

Research Article



Combined effect of emotional labor and job insecurity on sleep disturbance among customer service workers

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Abbreviations

CI: confidence interval; DCS: demand-control-support model; ERI: effort-reward imbalance model; KWCS: Korean Working Conditions Survey; OR: odds ratios; PTSD: post-traumatic

ABSTRACT

Background: Job insecurity and emotional labor are poor job-related factors that are known to cause sleep disturbances in customer service workers. This study investigates the combined effect of emotional labor and job insecurity on sleep disturbance.

Methods: This study used data from the Fifth Korean Working Condition Survey and included 15,147 paid workers who serve customers below 65 years. We re-classified into 6 groups based on whether the degree of emotional labor increased (Rarely/Sometimes/Always) or whether job insecurity (No/Yes) was present. We performed propensity score matching for several covariates and calculated odds ratio (OR) and 95% confidence intervals (CIs) for sleep disturbance by logistic regression models using only matched subjects.

Results: Workers exposed to emotional labor and job insecurity had significantly higher risk for 3 dimensions of sleep disturbance (difficulty falling asleep, waking up repeatedly during the sleep, and waking up with feeling of fatigue) (OR [95% CI]: 1.44 [1.22–1.69], 1.18 [0.99–1.40], 1.52 [1.30–1.79] for emotional labor; and 2.00 [1.75–2.29], 2.20 [1.91–2.53], 1.67 [1.45–1.92] for job insecurity). Compared to those who were exposed to both emotional labor rarely and without job insecurity, when workers had both poor job factors, the OR (95% CI) for sleep disturbance for difficulty falling asleep, waking up repeatedly during the sleep, and waking up with feeling of fatigue were 3.05 (2.42–3.86), 2.89 (2.26–3.69), and 2.60 (2.06–3.29), respectively. The relative excess risk due to Interaction of job insecurity and emotional labor was significant only for difficulty falling asleep, but not the other 2 sleep disturbance dimensions.

Conclusions: Customer service workers suffered from severe sleep disturbances according to the existing degree of emotional labor and job insecurity. The combined effect of both could have an additive influence on serious sleep disturbance among customer service workers.

Keywords: Customer service; Emotional labor; Job insecurity; Sleep disturbance; Korean Working Condition Survey; Propensity score matching

BACKGROUND

Emotional labor, according to Hochschild [1] in 1983, refers to “work involving the suppression and control of one's own emotions in order to create a publicly observable facial and bodily display”. Workers who constantly deal with customers face emotional

stress disorder; RERI: relative risk excess due to interaction; WLC: work-life conflict; WTA: work-time arrangements.

Competing interests

The authors declare that they have no competing interest.

Authors contributions

Conceptualization: Choi S, Jeong I; Data curation: Ko K; Formal analysis: Choi S; Investigation: Choi S, Park JB, Lee KJ, Jeong I; Writing - original draft: Choi S; Writing - review & editing: Choi S, Park JB, Lee KJ, Ko K, Jeong I, Lee S.

demands, and workers' inability to reveal their true feelings (authenticity) in the interest of the company has a negative impact on their health. Infringement of authenticity enables one to hide their own emotions, and the structural discrepancy between these emotions is called emotional dissonance; these increases burn out, psychosomatic complaints, sleep disturbance [2-4]. Korea has a particular culture in the service section expressed as “Gapjil”, which refers to “the abuse of underlings and subcontractors by executives who behave like feudal lords” [5]. Korea's Occupational Employment Statistics estimated that the number of workers who perform significant emotional labor is 5.92 million and increasing every year [6]. In response to this problem, on October 8, 2018, the Industrial Safety and Health Act was enacted to guarantee the health rights of workers performing emotional labor.

Companies are moving towards increasing employment flexibility, in sync with greater possibilities for profit making, and the increasing number of precarious jobs increases the insecurity perceived by the workers. Job insecurity is defined as a “subjective concern about whether to maintain this job in the future”, and as an occupational stressor, has been linked to negative health effects [7]. Some longitudinal studies show that job insecurity affects not only emotional exhaustion (burnout), general mental/psychological well-being, somatic complaints, and sleep disturbances [8], but also increases the risk of coronary heart disease and metabolic markers [9]. Customer service workers with low-level job qualifications and temporary employment are highly insecure as they are considered replaceable, in addition to dealing with emotional demand of the job [10].

Sleep, reported as an outcome of various physical and mental health indicators, is a common problem experienced by workers. Sleep disorder is a health problem with high social burden, which increases depression, metabolism, hypertension, and coronary heart disease, and during the daytime, increases absenteeism, and the likelihood of accidents [11,12].

