# Effects of Job Stress and Lifestyle on State-Trait Anxiety of Employees

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**ABSTRACT**

*This study examined the state-trait anxiety of employees after the COVID-19 outbreak based on Norman's interaction model on stress, anxiety, and coping. COVID-19 has affected the work, living environment, and emotional state of workers. Thus, after the COVID-19 outbreak, this study collected data from a total of 200 people using the Google survey form from September 1, 2021 to September 15, 2021. The survey questionnaire included various tools to assess job stress (KOSS-SF), lifestyle (FANTASTIC Life Inventory: FLI), and state-trait anxiety (STAI-T). The data was analyzed using SPSS 24.0 with the following statistical methods: t-test; ANOVA; Pearson's correlation coefficient; and hierarchical regression analysis. According to the results of the study, state anxiety was higher among subjects with chronic disease, stronger job desire, severe conflict in a relationship, unsatisfactory relationships with family and friends, and increased depression. On the other hand, trait anxiety was higher among married people and those with increased relationship conflict. Therefore, this study is significant in that it has identified anxiety factors among employees and the socially vulnerable class after the COVID-19 outbreak. . This study is also expected to be used as the basis for various studies to improve the physical and mental health of employees.*

*Keywords: COVID-19, Job Sess, Trait Anxiety, State Anxiety, Lifestyle*

## INTRODUCTION
Necessity of the study

Since the COVID-19 outbreak, there has been a rapid change from a mechanized and automated industrial system to an informatized industrial system. The physical threat of the infectious disease, coupled with the continuous reduction in consumption and employment instability, increased the anxiety of workers (1). Identifying the causes of anxiety in the workplace and finding solutions are related to the maintenance of individual stability, economic activity, and family stability; thus, it is meaningful to conduct specific research on job stress and lifestyle habits in the changed environment after the COVID-19 outbreak. Research has shown that occupational health interventions can be effective in alleviating stress and improving overall employee well-being (36).

Spielberger (2) classified anxiety into state anxiety, which is derived from the external situation within which individuals find themselves, and trait anxiety, which is a tendency to feel anxious across many situations (3). An infectious disease environment may cause hyperactivity of the autonomic nervous system due to tension, fear, and concerns which arise from coping with health problems, individual work roles, relationships with colleagues at various levels, and the work-from-home environment. Thus, state anxiety is viewed as a temporary state of anxiety that occurs in such situations. Meanwhile, trait anxiety is seen in an individual who solves problems in the changing work environment due to a new infectious disease (4, 5). The role of work environment factors in influencing employee stress and anxiety is also highlighted in studies examining job satisfaction and stress levels in various occupational settings (35).

Under the situation of the prevailing COVID-19 pandemic, the disease prevention measures of the government focused on ensuring the good health of the vulnerable and preventing the spread of disease. However, there was a lack of attention to job stress and new changes in individual lifestyle among the workplace staff, which occurred due to the changed working environment. If positive changes are made by the individual during the spread of the COVID-19, it is possible to prevent disease and improve the health status and quality of life; however, failure to do so may lead to confusion in the individual's life (6, 7, 8). A study was conducted about dealing with social problems related to human relations, labor market instability, and employment, and a few studies were conducted which focused on the relationship between the employees and the rapidly changing social environment caused by the new infectious disease. For instance, Fernandes-de-Oliveira et al. (38)

explored the emotional expressions and responses to the COVID-19 vaccine on social platforms like TikTok, reflecting broader societal concerns and anxieties. Additionally, AlZubi (32) discussed the application of Artificial Intelligence in predicting and diagnosing animal diseases, highlighting the importance of technological advances in responding to crises.

There was a lack of research on specific factors that influence the individual's lifestyle and job stress. This study examined the lifestyle and job stress under the changed environment of office workers after the COVID-19 outbreak using the multidimensional interaction model of Norman (9) in order to classify the anxiety factors into state or trait anxiety. In the model, personal changes were viewed as trait and state anxiety, while job stress was defined for stress factors and lifestyle for response factors. Therefore, it is expected that this study can be used as the basis to identify job stress and lifestyle of workers in the changed environment after the COVID-19 pandemic and to seek solutions.

