30) and poor marital relationships in young mothers (31).

Third, ambulatory blood pressure was monitored over the working day and evening. Heightened ambulatory blood pressure has been repeatedly associated with stressful work characteristics (8,32). One study of full-time schoolteachers found that systolic and diastolic pressure showed a greater after-work decrease in married than single teachers, with the largest reductions in those with children at home (33). The after-work drops in blood pressure were greatest in teachers reporting high social support. Baker and colleagues (34) demonstrated that lower marital cohesion was associated with greater ambulatory diastolic blood pressure in a sample of unmedicated hypertensive patients.

In this study, we estimate the relationship between marital-role quality and three psychobiological stress indicators in a sample of 105 participants (67 men, 38 women). Specifically, we test the following three hypotheses, estimating the moderating effect of gender on each:

1. Marital-role quality will be related to subjective stress ratings over a working day and evening.
2. Marital-role quality will be related to both cortisol levels following waking and to the slope of cortisol reduction over a working day and evening.
3. Marital-role quality will be related to ambulatory blood pressure over a working day and evening.

METHOD

The participants in this investigation were 105 men and women who had taken part in the Whitehall psychobiology study 3 years earlier (5). All were White, in good health, 52 to 62 years old, and day workers based in the London area. They were married or in equivalent stable relationships at the time of testing. Because the previous study was focused on socioeconomic status and health, the sample had been recruited to ensure representation of people from higher, intermediate, and lower grades of employment groups.

Ambulatory Monitoring Procedures

Ambulatory blood pressure monitoring was carried out using the SpaceLabs 90217 monitor (Redmond, WA), an instrument that satisfies international instrumentation protocols (35). The monitor was fitted between 7:30 and 9:30 a.m. on a working day at the participant's place of work or in the laboratory at University College London. Participants wore the monitors for the remainder of the day and evening, and blood pressure was measured at 20-min intervals. Each reading was accompanied by an entry in a diary in which the participant recorded location, activity over the past 5 min and current stress on a 5-point scale from 1 (low) to 5 (high).

Saliva samples were collected using cotton dental rolls (Salivettes; Surstedt, Leicester, UK) held in the mouth until saturated. Samples were taken on the same day as ambulatory blood pressure monitoring on waking up, 30 min later, and then at three later time points (10:00–10:30 a.m., 4:00–4:30 p.m., 8:00–8:30 p.m.). Tubes were returned to the investigators personally or by mail, and cortisol was analyzed using a time-resolved fluorescence immunoassay as described by Dressendorfer et al. (36). Intra- and interassay variability of the assay were less than 10% and 12%, respectively. Cortisol in saliva remains stable for several weeks at room temperature, so degradation during the period of collection and delivery is unlikely (37).

Psychological Measures

Marital-role quality was assessed using the short form (38) of the Marital/Partner Role Quality scales (39). Eight items addressed rewarding parts of relationships (e.g., "Having a partner who is a good listener"), and 7 assess marital-role concerns (e.g., "Your partner being critical of you"). Participants were asked to rate their own relationship on these features, using 4-point scales from 1 (not at all) to 4 (extremely). Scores were averaged so could range from 1 to 4 on both scales, with higher levels indicating greater marital/partner rewards and greater concerns, respectively. The internal consistency (Cronbach's α) scores for the two scales were .91 for rewards and .89 for concerns in a previous sample of 98 full-time and reduced-hours married women physicians in dual-earner families with at least one child younger than 14 (40) and were .91 for rewards and .94 for concerns in this study.

Negative affect was measured using the negative affect scale from the Positive Affect and Negative Affect Scales (41). The 10 negative feelings (e.g., distressed, irritable) were rated on 5-point scales from 1 (very slightly or not at all) to 5 (extremely), and scores were summed so that higher values indicate more negative affect (Cronbach's α = .89).

