



Emotional labor and depressive mood in service and sales workers: Interactions with gender and job autonomy

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ABSTRACT

Emotional labor is strongly correlated with negative consequences in psychological well-being and mental health status in workers. We investigated the associations of emotional labor with depressive mood and perceived usual stress level according to gender and its interactions with job autonomy in service and sales workers. The data from 2,055 service and sales workers from the Korea National Health and Nutrition Examination Surveys (KNHANES) conducted from 2007 to 2009 were analyzed. High emotional labor was associated with increased risk for depressive mood in female workers (adjusted odds ratio [aOR] = 2.19, 95% confidence interval [CI] = 1.56–3.07). Emotional labor and job autonomy showed interactive effects on depressive mood in that high emotional labor was associated with depressive mood only in the presence of low job autonomy in male workers (aOR = 2.85, 95% CI = 1.13–7.17). A significant mediation pathway between high emotional demand and prevalence of depressive mood through higher stress level was observed in female workers. In conclusion, female workers had high vulnerability to depressive symptoms due to emotional labor, and high job autonomy can act as a buffer against the detrimental effect of emotional labor in male workers.

1. Introduction

Work is viewed as one of the most important aspects in an individual's quality of life, and an unfavorable psychosocial working environment can substantially exert harmful effects on worker's mental health (Nieuwenhuijsen et al., 2010). In a nationally representative sample of workers in the United States, 6.4% workers met the diagnostic criteria of major depressive episode for 12 months according to the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI) (Kessler et al., 2006), and a previous meta-analysis showed that job-related stressors were strongly associated with onset of major depressive disorder (MDD) (Bonde, 2008).

Workers in frontline service jobs interact with customers and deal with their arguing, complaining, and sometime excessive demand (Yoon et al., 2016). High psychological strain and emotional demands have been reported in these workers (Tang, 2014). Service and sale workers are often required to express their emotions in a standardized manner, such as unwavering kindness and sympathy to customers (Wharton, 2009). Emotional labor, first defined by American sociologist Hochschild (1983) in her book *The Managed Heart*, is characterized by display of publicly desirable emotions while hiding or suppressing genuine emotions to adhere to emotional display rules mandated by organizations (Grandey, 2000; Wharton, 2009). Cumulative evidence

suggests that emotional labor has detrimental effects on psychological well-being, such as emotional exhaustion, burn out, and increased stress levels (Brotheridge and Grandey, 2002; Grandey et al., 2007), and on mental health status, such as depression, stress, and suicidality in workers (Muntaner et al., 2006; Yoon et al., 2016).

Along with emotional labor, the job demand–control (JDC) model, introduced by Karasek (1979), provides a conceptual framework that work-related psychological strain can be explained by the interplay of two job characteristics: *demand* (i.e., physical or mental workload or time pressure) and *control* (i.e., job autonomy reflecting skill discretion and decision authority). A growing body of evidence has shown that a combination of high job demand and low job control has the most harmful effect on workers' mental health (Häusser et al., 2010). In the context of the JDC model, recent studies found that emotional labor-related demand can cause adverse mental health outcomes, such as depressive symptoms or suicidal ideation, in an interactive manner with job control. A combination of high emotional labor and low job autonomy was associated with the most severe negative consequences (Sohn et al., 2016; Yoon et al., 2016). A previous meta-analysis performed by Bonde (2008) included the data of about 63,000 employees from 16 longitudinal studies on work-related risk for development of depression and used a validated scale for work-related perceived psychosocial stressors and clinical criteria of MDD or measurement of

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depressive symptoms. The meta-analytic study suggested that high job demand and low decision latitude (i.e., job control) showed the strongest, consistent association with the onset of MDD or depressive symptoms among male workers (Bonde, 2008).

Emotional labor-related work is highly gendered in most countries: A higher proportion of female than male workers perform emotional labor, and this occupational gender segregation is most prominent in the service and sales sectors (Guy and Newman, 2004; Wharton, 2009). In research on emotional labor and its harmful effect on psychological outcomes, the study samples have had high proportions of women workers (Kim and Choo, 2017; Muntaner et al., 2006; Oh et al., 2017). However, it remains unclear whether female or male workers have higher vulnerability to emotional labor's detrimental effect on mental health. Several studies have suggested that gender might moderate the relationship between emotional demand and psychological strain (Nixon et al., 2011; Scott and Barnes, 2011). Furthermore, a great deal of evidence has suggested that *display rules*, which are prescriptive social norms indicating how, when, and where workers' emotions should be suppressed or expressed, differ by gender (Simpson and Stroh, 2004). This difference might affect the potential moderating role of gender.