Previous studies have dealt with sleep problems of workers in emotional labor. Several psychosocial work variables such as facing angry customers, having emotional manual, experience of violence and high job strain were related to more sleep disturbances among customer service workers with emotional labor [13-16], while high self-control, social support attenuated the effects of emotional labor in sleep disturbance [14,17]. Emotional labor and job insecurity are known as poor occupational stressors, which cause sleep disturbances. Emotional labor and job insecurity are frequently exposed together in customer workers, but there is still a lack of research on the combined effect of both. The purpose of this study was to investigate the effect of emotional labor and job insecurity on sleep disturbance among customer service workers. In addition, we will examine how job insecurity combined with emotional labor, affects customer service workers on sleep disorders.

METHODS

Study setting and participants

This study used data from the fifth Korean Working Condition Survey (KWCS) undertaken by the Occupational Safety and Health Research Institute in 2017. KWCS, based on the European Working Conditions Survey and the UK Labour Force Survey, was designed to provide a general picture of the working environment and its health effects on workers. The study included 50,205 people over the age of 15 years, from across the country who was personally interviewed by a professional surveyor. In this study, only paid workers were included; those

who were self-employed workers, unpaid family workers and others were excluded. For generalization, workers aged 65 years or older were excluded from the study.

In order to include only those workers who serve customers, people who responded 'Rarely exposed'/'Never' exposed to the question, "Do you deal directly with people that are not your colleagues, such as customers, passengers, students, and patients?" were excluded. Those who responded as "Unsure", did not respond, or refused to respond to any of the questions about the variables used in the study were also excluded. The final sample included 15,147 paid workers (6,172 men; 8,975 women).

Main variables

Degree of emotional labor

The question "I must work while hiding my own emotions" was asked in order to measure the degree of emotional labor that suppressed emotions. The possible answers were 'Always', 'Usually', 'Sometimes', 'Rarely', 'Never'. We re-grouped the responses into 3 scales: options included 'Always (Always/Usually)', 'Sometimes (Sometimes)', and 'Rarely (Rarely/Never)'.

Job insecurity

Job insecurity was measured using the question, "If your company goes through financial difficulties and is shutting down or laying off employees, if you have not done anything wrong, can you continue to work for the company?" Those who answered 'No' to the question were classified as those who perceived job insecurity since they could not continue to work as they wanted. Conversely, those who answered 'Yes' were classified as having no job insecurity because they would continue working.

Sleep disturbance

The question, "How often have you had the following problems with sleep in the last 12 months?" was asked to measure sleep disturbance. There were 3 possible responses: "Difficulty falling asleep," "Waking up repeatedly during sleep," and "Waking up with feeling fatigued." Responses were defined as 'Have a sleep disturbance' if the subject answered 'Everyday', 'Several times per week' or 'Several times a month', and 'Do not have a sleep disturbance' if the participant answered 'Rarely' or 'Never'.

Covariates

Covariates for customer service workers were selected based on risk factors nature of occupation, and health indicators. The demographic factors included gender, age, marital status, and education level. Ages were classified as below 29 years old, in 30s, 40s, and 50s and above. Marital status was classified into yes or no according to including a spouse in household members. The level of education was classified into middle school or under, high school graduates and college or above.

Occupational factors, according to the Korean standard classification of occupations, categorized managers, experts and related workers, and office workers as white collar; service workers and sales workers as pink collar; and agricultural and fisheries skilled workers, technicians, equipment/machine operators, and assembly workers, and simple laborers as blue collars. Weekly working hours were classified as 40 hours or less, 41–52 hours, and 53 hours or more. Shift work was classified as 'Yes' or 'No'. For the question "Has there been at least one time last month since you left work and less than 11 hours before you came to work the next day?" responded were classified as 'Yes' or 'No' for quick return.

For the question 1) Working at a fast pace and 2) Working with strict deadlines, those that responded 'Throughout the working hours' or 'Most of the working hours' were classified as 'High' in job demand, and the rest of the responders were classified as 'Low' in job demand. For the question "Can you choose or change any of these items while working?", those that responded 'Yes' to all 3 categories, i.e., order, method, and speed/rate, were classified as 'High' for job control and the others as 'Low' for job control. For the question "My colleague/boss help and support me", those that responded 'Always'/'Most of the time' for colleague and boss were 'High' in job support. Change in work-time arrangement (WTA) was defined as the following question. "Do changes to your working time arrangements occur regularly? (If, yes) how long before are you informed about these changes?" From the answer 'Occurring change time several weeks in advance' to 'same day' was existing WTA change. Work-life conflict (WLC) was measured by the following question; "How well do your working hours fit in with your family or social commitments?", 'Very well' and 'Well' were classified WLC 'No' group.