Body mass index was computed from weight and height measurements. Participants were classified as smokers or nonsmokers on the basis of self-report. Participants were questioned about living arrangements and were subsequently grouped into four categories: living alone, living with partner only, living with partner and children younger than 18, and living with part-
ner and adult children. Personal income was grouped into four categories: less than £25,000; £25,000 to £34,999; £35,000 to £49,999; and more than £50,000 (at the time of assessment, £1 was approximately equivalent to U.S. $1.65).

Procedure

Participants were approached individually at the time of their attendance at a screening session for the full Whitehall II cohort. They were reminded about their previous involvement in the psychobiology substudy (which had taken place 3 years earlier) and were asked if they would be willing to carry out a further day of blood pressure and saliva sampling. Appointments were scheduled with individuals who agreed to take part, and they were given the marital-role and other questionnaires to complete. There were 199 people who took part in the Whitehall psychobiology study and were asked to participate. Of these, 21 declined to repeat ambulatory monitoring because of other medical problems such as cancer or because they had previously found it too obtrusive or uncomfortable. Eleven more agreed to participate, then withdrew or could not be scheduled before the end of the study, so 167 completed the study (84% response rate). Of these, 62 were either not married or in an equivalent stable relationship at the time of testing, or were not in paid employment, so analyses were conducted on 105 individuals.

Data Reduction and Analysis

Because of their previously established linkage to the psychobiological stress indicators in this study, we include as covariates age, grade of employment, smoking status, and negative affect. For blood pressure analyses, body mass index was included as an additional covariate, and for cortisol analyses, time of waking was included as an additional covariate. Age has a pronounced association both with cortisol and blood pressure. Grade of employment is an indicator of socioeconomic position and has been related both to ambulatory blood pressure (5) and to cortisol increases following waking (42). Smoking is associated both with ambulatory blood pressure (43) and with cortisol levels (44). Negative affect is a stable, mood-dispositional trait to view the world negatively that is thought to account for spuriously high correlations between self-report measures of predictor and outcome variables, especially in cross-sectional analyses (45–48) and therefore needs to be controlled. Body mass index was included in the blood pressure analyses because of well-established associations with blood pressure levels and hypertension, and time of waking in the morning has been linked with subsequent cortisol responses in some investigations (49).

The primary analyses in this study involved a repeated measures analysis of variance (ANOVA) on biological measures, with marital-role quality scales and gender as between-subject factors. For this purpose, the marital-role rewards and marital-role concerns scales were both divided into high and low groups by median split. Preliminary analyses indicated that the marital-role reward scale was not related to physiological activity. The results therefore focus on the marital-role concerns scale, although effects for marital-role rewards are presented briefly.

The ambulatory blood pressure recordings of three individuals were lost before downloading from monitors or were terminated prematurely. Individual readings were reviewed, and outliers were excluded using the criteria described by Berardi, Chau, Chanudet, Vilar, and Larroque (50). The number of eligible blood pressure readings averaged 33.9 ± 4.7. Because of missing data, we were not able to analyze each time point separately or average blood pressure into hourly means. Instead, we divided the day into four periods as was done in previous analyses of data from the earlier psychobiology study (5): morning (7:50 a.m.–10:50 a.m.), midday (11:00 a.m.–2:00 p.m.), afternoon (2:00 p.m.–5:00 p.m.), and evening (5:00 p.m.–10:30 p.m.). Blood pressure analyses were carried out on 98 participants with data in all four time periods. A repeated measures ANOVA was carried out with marital-role concerns (high/low) and gender as between-subject factors and time of day as the within-subject factor. Subsequently, an analysis of covariance was used, adjusting for factors known to influence blood pressure, including age, grade of employment, body mass index, and smoking. Negative affect scores were included as additional covariates in all analyses to control for negative affectivity biases. Negative affect scores were positively associated with marital-role concerns so were included as additional covariates in all analyses to control for negative affectivity biases.

The same classification into four periods was used in the analysis of stress ratings over the day. Because stress ratings were skewed toward lower values, we analyzed the proportion of occasions within each period of the day when ratings of 3 to 5 were given on the stress scale.