The majority of previous studies on emotional labor and workers' mental health status have focused on specific types of service sectors, such as call centers, home care, nursing homes, or health care workers (Delgado et al., 2017). However, few studies have investigated the effect of emotional labor in a representative sample of service or sales workers (Yoon et al., 2016). Thus, previous findings on specific emotional labor-related jobs might have limited generalizability to other service or sales job sectors (Kim and Choo, 2017). Furthermore, most previous research on this issue has investigated psychological variables, such as work-related emotional exhaustion, burn out, depersonalization, job satisfaction, or psychological well-being as their study outcomes, and these do not provide direct indications of workers' mental health status in areas such as depressive symptoms or perceived usual stress level (Hülshager and Schewe, 2011). This lack calls for a comprehensive study using a representative sample of service or sales workers that elucidates the complex relationships among emotional labor, depressive symptoms, and stress and the moderating roles of gender and job autonomy. Therefore, in the current study, we investigate the associations of emotional labor with depressive mood and perceived usual stress level according to gender and its interactions with job autonomy using a representative sample of service or sales workers. We also explore the mediation pathways among emotional labor, perceived usual stress level, and depressive mood. We determined *a priori hypotheses* as follows: 1) Stronger correlations of emotional labor with depressive mood and stress level will be observed in female workers than in male workers. 2) The combination of high emotional labor-related demand (i.e., emotional demand) with low job control will have the most detrimental effects on depressive mood and stress level. 3) The positive association between emotional demand and depressive mood will be significantly mediated by stress level.

2. Methods

2.1. Study design and participants

We analyzed the data from the fourth wave of the Korea National Health and Nutrition Examination Surveys (KNHANES) conducted from 2007 to 2009 in South Korea. The KNHANES is a nationally representative population-based study with a cross-sectional design, performed annually by Korea Centers for Disease Control and Prevention (KCDC) since 1998. This survey investigates the health and nutritional status of the Korean population and their socioeconomic and behavioral determinants. The sample for the KNHANES is composed of non-institutionalized civilians aged 1 year or older in selected households (Kweon et al., 2014). For selection of a nationally representative

sample, the KNHANES employed multi-stage clustered probability sampling, and weighted values were constructed by the Korea Institute of Health and Social Affairs for complex sampling design adjusted for survey non-response rate and post-stratification (Kweon et al., 2014). In each household, well-trained medical staff members and interviewers surveyed respondents using the health-interview questionnaires in a semi-structured manner for assessment of health and socioeconomic characteristics (Kweon et al., 2014). Detailed information about the study design of the KNHANES was described in the data resource profile (Kweon et al., 2014).

In the present study, from the 24,871 individuals enrolled in the fourth wave of the KNHANES (2007–2009), we obtained the data of 2,055 service and sales workers aged 19 years or older who responded to the questions regarding emotional demand, job control, depressive mood, and perceived usual stress level. Service and sales workers were included based on information about occupation category according to the Korean Standard Classification of Occupations (Yoon et al., 2016). We also included wage workers, unpaid family workers, and self-employed workers-employers. We did not require written informed consent of the participants in our study because the dataset of KNHANES is publicly available (<https://knhanes.cdc.go.kr/knhanes/main.do>). The study protocol was approved by the institutional review board of Korea University Ansan Hospital

2.2. Measurements of emotional demand, job control, depressive mood, and perceived usual stress level

Emotional demand was measured using the following four-point Likert-type self-report questions: "I have to hide or suppress my emotions while working (answer: never, rarely, sometimes, and always)" (Seok et al., 2014; Yoon et al., 2016). The question and response categories were developed by the Division of Health and Nutrition Survey, KCDC for the KNHANES (2007–2009) adapting the conceptualization of emotional labor by Morris and Feldman (1996). According to their responses, participants were assigned into high (answered "always" or "sometimes") and low (answered "rarely" or "never") emotional demand groups (Seok et al., 2014; Yoon et al., 2016). Job control was measured using the following four-point Likert-type self-report question: "I have the authority to make decisions about my job, and I can use that authority at work (answer: never, rarely, sometimes, and always)." The respondents were classified into high and low job-control groups similarly to those for emotional demand (Kim et al., 2016; Yoon et al., 2016). The questions about emotional demand and job control were used in previous social epidemiological studies that examined the association between job demand and control and physical and mental health status in workers using the data of KNHANES (Kang et al., 2013; Kim et al., 2016; Sohn et al., 2016; Yoon et al., 2016).

Prevalence of depressive mood was determined using the following single item: "Have you felt sadness or despair affecting your daily life for more than 2 weeks during the past year (answer: yes or no)" (Han et al., 2017). Perceived usual stress level was assessed using the following item on a four-point Likert scale: "How much stress do you usually feel in your daily life? (answer: very high, high, low, or little)" (Han et al., 2016). These single-item measures of depressive mood and perceived usual stress level were used in previous studies using data from the KNHANES that explored mental health status in workers (Han et al., 2017; Kim et al., 2015; Sohn et al., 2016) or in the general population (Han et al., 2016; Oh and Kim, 2017; Park et al., 2016). We also investigated the respondents' mental health service utilization during the past year with the question "during the past year, have you visited any healthcare institutions, or have you received consultation through the Internet, telephone, etc. due to your mental health problems?", per our previous study (Han et al., 2016).

