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# An Examination of Factors Related to Work-to-family Conflict among Employed Men and Women in Japan

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**Abstract: An Examination of Factors Related to Work-to-family Conflict among Employed Men and Women in Japan: Michiko KATO, *et al*. Department of Health Sociology, Division of Health Sciences and Nursing, Graduate School of Medicine, The University of Tokyo—Objectives:** The aims of this study of Japanese married employees were: 1) to examine the relationship between work-related factors and work-to-family conflict (WFC); 2) to examine the relationship between WFC and fatigue and depression; and 3) to explore the role of family togetherness in a path between WFC and health. **Methods:** A cross-sectional survey was conducted among employees belonging to a labor union federation of the chemical industry. All analyses were conducted by subgroup according to gender and parental status. **Results:** Data was collected from 12 companies located in the Tokyo metropolitan area from September to October 2005. The data of 961 married employees were analyzed. The main findings by regression analyses were: 1) high job demands, low job control, and unsupportive work-family culture were associated with high level of WFC; 2) WFC was positively associated with fatigue and depression regardless of gender and parental status; and 3) maintaining family togetherness was slightly, yet significantly associated with fatigue in the father group. **Conclusions:** WFC was unfavorably related to fatigue and depression in both genders regardless of parental status, and plays a role linking unfavorable work situations and health. As possible work-related factors of WFC, the data indicate not only individual workplace variables but also an organizational support. Additionally, maintaining family togetherness appears to benefit fathers by preventing fatigue. Strategies for reduction of WFC are therefore necessary to promote health among married workers of both genders.
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**Key words:** Depression, Family togetherness, Fatigue, Work-related factors, Work-to-family conflict

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In the last decade the awareness has risen that imbalances between work and family can have adverse effects. These effects include unhealthy lifestyles and health disorders as a result of insufficient recovery and excessive fatigue. Although dual-career couples have recently come to outnumber single career couples in Japan[1)], a strong traditional embedded division of labor by gender still exists. Organizational initiatives being promoted to support the reconciliation of work and family have rapidly increased since the Next Generation Development Support Measures Law came into force in 2004. This law requires corporations to provide a work environment that takes the family roles of employees into consideration. However, the initiatives tend to help mothers with young children. Strategies targeting men or fathers are required, because imbalances between work and family are a concern for men as well as women.

Work-family conflict is one of the most studied concepts within work-family interface research in western countries and it has recently been introduced to Japan[2)]. However, Japanese work-family conflict research has just commenced and has mainly been conducted within the human resource management field[2, 3)], and has mostly examined working mothers[4)]. To promote employees' health, work-related factors of work-family conflict and the relationships between work-family conflict and health need to be clarified with the data from married employees of both genders.

### *Definition of work-family conflict*

In the role stress theory, work-family conflict is defined as incompatibility between simultaneous demands of work and family roles[5)]. Work-family conflict implies a

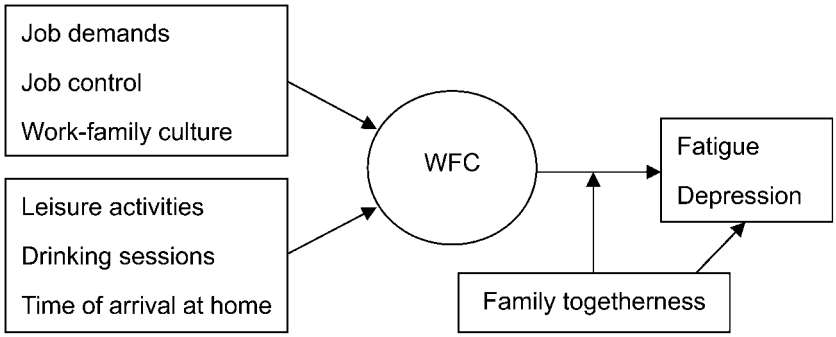


**Fig. 1.** Analytical framework of this study. WFC, work-to-family conflict.

perception that insufficient energy and/or time is available to cover both domains[6]. Thus the conflict occurs in two ways[7]: time-based when the time devoted to work makes it physically impossible to meet needs in the private domain, and energy-based or strain-based when strain at work psychologically spills over into the family.

In addition, work-family conflict is bi-directional and includes both work-to-family conflict (WFC) and family-to-work conflict[5]. Here we focus exclusively on WFC, because many studies have shown that WFC is more prevalent than family-to-work conflict[8, 9] and also has a substantial relationship to work-related factors[10].

In the effort-recovery model[11], health disorders can be explained as the result of chronic imbalance between work efforts and individual recovery opportunities, both internal recovery at work (e.g., break time during working times) and external recovery outside workplace. This process of lack of recovery opportunities seems fairly consistent with that of work-family conflict, and thus, work-family conflict may mediate between work-related factors and health[12, 13].

*Relationship between work-related factors and WFC*

Previous studies have indicated that high job demands[10, 14–16] and low job control[14, 16, 17] are positively associated with WFC, which are individual job characteristics in the job-demand-control model[18].

Work-family culture has been found to be negatively associated with WFC[19, 20]. This relationship exists beyond the actual use of or availability of formal means of support[21]. Work-family culture refers to employees' perceptions of organizational support for reconciling work and family[19] and is comparable to the organizational climate in the healthy organizational model[22]. In spite of the acknowledgment that the workplace environment is of importance in balancing work and family, work-family culture has been understudied in Japan.

