A Prospective Cohort Study of Presenteeism and Increased Risk of Divorce Among Japanese Workers

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Objective: We examined the association between the presenteeism and the risk of divorce among Japanese workers during the COVID-19 pandemic.

Methods: A prospective study of 27,036 individuals was conducted starting in December 2020, with 18,560 (68.7%) participating in the follow-up in December 2021. The Work Functioning Impairment Scale (WFun) was used to measure the degree of work function impairment. Results: Compared with the group with the lowest WFun score, the odds ratio for the group with moderate WFun was 1.16 (95% confidence interval, 0.74 to 1.82; \( P = 0.525 \)) and the odds ratio for the group with the highest WFun was 1.76 (95% confidence interval, 1.18 to 2.62; \( P = 0.006 \)). Conclusions: This study suggests that supporting workers with presenteeism has important implications not only from the perspective of labor productivity in management but also for the individual’s quality of life in terms of family relationships.

Keywords: COVID-19, divorce, family relations, Japan, presenteeism

The COVID-19 pandemic that began in 2019 and continues today has been affecting families and marital relationships.1–4 The pandemic has transformed the way people live and has also had a significant impact on their socioeconomic status. These challenges, such as economic hardship, change the employment environment, causing anxiety and stress about the disease and the limited opportunities for people to interact with each other. These changes may have resulted in significant modifications in family and marital relationships, with some reports suggesting that the COVID-19 pandemic had a negative impact on satisfaction with family relationships.5 There are also reports of increased family violence.6–9 Negative effects on family relationships have also been reported because of the telecommuting being conducted in many countries.2,8

Significant external stress events such as disasters have different effects on family relationships depending on the nature of the event, such as the severity of the impact on life and health, the duration of the impact, and the geographic extent of the impact.9–11 It has been reported that divorce, marriage, and fertility rates increase when natural disasters, such as hurricanes and floods, occur.12 It has also been reported that divorce rates decrease immediately after acts of terrorism.13–15 In situations of sudden threats to survival, people are likely to seek a secure condition as well as bonding and healing with family and loved ones. On the other hand, in the case of natural disasters that have relatively little impact on life and death but continue to damage socioeconomic conditions over the medium and long term, difficulties that hinder the continuation of marital and romantic relationships, such as unemployment, household financial difficulties, and health problems, are likely to occur.11,12

The COVID-19 pandemic has features similar to disasters that negatively affect marital relationships and romantic relationships. Already, this public health crisis is becoming prolonged. Whereas the health effects are severe for some susceptible individuals, the situation is not life-threatening for many. However, the various restrictions being implemented worldwide to deter infectious diseases are having a global economic impact, with significant effects on employment and the economy. In particular, health, employment, and economic stability are important factors in the maintenance of marital relationships.11,12,13 The impact of the COVID-19 pandemic on those with health problems or workers experiencing presenteeism (the loss in productivity of workers not fully functional on the job) is particularly significant. Treatment interruptions, anxiety, loneliness, and difficulty receiving support from the company due to telecommuting during the pandemic affected the working styles and quality of life of people with health problems.13–15 Workers who experience presenteeism experience difficulties in performing their duties and work disability.16,17 While experiencing work disability, workers with presenteeism may reduce working hours, change jobs, and earn less.18 Presenteeism is associated with subsequent absence from work and unemployment risk.19,20 These conditions are expected to negatively affect marital relationships. However, little is known about the association between presenteeism and family relationships. In addition, loneliness has emerged as a worldwide problem during the pandemic.21,22 It has been reported that more time spent with family members during the COVID-19 pandemic alleviated feelings of loneliness and emotional burden23, preserving family functioning during the pandemic became an important public health issue. Because external stresses such as disasters further enhance existing vulnerabilities in family and marital relationships,22 we hypothesized that workers with work functioning impairment would be at a higher risk of divorce during the COVID-19 pandemic. In this study, we examine the relationship between work functioning impairment and divorce in a cohort study of Japanese workers during the pandemic.
MATERIALS AND METHODS

This study was a prospective cohort study of Japanese workers. The subjects were monitors with an Internet research company who agreed to participate in the study and met the conditions for inclusion. This study was approved by the Ethics Committee of the University of Occupational and Environmental Health, Japan (reference nos. R2-079 and R3-006).