2.3. Covariates

We obtained the following socioeconomic and health-related characteristics of the respondents: gender, age (19–29 years, 30–39 years, 40–49 years, 50–59 years, 60 years or older), education level (elementary school graduation or below, middle school graduation, high school graduation, college degree or above), marital status (widowed, divorced or separated, never married, married), monthly household income level (below the first quartile [Q1], above Q1 and below the second quartile [Q1–Q2], above Q2 and below the third quartile [Q2–Q3], above Q3), employment status (wage workers with full time and permanent employment [non-precarious workers], workers with precarious employment [precarious workers], unpaid family worker, self-employed worker or employer), hazardous working condition (high level, low level), residential region (urban, rural), diagnosis of one or more of diabetes mellitus, hypertension, angina, asthma, and arthritis (yes, no), alcohol drinking (4 times or more/week, 2–3 times/week, 2–4 times/month, less than once/month, past or never), smoking (current, past, never), and vigorous-intensity physical activity (≥ 20 min/day and 3 times/weeks: yes, no). The quartile values of household income were obtained based on equivalent monthly household income, calculated by dividing raw monthly household income by square root of family size (Han et al., 2016). We determined the presence of hazardous working environments according to responses to the item, “My job is hazardous and has a high risk for workplace injuries,” as follows: high for answers of “usually” or “sometimes” and low for answers of “never” or “rarely.”

2.4. Statistical methods

To explore the complicated relationships among emotional demand, job control, depressive mood, and perceived usual stress level, we performed the following series of analyses. We applied gender stratification in the logistic regression models to evaluate the gender-specific effects of emotional demand and job control on mental health status. First, we examined whether there were any significant differences in socioeconomic and health-related variables between the high and low emotional demand groups using chi-square tests. We explored whether socioeconomic and health-related outcomes predicted high emotional demand using logistic regression analysis controlling for all the socioeconomic and health-related variables (i.e., gender, age, education level, marital status, household income level, employment status, hazardous working condition, residential region, chronic disease, alcohol consumption, smoking, and physical activity). Second, we investigated the associations of emotional demand and job control level with depressive mood and perceived usual stress level using a gender-stratified logistic regression model fully adjusted for all socioeconomic and health-related variables and job control and emotional demand levels. Third, we constructed a JDC-based model combining the variables of emotional demand and job control to investigate job control as a moderator of the relationships of emotional demand with depressive mood and stress level (i.e., high emotional demand and low job control group, high emotional demand and high job control group, low emotional demand and low job control group, low emotional demand and high job control group). The fully-adjusted logistic regression model included the combined variable and depressive mood and stress levels as independent and dependent variables, respectively, and all socioeconomic and health-related variables as covariates. Finally, we examined the mediating effect of perceived usual stress on the relationship of emotional demand with depressive mood using gender-stratification and employing the mediation analysis method developed by Hayes and Preacher (2014). This mediation analysis (2014) assesses the indirect effects of potential mediators in the logistic regression model using a non-parametric bootstrapping method. We used a program developed by Preacher and Hayes, PROCESS macro (ProcessV2.16.3, <http://www.processmacro.org/download.html>), for

mediation analysis with 5,000 bootstrapping iterations and full adjustment for all socioeconomic and health-related variables to obtain a bootstrapped 95% confidence interval for the mediating effect in each gender-stratified mediation model, including emotional demand, perceived usual stress level, and prevalence of depressive mood as independent variables, potential mediator, and dependent variable, respectively. We confirmed the significance of the mediating effect by verifying that the 95% confidence intervals of the mediating effects did not contain zero. We adopted a complex sampling design method to calculate the population-weighted nationally representative statistics in all except the mediation analysis. This difference was because Hayes and Preacher's method for mediation analysis could not be implemented in the setting of a complex sampling design. We employed multi-nominal regression analysis when the independent variable had three or more categories. All statistical analyses were performed using IBM SPSS Statistics for Windows, Version 24.0 (IBM Corporation, Armonk, NY, USA), and the PROCESS macro program provided the analytical tools embedded in the SPSS program.