As other work-related factors, activities on the way home may be related to WFC, because favorable recreational activities, such as social and physical activities, can offer recovery opportunities from work efforts[23, 24]. Many Japanese workers who live in large cities use the period between leaving work and arrival at home to engage in various activities[25]. We assumed these activities can be classified into two types: leisure activities (e.g., shopping), and drinking sessions with a high-duty profile. Not only being simply physically apart from the workplace but rather being psychologically disengaged from work-related issues is important for recovery[26]. Thus leisure activities may be negatively related to WFC, whereas drinking sessions may be positively related to WFC. Furthermore, a study on Japanese male workers in midlife[25] reported that these workers were increasingly fatigued and had difficulties in spending relaxing times with their families because their usual time of returning home was later than 21:00. This time may be a critical point at which strain at work transfers into family life.

*Relationship between WFC and health and family*

Several longitudinal studies have consistently reported health consequences of work-family conflict, including depression[26, 27] as a mental health indicator and fatigue[14, 15, 27] as a physical health indicator.

Although family-related variables generally have been used as outcomes of work-family conflict[28], to our knowledge, there have been no studies that have explicitly addressed the issue of what role family togetherness plays in the path between WFC and health. In this study, family togetherness refers to the behavior related to family responsibilities and mainly includes communication or the interaction with family members. In the view of the effort-recovery model[11], family togetherness is assumed to be a recovery opportunity; accordingly, family togetherness may be negatively associated with fatigue, and WFC may relate to fatigue differently depending on the degree of family togetherness.

*Objectives*

This cross-sectional study of married men and women had the following aims: 1) to examine the relationship

between work-related factors and WFC in terms of job demands, job control, work-family culture, behaviors on the way home, and the time of arrival at home; 2) to examine the relationship between WFC and fatigue and depression; and 3) to explore the function of family togetherness in the path between WFC and health (Figure 1 shows the analytical framework of this study.)

We conducted all analyses by 4 subgroups according to gender and parental status, because a meta-analysis[10] indicated that these demographic factors are strongly related to WFC.

## Methods

*Subjects and procedures*

Employees belonging to a labor union federation related to the chemical industry were the subjects of this study. All regular employees of oil, cement, medical, pharmaceutical and cosmetics companies are members of a labor union within the federation. These companies are mostly located in the Tokyo metropolitan area and have a relatively large number of employees, ranging from approximately 1,000 to 2,500. The distribution and collection of the self-administered questionnaires took place via labor union representatives. Participants were informed in writing about the purpose and methods of the study, and the protection of privacy. They were asked to respond only if they agreed to participate voluntarily in this study. Participants sealed completed questionnaires and put them in a designated collection box without any checks by union representatives. This study was conducted with the approval of the Ethical Review Board of the Graduate School of Medicine and Faculty of Medicine, The University of Tokyo.

*Development of instruments*

In this study, we devised three instruments including WFC, work-family culture and family togetherness, because no scales were available to apply to our sample at the time of data collection. To ensure face and content validity, when devising questionnaires, we followed several procedures[29]. First, we discussed the issues of the validity with three researchers who are familiar with family sociology. We also interviewed two managers (a man and a woman) of the labor union federation and asked them to review the proposed questionnaire for acceptability and comprehensiveness. Second, we conducted a pilot study on 40 married workers including three sociologists, and corrected and rephrased items on the questionnaires.

*Measures*

*WFC*: Because most of the earlier Japanese scales were prepared only for female employees, we devised 9 items to measure WFC by referring to Small & Riley's Work Spillover Scale[30]. We referred to their scale because it involves both time-based conflict and strain-based conflict based on the conceptual definition of work-family conflict[7]. Also the Small & Riley scale covers free time, items that work interferes with, that is crucial for promoting health[23, 24], whereas other scales we researched, involved only items of interference such as household chores and family duties. The Small & Riley scale (total 20 items) also contains items of general conflict, and when translated into Japanese, most items were long sentences. To minimize the burden on respondents, we shortened the number of items excluding those concerning general conflict. Three items were time-based (e.g., "Work takes quite a bit of time that I want to spend on resting and my hobbies."). As strain-based conflict, three items were psychology-based (e.g., "I can't get work out of my mind and can't relate properly to my family."), and three items were energy-based (e.g., "It is troublesome to do housework because I'm tired from work."). Response options were from 0='does not apply' to 3='does apply.' All 9 items were added together to yield a sum score. Cronbach's alphas were 0.91–0.93 (men) and 0.87–0.91 (women).

*Work-family culture*: Although we attempted to translate some English scales into Japanese, they contained several statements that did not seem to relate to the actualities found in Japanese corporations. We devised 10 items based on the dimensions of a family-supportive work environment that were reported by Thompson *et al*[19]. These dimensions were "supportive workplace for work-life balance," "organizational time expectations that may interfere with family roles" and "career consequences associated with using work-family benefit." Examples of the items are: "This is a workplace that understands and responds appropriately to personal or family matters," "To give one's job priority is expected in this workplace, even if making a sacrifice of family and private lives," and "In this workplace, employees who use available work-family programs are viewed as disadvantaging their careers". Answer options were 0='no' and 1='yes,' and all items were added together to yield a sum score, with a higher score indicating a workplace environment supportive of reconciling work and the family. Cronbach's alphas were 0.77–0.78 (men) and 0.71–0.77 (women).