Cortisol data were analyzed using a repeated measures ANOVA, with sample (waking, waking + 30 min, 10:00–10:30, 4:00–4:30, 8:00–8:30) as the within-subject factor. This was followed by separate analysis of the cortisol response to waking and the slope of the decline in cortisol over the day. The cortisol response to waking was assessed by calculating the change between waking and 30 min later. Recent evidence indicates that cortisol responses to waking are incorrectly measured when participants fail to obtain samples at the correct times (51). Delay between waking and taking the first sample is particularly problematic, because the awakening response may already have begun prior to assessment of the ‘waking’ value. It has previously been shown that individuals who report delaying more than 10 min in taking the waking sample produced significantly smaller increases following waking than those who were prompt with the waking sampling (42). In this analysis, we therefore excluded participants from analyses if their diaries indicated a delay of more than 10 min. Ninety-nine participants provided saliva samples both on waking and 30 min later from which cortisol could be analyzed, but 17 reported delays of more than 10 min. The analyses of cortisol awakening responses were therefore carried out with 82 participants, with marital-role concerns and gender as between-subject factors, and age, grade of employment, smoking status, time of waking, and negative affect as covariates. The cortisol slope or decline over the day was computed as the change between the waking and 8:00–8:30 p.m. values and were analyzed in the same fashion as the response to
waking. Ninety-one individuals were included in these analyses. Data are presented as means plus or minus standard deviation.

RESULTS

The characteristics of the participants in this study are summarized in Table 1. There was no gender difference in age, but men were more likely to be living in a household that included children than were women, \( \chi^2(3, N = 105) = 10.7, p = .013 \). The sample was predominantly recruited from high and intermediate grades of employment, but the distribution did not differ by gender. Participants worked an average of 8 hr 15 min per day, and more men than women had partners in paid employment, \( \chi^2(1, N = 105) = 4.66, p = .031 \). The personal incomes of men tended to be higher than those of women, \( \chi^2(1, N = 105) = 5.15, p = .023 \). Men and women did not differ significantly on measures of marital-role quality and negative affect, or in smoking and body mass index. Scores on the marital-role concerns scale were generally low, whereas those for marital-role rewards were rated higher, suggesting a generally favorable perception of marriages. Nevertheless, marital-role concern scores spanned the complete possible range from maximum to minimum scores, with substantial variability indicating that individual differences could reasonably be analyzed. Men and women did not differ in the range or variability of marital-role concern scores. The proportion of men in the high marital-role concerns category was slightly greater than that of women (53.7% vs. 44.7%), but this difference was not significant (\( p = .41 \)). The marital-role concerns and rewards scales were negatively correlated (\( r = -.28, p = .004 \)).

Marital-Role Concerns and Stress Over the Day

The analysis of subjective stress ratings over the day revealed main effects for gender, \( F(1, 97) = 5.64, p = .020 \); marital-role concerns, \( F(1, 97) = 8.57, p = .004 \); and period of the day, \( F(3, 291) = 7.37, p < .001 \), but no interactions between these factors. Women experienced stress more frequently over the day than did men (20.4% vs. 9.5% of ratings were high stress), whereas participants with greater marital-role concerns were more stressed than those with lower concerns (21.4% vs. 8.5% of ratings were high stress). The variation of stress over the day is shown in Figure 1 in relation to marital-role concerns. All values were adjusted for age, gender, grade of employment, body mass index, smoking, and negative affect. It can be seen that stress levels were similar in the two groups in the morning but declined over the day in the low marital-role concern group. By contrast, stress remained elevated in the high marital-role concern group throughout the work period. In both groups, stress levels were lower in the evening compared with the day. The main effect of marital-role rewards on stress ratings was not significant, \( F(1, 97) = 3.51, p = .064 \).