**Purpose of the Study**

The purpose of this study is to investigate the effect of job stress and lifestyle on the state-trait anxiety of office workers, and the specific objectives were the following: First, to identify the degree of job stress, lifestyle, and state-trait anxiety of office workers; Second, to identify the relationship between job stress, lifestyle, and state-trait anxiety of office workers; Third, to identify the effect of job stress and lifestyle on the state anxiety of office workers; and Fourth, to identify the effect of job stress and lifestyle on the trait anxiety of office workers.

Research Methods

1.3.1 Design This study is a descriptive survey that applied Norman's (9) behavior theory to the state and trait anxiety, job stress, and lifestyle of the office workers.

1.3.2 Subjects The subjects of this study were selected among those who were employed in an organization that guaranteed employment until retirement; those who worked for 40 hours a week and did not work in shifts; and those who understood the purpose of the study and agreed to participate in the study. The general characteristics of these subjects are consistent with the findings of Bagga et al. (34), who explored factors influencing consumer behavior in the context of sustainable transportation in India.

Instruments The state-trait anxiety was measured using the instrument (STAI-T) that was developed by Spielberger (1970)(10) and translated into Korean by Jung-taek Kim and Dong-kyun Shin (11), and then modified by Hee-jung Shim and Mi-a Seo (12). There are a total of 40 questions, and the higher the score, the higher the state-trait anxiety. Job stress was measured using the Korean Occupational Stress Scale - Short Form (KOSS-SF), a scale developed by Se-jin Jang et al. (13). It has a total of 24 questions, and the higher the score, the higher the job stress. This scale has also been effectively utilized in various other studies focused on job satisfaction and occupational health interventions (36). Lastly, for the measurement of lifestyle, a tool developed by Wilson and Ciliska (14) and translated by Kyung-wha Jung and Na-mi Jeon (15) was used. There are a total of 25 questions, and the higher the score, the better the lifestyle the subject enjoys. All instruments were granted with approval for use by the original developers, and the Cronbach's α of each instrument was identified to be 0.745 for state-trait anxiety, 0.719 for state anxiety, 0.774 for trait anxiety, 0.765 for job stress, and 0.705 for lifestyle.

Data collection and analysis methods This study was conducted after obtaining the approval from the Institutional Review Board of G University. The survey was conducted using the Google survey form from September 1, 2021, to September 15, 2021. Using the G*power 3.1.9.2, the significance level (α) was set to be 0.05, 0.90 for the power (1-β), and 0.15 for the medium effect size (fz) according to the statistical test method to be used in hierarchical regression analysis. In consideration of the dropout rate, the minimum number of samples required was set to 175 when the predictor variables were set to 16; thus, 200 questionnaires were distributed. Since all 200 questionnaires were completed, all of the collected data were used for the final analysis using SPSS 24.0 and included statistical tools of t-test, ANOVA, correlation analysis, and hierarchical regression analysis.

RESULTS

3.1 General characteristics The general characteristics of the study are shown in Table 1. In the general characteristics, chronic disease (p = .043) and occupation (p = .039) were significant variables for state anxiety, whereas marital status (p =.022) was a significant variable for trait anxiety. The influence of these variables on anxiety is consistent with research findings that link workplace factors with emotional well-being and job satisfaction (31, 35).