For occupational factors that only customer service workers have, for the question "Do you have to deal with angry customers, patients or students", those that responded 'Rarely'/'Never' were classified as 'Rarely', those that responded '¼ of working hours'/'Half of working hours' as 'Sometimes', and those that responded '¾ of working hours'/'Almost always'/'Always' were classified as 'Always'. As for workplace violence from customers, those that answered 'Yes' to any of the questions on whether they had experienced physical violence, sexual harassment, or bullying from customers in the last 12 months were classified as having experienced workplace violence.

Health indicators related to sleep disturbance, selected depression, for self-rated health. For the question "Over the past 12 months, have you had any of the following health problems?" those that responded with the option of depression measured 'Yes'/'No'. For the question, "How do you usually perceive your health?" those that responded 'Very insufficient'/'Insufficient' were classified as 'Poor'.

Statistical analysis

The association between participant's general, occupational factors and emotional labor was analyzed through chi-square frequencies and proportions. Chi-square test was performed to compare the relationship between emotional labor and sleep disturbance. Since this study was based on a large-scale survey, it is impossible to have participants with equal conditions.

This study was based on a survey investigating the overall working conditions, which was an observational study; however, there were potential covariates that could have affected causality of sleep disturbance, which resulted in selection bias. To control the effects of covariates associated with sleep disturbance, propensity scores were estimated for each individual. This method relies on a prediction equation for the likelihood of sleep disturbance. We adopted binary logistic models including all the covariates—working type, education, marital status, job demand, job control, job support, quick return, WTA change, and WLC with matching tolerance of 0.7 [18]. Next, multiple logistic regression was used to estimate the odds ratio (OR) and 95% confidence interval (CI) of sleep disturbance according to the severity of emotional labor and job insecurity that included the following variables: age, gender, engaging angry customers, experience of violence, working hour, shift work, depression, self-rated health, by adjusting the estimated propensity score.

Finally, in order to see the combined effects of the 2 exposure factors, 2 variables were grouped and re-classified into 6 groups, from 'Emotional labor (Rarely)–Job insecurity (No)' to 'Emotional labor (Always)–Job insecurity (Yes)', and logistic regression was used to estimate the OR and 95% CIs. Theoretical epidemiologists recommended an interaction analysis. The relative risk excess due to the interaction (RERI) is often considered the standard measure for interaction on the additive scale with case-control studies [19,20]. RERI was measured by the following formula:

$$\text{RERI} = (\text{OR concurrent exposure to emotional labor and job insecurity}) - (\text{OR exposure to only emotional labor}) - (\text{OR exposure to only job insecurity}) + 1$$

A measure of interaction on the additive scale, RERI can be used to assess whether there is synergism between the 2 exposures. If the RERI was larger than 0, a supra-additive (synergistic) interaction was suggested [21]. All statistical tests were 2-tailed, and *p*-values less than 0.05 were regarded as statistically significant. All statistical analyses were conducted using the SAS software package version 9.4 (SAS Institute, Cary, NC, USA).

Ethical statement

All participants provided written consent, after which the KWCS questionnaire was collected. Personal identifiable information was deleted before data analysis. This study used secondary data for analysis, and has been approved by the Institutional Review Board of Ajou University Medical Center (No. AJIRB-SBR-EXP-19-580).

RESULTS

Among the 15,147 subjects, the prevalence of those with sleep disturbances was as follows: 2,089 subjects (13.8%) had difficulty falling asleep, 1,827 subjects (12.1%) had waking up repeatedly during the sleep, and 2,246 (14.8%) experienced waking up with feeling fatigue. The distribution of general, occupational factors according to the degree of emotional labor showed that female, as well as those at a younger age, those with pink-collar jobs, those with higher job demand and job support, those with having shift work, quick return, WTA change and WLC, those with longer working hours per week, and those that have higher frequency of dealing with angry customers had significantly higher levels of emotional labor (**Table 1**).