3. Results

3.1. Socioeconomic and health-related characteristics in high and low emotional demand groups

Among 2,055 workers, 302 people had experienced depressive mood lasting more than 2 weeks within the past year (13.9%, all percentages are population-weighted values). Out of the 879 and 1,176 service and sales workers with high and low emotional demand, respectively, 172 (18.5%) and 130 (10.4%) had experienced depressive mood. Mean age of respondents was 43.1 years (range: 19 ~ 83 years, standard deviation: 12.2 years). There were significant differences in gender, age level, hazardous working condition, job control level, depressive mood, and perceived usual stress level between the high and low emotional demand groups (all, $p < 0.05$, Table 1). In the logistic regression analysis, we found that service and sales workers with female gender, younger age level of 19–29, 30–39, or 40–49 years (vs. 60 years or older), hazardous working conditions, or greater alcohol drinking frequency of more than 4 times per week were more likely to have high emotional demand level, whereas being unmarried (vs. married) was associated with low emotional demand (Table 1).

3.2. Association between high emotional demand/low job control and depressive mood/perceived usual stress level

Female service and sales workers with high emotional demand were more likely to experience depressive mood than those with low emotional demand level (adjusted odds ratio [aOR] = 2.19, 95% confidence interval [CI] = 1.56–3.07, Table 2 and Fig. 1). However, in male workers, high emotional demand was not associated with prevalence of depressive mood. Low job control did not affect depressive mood in either female or male workers (Table 2). High emotional demand was associated with perceived usual stress level of *very high* (aOR = 6.45, 95% CI = 3.14–13.27), *high* (aOR = 5.08, 95% CI = 3.04–8.48), or *low* (aOR = 2.46, 95% CI = 1.48–4.08) in female workers and of *very high* (aOR = 6.28, 95% CI = 2.24–17.62) or *high* (aOR = 3.27, 95% CI = 1.79–6.01) in male workers (Table 2). The results of logistic regression analyses without adjustment of the covariates are presented in the supplementary material (Table S1).

3.3. Moderating effect of job control on the relationships of emotional demand with depressive mood and perceived usual stress

A significant moderating effect of job control on the association of high emotional demand with depressive mood was observed in male workers (Table 3). Male workers with two detrimental job conditions in the JDC model (i.e., having both high emotional demand and low job

Table 1
Socioeconomic and health-related characteristics of the study population.

	High emotional demand (n = 879)		Low emotional demand (n = 1,176)		Chi-square test		High emotional demand	
	n	%	n	%	χ^2	p	aOR	95% CI
Gender								
Female	555	55.6	681	48.6	10.01	0.007	1.56^b	1.19 - 2.06
Male	324	44.4	495	51.4			1	
Age								
19–29 years	125	19.8	181	21.0	15.60	0.009	1.87^a	1.06 - 3.30
30–39 years	218	24.2	248	21.7			2.23^b	1.32 - 3.79
40–49 years	320	35.4	350	30.9			2.21^b	1.36 - 3.59
50–59 years	163	17.1	267	19.9			1.55	0.99 - 2.42
60 + years	53	3.5	130	6.5			1	
Education level								
Elementary school graduation or below	117	10.1	175	10.6	2.62	0.454	1.06	0.71 - 1.56
Middle school graduation	117	12.9	161	12.4			1.10	0.76 - 1.58
High school graduation	457	54.3	577	51.5			1.10	0.87 - 1.39
College degree or above	188	22.7	263	25.6			1	
Marital status								
Widowed	31	2.5	49	3.2	9.04	0.052	0.80	0.47 - 1.35
Divorced or separated	75	8.0	70	5.2			1.37	0.92 - 2.03
Never married	128	19.4	201	22.2			0.67^a	0.46 - 0.99
Married	645	70.1	856	69.4			1	
Income								
Less than Q1	93	9.7	130	9.0	1.92	0.650	1.11	0.78 - 1.60
Q1 - Q2	227	26.2	324	27.5			0.97	0.73 - 1.29
Q2 - Q3	299	34.4	377	32.0			1.10	0.86 - 1.40
More than Q3	260	29.8	345	31.5			1	
Employment status								
Permanent workers	251	29.8	296	27.5	3.37	0.502	1.00	0.76 - 1.32
Precarious workers	183	21.5	235	20.9			0.88	0.64 - 1.20
Unpaid family workers	48	4.9	98	6.5			0.72	0.44 - 1.18
Self-employed or employer	397	43.8	547	45.1			1	
Hazardous working condition								
High ("usually" or "sometimes")	242	27.2	188	16.7	33.32	<0.001	1.94^c	1.54 - 2.46
Low ("never" or "rarely")	637	72.8	988	83.3			1	
Residential region								
Urban	723	84.7	936	84.7	<0.001	0.993	1.07	0.83 - 1.37
Rural	156	15.3	240	15.3			1	
Any chronic disease								
Yes	191	18.8	269	19.3	0.08	0.796	1.02	0.78 - 1.33
No	688	81.2	907	80.7			1	
Alcohol								
4 or more / week	103	13.2	110	9.9	7.34	0.241	1.78^a	1.14 - 2.77
2 - 3 / week	150	18.2	211	19.7			1.21	0.84 - 1.74
2 - 4 / month	243	28.1	304	27.4			1.26	0.90 - 1.77
1 or less than / week	249	26.2	323	26.4			1.15	0.83 - 1.59
Past or never	134	14.2	228	16.6			1	
Smoking								
Current	235	30.9	320	32.9	0.98	0.701	1.07	0.79 - 1.45
Past	141	17.9	192	17.6			1.23	0.87 - 1.75
Never	503	51.2	664	49.4			1	
Physical activity								
No	723	80.9	950	79.7	0.49	0.545	1.13	0.88 - 1.46
Yes	156	19.1	226	20.3			1	
Job control								
Low	202	24.0	210	17.9	11.60	0.002		
High	677	76.0	966	82.1				
Depressive mood								
Yes	172	18.5	130	10.4	27.43	<0.001		
No	707	81.5	1046	89.6				
Perceived usual stress								
Very high	78	8.9	37	3.2	133.8	<0.001		
High	328	37.2	238	20.2				
Low	415	47.5	721	61.8				
Little	58	6.3	180	14.8				
Mental health service utilization								
Yes	23	3.0	21	1.5	4.80	0.051		