**Table 1.** General characteristics

| Characteristics | | N (%) | State anxiety | | Trait anxiety | |
|---|---|---|---|---|---|---|
| | | | M/SD | t/F | M/SD | t/F |
| Age | Under the age of 30 | 63(31.5) | 50.79(5.93) | 2.681 (.071) | 48.49(5.56) | .228 (.796) |
| | Ages 30-34 | 49(24.5) | 50.84(4.67) | | 47.76(5.43) | |
| | Ages 35 years or older | 88(44.0) | 48.84(6.61) | | 48.13(6.02) | |
| Education | High school graduate | 22(11.0) | 50.45(7.20) | .847 (.430) | 49.45(6.26) | 1.343 (.263) |
| | College graduate | 144(72.0) | 50.15(5.99) | | 47.74(5.68) | |
| | Graduate school or higher | 34(17.0) | 48.74(5.32) | | 49.03(5.46) | |
| Marital status | Unmarried | 95(47.5) | 49.83(5.64) | -.252 (.801) | 47.18(5.49) | -2.308 (.022) |
| | Married | 105(52.5) | 50.05(6.38) | | 49.03(5.80) | |
| Dependents | None | 55(27.5) | 50.11(5.38) | 2.518 (.059) | 47.89(4.02) | 1.578 (.196) |
| | 1 person | 45(22.5) | 51.49(6.46) | | 46.98(5.82) | |
| | 2 persons | 54(27.0) | 50.07(5.56) | | 49.43(5.77) | |
| | 3 or more persons | 46(23.0) | 48.09(6.52) | | 48.11(7.03) | |
| Religion | Yes | 70(35.0) | 50.07(6.00) | 0.217 (.828) | 48.03(5.31) | -.220 (.826) |
| | No | 130(65.0) | 49.88(6.06) | | 48.22(5.94) | |
| Chronic disease | Yes | 39(19.5) | 51.69(6.40) | -2.033 (.043) | 48.67(6.47) | -.628 (.531) |
| | No | 161(50.5) | 49.52(5.87) | | 48.02(5.53) | |
| Occupation | Technician and artificer | 28(14.0) | 47.00(5.38) | 2.392 (.039) | 46.29(4.618) | 1.753 (.124) |
| | Simple laborer | 14(7.0) | 48.31(6.60) | | 46.29(4.618) | |
| | Civil servant | 21(10.5) | 49.19(6.05) | | 50.48(6.70) | |
| | Office worker | 92(46.0) | 50.62(5.90) | | 48.49(5.42) | |
| | Serviceman and salesperson | 28(14.0) | 51.25(5.61) | | 48.50(6.54) | |
| | Specialized job | 17(8.5) | 51.35(6.67) | | 47.47(7.16) | |

*p<.05, **p<.01, ****p<.001

3.2 Degree of state-trait anxiety, job stress, and lifestyle

The magnitudes of the variables in the study are shown in Table 2. The score for the state-trait anxiety was 2.45 points (2.49 for state anxiety and 2.40 for trait anxiety), 2.51 points for job stress, and 31.62 points for lifestyle.

Table 2. State-trait anxiety, job stress, and lifestyle

| Category | | Range | Min. | Max. | Mean±SD |
|---|---|---|---|---|---|
| State-trait anxiety | | 1-4 (40-160) | 1.68 (67) | 3.20 (128) | 2.45±0.25 (98.10±10.08) |
| | State anxiety | 1-4 (20-80) | 1.55 (35) | 1.75 (31) | 2.49±0.30 (49.95±6.02) |
| | Trait anxiety | 1-4 (20-80) | 3.50 (64) | 3.20 (70) | 2.40±0.28 (48.15±5.72) |

| Category | Variable | Range | Min | Max | Mean±SD |
|---|---|---|---|---|---|
| Job stress | | 1-4 (24-96) | 1.17 (43) | 3.21 (77) | 2.51±0.29) (60.40±6.74) |
| | Job demand | 1-4 (4-16) | 1.00 (4) | 3.75 (15) | 2.57±0.48 (10.31±1.92) |
| | Lack of job autonomy | 1-4 (4-16) | 1.00 (4) | 4.00 (16) | 2.66±0.55 (10.66±2.22) |
| | Relationship conflict | 1-4 (3-12) | 0.75 (3) | 2.75 (11) | 1.89±0.36 (7.58±1.47) |
| | Job insecurity | 1-4 (2-8) | 0.50 (2) | 2.00 (8) | 1.25±0.33 (5.01±1.35) |
| | Organizational structure | 1-4 (4-16) | 1.00 (4) | 4.00 (16) | 2.52±0.46 (10.09±1.86) |
| | Inadequate compensation | 1-4 (3-12) | 0.75 (3) | 3.00 (12) | 1.79±0.48 (7.19±1.94) |
| | Workplace culture | 1-4 (4-16) | 1.25 (5) | 3.50 (14) | 2.20±0.51 (8.84±2.06) |
| Lifestyle | | (0-50) | (18) | (47) | (31.62±5.50) |
| | Family-friend | (0-2) | (0) | (6) | (4.05±1.48) |
| | Exercise-Leisure activity | (0-2) | (0) | (4) | (1.95±1.11) |
| | Nutrition | (0-2) | (1) | (8) | (4.68±1.66) |
| | Smoking-Caffeine | (0-2) | (0) | (6) | (4.23±1.08) |
| | Drinking | (0-2) | (1) | (4) | (3.17±0.70) |
| | Sleep-Seatbelt-Stress | (0-2) | (1) | (6) | (3.81±1.16) |
| | Personality | (0-2) | (0) | (6) | (3.56±1.20) |
| | Mentality | (0-2) | (1) | (6) | (3.62±1.40) |
| | Social life | (0-2) | (0) | (4) | (2.52±0.96) |