Experiencing greater emotional labor, led those with difficulty falling asleep to increase from 9.1% to 15.3%, those with waking up repeatedly during the sleep to rise from 8.6% to 13.0%, and those with waking up with feeling fatigue to rise from 9.5% to 17.8%; the increase being

Table 1. The relationship between general and occupational factors and emotional labor among workers who serve customers

Variables	Total study subjects (n = 15,147, 100.0)	Rarely (n = 2,186, 14.4)	Sometimes (n = 5,668, 37.4)	Always (n = 7,293, 48.2)	<i>p</i> -value
Gender					< 0.001
Man	6,172 (40.7)	954 (43.6)	2,395 (42.3)	2,823 (38.7)	
Woman	8,975 (59.3)	1,232 (56.4)	3,273 (57.7)	4,470 (61.3)	
Age (years)					0.018
≤ 29	2,638 (17.4)	356 (16.3)	950 (16.8)	1,332 (18.2)	
30–39	3,761 (24.8)	547 (25.0)	1,363 (24.0)	1,851 (25.4)	
40–49	4,362 (28.8)	633 (29.0)	1,646 (29.0)	2,083 (28.6)	
≥ 50	4,386 (29.0)	650 (29.7)	1,709 (30.2)	2,027 (27.8)	

(continued to the next page)

Sleep disturbance according to emotional labor, job insecurity

Table 1. (Continued) The relationship between general and occupational factors and emotional labor among workers who serve customers

Variables	Total study subjects (n = 15,147, 100.0)	Rarely (n = 2,186, 14.4)	Sometimes (n = 5,668, 37.4)	Always (n = 7,293, 48.2)	p-value
Working type					< 0.001
White collar	6,559 (43.3)	960 (43.9)	2,481 (43.8)	3,118 (42.7)	
Pink collar	5,969 (39.4)	778 (35.6)	2,187 (38.6)	3,004 (41.2)	
Blue collar	2,619 (17.3)	448 (20.5)	1,000 (17.6)	1,171 (16.1)	
Education level					0.263
Middle school or under	650 (4.2)	105 (4.8)	260 (4.6)	285 (3.9)	
High school	5,446 (36.0)	785 (35.9)	2,032 (35.9)	2,629 (36.0)	
College or above	9,051 (59.8)	1,296 (59.3)	3,376 (59.5)	4,379 (60.1)	
Marital status					0.626
No	4,093 (27.0)	597 (27.3)	1,506 (26.6)	1,990 (27.3)	
Yes	11,054 (73.0)	1,589 (72.7)	4,162 (73.4)	5,303 (72.7)	
Job demand					< 0.001
Low	11,832 (78.1)	1,850 (84.6)	4,561 (80.5)	5,421 (74.3)	
High	3,315 (21.9)	336 (15.4)	1,107 (19.5)	1,872 (25.7)	
Job control					0.213
Low	10,595 (69.9)	1,544 (70.6)	3,917 (69.1)	5,134 (70.4)	
High	4,552 (30.1)	612 (29.4)	1,751 (30.9)	2,159 (29.6)	
Job support					< 0.001
Low	4,083 (27.0)	733 (33.5)	1,769 (31.2)	1,581 (21.7)	
High	11,064 (73.0)	1,453 (66.5)	3,899 (68.8)	5,712 (78.3)	
Engaging angry customers					< 0.001
Rarely	9,210 (60.8)	1,588 (72.6)	3,630 (64.0)	3,992 (54.7)	
Sometimes	4,351 (28.7)	488 (22.3)	1,588 (28.1)	2,275 (31.2)	
Always	1,586 (10.5)	110 (5.1)	450 (7.9)	1,026 (14.1)	
Experience of violence					0.080
No	14,983 (98.9)	2,172 (99.4)	5,806 (98.9)	7,205 (98.8)	
Yes	164 (1.1)	14 (0.6)	62 (1.1)	88 (1.2)	
Weekly working hours					< 0.001
≤ 40	8,285 (54.7)	1,251 (57.2)	3,185 (56.2)	3,849 (52.8)	
41–52	4,500 (29.7)	616 (28.2)	1,641 (29.0)	2,243 (29.7)	
≥ 53	2,362 (15.6)	319 (14.6)	842 (14.8)	1,201 (16.5)	
Shift work					< 0.001
No	13,026 (86.0)	1,939 (88.7)	4,930 (87.0)	6,157 (84.4)	
Yes	2,121 (14.0)	247 (11.3)	738 (13.0)	1,136 (15.6)	
Job insecurity					0.531
No	13,600 (89.8)	1,952 (89.3)	5,107 (90.1)	6,541 (89.7)	
Yes	1,547 (10.2)	234 (10.7)	561 (9.9)	752 (10.3)	
Quick return					0.002
No	14,197 (93.7)	2,086 (95.4)	5,305 (93.6)	6,806 (93.3)	
Yes	950 (6.3)	100 (4.6)	363 (6.4)	487 (6.7)	
Change in work-time arrangement					< 0.001
No	11,499 (75.9)	1,804 (82.5)	4,321 (76.2)	5,374 (73.7)	
Yes	3,648 (24.1)	382 (17.5)	1,347 (23.8)	1,919 (26.3)	
Work-life conflict					< 0.001
No	11,447 (75.6)	1,737 (79.5)	4,366 (77.0)	5,344 (73.3)	
Yes	3,700 (24.4)	449 (20.5)	1,302 (23.0)	1,949 (26.7)	
Depression					< 0.001
No	14,766 (97.5)	2,162 (98.9)	5,542 (97.8)	7,062 (96.8)	
Yes	381 (2.5)	24 (1.1)	126 (2.2)	231 (3.2)	
Self-rated health					0.017
Good	14,926 (98.5)	2,157 (98.7)	5,603 (98.9)	7,166 (98.3)	
Poor	221 (1.5)	29 (1.3)	65 (1.1)	127 (1.7)	