Cortisol and Marital-Role Concerns

The repeated measures analysis of cortisol showed a significant marital-role concerns by sample interaction, \( F(4, 328) = 3.44, p = .035 \), but no such effect for marital-role rewards, \( F(4, 328) = .30 \). Participants reported waking up at 6:03 a.m. on average on the cortisol sampling day, with times varying between 4:00 a.m. and 7:45 a.m. Cortisol averaged 15.5 ± 8.1 nmol/l on waking, rising to 30.2 ± 16.7 nmol/l at 30 min. Waking levels did not vary with marital-role concerns or gender, but there was a significant difference in the cortisol response to waking that is illustrated in Figure 2, \( F(1, 73) = 4.28, p = .042 \). The cortisol in-

TABLE 1

<table>
<thead>
<tr>
<th>Description of the Sample</th>
<th>Mena</th>
<th>Womenb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>55.3 ± 2.4</td>
<td>54.7 ± 2.7</td>
</tr>
<tr>
<td>Living arrangements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living alone</td>
<td>1 (1.5%)</td>
<td>2 (5.3%)</td>
</tr>
<tr>
<td>Partner only</td>
<td>21 (31.8%)</td>
<td>23 (60.5%)</td>
</tr>
<tr>
<td>Partner and children &lt; 18 years</td>
<td>24 (36.4%)</td>
<td>6 (15.8%)</td>
</tr>
<tr>
<td>Partner and adult children</td>
<td>20 (30.3%)</td>
<td>7 (18.4%)</td>
</tr>
<tr>
<td>Grade of employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher</td>
<td>29 (49.2%)</td>
<td>12 (32.4%)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>23 (39.0%)</td>
<td>17 (45.9%)</td>
</tr>
<tr>
<td>Lower</td>
<td>7 (11.9%)</td>
<td>8 (21.6%)</td>
</tr>
<tr>
<td>Hours of work per day</td>
<td>8.18 ± 1.0</td>
<td>8.10 ± 1.5</td>
</tr>
<tr>
<td>Partner working?</td>
<td>47 (85.5%)</td>
<td>21 (65.6%)</td>
</tr>
<tr>
<td>Personal income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;£25,000 ($44,000)</td>
<td>7 (12.1%)</td>
<td>10 (27.0%)</td>
</tr>
<tr>
<td>£25,000–35,000 ($44,000–63,000)</td>
<td>13 (22.4%)</td>
<td>12 (32.4%)</td>
</tr>
<tr>
<td>£35,000–50,000 ($63,000–90,000)</td>
<td>26 (44.8%)</td>
<td>10 (27.0%)</td>
</tr>
<tr>
<td>&gt;£50,000 ($90,000)</td>
<td>12 (20.7%)</td>
<td>5 (13.5%)</td>
</tr>
<tr>
<td>Marital-role quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concerns</td>
<td>1.90 ± 0.9</td>
<td>1.62 ± 0.8</td>
</tr>
<tr>
<td>Rewards</td>
<td>3.13 ± 0.7</td>
<td>3.24 ± 0.6</td>
</tr>
<tr>
<td>Negative affect</td>
<td>16.0 ± 5.3</td>
<td>15.6 ± 5.5</td>
</tr>
<tr>
<td>Smoking (%)</td>
<td>6 (63.5%)</td>
<td>1 (2.6%)</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>25.4 ± 3.3</td>
<td>25.8 ± 4.7</td>
</tr>
</tbody>
</table>

Note. Values are means ± standard deviation and number (%).