*p<.05, **p<.01, ****p<.001

### 3.3 Correlation of the key variables

The variables correlated with state-trait anxiety are shown in Table 3. State anxiety was correlated with trait anxiety (p=.001), job demand (p=.001), relationship conflict (p=.001), workplace culture (p=.001), family-friends (p=.003), sleep-seatbelt-stress (p=.001), mentality (p=.001), and social life (p=.001). Trait anxiety was correlated with job demand (p=.001), lack of job autonomy (p=.003), relational conflict (p=.001), job insecurity (p=.003)), organizational structure (p=.001), inadequate compensation (p=.001), workplace culture (p=.024), exercise-leisure (p=.017), and mentality (p=.009).

**Table 3.** Correlation between variables

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| State anxiety | 1 | 1 | | | | | | | | | | | | | | | | |
| Trait anxiety | 2 | .473*** | 1 | | | | | | | | | | | | | | | |
| Job stress | 3 | .392*** | .325*** | 1 | | | | | | | | | | | | | | |
| | 4 | -.102 | .210** | .169* | 1 | | | | | | | | | | | | | |
| | 5 | .752*** | .320*** | .311*** | -.082 | 1 | | | | | | | | | | | | |
| | 6 | -.077 | .210** | .006 | .253*** | -.044 | 1 | | | | | | | | | | | |
| | 7 | .111 | .304*** | .212** | .303*** | .079 | .435*** | 1 | | | | | | | | | | |
| | 8 | -.087 | .261** | .153* | .428*** | -.030 | .467*** | .545*** | 1 | | | | | | | | | |
| | 9 | .512*** | .159* | .237** | -.330*** | .370*** | -.375*** | .231** | .405*** | 1 | | | | | | | | |
| Lifestyle | 10 | -.206** | -.060 | -.098 | .118 | -.005 | .341*** | .116 | .150* | -.509*** | 1 | | | | | | | |
| | 11 | -.007 | .168* | .087 | .153* | -.048 | .124 | .272** | .233** | -.207** | .050 | 1 | | | | | | |
| | 12 | -.027 | .167* | -.036 | .154* | -.036 | .232** | .211** | .215** | -.207** | .165* | .173* | 1 | | | | | |
| | 13 | -.043 | .020 | .006 | -.095 | .002 | .121 | .113 | .111 | -.022 | .020 | -.041 | .191** | 1 | | | | |
| | 14 | -.062 | .004 | -.080 | -.017 | .017 | .009 | .003 | .003 | -.059 | .182** | -.060 | .041 | .269*** | 1 | | | |
| | 15 | -.225* | -.072 | -.105 | .136 | -.189** | .318*** | .140* | .256** | -.398*** | .291*** | .055 | .174* | .237** | .318*** | 1 | | |
| | 16 | -.130 | -.056 | -.111 | .014 | -.195** | .048 | .103 | .072 | -.135 | -.001 | .053 | .072 | .058 | .005 | .140* | 1 | |
| | 17 | .543*** | .185* | -.243** | .316*** | -.392*** | .311*** | .170* | .364*** | .915*** | .420*** | .184** | .164* | .011 | .024 | .399*** | .150* | 1 |
| | 18 | .315*** | -.100 | -.160* | .236** | -.217** | .347*** | .236** | .324*** | .809*** | .487*** | .181* | .198** | .028 | .075 | .262** | .060 | .511*** |