(continued on next page)

Table 1 (continued)

	High emotional demand (n = 879)		Low emotional demand (n = 1,176)		Chi-square test		High emotional demand	
	n	%	n	%	χ^2	p	aOR	95% CI
No	856	97.0	1155	98.5				

n = unweighted number of subjects, % = population-weighted percentage.

The adjusted odds ratio was obtained by logistic regression analysis including high emotional demand as a dependent variable and all socioeconomic and health-related variables as covariates.

aOR, adjusted odds ratio; CI = confidence interval. If aOR > 1, then high emotional demand is more likely compared to reference variables.

^a p < 0.05;

^b p < 0.01;

^c p < 0.001

control) were more likely to experience depressive mood compared to those without any detrimental job control (i.e., having both low emotional demand and high job control, aOR = 2.85, 95% CI = 1.13–7.17). Male workers with both high emotional demand and high job control did not have increased risk for depressive mood (Table 3). High emotional demand with either high or low job control was significantly associated with depressive mood in female workers (Table 3). Female workers with both high emotional demand and low job control generally had greater aOR for very high, high, or low level of stress compared to those with high emotional demand and high job control (Table 3). Male workers with high emotional demand and low job control had an increased risk only for very high level of stress (Table 3).

3.4. Mediating effect of perceived usual stress level on the relationship of emotional demand with depressive mood

We observed that the association between high emotional demand and depressive mood was significantly mediated by perceived usual stress level in female workers (estimated indirect effect = 0.327, bootstrapped 95% confidence interval [boot CI] = 0.224–0.444, direct effect = 0.446, Table 4). However, we found no significant direct effect of high emotional demand on depressive mood in male workers, consistent with the results of the main analysis. Thus, a mediation pathway could not be established in male workers (Table 4).

3.5. Secondary analysis for investigating the moderating effect of socioeconomic status on the correlation between emotional demand and depressive mood in female workers

As a secondary analysis, we performed an analysis investigating the interactive effects of income and education level on the association between emotional demand and depressive mood among female workers, because our main result of significant correlation between high emotional demand and depressive mood was found only in female workers, and education level and income level are the most widely used

indices of socioeconomic status (SES) in social epidemiologic studies on mental health (Lorant et al., 2003). We performed SES-stratified regression analyses with full adjustment for all socioeconomic and health-related variables and job control among female workers with the following stratifications: i) female workers with low income and low education level, ii) low income and high education level, iii) high income and low education level, and iv) high income and high education level. The operational SES was determined as follows: education level (low: middle school graduation or below vs. high: high school graduation or above) and income level (low: below Q2 vs. high: above Q2). In the analysis, we found that significant correlation between high emotional demand and depressive mood was only found among female workers with both high income and high education level (aOR = 2.48, 95% CI = 1.43–4.29, Table S2).

4. Discussion

In this study, we observed a significant correlation between high emotional demand and depressive mood in female service and sales workers, but not in male workers. A moderating effect of job control level on the association between high emotional demand and depressive mood was found in male workers. We also observed that the correlation between high emotional demand and depressive mood was significantly mediated by perceived usual stress level among female workers. To the best of our knowledge, this study firstly investigated the complex relationship among emotional demand, job control, depressive mood, stress level, and gender among representative samples of service and sales workers.