*Family togetherness*: To assess family togetherness, 6 items were devised by referring to the "Checklist of How Wonderful Father Is"[31], which aimed to measure the extent to which fathers with young children perform their family role. We modified this scale for participants of the present study based on the results of the pilot study. An example item is: "I usually listen carefully to family members and we talk over family issues and important decisions to be made." Answer alternatives were from 0='does not apply' to 3='does apply,' with a higher score indicating a greater degree of family togetherness. Cronbach's alphas were 0.85–0.86 (men) and 0.82–0.88 (women).

*Job demands and job control*: These variables were measured by 3 items for job demands and 3 items for job control from the "Chart for Assessing Job Stress"[32]. Response options were from 1='does not apply' to 4='applies.' Cronbach's alphas were 0.70–0.71 (men) and 0.66–0.75 (women) for job demands, whereas they were 0.61–0.67 (men) and 0.60–0.62 (women) for job control.

*Frequency of drinking sessions*: Participants responded to the questions on the average number of times per month they went out drinking during the last 3 mo. Answer options were from 1='almost none' to 6='nearly every day,' which were coded into 3 categories 1='almost none,' 2='1–2 days per month' and 3='more than one day per week.'

*Leisure activities*: A list of 8 categories of activities were devised by referring to a study about typical activities of employees living in large cities[25], which was modified for the participants of this study. Participants were asked which of the activities they spent time on from the completion of their workday to their arrival at home during last 3 mo. This was a multiple choice question, with examples of possible answers such as "Meeting with friends" and "Going to the theater and sports." Then, a dichotomous variable was created: individuals who selected no activities were coded as 0='no,' whereas, those who reported one or more activities were coded as 1='yes.'

*Time of arrival at home*: Participants were asked a question about the average time of arrival at home on working days. Responses were coded into 3 categories: 1='before 19:00,' 2='19:00 to 21:00,' and 3='after 21:00.'

*Fatigue*: To assess fatigue, 18 items from the Cumulative Fatigue Symptoms Index (CFSI-18)[33] were used. Examples of items are: "My head feels heavy" and "I'm often distracted," (0='no' and 1='yes'). Cronbach's alphas were 0.86–0.87 (men) and 0.85–0.87 (women).

*Depression*: A Japanese translation of the short version of the Center for Epidemiologic Studies Depression (CES-D) scale[34, 35] was used. Answer alternatives were from 0='not at all' to 3='almost everyday.' Cronbach's alphas were 0.88–0.91 (men) and 0.89–0.90 (women).

*Control variables*: Age, presence of chronic disease, and type of job were included as control variables in the regression equations. Age was reported in years. The presence of chronic disease was recorded as 0='no' and 1='yes.' Occupational categories were coded into 2 types of job (0=blue collar and 1=white collar).

*Statistical analyses*

We conducted all analyses on 4 subgroups: fathers, mothers, men without children and women without children.

The characteristics of participants were compared between groups with children and those with no children by gender, using the $\chi^2$ test for categorized data and the t-test for continuous data. Main study variables were assessed using one-way analysis of variance (ANOVA) and group means were compared using Tukey's test for multiple comparisons.

To minimize problems of multicollinerarity, variables were selected by checking the correlation between study variables (see Appendix) as well as the variance inflation factor <10. Assuming WFC to be a dependent variable, multiple regression analysis was performed on job demands, job control and work-family culture, as well as on the leisure activities, drinking sessions and the time of arrival at home. Hierarchical regression analyses were conducted for fatigue and depression independently as dependent variables. For both analyses, the first block (Model 1) contained the control variables and the variables related to job and organizational characteristics and the second block (Model 2) included WFC. The third block (Model 3) of variables consisted of family togetherness. Subsequently, for fatigue as the dependent variable, the interaction term between WFC and family togetherness was additionally entered in the last block (Model 4). To minimize problems of multicollinerarity, the products of deviations of WFC and family togetherness were added as an interaction term[36].

If a significant interaction term was found, analyses of simple slopes of regression of uncentered fatigue on centered WFC at three values of centered family togetherness were conducted[37]. These three values were one standard deviation above and below the mean of centered family togetherness. Statistical significance was set at $p<0.05$ (two-sided). All analyses were conducted using SPSS 11.0 J or 16.0 J for Windows.

## Results

The data were collected from 12 companies or departments from September to October 2005. Of the 1,817 participants (valid response rate: 64.9%), we analyzed data provided by 961 married participants: 575 fathers; 163 men who had no children; 127 mothers; and 96 women who had no children. Table 1 shows the characteristics of the participants. Range of the mean age of the participants was 36.7–40.9 yr, and that of the participants with children was 48.4%, of whom 60.2% had children younger than 6 yr of age. Most participants were white-collar. Approximately 20% of men worked more than an average of 60 h per week. More than half of men took part in leisure activities and regularly took part in drinking sessions.

Table 2 shows the result of ANOVA and multiple comparisons between groups. Work-family culture was significantly higher for fathers than women, and WFC was likely to be higher for mothers. Family togetherness among the four subgroups was almost at the same level, but a significant difference between fathers and women without children was observed.