statistically significant. Job insecurity also increased in 3 sleep disturbance dimensions, which was statistically significant (12.5%→25.5%; 10.8%→23.6%; 13.8%→23.6%). In the distribution of factors according to sleep disturbance, higher job demand, lower job control, more frequent engaging of angry customers, and more WLC led to significantly higher levels

Sleep disturbance according to emotional labor, job insecurity

of sleep disturbance in all 3 dimensions evaluating sleep. Additionally, unfavorable work time scheduling (shift work, quick return, WTA change) and health indicators (depression, poor self-rated health) showed a higher prevalence of all dimensions of sleep disturbance (Table 2).

A total of 15,147 subjects in the study were conducted for propensity score matching. Those who matched by difficulty falling asleep were 4,178, waking up repeatedly during the sleep were 3,654 and waking up with feeling of fatigue were 4,492. The adjusted OR and 95% CI were presented through logistic regression analysis that was adjusted for general, occupational, health factors and estimated propensity score. Using emotional labor and job insecurity as independent variables and sleep disturbance symptoms as dependent variables.

Table 2. The relationship between occupational factors and sleep disturbance among workers who serve customers

Variables	Difficulty falling asleep		Waking up repeatedly during the sleep		Waking up with feeling of fatigue	
	Yes	p-value	Yes	p-value	Yes	p-value
Job demand		< 0.001		< 0.001		< 0.001
Low	1,382 (11.7)		1,148 (9.7)		1,395 (11.8)	
High	707 (21.3)		679 (20.5)		851 (25.7)	
Job control		< 0.001		< 0.001		< 0.001
Low	1,656 (15.6)		1,394 (13.2)		1,714 (16.2)	
High	433 (9.5)		433 (9.5)		532 (11.7)	
Job support		0.675		0.030		0.001
Low	571 (14.0)		454 (11.1)		538 (13.2)	
High	1,518 (13.7)		1,373 (12.4)		1,708 (15.4)	
Engaging angry customers		< 0.001		< 0.001		< 0.001
Rarely	977 (10.6)		816 (8.9)		1,028 (11.2)	
Sometimes	755 (17.4)		661 (15.2)		759 (17.4)	
Always	357 (22.5)		350 (22.1)		459 (28.9)	
Experience of violence		0.441		0.134		0.001
No	2,063 (13.8)		1,801 (12.0)		2,207 (14.7)	
Yes	26 (15.9)		26 (15.9)		39 (23.8)	
Weekly working hours		< 0.001		< 0.001		< 0.001
≤ 40	1,087 (13.1)		910 (11.0)		1,047 (12.6)	
41–52	688 (15.3)		603 (13.4)		747 (16.6)	
≥ 53	314 (13.3)		314 (13.3)		452 (19.1)	
Shift work		< 0.001		< 0.001		< 0.001
No	1,745 (13.4)		1,526 (11.7)		1,866 (14.3)	
Yes	344 (16.2)		301 (14.2)		380 (17.9)	
Quick return		< 0.001		< 0.001		< 0.001
No	1,914 (13.5)		1,659 (11.7)		2,028 (14.3)	
Yes	175 (18.4)		168 (17.7)		218 (22.9)	
Change in work-time arrangement		< 0.001		< 0.001		< 0.001
No	1,346 (11.7)		1,154 (10.0)		1,368 (11.9)	
Yes	743 (20.4)		673 (18.4)		878 (24.1)	
Work-life conflict		< 0.001		< 0.001		< 0.001
No	1,389 (12.1)		1,227 (10.7)		1,454 (12.7)	
Yes	700 (18.9)		600 (16.2)		792 (21.4)	
Emotional labor		< 0.001		< 0.001		< 0.001
Rarely	200 (9.1)		188 (8.6)		208 (9.5)	
Sometimes	772 (13.6)		692 (12.2)		740 (13.1)	
Always	1,117 (15.3)		947 (13.0)		1,298 (17.8)	
Job insecurity		< 0.001		< 0.001		< 0.001
No	1,695 (12.5)		1,462 (10.8)		1,881 (13.8)	
Yes	394 (25.5)		365 (23.6)		365 (23.6)	
Depression		< 0.001		< 0.001		< 0.001
No	1,985 (13.4)		1,719 (11.6)		2,117 (14.3)	
Yes	104 (27.3)		108 (28.3)		129 (33.9)	
Self-rated health		< 0.001		< 0.001		< 0.001
Good	2,023 (13.6)		1,753 (11.7)		2,173 (14.6)	
Poor	66 (29.9)		74 (33.5)		73 (33.0)	