The strong correlation of emotional labor with depressive symptoms in female service and sales workers in our study is supported by previous findings that hiding or suppressing emotion was related with increased risk for depressive symptoms among call center workers (Kim and Choo, 2017; Oh et al., 2017), nursing home staff (Muntaner et al., 2006), home care workers (Muntaner et al., 2006), and nurses (Schmidt and Diestel, 2014). Emotional labor involves two kinds of

Table 2

Associations of high emotional demand and low job control with depressive mood and perceived usual stress level in a gender-stratified analysis.

Mental health outcomes	High emotional demand				Low job control			
	Female		Male		Female		Male	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Depressive mood (Yes)	2.19 ^a	1.56 - 3.07	1.43	0.83 - 2.47	0.84	0.57 - 1.24	1.69	0.77 - 3.73
Perceived usual stress								
Very high	6.45 ^a	3.14 - 13.27	6.28 ^a	2.24 - 17.62	2.16	0.99 - 4.70	1.27	0.39 - 4.17
High	5.08 ^a	3.04 - 8.48	3.27 ^a	1.79 - 6.01	1.14	0.62 - 2.09	0.75	0.36 - 1.57
Low	2.46 ^a	1.48 - 4.08	1.34	0.74 - 2.41	1.23	0.70 - 2.19	0.68	0.34 - 1.33

In an adjusted model, we performed logistic regression analyses for depressive mood or specific stress level, after controlling for all potential confounding factors (socioeconomic and health-related variables and emotional demand/job control).

aOR, adjusted odds ratio; CI = confidence interval. If aOR > 1, then depressive mood or specific stress level is more likely compared to reference variables.

^a p < 0.001.



Fig. 1. Comparisons of the estimated (population-weighted) prevalences of depressive mood between workers with high versus low emotional demand in female and male service and sales workers. Note: **adjusted odds ratio = 2.19, 95% confidence interval = 1.56–3.07, $p < 0.001$; *adjusted odds ratio = 1.43, 95% confidence interval = 0.83–2.47, $p > 0.1$.

emotion management processes, surface acting or deep acting (Grandey, 2000). Surface acting is a response-focused emotional management strategy that inhibits already generated genuine emotions and modifies observable expressions to fulfill organizational display rules. Deep acting is an antecedent-focused emotion regulation strategy in which one effortfully adjusts one's perception or process of emotional cues before development of emotion (Grandey, 2000; Kim and Choo, 2017; Oh et al., 2017). The measurement of emotional labor in our study focused on hiding or suppressing of emotion in the workplace, which is surface acting (Brotheridge and Grandey, 2002). Previous studies have found surface acting to be more consistently detrimental to mental health status in workers compared to deep acting (Hülsheger and Schewe, 2011; Oh et al., 2017; Schmidt and Diestel, 2014). A previous study investigating the associations of the two types of emotional labor with depressive symptoms in 274 call center workers also found that surface acting, but not deep acting, was positively correlated with severity of depressive symptoms (Oh et al., 2017). It has been suggested that faking or hiding one's emotions and using standardized expressions of emotion can cause a disconnection between felt emotion and expressed emotion; thus, obeying display rules can result in emotional dissonance (Hülsheger and Schewe, 2011). Emotional dissonance can lead to emotional exhaustion, burn out, depersonalization, lower

self-authenticity, psychological strain, and stress-like physiological responses, which in turn can lead to depressive symptoms (Hopp et al., 2010; Hülsheger and Schewe, 2011; Yoon et al., 2016).

In this study, an association of high emotional demand with depressive mood was observed only in female workers. To the best of our knowledge, no study has previously examined whether gender moderates the effect of emotional labor on depressive symptoms, but several pieces of indirect evidence have been suggested. A previous study investigated the moderating effects of gender on the correlations of the two types of emotional labor (surface and deep acting) with emotional exhaustion and affective well-being in 176 customer service workers. The study reported a significant interaction between gender and surface acting with respect to emotional exhaustion and affective well-being (Johnson and Spector, 2007). The study suggested that female workers with higher levels of surface acting had more severe emotional exhaustion and poorer affective well-being compared to male workers with the same level of surface acting (Johnson and Spector, 2007). This finding is similar to our observation of stronger correlations of surface acting with depressive mood and stress level in female workers than in males. A higher vulnerability to emotional labor in female vs. male service and sales workers was also suggested by a study that examined the interactive effect of gender and mental demands, including surface

Table 3
Demand-control model with depressive mood and perceived usual stress level in a gender-stratified analysis.