1. State anxiety, 2. Trait anxiety, 3. Job demand, 4. Lack of job autonomy, 5. Relationship conflict, 6. Job

insecurity, 7. Organizational structure, 8. Inadequate compensation, 9. Workplace culture, 10. Family-Friends, 11. Exercise-Leisure, 12. Nutrition, 13. Smoking-Caffeine, 14. Drinking, 15. Sleep-Seatbelt-Stress, 16. Personality, 17. Mentality, 18. Social life

### 3.3.1 Factors influencing state anxiety

The factors that influenced state anxiety in this study are shown in Table 4. The explanatory power of the final Model 3 was 66.6%. The presence of chronic diseases (p=.020), higher job demand (p=.002), increased relationship conflict (p=.000), poor family and friend relationship (p=.049), and negative mentality (p=.029) were shown to influence state anxiety.

**Table 4.** Factors influencing state anxiety

| Variable | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | B | β | *p* | B | β | *P* | B | β | *p* |
| (Constant) | 57.16 | - | .000 | 24.65 | - | .000 | 79.69 | - | .003 |
| Chronic disease | 2.24 | .14 | .035 | 1.57 | .104 | .014 | 1.47 | .09 | .020 |
| Job | -0.72 | -.15 | .027 | -0.35 | -.076 | .071 | -0.35 | -.07 | .088 |
| Job demand | - | - | - | 1.85 | .148 | .001 | 1.73 | .13 | .002 |
| Relationship conflict | - | - | - | 9.80 | .601 | .001 | 10.06 | .61 | .000 |
| Workplace culture | - | - | - | 2.868 | .246 | .001 | -11.82 | -.01 | .092 |
| Family-Friends | - | - | - | - | - | - | -0.40 | -.10 | .049 |
| Sleep-Seatbelt-Stress | - | - | - | - | - | - | 0.06 | .01 | .790 |
| Mentality | - | - | - | - | - | - | -3.85 | -.89 | .029 |
| Social life | - | - | - | - | - | - | -3.00 | -.47 | .091 |
| F(*p*) | 4.59(.001) | | | 76.01(.001) | | | 45.06(.001) | | |
| R² | .045 | | | .662 | | | .681 | | |
| Adjusted R² | .035 | | | .653 | | | .666 | | |

**Dummy:** Chronic disease=1 (Yes), 0 (No); Occupation=1 (Yes), 0 (No)

### 3.2.4 Factors influencing trait anxiety

The factors that influenced trait anxiety in this study are shown in Table 5. In the final Model 3, the explanatory power was 27.7%, and it became higher as the relationship conflict increased (p=.012).

**Table 5.** Factors influencing trait anxiety

| Variable | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | B | B | *p* | B | β | *p* | B | β | *p* |
| (Constant) | 45.32 | | .000 | 17.36 | - | .000 | 19.35 | - | .006 |
| Marital state | 1.85 | .16 | .022 | 0.81 | .07 | .271 | 0.95 | .083 | .200 |
| Job demand | - | - | - | 1.59 | .13 | .054 | 1.54 | .130 | .060 |
| Lack of job autonomy | - | - | - | 1.40 | .13 | .055 | 1.34 | .131 | .063 |
| Relationship conflict | - | - | - | 2.84 | .18 | .009 | 2.74 | .177 | .012 |
| Job insecurity | - | - | - | 2.50 | .14 | .045 | 2.36 | .140 | .057 |
| Organizational structure | - | - | - | 1.57 | .12 | .096 | 1.07 | .088 | .258 |
| Inadequate compensation | - | - | - | 1.61 | .13 | .099 | 1.47 | .125 | .129 |
| Workplace culture | - | - | - | 2.84 | .25 | .001 | 2.18 | .197 | .210 |
| Exercise-Leisure | - | - | - | - | - | - | 0.62 | .121 | .063 |
| Nutrition | - | - | - | - | - | - | 0.36 | .105 | .101 |
| Mentality | - | - | - | - | - | - | -0.41 | -.102 | .506 |
| F(*p*) | 5.32(.022) | | | 9.73(.000) | | | 7.93(.000) | | |
| R² | .026 | | | .290 | | | .317 | | |
| Adjusted R² | .021 | | | .260 | | | .277 | | |