Sleep disturbance according to emotional labor, job insecurity

Table 3. Adjusted odd ratios for sleep disturbance by emotional labor and job insecurity among workers who serve customers after propensity score matching

Variables	Difficulty falling asleep (n = 4,178)		Waking up repeatedly during the sleep (n = 3,654)		Waking up with feeling of fatigue (n = 4,492)	
	OR	95% CI	OR	95% CI	OR	95% CI
Emotional labor						
Rarely	1.00	Reference	1.00	Reference	1.00	Reference
Sometimes	1.44	1.22–1.70	1.31	1.10–1.56	1.24	1.05–1.47
Always	1.44	1.22–1.69	1.18	0.99–1.40	1.52	1.30–1.79
Job insecurity						
No	1.00	Reference	1.00	Reference	1.00	Reference
Yes	2.00	1.75–2.29	2.20	1.91–2.53	1.67	1.45–1.92

Logistic regression conducted on only matched subjects after using propensity score matching for covariates (working type, education, marital status, job demand, job control, job support, quick return, change in work-time arrangement, work-life conflict). Adjusted for general factors (gender, age), occupational characteristics (engaging angry customers, experience of violence, weekly working hours, shift work) health characteristics (depression, self-rated health), and the estimated propensity score.

OR: odd ratio; CI: confidence interval.

As emotional labor increased, OR with difficulty falling asleep increased 1.44 (95% CI: 1.22–1.70) times in the ‘Sometimes’ group and 1.44 (95% CI: 1.22–1.69) times in the ‘Always’ group. Those with waking up repeatedly during the sleep increased 1.31 (95% CI: 1.10–1.56) times and 1.18 (95% CI: 0.99–1.40) times, which was the highest in the ‘Sometimes’ group in the emotional labor category. Those with waking up with feeling fatigue increased gradually 1.24 (95% CI: 1.05–1.47) times in the ‘Sometimes’ group and 1.52 (95% CI: 1.30–1.79) times in the ‘Always’ group. For those with job insecurity, OR significantly increased, with 2.00 (95% CI: 1.75–2.29) times in those with difficulties falling asleep, 2.20 (95% CI: 1.91–2.53) times in those with waking up repeatedly during the sleep, and 1.67 (95% CI: 1.45–1.92) times in those with waking up with feeling fatigue (Table 3).

In order to see the combined effect of the degree of emotional labor and job insecurity, 2 items of job insecurity (‘No’/‘Yes’) and 3 items of emotional labor (‘Rarely’/‘Sometimes’/‘Always’) were categorized into 6 items, and logistic regression analysis was performed with corrected general, occupational, health factors, and estimated propensity score. Compared to the reference group, the adjusted OR sequentially increased in all sleep disturbance categories depending on whether the degree of emotional labor increased or whether job insecurity was present. Compared to the reference, the concurrently exposed group showed a high increase in the OR, by 3.05 (95% CI: 2.42–3.86) times, for those with difficulty falling asleep; OR increased 2.89 (95% CI: 2.26–3.69) times for those with waking up repeatedly during the sleep; and 2.60 (95% CI: 2.06–3.29) times for those with waking up with feeling fatigue compared, to when exposed to only one risk factor (Table 4).

For identifying additive effect of emotional labor and job insecurity, the RERI and statistical significance estimated. The RERI for emotional labor and job insecurity were > 0 for all sleep disturbance dimensions, indicating that there was supra-additive interaction. The RERI for difficulty falling asleep was 1.00 (95% CI: 0.28–1.71), waking up repeatedly during the sleep was 0.59 (95% CI: –0.53–1.70), waking up with feeling fatigue was 0.63 (95% CI: –0.27–1.71) However, only difficulty falling asleep was statistically significant (Table 4).

