

**RESEARCH ARTICLE**

# Socioeconomic status, work-life conflict, and mental health

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**Abstract**

**Background:** Work-life conflict (WLC) has a critical effect on employee mental health. However, research on occupational health has neglected the family domain. Furthermore, although it is reasonable to assume that the effect of WLC on health may differ according to socioeconomic circumstances, there is little empirical evidence for differences in the impact of WLC by socioeconomic status (SES). The purpose of this study was to assess the role of SES as an effect modifier, while examining whether the SES level affects the relationship between WLC and mental health.

**Method:** We analyzed data from the nationally representative South Korean Working Conditions Survey of 2014, including 49 401 workers. Logistic regression analyses, stratified by sexes, were performed to identify sex differences, and interaction terms including WLC and SES were also incorporated.

**Results:** WLC (men: OR = 1.24; women: OR = 1.18) and domestic demands (men: OR = 1.16; women: OR = 1.22) were significantly associated with mental health. WLC exhibited a stronger association with mental health for individuals with high SES, both in terms of education (men: OR = 1.61 vs 1.51; women: OR = 1.52 vs 1.24) and income (men: OR = 1.44 vs 1.10; women: OR = 1.48 vs 1.20).

**Conclusions:** Our data suggest that future efforts for health promotion should consider workers' family demands and SES as important modifying factors of psychological health in the workplace.

**KEYWORDS**

family demands, mental health, socioeconomic status, work-family conflict, work-life conflict

## 1 | INTRODUCTION

Mental disorders are a heavy burden on society in terms of social marginalization and economic costs, not only for those affected and their families but also for social- and work-related environments.<sup>1</sup> According to a World Health Organization (WHO) report, an estimated 4.4% of the global population suffers from depression and 3.6% from anxiety disorders.<sup>2</sup> The estimated direct global costs associated with the diagnosis and treatment of mental disorders were USD 0.8 trillion.<sup>3</sup> The estimated indirect economic costs of mental disorders, including income losses due to mortality and care-seeking and lower productivity due to work

absence or early retirement, were USD 1.7 trillion, which is much higher than the direct costs, compared with chronic diseases such as cancer and cardiovascular diseases.<sup>3</sup> Moreover, the direct and indirect economic costs of mental disorders are both expected to double by 2030.<sup>3</sup>

A low socioeconomic status (SES) is known to be associated with more frequent mental health problems.<sup>4</sup> People of the lowest SES are estimated to be two to three times as likely to have a mental disorder than are those with the highest SES.<sup>5</sup> This is generally explained by the theory that stress responses result from demand-resource imbalance,<sup>6</sup> because individuals with low SES face greater demands from exposures that threaten health and survival but are endowed with fewer resources

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to cope with such challenges.<sup>7</sup> For example, a disadvantaged environment can expose individuals to greater uncertainty, conflicts, and threats for which there are often inadequate resources to respond effectively.<sup>8</sup> These experiences can create chronic stress, which cumulates throughout life.<sup>8</sup> Differences in exposure to and resources to deal with chronic stress help to explain the relationship between low SES and poorer mental health outcomes.

Several studies have shown associations between mental health and working conditions such as decision latitude, psychological demands, physical demands, and social support in the workplace.<sup>9-11</sup> However, more recently, researchers have also considered work-family conflict (WFC) as a work-related risk factor for mental health, particularly as the number of female workers has increased steadily.<sup>12,13</sup> WFC has been defined as a form of inter-role conflict in which the pressures from the demands of work and family are incompatible, such that they negatively affect each other.<sup>14</sup> Prior studies have found that WFC influences a variety of mental health outcomes, including psychological well-being, emotional exhaustion, and depression.<sup>15</sup> Recent studies have used the term WLC to expand the scope of WFC to reflect individuals' personal life roles, interests, and responsibilities beyond those related to one's family.<sup>13,16</sup>

Many studies have investigated the association between WLC and mental health, but prior studies had a number of limitations. First, although family demands are the main determinants of WLC,<sup>17</sup> little is known about family demands, particularly in relation to domestic responsibilities.<sup>18,19</sup> Studies have examined whether having young children and living without a partner, as measures of family conditions are related to workers' mental health such as psychosomatic symptoms.<sup>20,21</sup> However, household size, having a child, and living with an elderly relative are not direct, relevant measures of family demands like the degree of involvement in family-related work.<sup>22</sup> Second, most studies have investigated homogeneous groups, focusing on the middle or high-class population groups, particularly white collar workers and managers, limiting the generalization of results.<sup>13</sup> According to a review of work-family research, about 70% of work-family studies reported sample characteristics that were focused on professionals or managers, whereas only 6% of these studies included workers in lower-level occupations such as production.<sup>23</sup> Therefore, these studies do not reflect the wider range of socioeconomic experiences and, possibly, conceal important social gradients in WLC that apply across the entire spectrum of socioeconomic levels.