The baseline survey was conducted in December 2020. Invitations to participate in the survey were sent to 600,000 individuals with an active participation history out of approximately 4.7 million preregistered monitors. Of these, approximately 55,000 individuals met the participation criteria. Individuals who were employed at the time of the survey and ages of 20 to 60 years were eligible. In addition, to obtain an equilibrium of the survey participants, stratified sampling was conducted to ensure equal numbers by sex, occupation (office work, nonoffice work), and region of residence. For place of residence, 47 prefectures were applied and divided into five levels according to COVID-19 infection rates. A total of 33,302 people participated in the study.

Of these participants, 27,036 were included in the study after excluding those who gave fraudulent responses. Criteria for fraudulent responses included response time of less than 6 minutes, weight of less than 30 kilograms, height of less than 140 centimeters, multiple inconsistent responses regarding family members living in the same household, and incorrect answers to the question to choose the third highest number out of four numbers presented.

The follow-up survey was conducted in December 2021, and 18,560 (69%) of the 27,036 participants participated. Of these participants, 10,476 who reported being married at baseline were included in the analysis.

Measurements at Baseline

Participants’ work functioning impairment at baseline was assessed using the work functioning impairment scale (WFUn), an instrument based on the Rasch model and validated as required by consensus-based standards for the selection of health measurement instruments (COSMIN). On the basis of previous studies, WFUn scores were classified as normal work functioning (7 to 13 points), mild work functioning impairment (14 to 20 points), and severe impairment (21 to 35 points).

At the baseline survey, participants also answered questions regarding the following: sex, age, income, education, smoking, drinking habits, type of work, size of company, and frequency of telecommuting.

Changes in Marital Status

At the time of the follow-up survey, respondents were asked about their marital status (married, bereaved, or divorced). The response of divorced was used as the outcome.

Statistical Analysis

The odds ratio (OR) of WFUn associated with divorce was estimated using a multilevel logistic regression model. Multivariate analyses adjusted for sex, age, income, education, smoking, drinking habits, type of work, firm size, frequency of telecommuting, and the incidence rate of COVID-19 by prefecture at baseline. A P value less than 0.05 was considered statistically significant. All analyses were conducted using Stata (Stata Statistical Software: Release 17; StataCorp LLC, Texas, TX).

RESULTS

Table 1 shows the characteristics of the subjects at baseline by degree of work functioning impairment. At baseline, of the 10,476 subjects, 6576 (62%) had normal work functioning, 1969 (19%) had mild work functioning impairment, and 1931 (18%) had severe work functioning impairment. Sex, age, type of work, education, frequency of telecommuting, smoking, and drinking habits did not differ substantially between groups. The group with the lowest work functioning impairment had the highest income. The percentage of individuals with the highest income was mostly in the group with normal work functioning (34%), 31% were in the group with mild work functioning impairment, and 26% were in the group with severe work functioning impairment. Individuals with higher work functioning impairment worked in larger firms; 28% worked in establishments with more than 1000 employees and were members of the group with normal work functioning, compared with 30% of individuals who reported severe work functioning impairment.

Age- and sex-adjusted and multivariate-adjusted ORs of WFUn associated with divorce are shown in Table 2. The results from the age- and sex-adjusted model and from the multivariate model are very similar. In the multivariate model, compared with the normal WFUn group, the OR of the mildly impaired group was 1.16 (95% confidence interval, 0.78 to 1.82; P = 0.525), and the OR of the severe group was 1.76 (95% confidence interval, 1.76 to 1.8; P = 0.006), which showed a significant trend (P for trend = 0.009). No other socioeconomic factor was associated with divorce in either age- and sex-adjusted or multivariate analyses.