DISCUSSION

The purpose of this study is to investigate the degree of emotional labor and the impact of job insecurity on sleep disturbance among customer service workers who were part of the

Sleep disturbance according to emotional labor, job insecurity

Table 4. Combined effect of emotional labor and job insecurity on sleep disturbance among workers who serve customers

Variables	Emotional labor						RERI (95% CI)
	Rarely		Sometimes		Always		
	OR	95% CI	OR	95% CI	OR	95% CI	
Difficulty falling asleep (n = 4,178)							
Job insecurity							1.06 (0.06–2.06)
No	1.00	Reference	1.41	1.18–1.69	1.36	1.14–1.63	
Yes	1.63	1.09–2.44	2.55	1.96–3.32	3.05	2.42–3.86	
Waking up repeatedly during the sleep (n = 3,654)							0.64 (–0.47–1.76)
No	1.00	Reference	1.34	1.11–1.62	1.14	0.95–1.38	
Yes	2.10	1.41–3.13	2.43	1.85–3.20	2.89	2.26–3.69	
Waking up with feeling of fatigue (n = 4,492)							0.69 (–0.20–1.59)
No	1.00	Reference	1.22	1.02–1.46	1.48	1.24–1.76	
Yes	1.43	0.94–2.18	1.96	1.50–2.58	2.60	2.06–3.29	

Logistic regression conducted on only matched subjects after using propensity score matching for covariates (working type, education, marital status, job demand, job control, job support, quick return, change in work-time arrangement, work-life conflict). Adjusted for general factors (gender, age), occupational characteristics (engaging angry customers, experience of violence, weekly working hours, shift work) health characteristics (depression, self-rated health), and the estimated propensity score. Measure for interaction on the additive scale; RERI for emotional labor 'Always' and job insecurity 'Yes' group to reference. OR: odd ratio; CI: confidence interval; RERI: relative risk excess due to the interaction.

KWCS, a representative survey on Korean workers. Due to the increase in emotional labor and presence of job insecurity, the risks of all 3 dimensions measuring sleep disturbance increased. In addition, the RERI of the combined effect of emotional labor and job insecurity on the sleep disturbance were > 0 , this finding represented supra-additive effect of emotional labor and job insecurity on sleep disturbance.

According to the Korea Occupational Safety & Health Agency in 2015, 5,152 people were surveyed on their experiences of being diagnosed with insomnia/sleep disorders. Depending on the level of emotional labor, level of sleep disorders increased by 1.96 times in males (95% CI:1.17–3.28) and 1.92 times in females (95% CI:1.16–3.18); in our study the increase in the level of emotional labor increased at a similar rate as those reported in previous studies [6]. Previous studies about workers exposed to emotional labor showed that sleep disorders varied according to various psychological factors such as experience with violence, high job strain, less social support, perceived stress, and lower degree of control [13,15,22,23]. This study adds to the existing body of literature by examining the additive effect of job insecurity, which has been understudied so far among the unfavorable job-related factors of customer service workers.

In our study, the degree of emotional labor increased for females, younger workers, and sales workers as pink collar. Most unfavorable psychosocial working conditions investigated in our study were related to sleep disturbance, which was in line with previous studies. While high job demand, engaging angry customer, experience of violence, depression, poor self-rated health and WLC increased sleep disturbance, high job control, and job support decreased sleep disturbance, and work time scheduling had a bad effect on sleep [24].

Propensity score matching was implemented for reducing selection bias and only matched subjects were used for logistic regression analysis. After being matched, the number of participants decreased from 15,147 to 4,178 for difficulty falling asleep, 3,654 for waking up repeatedly during sleep, 4,492 for waking up with feeling fatigued. The weakness of propensity score matching is that subjects could be greatly reduced. However, since this study used a large-scale survey, there were enough subjects after matching [25].

In the current study, we determined that emotional labor and job insecurity were associated with a higher frequency of sleep disturbance, respectively. This association is consistent with

the findings from previous studies [2,4,8]. After adjusting covariates associated with sleep, combined emotional labor and job insecurity increased adjusted OR substantially. Estimated combined effect on the additive scale of emotional labor and job insecurity together was greater than the sum of the estimated effects of emotional labor alone and job insecurity alone so that there was positive interaction on the additive scale. Compared to the reference (Emotional labor [Rarely]–Job insecurity [No]), the RERI of concurrent exposure to both were higher than zero in 3 dimensions of sleep disturbance. The results of combined effect suggest that workers with emotional labor and perceived job insecurity might have a more negative effect on sleep disturbance than a simple sum in some situations. However, the RERI was statistically significant for only difficulty falling asleep, waking up repeatedly during the sleep, waking up with feeling fatigue not significant. Hyper-arousal caused by unresolved negative tension during the day due to job insecurity and emotional labor may make it difficult for workers to get away from work, which may affect difficulty falling asleep [26]. In our study, since exposure periods of emotional labor and job insecurity were not included, a chronic effect could not be identified for disturbing sleep.