Generally, SES influences the relative importance that individuals attribute to their work and family roles,<sup>24</sup> which may, in turn, affect their exposure to WLC.<sup>25</sup> Education shapes future occupational opportunities and earnings potential. Occupation, in turn, affects job-related demands (eg, required labor hours) and resources (eg, wages), which are the primary determinants of WLC. As such, we expect that SES has important effects on WLC. Few population-based studies have examined SES in relation to exposure to WLC, and those that have done so have reported mixed results.<sup>26-30</sup> In addition, to date, no study has investigated differences in the effects of WLC on mental health due to SES. To address this gap in the literature, we assessed the complete range of SES and evaluated its connection with WLC.

In this study, using data from the nationally representative Fourth South Korean Working Conditions Survey, we attempted to address how the observed associations between WLC, family demands, and mental health by SES emerged by investigating two research questions: (a) Do WLC and family demands affect mental health? (b) Are there differences in the impact of WLC on mental health by SES? If so, what might explain these differences? Our study contributes to the literature by considering WLC and family demands as psychosocial factors in the study of occupational health. This study also used a unique data set from a nationally representative survey conducted in 2014 that contains the subjects' occupations and different subpopulations. Therefore, we were able to evaluate differences in the impact of WLC by SES.

## 2 | MATERIALS AND METHODS

### 2.1 | Study subjects

The data have been taken from the fourth version of the Korean Working Conditions Survey (KWCS), which was a cross-sectional survey based on a representative sample of the working population of South Korea, conducted in 2014. The KWCS is based on the European Working Conditions Survey, which has been conducted five times since 1991.<sup>31</sup> The survey was administered to 50 007 workers more than equal to 15 years old who, at the time of the survey, had performed paid work for more than 1 hour during the previous week. However, including nonadults in our sample can cause biased estimation because the SES of nonadults is likely to be classified as low. After excluding non-adults from our sample, 49 401 workers were analyzed. The validity and reliability of the fourth version of KWCS, whose study design was the same as that of the third version of the KWCS, were evaluated previously, and the quality of the survey was assured.<sup>32</sup>

### 2.2 | Measures

#### 2.2.1 | Work-life conflict

WLC was examined with the three items addressed by the following questions. (a) Work-life fit – “How well do your working hours fit in with your family or social commitments? Very well/well/not very well/not at all well”. Answering “very well”, or “well” was deemed to indicate a good work-life fit, and answering “not very well” or “not at all well” was deemed to indicate a poor work-life fit. (b) Frequency of overtime work – “Over the last 12 months, how often have you worked during your free time to meet work demands? Nearly every day/once or twice a week/once or twice a month/less often/never.” Answering “nearly every day” or “once or twice a week” was deemed to indicate a high frequency of overtime work, and answering “once or twice a month” or “less often, never” were deemed to indicate a low frequency of overtime work. (c) Work-schedule adjustment – “Would you say that, for you, arranging to take an hour or two off during working hours to take care of personal or family matters is: not difficult at all/not too difficult/somewhat difficult/

very difficult." Answering "not difficult at all" or "not too difficult" was deemed to indicate a good work-schedule adjustment, and answering "once or twice a month" or "less often, never" were deemed to indicate a bad work-schedule adjustment. WLC was defined as a binary variable, being equal to 1 if answers to at least two of the above three questions (ie, pertaining to poor work-life fit, high frequent overtime, and/or bad work-schedule adjustment) indicated the existence of WLC.

### 2.2.2 | Family demands

Subjects were asked about the frequency with which they undertook three household chores by the following questions: "In general, how often are you involved in any of the following activities outside of work (a) Childcare demands to care for and educating your children and grandchildren, (b) Domestic demands cooking and housework, (c) Elderly care demands to care for elderly/disabled relatives?" The allowed frequency responses were "1 hour or more every day"; "every second day for less than 1 hour"; "once or twice a week"; "once or twice a month"; "once or twice a year"; "never"; "not applicable". Persons responding "1 hour or more every day" to this question were defined as having family demands.

### 2.2.3 | Poor mental health

Respondents were asked whether they had experienced any depression or anxiety in the most recent past 12 months. The possible responses were "yes" and "no".

### 2.2.4 | Socioeconomic status

Although education level, income, and occupation have generally been used as measures of SES, we selected education level and income, because occupation classifications are often unstable and their benefit may vary widely by social context.<sup>33,34</sup> It is also possible that education and income would reveal slightly different gradients of status.<sup>34</sup> Therefore, using both should be a more accurate way of measuring SES. Education level and monthly income were each classified into high and low groups. The median monthly wage earned by Korean workers is approximately USD 1675 (the average of monthly wage = USD 2068).<sup>35</sup> Therefore, we classified the high- and low-income groups based on USD 1880, the value nearest to the wage category boundary. We designated the high-education group as those with a college or university education.