DISCUSSION

This study showed that, in Japan during the COVID-19 pandemic, the higher the degree of work functioning impairment was, the higher the occurrence of divorce. On the other hand, there were no socioeconomic...
Work functioning impairment scale

| Scale          | OR   | 95% CI    | P     | OR   | 95% CI    | P     |
|----------------|------|-----------|-------|------|-----------|-------|
| 7–13 (moderate) | Reference | Reference |       | Reference | Reference |       |
| 14–20 (severely) | 1.15 | 0.74 1.81 | 0.535 | 1.16 | 0.74 1.82 | 0.525 |
| 21–35 (severely) | 1.78 | 1.20 2.65 | 0.004 | 1.76 | 1.18 2.62 | 0.006 |
| Annual income (million yen) |
| <500 | 1.56 | 1.00 2.44 | 0.053 | 1.43 | 0.89 2.30 | 0.144 |
| 500–699 | 1.13 | 0.69 1.83 | 0.628 | 1.07 | 0.65 1.75 | 0.803 |
| 700–899 | 1.23 | 0.76 2.00 | 0.392 | 1.18 | 0.72 1.93 | 0.503 |
| ≥900 | Reference | Reference | (0.082) | Reference | Reference | (0.161) |
| Age |
| <100 | 1.01 | 0.99 1.03 | 0.470 | 1.01 | 0.99 1.03 | 0.407 |
| 21–40 | 2.14 | 1.48 3.09 | <0.001 | 2.25 | 1.52 3.31 | <0.001 |
| Sex, women (vs men) |
| Current smoker (vs nonsmoker) |
| Reference | 1.29 | 0.89 1.87 | 0.183 | 1.27 | 0.87 1.85 | 0.213 |
| Education |
| Junior high school | 2.47 | 0.77 7.94 | 0.130 | 2.15 | 0.65 7.03 | 0.207 |
| High school | 1.19 | 0.82 1.74 | 0.356 | 1.14 | 0.77 3.18 | 0.521 |
| Vocational school/college/university/graduate school | Reference | Reference | 0.162 | Reference | Reference | 0.291 |
| Alcohol consumption |
| 6–7 days per week | 0.94 | 0.59 1.49 | 0.777 | 0.92 | 0.58 1.47 | 0.726 |
| 4–5 days per week | 1.34 | 0.74 2.41 | 0.336 | 1.37 | 0.76 2.48 | 0.296 |
| 2–3 days per week | 1.05 | 0.61 1.82 | 0.852 | 1.12 | 0.65 1.94 | 0.683 |
| <1 day per week | 1.08 | 0.65 1.77 | 0.775 | 1.12 | 0.68 1.84 | 0.668 |
| Full-time ever |
| Reference | Reference | (0.959) | Reference | Reference | (0.886) |
| Job type |
| Mainly desk work | 1.05 | 0.69 1.57 | 0.831 | 1.00 | 0.66 1.51 | 0.984 |
| Mainly labor | 1.17 | 0.77 1.76 | 0.469 | 0.99 | 0.64 1.53 | 0.951 |
| No. of employees in the workplace |
| <100 | 1.23 | 0.76 2.01 | 0.396 | 1.11 | 0.66 1.85 | 0.703 |
| 100–999 | 0.92 | 0.55 1.52 | 0.735 | 0.83 | 0.49 1.40 | 0.485 |
| 1000–9999 | 1.33 | 0.84 2.10 | 0.225 | 1.24 | 0.78 1.97 | 0.366 |
| Telecommuting frequency |
| <4 days per week | 1.10 | 0.65 1.88 | 0.720 | 1.01 | 0.57 1.79 | 0.966 |
| 2 days per week | 0.56 | 0.23 1.38 | 0.209 | 0.50 | 0.20 1.27 | 0.145 |
| <1 day per week | 0.59 | 0.19 1.86 | 0.366 | 0.57 | 0.18 1.82 | 0.344 |
| Hardly ever | Reference | Reference | (0.626) | Reference | Reference | (0.581) |

CI: confidence interval.
*The model included WFun, age, sex, education, annual household income, job type, smoking, alcohol consumption, number of employees in the workplace, telecommuting frequency, and the incidence rate of COVID-19 by prefecture at baseline.

*P value for trend.

Factors such as income, job type, or educational background that were associated with divorce risk. To our knowledge, this study is the first to prospectively examine presenteeism and family relationships.

There are several possible mechanisms for the association between work functioning impairment and divorce. First, working with a poor health condition leads to a variety of disadvantages in employment. Workers with poor health experience situations that leave them unable to perform, such as physically demanding jobs, business trips, and night shifts. These experiences lead to reduced work hours, changes in job descriptions, changes in the workplace, and, eventually, resignation or unemployment. Because the primary purpose of work is to earn an income and support the family, it is possible that the maintenance of family relationships may not function adequately through disadvantages in employment.