Table 3 shows the results of multiple regression

**Table 1.** Characteristics of participants

| Variable | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | Fathers (n=575) | Without children (n=163) | *p* | Mothers (n=127) | Without children (n=96) | *p* |
| Mean age (SD), yr | 39.5 (7.5) | 36.8 (8.5) | <0.001§ | 40.9 (6.3) | 36.7 (7.5) | <0.001§ |
| Age of youngest child | | | | | | |
| <6 yr | 60.2 | – | – | 48.4 | – | – |
| ≥6 yr | 39.8 | – | | 51.6 | – | |
| Spouse's employment | | | | | | |
| Not working | 70.4 | 39.6 | <0.001† | 1.2 | 1.7 | 0.640† |
| Working | 29.6 | 60.4 | | 98.8 | 98.3 | |
| Type of job | | | | | | |
| Blue-collar | 29.1 | 21.9 | 0.072‡ | 20.2 | 7.3 | <0.05‡ |
| White-collar | 70.9 | 78.1 | | 79.8 | 92.7 | |
| Hours at work (weekly) | | | | | | |
| <40 h | 20.2 | 21.6 | 0.955‡ | 50.4 | 22.9 | <0.001‡ |
| 40–49 h | 41.0 | 40.7 | | 35.4 | 49.0 | |
| 50–59 h | 22.1 | 20.4 | | 10.2 | 18.8 | |
| ≥60 h | 16.7 | 17.3 | | 3.9 | 9.4 | |
| *Behaviors on the way home* | | | | | | |
| Leisure activities | | | | | | |
| No | 54.1 | 55.6 | 0.742‡ | 70.1 | 31.9 | <0.001‡ |
| Yes | 45.9 | 44.4 | | 29.9 | 68.1 | |
| Drinking sessions | | | | | | |
| Almost none | 29.1 | 26.4 | 0.460‡ | 63.8 | 32.3 | <0.001‡ |
| 1–2 days/mo | 43.9 | 41.7 | | 29.9 | 49.0 | |
| ≥1 day/wk | 27.0 | 31.9 | | 6.3 | 18.8 | |
| Time of arrival at home* | | | | | | |
| Before 19:00 | 17.3 | 13.7 | 0.485‡ | 48.8 | 20.2 | <0.001‡ |
| 19:00–21:00 | 40.0 | 44.5 | | 42.4 | 44.7 | |
| After 21:00 | 42.7 | 41.8 | | 8.8 | 35.1 | |

Data shown in %. SD, standard deviation. –, data were not applicable. *excluding individuals with night duty. †Fisher's exact test. ‡$\chi^2$ test. §*t*-test.

**Table 2.** Analysis of variances of study variables by subgroup

| | | Men | | Women | | | | |
|---|---|---|---|---|---|---|---|---|
| Variable | (Range) | Fathers[a] (n=575) | Without children[b] (n=163) | Mothers[c] (n=127) | Without children[d] (n=96) | F* | *p** | Multiple comparison* |
| Job demands | (3–12) | 9.0 (1.9) | 9.0 (1.9) | 8.5 (1.9) | 8.3 (2.0) | 5.8 | <0.01 | ac; ad; bd |
| Job control | (3–12) | 8.2 (1.7) | 8.1 (1.6) | 8.2 (1.8) | 8.1 (1.7) | 0.3 | 0.83 | |
| Work-family culture | (0–10) | 7.3 (2.5) | 7.0 (2.6) | 6.3 (2.6) | 6.2 (2.5) | 9.9 | <0.001 | ac; ad |
| WFC | (0–27) | 8.7 (5.8) | 9.9 (6.1) | 11.2 (5.4) | 9.6 (6.2) | 6.9 | <0.05 | ac |
| Family togetherness | (0–18) | 13.0 (3.3) | 13.2 (3.4) | 13.1 (3.0) | 14.1 (3.4) | 3.3 | <0.001 | ad |
| Fatigue | (0–18) | 5.7 (4.3) | 6.0 (4.5) | 8.2 (4.7) | 8.2 (4.4) | 15.4 | <0.001 | ac; ad; bc; bd |
| Depression | (0–36) | 4.9 (5.0) | 5.4 (6.0) | 7.3 (5.9) | 7.1 (6.0) | 9.1 | <0.001 | ac; ad; bc |

Data shown as mean (standard deviation). WFC, work-to-family conflict. *One-way analysis of variance and Tukey's test were used to assess the differences among the subgroups (a: fathers; b: men without children; c: mothers; d: women without children).

**Table 3.** Multiple regression analysis for factors of WFC

| Variable | Men | | Women | |
|---|---|---|---|---|
| | Fathers (n=575) | Without children (n=163) | Mothers (n=127) | Without children (n=96) |
| Age | –0.04 | –0.06 | –0.10 | –0.03 |
| Type of job† | –0.03 | 0.02 | –0.15 | 0.00 |
| Chronic disease‡ | –0.02 | 0.00 | –0.01 | 0.14 |
| Work-related factors | | | | |
| Job demands | 0.32*** | 0.32*** | 0.39*** | 0.49*** |
| Job control | –0.12** | –0.03 | 0.00 | –0.25* |
| Work-family culture | –0.25*** | –0.31*** | –0.18* | –0.07 |
| Leisure activities§ | –0.09** | –0.10 | –0.14 | 0.07 |
| Drinking sessions‖ | | | | |
| 1–2 days/mo | –0.02 | 0.00 | 0.01 | –0.01 |
| ≥1 day/wk | –0.03 | 0.03 | –0.20 | –0.21 |
| Time of arrival at home¶ | | | | |
| Before 19:00 | –0.13** | –0.03 | –0.08 | –0.05 |
| After 21:00 | 0.11* | 0.15 | 0.19 | 0.09 |
| Night duty | –0.10* | 0.01 | – | 0.19* |
| Adjusted $R^2$ | 0.32 | 0.25 | 0.30 | 0.33 |