### 2.2.5 | Key covariates

Socio-demographic characteristics included age (20-39, 40-49, 50-59, or 60 and over), family type (single, or non-single), and employment type (self-employed, employee, or employ others). We also selected work-related variables reportedly associated with mental health.<sup>36</sup> Occupation was classified into five categories: (a) managerial and professional

(professional technicians or senior management), (b) white-collar, (c) sales and service, (d) skilled blue-collar (skilled or semiskilled), (e) unskilled and other (non-skilled, agriculture, or forestry). Subjects were classified as having non-shift or shift-based schedules, and company size were classified as less than 10, 10 to 99, or more than equal to 100 employees. To estimate the participants' self-rated health, we asked, "How would you rate your health, in general?" with five possible answers. These were collapsed into three categories: "poor health (very poor or poor)", "average health (average)", and "good health (good or very good)". Subjects were classified into three categories based on working hours: (a) part-time workers (less than 30 hours per week), (b) full-time workers (between 30 and 47 hours per week), and (c) overtime workers (more than 48 hours per week); OECD defines part-time workers as those who work less than 30 hours per week,<sup>37</sup> and EWCS defines overtime workers as those who work more than 48 hours per week.<sup>38</sup> Perceived job stress was examined using the statement: "I am under stress at work." The possible responses were: "high perceived job stress (always or most of the time)" and "low perceived job stress (sometimes, not much, or not at all)". Physical demands at work were measured from the following questions: "Does your main paid job involve (a) tiring or painful positions, (b) lifting or moving people, (c) carrying or moving heavy loads, (d) standing, or (e) repetitive hand or arm movements." Items were scored on a 7-point scale ranging from 1 (*never*) to 7 (*all the time*). The sum of the item scores was used as the scale score, and these scores were dichotomized around the medians for the logistic regression analysis.

## 2.3 | Statistical analysis

In all analyses, we studied men and women separately to consider sex differences. Data were analyzed with multivariate logistic regression to examine relationships between WLC, family demands, and poor mental health, controlling for confounding variables such as age, education, family type, employment type, income, occupational category, working hours, perceived job stress, and physical demands. We then used a statistical test to assess whether there is a sex difference in the effects of WLC on poor mental health using multiple logistic regression for the full study sample ( $n = 49\,401$ ). Specifically, we added an interaction term for sex and WLC, controlling for confounding factors, such as socio-demographic, self-rated health, work-related variables, and family demands. Finally, to test whether mental health differed by SES, we added interaction terms for WLC and education and income levels to the multiple logistic regression. All analyses were conducted using the program R 3.3 (R Foundation for Statistical Computing, Vienna, Austria).

## 3 | RESULTS

### 3.1 | Prevalence of poor mental health by SES, work-related variables, family demands, and WLC

The prevalence rates of self-reported poor mental health during the previous year according to socio-demographic characteristics, work

**TABLE 1** Demographic characteristics of the study population and prevalence of poor mental health in the past 12 mo by demographic characteristics, work and family demands in men and women workers, *n* (%)