Among customer service workers, when emotional labor and job insecurity are combined, sleep disturbance is higher. The explanations are as follows. Job stress is a well-known cause of sleep disorders [27]. Several studies show that cortisol increases when the hypothalamic-pituitary-adrenal axis is activated by stress, which is linked to sleep disorders [28]. In explaining stress, demand-control-support (DCS) model and effort-reward imbalance (ERI) model have been proposed. In previous studies, including both models have a higher risk in comparison with having only one of the exposures, and increase in stress leads to insomnia [29,30]. Based on this, emotional labor is considered one of the job demands, and the higher the emotional labor means the higher the job demand according to the DCS model, and job insecurity increases stress by inducing an imbalance that lowers rewards according to the ERI model. Job insecurity and emotional labor can be more stressful if they occur together, than when they occur separately.

Furthermore, perceived job insecurity work chronically, causing allostatic load [31]. Allostatic load is the exhaustion of the body and brain caused by accumulation of chronic stress, which disrupts homeostasis. Allostatic load is known to cause insomnia and increase various kinds of hormones (glucocorticoids and catecholamines). Workers with allostatic load could not maintain homeostasis, so it was difficult to resolve negative emotions caused by emotional labor in daytime [32,33]. Negative emotions (frustrated, irritated) not resolved during the day could disturb workers by making them unable to turn off from work and prepare for sleep.

Lastly, in our study workers with greater emotional labor had a higher rate of contact with angry customers (5.1%→7.9%→14.1%), which inevitably led to frequent exposure to violent accidental events (0.6%→1.1%→1.2%). Previous studies have suggested that workplace harassment causes sleep disorders [15,34]. In a literature survey targeting healthcare workers, workers who experienced violence showed sleep problems, emotional consequences, as well as poor physical symptoms. Victims feel anger, sadness, fear, disgust, and surprise, and these feelings felt during the day become hyper-aroused at night and adversely affect sleep in the evening [35]. Complaints from customers were likely to disturb job security; therefore, people with job insecurity have a high tendency to intensify the problem. Additionally, the most common psychological consequence felt by the victims of violence were post-traumatic stress disorder (PTSD), with 5% to 32% of the victims meeting the same diagnostic criteria. PTSD seems to disrupt sleep by increasing the duration of light sleep, decreasing the duration of deep, restorative sleep, and interfering with rapid eye movement sleep [36].

Among various PTSD symptoms, 95.5% experienced flashbacks, and since workers with job insecurity could not find alternative jobs, they inevitably had to continue working in that location with flashbacks where violence occurred, which can exacerbate sleep disorders.

This study had several limitations. Firstly, KWCS used in this study is a survey that investigates the overall working environment; however, since it is not a survey of validated details about emotional labor, job insecurity, and sleep disturbance, sub-effects could not be identified for various aspects of emotional labor affecting sleep. Further research is necessary to determine the effects of various aspects of emotional labor through tools such as Korean Emotional Labor Scale, which has 5 sub-factors with 26 items developed for domestic circumstances [37]. Secondly, since the participants were asked to respond based on their experiences in sleep disturbances for the last 12 months, there could be limitations in terms of participants' errors and as a subjective survey on sleep disturbances. In addition, confounding may occur because past history, drug history, and social history that may affect sleep were not investigated. Thirdly, in this study, as job insecurity and emotional labor were investigated at one point in time, it is difficult to assess whether effects on sleep disturbance is chronic or not. Since sleep disturbance is affected chronically, long-term effect of emotional labor and job insecurity need to be measured. Lastly, because this is a cross-sectional study, the causal relationship cannot be identified and the relationship between the duration of emotional labor and sleep disturbances cannot be elucidated. Therefore, a longitudinal study to examine this is necessary in the future.

However, since this was a large-scale national survey, sampling methods accounted for all occupations, thus representing the characteristics of customer service workers in Korea. This study implies that the harmful effect of emotional labor on sleep disturbance might be more serious to workers with perceived job insecurity. Workers with emotional labor tend to be exposed to multiple job stressors including job insecurity at the same time, which cause not only sleep disturbance but also several health problems. To reduce sleep disturbance among workers in emotional labor, resolving job insecurity might be necessary by extending permanent employment and building a worker's capacity program.

CONCLUSIONS

We confirmed that customer service workers suffered from severe sleep disturbances according to the degree of emotional labor and revealed the combined effects between job insecurity and emotional labor, which many customer service workers are exposed to at the same time. Considering this, countermeasures against adverse health effects of customer service workers through stable employment structure may be suggested.

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