Values represent standardized regression coefficients. WFC, work-to-family conflict. –, data were not applicable. †0=blue- collar, 1=white-collar. ‡0 = no, 1=yes. §0=no, 1=yes. ‖reference category: almost none. ¶reference category: 19:00–21:00. *$p$<0.05, **$p$<0.01, ***$p$<0.001.

analysis when the dependent variable was WFC. A significant negative relationship between job demands and WFC was found. A significant negative relationship between job control and WFC was observed in 2 of the 4 groups. A significant negative relationship between work-family culture and WFC was demonstrated in 3 groups. Moreover, a significant negative relationship between leisure activities and WFC was found in the case of fathers. However, there was no relationship between drinking sessions and WFC. There was a significant positive relationship between arriving home at 21:00 and WFC in the case of fathers.

The results of hierarchical regression analyses are shown in Table 4 (A) with fatigue or (B) depression as the dependent variable. Significant positive relationships between WFC and fatigue and depression were found for all groups. The relationship between job demands and fatigue declined or disappeared with the addition of WFC in 3 of the 4 groups. The relationship between job control and fatigue slightly declined with the addition of WFC in the father group. Similarly, the relationship between work-family culture and fatigue declined or disappeared with the addition of WFC in 3 groups. Similarly, for depression as the dependent variable, the relationship between work-related factors and depression declined or disappeared in one or two groups with the addition of WFC.

Additionally, family togetherness was slightly, yet significantly associated with fatigue, and the interaction term between WFC and family togetherness (not shown in the table due to lack of available space) was also slight, yet significantly associated with fatigue in the case of fathers ($\beta$=–0.09, $p$=0.032). Figure 2 shows plots and equations of the regression of fatigue ($\hat{Y}$) on centered WFC (x) for three values of centered family togetherness (z).

## Discussion

Few studies have examined the factor of WFC using data provided by married employees of both genders in studies of unhealthy lifestyles and health disorders in Japan. We collected a relatively large data set from both genders at several companies and examined the relationship between work-related factors and WFC, and the relationship between WFC and health. This study also intended to shed light on the role played by family togetherness in a path between WFC and fatigue. Our findings will contribute to research on occupational health in terms of the promotion of work-family balance for married employees' health.

*Relationship between work-related factors and WFC*

The result of this study was consistent with those of previous studies[14–17, 19, 20] that indicated that high job demands and low job control are positively associated with WFC, and supportive work-family culture is negatively associated with WFC. The negative relationship between work-family culture and WFC was

**Table 4.** Hierarchical multiple regression analysis for the relationship between WFC and health

(A) Dependent variable: Fatigue

| | Men | | | | | | Women | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fathers (n=575) | | | Without children (n=163) | | | Mothers (n=127) | | | Without children (n=69) | | |
| | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| Job demands | 0.13 ** | –0.02 | –0.01 | 0.33 *** | 0.19 * | 0.20 * | 0.15 | 0.00 | 0.02 | 0.25 * | 0.01 | 0.01 |
| Job control | –0.17 *** | –0.11 ** | –0.11 * | –0.22 ** | –0.20 ** | –0.20 * | –0.10 | –0.10 | –0.08 | –0.15 | –0.02 | –0.02 |
| Work–family culture | –0.28 *** | –0.18 *** | –0.18 *** | –0.21 * | –0.08 | –0.09 | –0.34 *** | –0.26 ** | –0.27 ** | –0.09 | –0.06 | –0.05 |
| WFC | | 0.42 *** | 0.41 *** | | 0.40 *** | 0.39 *** | | 0.33 ** | 0.31 ** | | 0.46 *** | 0.46 *** |
| Family togetherness | | | –0.09 * | | | –0.07 | | | –0.07 | | | –0.02 |
| Adjusted $R^2$ | 0.18 | 0.30 | 0.31 | 0.23 | 0.34 | 0.34 | 0.22 | 0.29 | 0.29 | 0.14 | 0.27 | 0.27 |

(B) Dependent variable: Depression

| | Men | | | | | | Women | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fathers (n=575) | | | Without children (n=163) | | | Mothers (n=127) | | | Without children (n=69) | | |
| | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| Job demands | 0.06 | –0.09 | –0.08 | 0.17 * | 0.01 | 0.03 | 0.18 | –0.01 | –0.01 | 0.16 | –0.10 | –0.09 |
| Job control | –0.20 *** | –0.14 ** | –0.14 ** | –0.10 | –0.08 | –0.08 | –0.10 | –0.10 | –0.10 | –0.30 ** | –0.16 | –0.16 |
| Work–family culture | –0.28 *** | –0.18 *** | –0.17 *** | –0.16 | –0.02 | –0.04 | –0.24 * | –0.15 | –0.15 | –0.21 | –0.17 | –0.17 |
| WFC | | 0.41 *** | 0.40 *** | | 0.43 *** | 0.41 *** | | 0.41 *** | 0.41 *** | | 0.49 *** | 0.48 *** |
| Family togetherness | | | –0.07 | | | –0.11 | | | 0.01 | | | –0.08 |
| Adjusted $R^2$ | 0.15 | 0.27 | 0.27 | 0.12 | 0.25 | 0.26 | 0.14 | 0.25 | 0.25 | 0.14 | 0.30 | 0.30 |

Values represent standardized regression coefficients. Age, type of job and chronic disease were controlled for in the analyses.For fatigue as dependent variable, Model 4 consisting of the interaction term (WFC × family togetherness) is not shown due to lack of available space. WFC, work-to-family conflict. *$p$<0.05, **$p$<0.01, ***$p$<0.001.