	Men ( <i>n</i> = 24 939)			Women ( <i>n</i> = 24 462)		
		Good Mental health <i>n</i> = 20 924 (83.9)	Poor Mental health <i>n</i> = 4015 (16.1)		Good Mental Health <i>n</i> = 18 864 (77.1)	Poor Mental Health <i>n</i> = 5598 (22.9)
<b>Age</b>						
20-39 y	7024 (28.2)	6425 (91.5)	599 (8.5)	6348 (26.0)	5607 (88.3)	741 (11.7)
40-49 y	6424 (25.8)	5491 (85.5)	933 (14.5)	6856 (28.0)	5658 (82.5)	1198 (17.5)
50-49 y	5932 (23.8)	4953 (83.5)	979 (16.5)	6028 (24.6)	4591 (76.2)	1437 (23.8)
60 y and older	5559 (22.3)	4,055 (72.9)	1,504 (27.1)	5,230 (21.4)	3,008 (57.5)	2,222 (42.5)
<b>Education level</b>						
≤High school	13 877 (55.6)	10 914 (78.6)	2963 (21.4)	15 881 (64.9)	11 408 (71.8)	4473 (28.2)
≥College	10 868 (43.6)	9848 (90.6)	1020 (9.4)	8388 (34.3)	7313 (87.2)	1075 (12.8)
No answer	194 (0.8)	162 (83.5)	32 (16.5)	193 (0.8)	143 (74.1)	50 (25.9)
<b>Family type</b>						
Single	3316 (13.3)	2799 (84.4)	517 (15.6)	4546 (18.6)	3147 (69.2)	1399 (30.8)
Non-single	21 623 (86.7)	18 125 (83.8)	3498 (16.2)	19 916 (81.4)	15 717 (78.9)	4199 (21.1)
<b>Employment type</b>						
Self-employed	9384 (37.6)	7364 (78.5)	2020 (21.5)	7434 (30.4)	5409 (72.8)	2025 (27.2)
Employee	15 442 (61.9)	13 465 (87.2)	1977 (12.8)	14 715 (60.2)	11 974 (81.4)	2741 (18.6)
Employs others	113 (0.5)	95 (84.1)	18 (15.9)	2313 (9.5)	1481 (64.0)	832 (36.0)
<b>Income (USD<sup>a</sup> per mo)</b>						
<1880	8294 (33.3)	6448 (77.7)	1846 (22.3)	14 442 (59.0)	10,896 (75.4)	3546 (24.6)
≥1880	15 888 (63.7)	13 852 (87.2)	2036 (12.8)	7300 (29.8)	6155 (84.3)	1145 (15.7)
No answer	757 (3.0)	624 (82.4)	133 (17.6)	2720 (11.1)	1813 (66.7)	907 (33.3)
<b>Self-rated health</b>						
Poor	1671 (6.7)	905 (54.2)	766 (45.8)	2429 (9.9)	1142 (47.0)	1287 (53.0)
Average	6267 (25.1)	4668 (74.5)	1599 (25.5)	6815 (27.9)	4575 (67.1)	2240 (32.9)
Good	17 001 (68.2)	15 351 (90.3)	1650 (9.7)	15 218 (62.2)	13 147 (86.4)	2071 (13.6)
<b>Occupational category</b>						
Managerial, professional	3491 (14.0)	3144 (90.1)	347 (9.9)	2686 (11.0)	2338 (87.0)	348 (13.0)
White collar	4164 (16.7)	3884 (93.3)	280 (6.7)	3854 (15.8)	3453 (89.6)	401 (10.4)
Sales and services	6028 (24.2)	5312 (88.1)	716 (11.9)	11 177 (45.7)	8938 (80.0)	2239 (20.0)
Skilled blue collar	8362 (33.5)	6360 (76.1)	2002 (23.9)	4010 (16.4)	2325 (58.0)	1685 (42.0)
Unskilled and others	2894 (11.6)	2224 (76.8)	670 (23.2)	2735 (11.2)	1810 (66.2)	925 (33.8)
<b>Shift type</b>						
Non-shift	22 771 (91.3)	19 093 (83.8)	3678 (16.2)	23 204 (94.9)	17 887 (77.1)	5317 (22.9)
Shift	2168 (8.7)	1831 (84.5)	337 (15.5)	1258 (5.1)	977 (77.7)	281 (22.3)
<b>Company size</b>						
<10	14 245 (57.1)	11 491 (80.7)	2754 (19.3)	16 577 (67.8)	12 346 (74.5)	4231 (25.5)
10-99	6814 (27.3)	6016 (88.3)	798 (11.7)	5991 (24.5)	4976 (83.1)	1015 (16.9)
≥100	3880 (15.6)	3417 (88.1)	463 (11.9)	1894 (7.7)	1542 (81.4)	352 (18.6)
<b>Work hours (per wk)</b>						
<30 (Part-time workers)	1498 (6.0)	1080 (72.1)	418 (27.9)	3153 (12.9)	2126 (67.4)	1027 (32.6)
30-47 (Full-time workers)	10 507 (42.1)	9118 (86.8)	1389 (13.2)	10 554 (43.1)	8463 (80.2)	2091 (19.8)
≥48 (Overtime workers)	12 626 (50.6)	10 487 (83.1)	2139 (16.9)	10 483 (42.9)	8096 (77.2)	2387 (22.8)
No answer	308 (1.2)	239 (77.6)	69 (22.4)	272 (1.1)	179 (65.8)	93 (34.2)
<b>Perceived job stress</b>						
No	19 321 (77.5)	16 291 (84.3)	3030 (15.7)	19 193 (78.5)	14 771 (77.0)	4422 (23.0)
Yes	5618 (22.5)	4633 (82.5)	985 (17.5)	5269 (21.5)	4093 (77.7)	1176 (22.3)