Demand-control model	Depressive mood		Very high stress (vs. little stress)				High stress (vs. little stress)				Low stress (vs. little stress)					
	Female		Male		Female		Male		Female		Male		Female		Male	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
High ED + Low JC	1.96 ^b	1.20 - 3.22	2.85 ^a	1.13 - 7.17	18.16 ^c	5.10 - 64.67	8.63 ^a	1.51 - 49.43	7.43 ^c	2.73 - 20.20	3.30	0.93 - 11.75	4.06 ^b	1.53 - 10.78	0.92	0.26 - 3.33
High ED + High JC	1.96 ^c	1.33 - 2.87	1.27	0.68 - 2.39	6.22 ^c	2.83 - 13.67	7.28 ^c	2.41 - 22.02	4.65 ^c	2.55 - 8.48	2.80 ^b	1.45 - 5.44	2.15 ^b	1.22 - 3.78	1.32	0.70 - 2.48
Low ED + Low JC	0.61	0.31 - 1.21	1.20	0.40 - 3.58	2.17	0.72 - 6.56	1.93	0.32 - 11.58	1.06	0.50 - 2.26	0.40	0.14 - 1.18	1.05	0.55 - 2.00	0.68	0.30 - 1.55
Low ED + High JC	1		1		1		1		1		1		1		1	

In an adjusted model, we performed logistic regression analyses for depressive mood or specific stress level after controlling for all potential confounding variables (socioeconomic and health-related variables).

aOR, adjusted odds ratio; CI = confidence interval. If aOR > 1, then depressive mood or specific stress level is more likely compared to reference variables.

^a $p < 0.05$

^b $p < 0.01$

^c $p < 0.001$ (abbreviations: ED, emotional demand level; JC, job control level)

Table 4
Mediation pathway between emotional demand and depressive mood through perceived usual stress in female and male service and sales workers.

Gender	Independent variable (IV)	Mediator (M)	Dependent variable (DV)	IV on M		M on DV		IV on DV			Mediating effect of M		
				Effect of IV on M	p	Effect of M on DV	p	Direct effect of IV on DV	p	Indirect effect	Boot SE	Boot LLCI	Boot ULCI
Female*	Emotional demand	Perceived usual stress	Depressive mood	0.331	<0.0001	0.988	<0.0001	0.446	0.006	0.327	0.057	0.224	0.444
Male				0.355	<0.0001	0.898	<0.0001	0.156	0.563	0.319	0.083	0.177	0.501

All estimated effect values, p-values, standard errors, and confidence intervals were obtained from the mediation analysis described by Hayes and Preacher (2014). Significant mediating effect indicated in bold with an asterisk ($p < 0.05$).

DV, dependent variable; M, mediator; IV, independent variable; boot SE, boot-strapped standard error; boot LLCI/ULCI, lower level (LL) or upper level (UL) confidence interval (CI) for boot-strapped effect value in the mediation analysis based on 5,000 bootstrap samples.

acting, on the level of self-rated health in 2,832 manual workers in the KNHANES 2008–2009 (Kim et al., 2016). They observed an interaction between gender and mental demand and reported that increased mental demand was more detrimental to the self-rated health status of female workers than male workers (Kim et al., 2016). Although self-rated health status had a strong correlation with depressive mood (Ambresin et al., 2014; Shin et al., 2016), the study by Kim et al. (2016) provides only indirect evidence of our suggestion. We could provide a hypothetical explanation for stronger associations of emotional labor-related demand with depressive mood and stress level in the sociocultural context of the labor environment. It is possible that female service and sales workers encounter stronger demands for emotional labor when male and female workers apply similar degrees of surface acting in their work, because social prejudice and pressure on women's traditional care-taking role might be transferred to the service sector, and this could overburden women with increased emotional demand in the workplace, with respect to both quantity and quality (Lee, 2015). Gender-specific displaying rules also could affect the moderating effect. For example, female workers are more likely to be required to follow feminine display rules—suppressing negative emotions and simulating positive emotions—whereas male workers are expected to adopt masculine display rules—suppressing positive emotions and simulating negative emotions—and these different emotional displaying rules might moderate the effect of gender (Simpson and Stroh, 2004). Further efforts to develop both empirical evidence and theoretical frameworks for the potential moderating role of gender are required to disentangle this complex issue.

With regard to the effect of job control, we observed that male workers with both high emotional demand and low job autonomy experienced depressive mood, whereas those with high emotional demand and high job autonomy did not. This implies that high emotional demand exerts a harmful effect on male workers' mood in an interactive manner with degree of job autonomy. A growing body of evidence has also suggested that high job autonomy could alleviate the negative consequences of high emotional demand on workers' mental health status (Häusser et al., 2010). As a theoretical model that explains mental strain in the context of the workplace, the JDC model posits that interactions between high psychological job demand and low job control lead to negative consequences on workers' mental health (Häusser et al., 2010). According to this model, high emotional demand and low job autonomy have detrimental effects on psychological outcomes in an additive or multiplicative manner, and high job control buffers the harmful effects of high emotional demand on mental health indicators (Häusser et al., 2010; Tang, 2014). For female workers, we did not find a moderating effect of job autonomy in the association between high emotional demand and depressive mood. Female workers with high emotional demand and high job control and those with high emotional demand and low job control showed similar aOR for experiencing depressive mood, while the former showed greater aORs compared to the latter for stress level. We postulate that high job

autonomy has a gender-specific buffering effect on high emotional demand in our sample. A recent study investigating the associations of emotional demand and job control with suicidal ideation using the same dataset of KNHANES supports our postulation (Yoon et al., 2016). They found that low job control level was associated with increased suicidal thoughts in male workers, but not in female workers. Based on our findings, we provide an explanation that male workers in the service and sale sectors might have higher sensitivity to job autonomy with respect to depressive symptoms than female workers. We recommend further studies on this issue.