**Dummy:** Married=1 (Married), 0 (Unmarried)

## 4. DISCUSSION

*A study conducted by Park (16), which examined the state anxiety of office workers before the COVID-19 outbreak using the STAI-T tool, reported the values of 42.0~44.8 points for state anxiety whereas 42.0~43.8 points for trait anxiety, and it was found out that the results of this study were higher than these values. Also, in a study conducted in the general public in Russia by Nikita et al. (17) using the same tool, the score on state anxiety was 44 points and the trait anxiety score was 52 points. Meanwhile, it was found out that the Korean office workers had a higher state anxiety and lower trait anxiety than the Russian general public. These results can be interpreted as adapting to changes in daily life due to self-quarantine and social distancing to prevent COVID-19, while encountering difficulties in office work. The existing economic and emotional support programs related to new infectious diseases tended to be provided mainly to women, children, the elderly, and socially vulnerable groups (18). However, considering the results of this study, which showed that the scores on office workers' state anxiety were high, it is recommended to implement a customized emotional support program for office workers in the future.*

*The total score for job stress was 60.40 points (2.51 points on the average). Such figure was higher than 57.43 points, which was the job stress score obtained in a study conducted by Lee and Nam (10) among 278 workers in private institutions, SMEs, public institutions, and large corporations in Korea using the same instrument. In addition, it was higher than the average score of 2.20 points obtained in a study that was conducted by Ryu (20) for the 315 employees working in public institutions. This result may be due to the fact that the lack of job autonomy continued as the work environment was restricted because of the prevalence of non-face-to-face work, although job insecurity has eased after the period of active quarantine to prevent COVID-19 (29-34). Therefore, it will be necessary to build a workplace culture that minimizes confusion by expanding the work autonomy of employees and improving the stability of the organizational system in working from home and other new types of work environments.*

*Lifestyle showed a 'fair' level with a total score of 31.62 points. In a study conducted by Kolpa et al (21) for adults in Brazil using the same instrument, the lifestyle score of the subjects was 35.73 points, and it was the same as the 'fair' level obtained in this study. Although social distancing guidelines have been maintained since the active pandemic prevention period and the pandemic situation has improved, it appeared that people still consumed easily accessible but addictive means such as smoking, caffeine consumption, and excessive drinking due to restricted personal and outdoor activities owing to their anxiety over COVID-19. Therefore, there is a need to find positive lifestyle habits that can be achieved even under controlled circumstances such as quarantine activities. It is also necessary to pay attention to the role of the government and the media, as the information released by the government and the media can promote negative emotions and stressful experiences (22).*

*The explanatory power of job stress and lifestyle for state anxiety was 66.6%. The level of state anxiety became higher due to presence of a chronic disease, higher job demands, increased relationship conflict, decreased relationships with family and friends, increased depression, and more negative emotions of the person. Such results were consistent with the findings of Shin and Son (23). Although the social confusion was minimized due to the national quarantine policy over COVID-19 (24), the state anxiety may have increased due to the following: lack of safety protocols or non-compliance due to workplace instability; direct or indirect effects on colleagues and team activities at work; increased stress caused by work pressure from superiors; or limited ways to relieve stress (25, 28). Therefore, it is necessary to implement various measures to resolve communication difficulties between colleagues in situations of environmental changes and to enhance solidarity among team members.*

*The explanatory power of job stress and lifestyle for trait anxiety was found to be 27.7%. It was consistent with the results of a study conducted by Lee and Hong (26) that reported positive correlation between job stress and anxiety. Work environments such as working from home may create a situation where employees have to solve problems on their own as compared to face-to-face work, and there may be difficulty getting help or solving the problem at hand. Therefore, it is necessary to establish a measure to communicate within the workplace that allows effective cooperation even in a limited work environment.*

## 5. CONCLUSION

*By implementing Norman's (9) multidimensional interaction model, this study identified the influence of job stress and lifestyle on anxiety in the workplace environment which changed after the COVID-19 outbreak. The study is significant as it identified the sub-factors of state and trait anxiety among the office workers in terms of job stress and personal lifestyle in the social environment that changed due to COVID-19. For such reason,*

*this study is expected to serve as basis for various studies that focus on office workers.*

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