Second, having a work functioning impairment means that the person may be disturbed not only at work but also in his or her daily life, especially in the home. The inability to adequately fulfill expected family roles, such as caring for children and housework, may have a negative impact on family relationships, such as family dissatisfaction.

Third, on the basis of the theory of self-regulatory depletion, presenteeism was originally caused by a lack of marital happiness, the preexistent between them, resulting in negative interactions in the marital relationship. Depletion of self-regulation capacity has been proposed as a mechanism by which external stress can reduce cooperation and satisfaction between partners. Individual effort is required to cope with external stress, which consumes self-regulatory capacity. As self-regulatory capacity declines, negative attitudes and behaviors toward partners and criticism of partners increase. Employment instability, economic disadvantage, and decreased satisfaction with family life due to work functioning impairment may deplete partners’ mutual self-resources and lead to negative relationships.

Fourth, it is possible that the inherently poor marital relationship may have affected presenteeism at baseline. Divorce is not always a sudden event; it is based on the medium- and long-term marital relationship. Poor marital relationships have been noted to be an important cause of presenteeism. External shocks from the COVID-19 pandemic have resulted in changes in employment and economic circumstances, reduced opportunities for interaction with nonfamily members, and loss of coping and respite opportunities due to restrictions on outings. If presenteeism was originally caused by a lack of marital happiness, the various external shocks brought about by the COVID-19 pandemic may have pushed the couple to decide to divorce.
Socioeconomic status such as income, job type, educational history, and firm size were not directly associated with divorce risk in this study, suggesting that during the COVID-19 pandemic, divorce is not directly brought about by impoverishment due to economic circumstances. One reason why socioeconomic status was not directly associated with divorce is that this study was conducted with married persons who had already agreed on their socioeconomic status and accepted their marital status. Alternatively, this study underestimates the association between socioeconomic status and divorce if changes in socioeconomic status since the baseline, such as a decline in income, are the reason for divorce, because changes in socioeconomic conditions since the baseline are not captured in this study.

This study suggests that supporting workers with presenteeism has important implications not only from the perspective of labor productivity and corporate management, but also for the individual's quality of life in terms of family relationships. In Japan, presenteeism has attracted attention in recent years from the perspectives of labor productivity and corporate management. However, there has been insufficient discussion of the risk of workers becoming even more unhealthy by working in poor physical conditions, the deterioration of their quality of life, and the perspective of being at risk of unemployment and economic deprivation. Although some firms are willing to reduce the risk of retirement, they have no incentive to engage with retired workers thereafter. This study further shows that workers with presenteeism are also at a higher risk of divorce. We argue that support for workers with presenteeism should be discussed from a social security perspective, not only management issues for worker productivity within companies.

Limitations of this study should be mentioned. First, because this study assesses the extent of work functioning impairment at baseline, subsequent changes in work functioning impairment are unknown. Such a change may lead to an underestimation of the association between work functioning impairment and divorce. Second, the details of reasons for work functioning impairment, namely, health status, diagnosis of illnesses, symptoms, and treatment status, are not known. The association between work functioning impairment and divorce may differ depending on the underlying health condition, for example, mental illness or physical illness, and whether it is an acute or chronic health condition. Third, because the study evaluates socioeconomic status at baseline, it underestimates the association between socioeconomic status and divorce if changes in socioeconomic status since then, such as a decline in income, are the reason for divorce. Fourth, although this study is a cohort, reverse causality cannot be ruled out. Divorce is one of the factors of presenteeism. Potential negative marital relationships may have been affecting work functioning impairment at baseline. Fifth, because this study was conducted during the COVID-19 pandemic, this association may differ from that under normal circumstances; whether the external stress of COVID-19 strengthens or negatively affects the marital relationship requires further examination.

This study followed Japanese workers for 1 year during the COVID-19 pandemic and found that workers with impaired work functioning were at a higher risk of divorce, whereas socioeconomic status was not associated with divorce. For workers with work functioning impairment, measures that alleviate work functioning impairment, such as medical care, self-care, and coordination of work with the workplace, may lead not only to productivity but also to the maintenance of good family relations, and such aspects should be discussed further in the future.

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