We observed that high perceived usual stress level mediated the association between high emotional demand and prevalence of depressive mood in female, but not in male, workers. Emotional labor-related job demand is positively associated with both occupational stress and (non-occupational) perceived usual stress level in workers (Delgado et al., 2017; Lee, 2015; Oh et al., 2017), and a strong correlation between stress level and depressive symptoms was also robustly established (Bergdahl and Bergdahl, 2002; Pruessner et al., 2003). To the best of our knowledge, we are the first to show that high stress level could be a mediator in the pathway between emotional labor and depressive mood. One previous study provided a clue to elucidate an underlying neurobiological mechanism of this mediation pathway. Qi et al. found a positive correlation between the degree of surface acting and cortisol concentration in hair among female kindergarten teachers (Qi et al., 2017). Given that the hypothalamic–pituitary–adrenal (HPA) axis is the most important stress hormone system, and that chronic stress-induced cortisol secretion is deeply involved in the pathophysiology of depression (Pariante and Lightman, 2008), it is likely that disturbance in the HPA axis has a pivotal role in the links among emotional labor, stress, and depressive mood.

In a secondary analysis, we observed a significant moderating effect of SES on the association between high emotional demand and depressive symptoms among female workers. Those with both high income and education level only showed a significant correlation. This indicates that higher SES in female workers may result in higher vulnerability for detrimental effects of emotional labor on depressive mood. Generally, higher SES is known to be associated with a buffering effect for harmful effects of job-related stress on mental health status (Ibrahim et al., 2009); however, no study has investigated the moderating effect of SES regarding the correlation between emotional labor and depressive symptoms. Further studies are required.

This study used a nationally representative sample of service and sales workers with a complex sampling design and applied a conservative adjustment for potential confounding factors to elucidate a complex relationship among gender, emotional labor, job autonomy, stress, and depressive mood. However, there are several limitations to consider. First, we could not adopt a standardized scale to measure emotional labor, such as the scales developed by Brotheridge and Lee (2003) or Grandey (2003) and used in several studies (Nixon et al., 2017; Qi et al., 2017). This constraint is because the KNHANES was

designed as a comprehensive health survey using a nationally representative sample of the general population, rather than specifically focusing on emotional labor and workers' mental health (Kweon et al., 2014). Thus, we investigated the degree of surface acting using only a single-item measure and could not explore the influence of deep acting on workers' depressive mood and stress level. This limitation might affect our results. Second, according to Karasek's JDC model, the concept of job control compasses two major aspects including job autonomy (i.e., decision authority) and skill discretion (i.e., one's opportunity to use specific job skills in the working process, high skill level, required to learn new things, non-repetitive work, and required creativity) (Häusser et al., 2010; Karasek Jr, 1979); however, this study used a single questionnaire focusing on job autonomy. This could limit the assessment of whole aspects of job control among service and sales workers and may affect our results. Third, our study is not free from the bias of the "healthy worker survival effect" that those who remain working in emotional labor-related jobs tend to have greater psychological resilience and excellence in suppressing their emotions in the workplace, (Arrighi and Hertz-Picciotto, 1994; Yoon et al., 2016), and this could attenuate the detrimental effect of emotional labor on mental health status. Furthermore, the cross-sectional design in this study makes it difficult to elucidate a causal relationship between emotional labor and depressive mood. Future longitudinal studies are necessary to examine causality.

In summary, using a nationally representative sample of service and sales workers, we identified that high emotional demand, which reflects a core characteristic of emotional labor (i.e., hiding or suppressing one's emotion in work), was associated with increased risk for depressive mood in female workers. Emotional demand and job control showed interactive effects on depressive mood in that high emotional demand was associated with depressive mood only in the context of low job autonomy in male workers. We also confirmed a significant mediation pathway between high emotional demand and prevalence of depressive mood through higher stress level in female workers. We recommend future studies investigate the effects of all components of emotional labor (i.e., surface acting, deep acting, and emotional dissonance) in workers' mental health using longitudinal designs and representative samples of workers in the service and sales sectors.

Conflicts of interest

None.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2018.06.044.

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