**TABLE 1** (Continued)

	Men (n = 24 939)			Women (n = 24 462)		
		Good Mental health n = 20 924 (83.9)	Poor Mental health n = 4015 (16.1)		Good Mental Health n = 18 864 (77.1)	Poor Mental Health n = 5598 (22.9)
Physical demands						
No	13 415 (53.8)	11 924 (88.9)	1491 (11.1)	12 564 (51.4)	10 508 (83.6)	2056 (16.4)
Yes	11 099 (44.5)	8653 (78.0)	2446 (22.0)	11 516 (47.1)	8068 (70.1)	3448 (29.9)
No answer	425 (1.7)	347 (81.6)	78 (18.4)	382 (1.6)	288 (75.4)	94 (24.6)
Childcare demands						
No	23 461 (94.1)	19 673 (83.9)	3788 (16.1)	19 649 (80.3)	14 851 (75.6)	4,798 (24.4)
Yes	1478 (5.9)	1251 (84.6)	227 (15.4)	4813 (19.7)	4013 (83.4)	800 (16.6)
Domestic demands						
No	21 714 (87.1)	18 322 (84.4)	3392 (15.6)	5993 (24.5)	5006 (83.5)	987 (16.5)
Yes	3225 (12.9)	2602 (80.7)	623 (19.3)	18 469 (75.5)	13 858 (75.0)	4611 (25.0)
Eldercare demands						
No	24 768 (99.3)	20 786 (83.9)	3982 (16.1)	23 926 (97.8)	18 515 (77.4)	5411 (22.6)
Yes	171 (0.7)	138 (80.7)	33 (19.3)	536 (2.2)	349 (65.1)	187 (34.9)
Work-life conflict						
No	17 960 (72.0)	15 189 (84.6)	2771 (15.4)	18 463 (75.5)	14 287 (77.4)	4176 (22.6)
Yes	6979 (28.0)	5735 (82.2)	1244 (17.8)	5999 (24.5)	4577 (76.3)	1422 (23.7)

Note: Percentages in the shaded areas are the column percentages of each variable. Other percentages are row percentages by sex.

<sup>a</sup>In the survey year, the exchange rate was 1000 KRW = 0.94 USD.

demands, family demands, and WLC are shown in Table 1. Individuals with missing values for education level, income, physical demands, or working hours were defined as the “no-answer group”. Of the men and women subjects, 16.1% and 22.9%, respectively, reported having poor mental health in the past 12 months, as shown in Table 1. Relative to those less than 40 years old, we found that the prevalence of poor mental health increased with age. Regarding social and economic positions, of those with less than high school education, 21.4% and 28.2% of the man and women subjects, respectively, reported having poor mental health, which was higher than for those with a college education. The prevalence of poor mental health was higher in subjects with low income than those with high income in both men (22.3%) and women (24.6%). Regarding self-rated health, subjects who evaluated their self-rated health as poor had a higher prevalence of poor mental health than those who evaluated their self-rated health as good or average in both men (45.8%) and women (53.0%).

Regarding occupation, men (23.9% and 23.2% for skilled blue-collar workers and unskilled workers and others, respectively) and women (42.0% and 33.8%) who were laborers had a higher prevalence of poor mental health than did white-collar, sales, and service workers. Men (27.9%) and women (32.6%) who worked less than 30 hours per week had a higher prevalence of poor mental health than those who worked more than 30 hours per week. The prevalence of poor mental health was higher in those employed in physically demanding occupations (22.0% of men and 29.9% of women) than in those employed in non-physically demanding occupations. Regarding family demands, both men and women with high

domestic (19.3% of men and 25.0% of women) and eldercare demands (19.3% of men and 34.9% of women) had a higher prevalence of poor mental health than those without such demands.

### 3.2 | Relationships between family demands, WLC, and poor mental health

As shown in Table 2, WLC was significantly associated with poor mental health in both men (odds ratio [OR] = 1.24, 95% CI = 1.14–1.35) and women (OR = 1.18, 95% CI = 1.10–1.27). There was no sex difference in the effect of WLC on poor mental health. The interaction term between sex and WLC in the multiple logistic regression model for the full study sample was not significant ( $P = .40$ ). Regarding family demands, the effects on poor mental health differed by sex. Domestic demands were related to poor mental health in both men (OR = 1.16, 95% CI = 1.03–1.31) and women (OR = 1.22, 95% CI = 1.12–1.33). However, childcare demands were related to poor mental health only in men (OR = 1.51, 95% CI = 1.28–1.78), while eldercare demands were related to poor mental health only in women (OR = 1.24, 95% CI = 1.02–1.52).