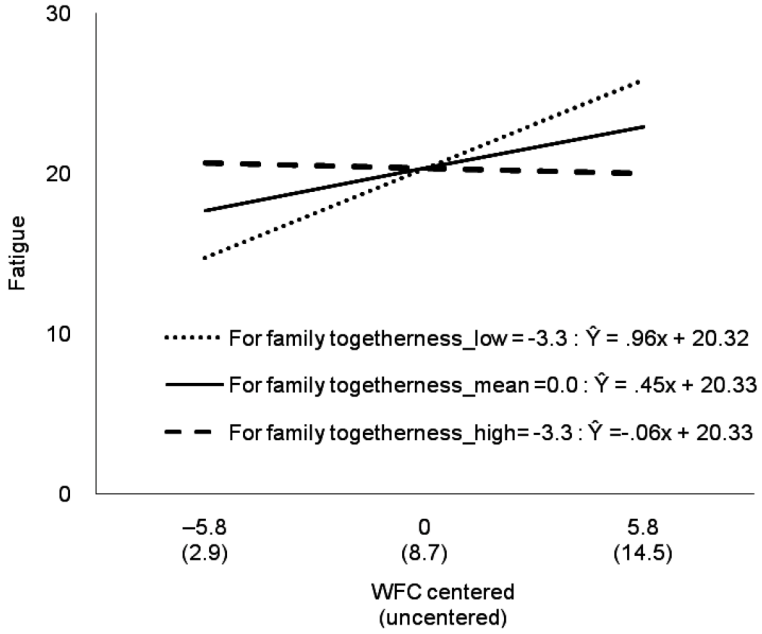


**Fig. 2.** Interaction between family togetherness and WFC on fatigue in the father-group by simple slopes analysis. Regression of fatigue (Y) on WFC (x) for three levels of family togetherness (z). Simple slopes were calculated for centered WFC and centered family togetherness using one standard deviation. WFC, work-to-family conflict.

observed for men regardless of parental status, implying that a family-supportive work environment is important for men or fathers as well as working mothers. Company policies should focus on creation of a workplace atmosphere and customs that provide support for integration of work and family. For instance, when a male employee who has a key role at work wishes to take parental leaves even for a month, measures should be taken to avoid hindering activities in the workplace due to his absence, such as making arrangements for the transfer of his tasks to appropriate co-workers.

A negative relationship between leisure activities and WFC was observed in the fathers group, supporting the proposition that favorable recreational activity, which they spent time on from the completion of their workday to their arrival at home may be an opportunity to recover from strain at work[23, 24]. One interpretation for the modest relationship between leisure activities and WFC, contrary to the strong relationship between workplace variables and WFC, is that these activities may be strongly influenced by the length of working time or the degree of strain at work[25]. This implies a work environment that enables employees to engage in appropriate recreational activities without constraint is important. A possible explanation for the absence of a relationship between drinking sessions and WFC is that some workers may find pleasure in going out to drink, because it could offer opportunities to communicate and gain work-related information in common with co-workers[25]. The positive relationship between WFC and a returning home time after 21:00 for fathers supports the proposition that this time is a critical point beyond which there are negative impacts with job spillover into the home domain because of exhaustion and insufficient time spent with family[25].

*Relationship between WFC and health*

The result of this study was consistent with those of previous studies[14, 15, 26, 27] that indicated that WFC is positively associated with fatigue and depression. This relationship was observed in all groups, implying that interventions and policies that are designed to alleviate problems between work and family will benefit married employees regardless of gender and parental status. In addition, the results of hierarchical regression analyses showed changes in the relationship between work-related factors and health due to the addition of WFC, indicating that WFC appears to partly or completely mediate between work-related factors and health. This finding supports the proposition that WFC may be a crucial process that links stressful work situation to poor individual health[12, 13]; thus, implying a reduction of WFC is important to prevent fatigue and depression among married workers.

*Function of family togetherness*

The hierarchical regression analyses and subsequent analyses of simple slopes indicate that family togetherness

has the potential to be negatively associated with fatigue, and also to moderate the positive relationship between WFC with fatigue in the father group. Although the possibility of a positive relationship between family togetherness and fatigue in low level WFC remains unsolved, the data show that the function of family togetherness appears to operate, when individuals suffer from high level WFC; the relationship between WFC and fatigue may be particularly weak. Strategies of work-life balance that facilitate fathers taking family roles appear to be useful for preventing fatigue.

*Limitations of the study*

This study has several limitations. First, the data were collected using a cross-sectional design, meaning that no conclusions regarding the causal direction of effects can be drawn. Second, our hypotheses were tested using a predominately fathers' sample. This unbalanced sample could result in small subgroups that might lead to insufficient power to reject the null hypothesis and present difficulties in comparisons between subgroups. Third, the subjects invited to participate in this study were largely white-collar workers in large corporations in the Tokyo metropolitan area, and the generalization of the findings should be done with caution. Despite these limitations, we chose most factors from previous longitudinal studies. We also analyzed a relatively large data set mixed in gender and parental status, which was drawn from several different corporations. The current study contributes to previous research on WFC in several ways.