*a = 67, *b = 38.
crease following waking was smaller in the high than low marital-role concern group, after controlling for age, gender, grade of employment, smoking, time of waking, and negative affect. In addition, the cortisol slope across the day was significantly flatter among individuals with high marital-role concerns, after controlling for these same variables, $F(1, 82) = 5.23, p = .010$. The mean change between the morning peak and evening was $22.2 \pm 12.8$ nmol/l in the high marital-role concern and $30.3 \pm 17.1$ nmol/l in the low marital-role concern groups, adjusting for covariates. It is evident that the steeper slope in the low marital-role concern group was primarily due to a higher morning peak rather than a lower value in the evening. Separate data points were compared using Tukey’s least significant difference test, which confirmed that there was a significant effect from marital-role concerns for the morning peak but not the evening level. Across the day (excluding the morning peak), cortisol averaged $6.17 \pm 2.8$ nmol/l, but this value did not vary by gender or marital-role concerns. Similarly, there was no difference between high and low marital-role concern groups in cortisol sampled at 10:00–10:30 a.m. ($Ms = 9.33 \pm 4.3$ and $9.45 \pm 6.2$ nmol/l) or at 4:00–4:30 p.m. ($Ms = 5.00 \pm 3.4$ and $6.85 \pm 5.7$ nmol/l, respectively). These results indicate that high marital-role concerns were associated with a reduced cortisol response to waking and a flatter diurnal profile of cortisol output over the day.

**Ambulatory Blood Pressure and Marital-Role Concerns**

The analysis of diastolic pressure showed a significant marital-role concern group by time of day interaction, $F(3, 282) = 2.86, p = .044$. There was no association with marital-role rewards, $F(3, 282) = 1.31 $. The pattern of results is summarized in Figure 3. Post hoc comparisons indicated that the difference between marital-role concern groups was greatest over the midday period (12:00–2:00 p.m.), $p = .004$. Diastolic pressure was 4.8 mmHg higher in the middle of the day in participants reporting high levels of marital-role concerns, after adjusting for age, gender, grade of employment, body mass index, smoking, and negative affect. A similar though less pronounced pattern was present for systolic pressure, where the Marital-Role Concern

![FIGURE 2](image)

**FIGURE 2** Mean salivary cortisol on waking, 30 min later, and at 8:00–8:30 p.m. in the high marital-role concern (solid line, $n = 43$) and low marital-role concern (dotted line, $n = 41$) groups. Values are adjusted for age, gender, grade of employment, smoking, time of waking, and negative affect. Error bars are SEM.

![FIGURE 3](image)

**FIGURE 3** Mean diastolic blood pressure in the four periods of the day in the high marital-role concern (solid line, $n = 49$) and low marital-role concern (dotted line, $n = 51$) groups. Values are adjusted for age, gender, grade of employment, body mass index, smoking, and negative affect. Error bars are SEM.

Group × Time interaction approached significance, $F(1, 94) = 3.38, p = .069$. Systolic pressures over the midday period averaged 127.1 and 122.8 mmHg in the high and low marital-role concern groups, respectively, after adjusting for covariates. This difference was larger than those for the morning (124.9 vs. 124.4 mmHg), afternoon (124.0 vs. 122.7 mmHg), or evening (121.1 vs. 120.6 mmHg).

**DISCUSSION**

In this study of 105 employed men and women who had previously been engaged in Whitehall studies, marital concerns were uniformly related to the three psychobiological stress indicators in this study, whereas marital rewards were consistently unrelated to the same indicators. In addition, these results did not vary by gender.

The analyses of subjective stress indicate that men and women with higher marital-role concerns reported greater stress throughout the working day and evening. This difference was not due to negative affectivity reporting bias among participants with greater marital-role concerns, because this factor was con-
trolled in the analyses. It is interesting that stress levels declined after work in this group, even though they mostly returned home to their partners in the evening. The finding suggests that poor quality marital/partner relationships may result in persistent distress that could in turn contribute to the elevated levels of depression and anxiety that have previously been observed in such individuals (13,17).

The cortisol results indicated that increases following waking were attenuated in participants with poor marital quality, whereas the slope across the day was flatter. It is evident from Figure 2 that the cortisol slope effect was secondary to the difference in morning peak cortisol. When the cortisol slope was defined as the difference between waking and evening values, no association with marital-role quality could be identified. The results are therefore only partly consistent with those reported by Adam and Gunnar (31), who showed an association between poor marital relationships and a flattened cortisol slope that was not due solely to a difference in morning peak cortisol levels. The attenuated cortisol increase following waking is interesting in the context of other findings concerning this response. Both an elevation and diminution in the cortisol increase following waking have been associated with stressful conditions (26–29). One possibility is that cortisol increases following waking might be enhanced when individuals are actively striving to cope with difficulties but reduced in conditions of exhaustion and withdrawal. Thus burnout and chronic fatigue have been associated with reduced responses (28,29). Poor marital-role quality among people in middle age in long-term relationships might constitute another example of chronic stress leading to resignation and withdrawal.