### 3.3 | Does SES exert a moderating effect on the relationship between WLC and poor mental health?

Significant modifying effects of WLC and SES on mental health were found, as shown in Table 3. Several findings were observed from this

**TABLE 2** Associations of family demands and work-life conflict with poor mental health

	Odds ratio (95% confidence interval)	
	Men (n = 24 939)	Women (n = 24 462)
<b>Education level</b>		
≤High school	1.00	1.00
≥College	0.82 (0.75–0.91)**	0.95 (0.86–1.06)
No answer	0.84 (0.56–1.26)	1.05 (0.74–1.49)
<b>Income (USD<sup>a</sup> per mo)</b>		
<1880	1.00	1.00
≥1880	0.96 (0.88–1.06)	1.02 (0.94–1.12)
No answer	1.15 (0.92–1.45)	1.21 (0.94–1.48)
<b>Self-rated health</b>		
Poor	1.00	1.00
Average	0.48 (0.43–0.54)**	0.57 (0.52–0.64)**
Good	0.20 (0.18–0.23)**	0.26 (0.24–0.29)**
<b>Occupational category</b>		
Managerial and professional	1.00	1.00
White collar	0.91 (0.76–1.08)	0.96 (0.82–1.12)
Sales and services	0.89 (0.77–1.04)	1.09 (0.94–1.26)
Skilled blue collar	1.59 (1.38–1.83)**	1.74 (1.47–2.05)**
Unskilled and others	1.60 (1.35–1.90)**	1.41 (1.19–1.67)**
<b>Shift type</b>		
Non-shift	1.00	1.00
Shift	0.96 (0.84–1.10)	1.21 (1.04–1.40)*
<b>Work hours (per wk)</b>		
30–47 (full-time workers)	1.00	1.00
<30 (part-time workers)	1.34 (1.16–1.55)**	1.26 (1.14–1.39)**
≥48 (overtime workers)	1.01 (0.92–1.09)	1.04 (0.96–1.13)**
No answer	0.99 (0.74–1.33)	1.42 (1.08–1.88)**
<b>Perceived job stress</b>		
No	1.00	1.00
Yes	1.26 (1.16–1.37)**	1.12 (1.03–1.21)**
<b>Physical demands</b>		
Low	1.00	1.00
High	1.50 (1.38–1.62)**	1.54 (1.44–1.65)**
No answer	1.41 (1.08–1.85)*	1.48 (1.15–1.91)**
<b>Childcare demands</b>		
No	1.00	1.00
Yes	1.51 (1.28–1.78)**	1.10 (0.99–1.22)
<b>Domestic demands</b>		
No	1.00	1.00
Yes	1.16 (1.03–1.31)*	1.22 (1.12–1.33)**
<b>Eldercare demands</b>		
No	1.00	1.00
Yes	0.88 (0.58–1.33)	1.24 (1.02–1.52)*
<b>Work-life conflict</b>		
No	1.00	1.00
Yes	1.24 (1.14–1.35)**	1.18 (1.10–1.27)**

<sup>a</sup>In the survey year, the exchange rate was 1000 KRW = 0.94 USD. Odds ratios were adjusted for age, family type, and all other variables in the Table 1.

\* $P < .05$ ; \*\* $P < .01$ .

table. First, among those who do not have WLC, there were relatively consistent patterns of the association of low SES with poor mental health in all SES strata for both men and women. Second, those with WLC tended to show higher ORs for poor mental health compared to those without WLC, except for income among men. Third, WLC had a stronger association with poor mental health for individuals with high SES, both in terms of education and income measures for both men and women. For example, the ORs were greater in the high education level group than in the low education level group for both men (OR = 1.61 vs 1.51) and women (OR = 1.52 vs 1.24). Regarding income levels, WLC had a higher impact on workers with the high-income groups for both men (OR = 1.44 vs 1.10) and women (OR = 1.48 vs 1.20).

## 4 | DISCUSSION

This study, conducted using data from the nationally representative South Korean Working Conditions Survey collected in 2014, examined associations between WLC, family demands, and mental health to evaluate SES connections with WLC. Our findings showed that WLC and family demands were significantly associated with poor mental health in both men and women, after controlling for physical and psychosocial work environment factors. Further, this study found that SES acted as a significant effect modifier that exacerbated the effects of WLC on mental health, which has not been documented in the literature.

Our main contributions can be summarized as follows. First, WLC, specifically the interaction with work demands, has been explored thoroughly in the literature; however, study of its interaction with family demands has been limited, mainly due to lack of data for family demands. Using a novel data set that includes variables measuring family demands, we fill this gap by showing that family demands and WLC are important risk factors in the association between psychosocial factors in the work environment and poor mental health. Second and more importantly, ours is the first study to examine whether the effects of WLC on mental health are dependent on SES. We found that the degree of the effects of WLC on mental health was higher for higher SES, which might be explained by aspirations.