*Suggestions for future research*

Our newly developed instruments including WFC, work-family culture and family togetherness are considered to have acceptable degrees of face and content validity for several reasons[29]: the discussion with the researchers; the interview with managers in the field of this study; and the pilot study on a relevant population. Our WFC scale covers both time-based and strain-based conflict based on the conceptual definition of work-family conflict[7] and work-family culture also covers the basic three elements[19] (e.g., organizational time expectations that may interfere with family roles). Furthermore, our WFC scale was significantly associated with health indicators and several work-related factors that have been consistently reported by previous studies[14, 15, 27, 28], indicating that it may have an applicable degree of concurrent validity.

Research investigating the other aspect of validity of our WFC scale, such as construct validity, is planned for future studies of work-family conflict. For the family togetherness scale used in this study, several behaviors on which we focused, communication and interactions with family, are crucial to the family role; however, research developing a comprehensive scale that includes other dimension such as experiencing genial times with family is desirable.

## Conclusion

From our findings, we conclude that WFC has positive associations with fatigue and depression regardless of gender and parental status, and plays a role linking unfavorable work situations and health. As possible work-related factors of WFC, the data indicate not only individual workplace variables but also organizational support. Maintaining family togetherness appears to assist in prevention of fatigue for fathers. Strategies for reduction of imbalances between work and family are therefore necessary to promote health among married workers of both genders.

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**Appendix:** Pearson correlation coefficients of study variables