We observed elevated ambulatory diastolic blood pressure over the middle of the working day in men and women with greater marital-role concerns, with a similar trend in systolic pressure. These differences in blood pressure are unlikely to be clinically significant in themselves. But they may indicate that poor marital relationships relate to disruption of cardiovascular responses to the challenges of everyday life. It is interesting that the blood pressure differences were not evident in the evening when participants had returned home. These effects have not been described in normotensives before. Baker et al. (34) found an inverse relationship between marital cohesion and blood pressure, but their study was carried out in a hypertensive population, and the analysis was based on nighttime levels. In a previous study, blood pressure reductions in the evening were greater in working people who reported high levels of social support (33), but the present results were related specifically to marital/partner relationships and not to social support in general. There are other acute influences on blood pressure such as social interaction and physical activity that were not included in these analyses, and these may have obscured the impact of underlying marital-role problems (52). These analyses do suggest that in addition to the carryover of work stress into domestic life that has been evident for many years (4), there are also influences of domestic strain on biological function over the working day.

The mechanisms underlying this carryover of relationship difficulties into working life cannot be confidently identified in this study. The higher levels of perceived stress reported by participants with greater marital-role concerns might be due to greater exposure to hassles at work (perhaps because of less than optimal performance of duties) or to differences in appraisal of the ups and downs of the ordinary working day. Because we controlled for negative affectivity, the pattern is unlikely to be due to reporting biases. It is possible that the subjective stress experienced over the day was associated with chronic mild sympathetic nervous system activation and disruption of hypothalamic-pituitary-adrenocortical axis function, resulting in the patterns of moderately elevated diastolic pressure and disturbances of cortisol output that we observed.

These findings add to the growing literature suggesting that subjective indicators of workplace role quality may be important predictors of stress-related physical health outcomes. Specifically, marital concerns appear to be one such subjective stressor (18,53,54). Previous research suggests that a possible mechanism linking troubled marriages to health outcomes is depressed immune function (11). This study suggests a second mechanism—poorer stress-related biological response.

It is also noteworthy that the relationship between marital concerns and the three psychobiological outcomes was not affected by gender. This finding challenges strongly held beliefs that marital quality is more central to the well-being of women than of men (19–22), although the finding should be regarded with some caution given that there were almost twice as many men as women in this sample. Given this caveat, one possible explanation for these somewhat unexpected findings lies in recent and pervasive changes in women’s roles. The prevalence of multiple roles (i.e., worker, wife, and mother) may have weakened the relative importance of marital quality to women’s well-being compared to men’s. The roles of wife and mother were once the primary adult roles available to women. Women today have a wider range of opportunities for the fulfillment of socially accepted goals—opportunities that may include but are no longer limited to having a happy and harmonious marriage (24, p. 471).

This study, like all studies, has limitations. One such limitation is that the sample was homogeneous with respect to age and race. All participants were White, and most were in their 50s. In addition, most were not living with dependent children. Future research is needed to determine whether these findings would generalize to a more demographically diverse sample. Ambulatory blood pressure monitoring stopped when participants went to bed, so we did not assess nighttime values. Although we took factors that have been associated with salivary cortisol and ambulatory blood pressure into account statistically, the possibility of residual confounding remains. The investigation was cross-sectional, so causal conclusions about the impact of marital factors cannot be drawn, and the sample size was not sufficient to investigate possible interactions between socioeconomic position and marital relationships. Nevertheless, the results add to the evidence that psychosocial factors influence biological function in everyday life, and suggest that poor marital relationships are related to neuroendocrine and cardiovascular activation as well as to adverse psychological outcomes.
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