Family demands must be a key factor in WLC research.<sup>17</sup> It should be considered a key determinant of WLC, as WLC is comprised of the conflicts arising from family and work demands. Although there is abundant empirical evidence that family demands constitute a stressor that can compromise WLC,<sup>39</sup> and that family demands exacerbate the negative impact of WLC,<sup>22</sup> no previous study of the health effects of WLC has explored the role of family demands in the broader context of WLC and mental health. We linked these two distinct lines of research, and our results suggested that family demands can be risk factors by acting as new psychosocial work environment factors. This study showed that family demands and WLC had explanatory power for mental health problems, after controlling for well-established work demands. Thus, the results of

**TABLE 3** Odds ratios for associations of poor mental health and work-life conflict with socioeconomic status with significant interaction effects

		Work-life conflict			
		Men (n = 24 939)		Women (n = 24 462)	
		No	Yes	No	Yes
Model 1	Education level				
	High ( $\geq$ college)	1	1.61**	1	1.52**
	Low ( $\leq$ high school)	1.38**	<u>1.51</u>	1.17**	<u>1.24</u>
	No response	1.28	0.93	1.22	1.32
Model 2	Income (USD <sup>a</sup> per mo)				
	High ( $\geq$ 1880)	1	1.44**	1	1.48**
	Low ( $<$ 1880)	1.18**	<u>1.10</u>	1.10	<u>1.20</u>
	No response	1.22	1.69	1.34**	<u>1.27</u>

Note: An underlined OR for the combined effects indicates that the interaction term was significant ( $P < .05$ ).

<sup>a</sup>In the survey year, the exchange rate was 1000 KRW = 0.94 USD. Models were adjusted for age, work-related variables, family-related variables, and all other variables in Table 1.

\*\* $P < .01$ .

this study indicate that researchers should take family demands and WLC into account as psychosocial work environment factors in studying associations with mental health problems.

Sex differences in work and family experiences have consistently been an important theme in work and family research.<sup>40</sup> Many researchers have hypothesized that women suffer from the conflict far more than men do because of their typically greater home responsibilities and their greater emphasis of the importance of family roles.<sup>41</sup> However, recent researchers have reported that the level of WLC in men and women does not support this.<sup>42</sup> The sex differences in the relationship between WLC and health are not clear. Some studies have found evidence for sex differences, such as insomnia, depression, poor self-rated health, and back pain,<sup>13,43</sup> while others have found no evidence of sex differences in the relationship between WLC and health, such as poor self-assessed health, poor psychological health, and poor physical symptoms.<sup>44</sup> When mental health was used as a health outcome, WLC was significantly associated with poor mental health in the previous 12 months in both men and women. However, there was no sex difference in the effect of WLC on poor mental health.

Regarding work hours, there are two alternative hypotheses regarding how work hours affect WLC. The first hypothesis holds that because part-time job workers can spend relatively more time on their families and personal lives, they are likely to have less WLC. The second hypothesis holds that some workers prefer part-time (rather than full-time) jobs due to their heavier commitment in the care of family-related matters. In this case, they are likely to have more WLC. In other words, more demand for family-related work can force them to seek part-time jobs. To distinguish the two hypotheses, we created a category variable, distinguishing part-time, full-time, or overtime workers, and ran logistic regressions of WLC on this category variable in addition to other control variables used in the baseline regression. Our results show that part-time workers are more likely to report a lower level of WLC than those who work

full-time or overtime (Result are omitted for brevity). This suggests that part-time workers are able to manage their work-life balance better, possibly due to their ability to allocate relatively more time to family life.

Next, we explored how work hours are associated with mental health. Part-time work could plausibly mitigate WLC, and enhance individual health, including mental health. Alternatively, part-time work might negatively affect mental health, since many part-time jobs involve nonstandard work schedules with late shifts and week-end work. Rather than being "stepping stones", part-time jobs are "dead-end" jobs with poor pay and little prospect for promotion.<sup>45</sup> If part-time jobs are poor-quality jobs, with poor pay and low job security, we would expect part-time workers to have poorer mental health.<sup>46</sup> Our results show that part-time workers tend to have poorer mental health. This result can be attributed to the fact that part-time jobs in Korea are generally temporary, poor-quality jobs with poor pay and low job security.<sup>47</sup>

Although it is reasonable to assume that the effects of WLC on health differ according to socioeconomic circumstances, there is little empirical evidence for differences in the impact of WLC on health according to SES such as education and, income level. This is that most research on family demands and WLC has investigated homogeneous populations, typically white-collar workers, that is, well-educated workers.<sup>13</sup> By contrast, we used a nationally representative survey data set that includes various subpopulations and occupations, which enabled us to evaluate differences in the impact of WLC on health by SES. Our results suggest that income and education level acted as significant effect modifiers of the relation between WLC and mental health in both men and women. That is, the effect of WLC on poor mental health was stronger in participants with higher education and income levels in both men and women.