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Men[a] | | | | | | | | | | | | | | | | | |
| 1 | Age | | –0.11 | 0.33 | –0.13 | –0.05 | –0.02 | –0.25 | –0.19 | 0.06 | –0.08 | 0.02 | –0.02 | –0.15 | 0.09 | –0.25 | 0.05 |
| 2 | Type of job[†] | –0.37* | | –0.05 | 0.13* | –0.02 | –0.04 | 0.12* | 0.17* | 0.03 | 0.07 | 0.02 | 0.03 | 0.30* | –0.32* | 0.42* | –0.46* |
| 3 | Chronic disease[‡] | 0.36* | –0.14 | | –0.06 | 0.11* | 0.02 | –0.09* | –0.07 | 0.04 | –0.07 | –0.01 | –0.01 | –0.04 | 0.03 | –0.15* | –0.04 |
| 4 | WFC | –0.14 | 0.13 | 0.01 | | 0.49* | 0.46* | –0.04 | 0.46* | –0.30* | –0.32* | –0.12* | –0.02 | 0.03 | –0.20* | 0.27* | –0.11* |
| 5 | Fatigue | –0.10 | 0.02 | 0.06 | 0.53* | | 0.68* | –0.12* | 0.22* | –0.28* | –0.35* | –0.12* | –0.04 | 0.00 | –0.04 | 0.08 | 0.02 |
| 6 | Depression | –0.10 | 0.02 | 0.22* | 0.47* | 0.65* | | –0.12* | 0.15* | –0.29* | –0.34* | –0.03 | –0.01 | –0.03 | –0.02 | 0.02 | 0.03 |
| 7 | Family togetherness | –0.16 | 0.11 | –0.11 | –0.03 | –0.06 | –0.13 | | 0.13* | 0.02 | 0.08 | –0.01 | 0.06 | 0.00 | –0.04 | 0.08 | –0.08 |
| 8 | Job demands | –0.15 | 0.16* | 0.04 | 0.41* | 0.37* | 0.22* | 0.14 | | –0.27* | –0.14* | –0.05 | 0.01 | 0.06 | –0.16* | 0.33* | –0.11* |
| 9 | Job control | –0.13 | 0.10 | –0.06 | –0.13 | –0.29* | –0.15 | 0.07 | –0.05 | | 0.28* | 0.08 | 0.05 | 0.05 | 0.11* | –0.03 | –0.10* |
| 10 | Work–family culture | –0.03 | 0.08 | –0.13 | –0.34* | –0.30* | –0.23* | –0.02 | –0.05 | 0.29* | | 0.02 | 0.03 | 0.10* | –0.01 | 0.04 | –0.02 |
| 11 | Leisure activities[‖] | –0.06 | –0.04 | –0.04 | –0.20* | –0.11 | –0.01 | –0.02 | –0.18* | 0.12 | 0.15 | | 0.07 | 0.04 | –0.05 | –0.03 | –0.01 |
| 12 | DSs: 1–2 days /mo[¶] | –0.02 | 0.11 | 0.01 | –0.01 | 0.01 | 0.01 | 0.02 | 0.10 | –0.03 | 0.03 | 0.01 | | –0.54* | 0.01 | –0.04 | –0.03 |
| 13 | DSs: ≥1 day /wk[¶] | –0.21 | 0.23* | –0.12 | –0.02 | –0.09 | –0.09 | –0.04 | –0.07 | 0.22* | 0.21* | 0.24* | –0.58* | | –0.17* | 0.28* | –0.18* |
| 14 | TAH: Before 19:00[††] | 0.37 | –0.30* | 0.14 | –0.15 | –0.08 | –0.09 | –0.04 | –0.22* | –0.26* | –0.07 | 0.00 | –0.01 | –0.26* | | –0.33* | –0.16* |
| 15 | TAH: After 21:00[††] | –0.22* | 0.29* | –0.15 | 0.27* | 0.11 | 0.03 | 0.05 | 0.25* | 0.02 | –0.02 | –0.03 | –0.17* | 0.29* | –0.29* | | –0.29* |
| 16 | TAH: Night shift[††] | 0.07 | –0.26* | 0.08 | 0.05 | 0.18* | 0.12 | 0.06 | 0.07 | –0.09 | –0.17* | –0.14 | 0.00 | –0.15 | –0.13 | –0.26* | |
| Women[b] | | | | | | | | | | | | | | | | | |
| 1 | Age | | –0.27 | 0.18 | –0.01 | 0.12 | 0.15 | –0.17 | 0.13 | –0.04 | –0.10 | 0.32 | 0.09 | 0.02 | –0.09 | 0.08 | – |
| 2 | Type of job[†] | –0.06 | | –0.14 | –0.22* | –0.14 | –0.15 | –0.03 | –0.22* | 0.25* | 0.10 | –0.06 | –0.01 | 0.13 | –0.08 | 0.09 | – |
| 3 | Chronic disease[‡] | 0.10 | 0.04 | | 0.16 | 0.29* | 0.24* | –0.05 | 0.27* | –0.15 | –0.18 | 0.01 | –0.04 | –0.11 | –0.09 | –0.03 | – |
| 4 | WFC | –0.06 | –0.04 | 0.09 | | 0.45* | 0.48* | –0.29* | 0.49* | –0.22* | –0.27* | –0.22* | 0.05 | –0.18* | –0.10 | 0.12 | – |
| 5 | Fatigue | –0.10 | –0.04 | 0.29* | 0.51* | | 0.65* | –0.21* | 0.27* | –0.27* | –0.41* | –0.12 | 0.08 | –0.22* | 0.04 | 0.02 | – |
| 6 | Depression | –0.01 | –0.06 | 0.15 | 0.53* | 0.66* | | –0.16 | 0.28* | –0.24* | –0.31* | –0.08 | 0.11 | –0.22* | 0.01 | 0.02 | – |
| 7 | Family togetherness | –0.27* | 0.25* | 0.07 | –0.06 | –0.01 | –0.12 | | –0.04 | 0.19* | 0.05 | –0.08 | –0.06 | 0.07 | 0.01 | –0.05 | – |
| 8 | Job demands | –0.02 | 0.05 | –0.15 | 0.48* | 0.20 | 0.14 | 0.00 | | –0.28* | –0.11 | –0.15 | 0.03 | –0.05 | –0.16 | 0.09 | – |
| 9 | Job control | 0.07 | 0.30 | 0.02 | –0.26* | –0.16 | –0.32* | 0.07 | 0.09 | | 0.28* | 0.05 | 0.01 | 0.23* | –0.11 | 0.11 | – |
| 10 | Work–family culture | –0.07 | 0.17 | –0.07 | –0.23* | –0.18 | –0.31* | 0.13 | –0.16 | 0.25* | | 0.05 | –0.09 | 0.20* | –0.05 | 0.03 | – |
| 11 | Leisure activities[‖] | –0.19 | 0.19 | 0.05 | 0.10 | –0.02 | 0.06 | –0.08 | 0.04 | 0.01 | 0.03 | | 0.29* | 0.11 | –0.18* | 0.05 | – |
| 12 | DSs: 1–2 days /mo[¶] | –0.03 | 0.11 | 0.12 | 0.02 | –0.05 | –0.11 | –0.03 | –0.18 | –0.07 | 0.10 | –0.01 | | –0.17 | –0.18* | 0.05 | – |
| 13 | DSs: ≥1 day /wk[¶] | –0.12 | 0.13 | –0.09 | –0.05 | –0.02 | –0.02 | 0.10 | 0.23* | 0.15 | –0.03 | 0.28* | –0.47* | | –0.26* | 0.50* | – |
| 14 | TAH: Before 19:00[††] | 0.17 | –0.36 | –0.05 | –0.26* | –0.20* | –0.07 | –0.06 | –0.33* | 0.01 | 0.06 | –0.34* | –0.12 | –0.17 | | –0.30* | – |
| 15 | TAH: After 21:00[††] | –0.10 | 0.04 | 0.10 | 0.33* | 0.14 | 0.12 | –0.04 | 0.38* | –0.15 | –0.16 | 0.31* | 0.05 | 0.21* | –0.36* | | – |
| 16 | TAH: Night shift[††] | –0.12 | 0.03 | –0.05 | 0.17 | 0.14 | 0.14 | 0.06 | 0.09 | 0.05 | –0.03 | 0.07 | –0.10 | 0.21* | –0.05 | –0.08 | |

[a]men: above the diagonal, fathers (n=575); below the diagonal, men without children (n=163). [b]women: above the diagonal, mothers (n=127); below the diagonal, women without children (n=96). –: data were not applicable. [†]0=blue–collar, 1=white–collar. [‡]0=no, 1=yes. [§]0 <6 yr, 1≥6 yr. [‖]0=no, 1=yes. [¶]DSs, drinking sessions, reference category: almost none. [††]TAH, time of arrival at home, reference category: 19:00–21:00. *$p$<0.05.