Previous studies found that workers with higher education levels tended to report more frequent exposure to WLC.<sup>29,48-50</sup> Better-educated individuals are likely to have professional jobs that involve

more pressures with better income, and more individuals who engage in role-blurring work-family activities. These occupational characteristics of better-educated can cause greater WLC.<sup>51</sup> Nevertheless, prior studies found that income has a nonsignificant relationship with WLC. One potential explanation for the lack of a clear relationship between income and WLC could be that different definitions of income were used across different studies.<sup>52</sup> Specifically, studies that used family income found a negative correlation between income and WLC.<sup>53</sup> Studies that used the amount of money an individual person received from their job (s) found positive correlations.<sup>54,55</sup>

The relative magnitude of the effect of WLC on mental health appears greater among high socioeconomic groups compared to lower socioeconomic groups, regardless of whether SES was measured by education or income. As discussed above, this is intriguing and somewhat counterintuitive, as low SES represents vulnerability to health problems in most studies, which typically show synergistic effects that exacerbate the health consequences of hazardous exposure. However, there are other possible explanations for our findings. The pathway by which WLC affects mental health may be different from that of SES. In our study, SES acted as a significant effect modifier of the relationship between mental health and WLC in both men and women, indicating that the effect of WLC on mental health was stronger in participants with high SES. The nature of WLC as a stressor may not arise from external threats but, rather, from internal psychological demands to coordinate the balance between work and life according to the aspirations of reward, not only from work but also from personal and social life. Compared to those with lower SES, those with higher SES tend to have higher occupational aspirations and greater means to achieve their aspirations.<sup>56</sup> However, their aspirations may not always be fulfilled, and studies show that the discrepancy between aspirations and reality leads to goal-striving stress, that may be greater among more advantaged individuals compared to poorer people.<sup>57</sup> Thus, those with higher SES in our study might have greater aspirations surrounding work-life balance, and the lack of such balance leads to greater goal-striving stress, compared with lower SES groups. Therefore, the lower risk of mental health problems associated with WLC among the low SES group may reflect the contradictory fact that adverse socioeconomic conditions may limit the aspirations for higher well-being through work-life balance and lead to lower goal-striving stress arising from WLC.

Our study has some limitations. The first methodological limitation is that this was a cross-sectional study. Thus, we were unable to determine any causal relationship between exposure (family demands and WLC) and outcome (poor mental health). However, previous longitudinal studies have confirmed the direction of the relationship between WLC and health.<sup>58</sup> Second, both exposure and outcome were measured with self-reported data. These may have been strongly influenced by the respondents' characteristics and moods at the time. Furthermore, poor mental health was measured using only a single question and, thus, there could be concerns about the limited reliability and validity of these data. Third, we addressed missing values using the missing indicator method.<sup>59</sup> In our data set,

information was missing in 0.8% for education level, 7.0% of the subjects for income, 1.2% for working hours, and 1.6% for physical demands, as determined by the number of responses to "no answer" categories. We examined the empirical distributions of covariates across two groups of subjects, subjects with complete data and subjects with missing data, to better understand the nature of missing data. We found that the distributions of each covariate obtained from subjects with complete data and those with missing data are remarkably similar. Next, we examined how including subjects with missing data affects our results. To do so, we used the complete case analysis by excluding subjects with missing data. Our results of logistic regression obtained from the complete case analysis were comparable to the baseline results obtained from the missing indicator method.

## 5 | CONCLUSIONS

Our findings suggest that WLC and family demands are associated with poor mental health among South Korean workers, independently of work demands. Moreover, higher SES may increase the effect of WLC on mental health in both men and women. Based on strong empirical evidence, we suggest that researchers need to take WLC and family demands into account as important risk factors in examining the effects of working conditions on mental health problems, and future efforts for health promotion should reflect the new characteristics of psychosocial factors in the workplace and their interactions with workers' WLC and SES.

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### CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

### DISCLOSURE BY AJIM EDITOR OF RECORD

John D. Meyer declares that he has no conflict of interest in the review and publication decision regarding this article.

### AUTHOR CONTRIBUTIONS

Y-MK formulated the research question, designed the study, analyzed data, and wrote the manuscript. S-IC contributed to data analysis and revised the manuscript.

### ETHICS APPROVAL AND INFORMED CONSENT

This study was approved by the institutional review board (IRB) of the Public Institutional Bioethics Committee designated by the Ministry of Health and Welfare (P01-201911-22-002).



## DISCLAIMER

The paper's contents are solely the responsibility of the authors and do not necessarily represent the official views of the Occupational Safety and Health Research Institute.

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