

# Influence of Job Characteristics on Job Stress and Job Satisfaction: Mediation Effect of Job Ethics and Job Engagement

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## Abstract

This study explored the correlation between job characteristics and job stress with K pharmaceutical company's staff, through a mediation model and path model of job ethics and job engagement. To this end, data were collected from 366 out of 370 survey responses. The survey consisted of four scales measuring the following: job characteristics, job stress, job ethics, and job engagement. The results were analyzed by the SPSS 22.0 program. Bootstrapping methods were used by the author to verify the average and standard deviation of variables, and to create the mediation model of how job characteristics relate to job stress, job ethics, and job engagement. In the current study, Cronbach's alpha was calculated, and the values of the scales were .825 for job characteristics, .896 for job stress, .796 for job satisfaction, .830 for job ethics, and .924 for job engagement. For the research results, this study presented descriptive statistics for each variable of respondents and conducted a correlation analysis between job characteristics and job stress in relation to job ethics and job engagement ( $\beta = -.063$ , C.I.[-.103~-.031]), job ethics ( $\beta = .080$ , C.I.[.032~.137]), job engagement ( $\beta = -.253$ , C.I.[-.323~.185]), and job characteristics and job stress alone ( $\beta = -.226$ , C.I.[-.312~.140]). Furthermore, the path model showed significant relationships among job characteristics, job stress, job satisfaction, job ethics, and job engagement. The mediation analysis revealed that there were meaningful correlations among job characteristics, job stress, job satisfaction, job ethics, and job engagement in K pharmaceutical company's staff.

**Keywords:** Job Characteristics, Job Stress, Job Ethics, Job Engagement, Path Model

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## 1. Introduction

In modern society, occupational schemes have come under pressure from rising costs and increasing complexity.

Modern society is becoming a social organization that values individual capabilities and goals as a result of its complex structure and composition brought on by urbanization and globalization. As a result, people today are forced to live in a network society where they have to be professional and manage jobs with various characteristics within the organization. In this organizational society, harmony within the job characteristics surrounding individuals has been an important prerequisite.

Job-related factors are known to be the leading cause of stress for Koreans. According to the results of a survey conducted by the National Statistical Office (2018) on stress levels of people over the age of 13 [1], 71.8% of respondents answered that they felt stressed in their work life. School life (49.6%) and family life (40.8%) followed, respectively. Job stress levels have been the highest in the life sector since 2008. In addition, according to an announcement by the WHO (2019) [2], "burnout," or a feeling of severe fatigue due to accumulated work stress and a feeling of helplessness, is recognized as a disease. For decades, debates have continued over whether to label "burnout" as a disease, where people who have worked hard at their jobs become stressed out and eventually end up hating their jobs and failing at work. In response, the WHO defines it as a "syndrome due to chronic workplace stress that is not properly managed." Only work-related burnout, and none related to other areas like academics, is acknowledged as a disease, reinforcing that the fatigue of office workers can lead to illness. Serious conditions caused by

underlying job stress entail socioeconomic costs. In particular, job stress causes absenteeism due to mental illness, reduced work efficiency, difficulty in job performance, and expenses for stress relief. Examples of common job stressors include work overload, role problems, poor job control, lack of support from supervisors and coworkers, and interpersonal conflicts. It is the bane of the modern world. These stressors may lead to negative psychological (e.g., depression, irritability, and burnout), physical (e.g., headaches, heart palpitations, and hyperventilation), and behavioral (e.g., absenteeism, high turnover, and violence) symptoms or “strain sensation.”

The psychological process that is involved in dealing with these job stressors to reduce strain is called “coping mechanism.”

More specifically, coping with job stress refers to the mental and behavioral strategies that employees use to handle the stressors they encounter at work.

Coping mechanism for job stress is a key concept in understanding people’s adaptation to their job characteristics. Job characteristics include task identity, task significance, skill variety, autonomy, and job feedback (Hackman & Oldham, 1980) [3], and these affect job stress. Job conflict, which arises from these factors, affects job ethics and job engagement of corporate members.

Verquer (2003) argues that organizations with diverse job characteristics maximize corporate performance by increasing interactions within the organization at different levels, such as interactions between individuals and the organizations, their jobs, and their coworkers [4]. Furthermore, Freudenberger (1975) states that individuals who are in environments they feel are suitable for their own characteristics and describe having a level of environmental conformity, report that these conditions allow them to adapt to the environment [5]. In other words, it is argued that the satisfaction of an employee increases the performance of the organization they work for and that the environmental characteristics of the organization to which the individual belongs can harmoniously blend with the job characteristics of the employee. The level of job characteristic conformity affects individual satisfaction and organizational performance through important interactions between the employee and the work environment. Therefore, good relationships between individuals and their organizations, jobs, and coworkers aid in accomplishing their maximum achievement as professionals in a complex modern society, and in attaining the happiness desired by all human beings.

The psychological value of a job based on its characteristics can verify the level of perception about the job, such as the understanding of the job, based on one’s beliefs, and how well it’s being performed. In the case of an individual performing a public duty for a public company, job recognition and actions are based on goals pursued by the company and demanded from publicity and specificity rather than diversity. The value of these public duties can be interpreted as the value of the public office. Among these values, ethical consciousness, which is a concept with a value-oriented, normative, and justifiable character, signifies a principle or a code of conduct that a person should comply with. It also refers to personal and collective feelings and opinions on the criteria for judging good and evil or right and wrong (Kim, 1998) [6]. An Employee’s performance absolutely requires conscientious awareness, actions, and fairness. With that, a great emphasis is placed on the ethics of corporate employees, with the main virtues being devotion and loyalty to the company, creativity and responsibility for the job, honesty and service to the general public, respect and trust in the workplace, and integrity and order in everyday life. This means maintaining conscientiousness in terms of managing public affairs, and employees are required to consider the level of ethical consciousness where they work.

When job stress becomes increasingly difficult to control, it often involves job characteristics [7], job stress [8], job ethics [9], and job engagement [10]. Therefore, we have to conceptualize the role of ethical leaders regarding psychological interventions about the job model.

There seem to be two answers: First, people work because they want to overcome psychological or cognitive problems: the job is a means for modification of job ethics.

Second, people work to achieve a better understanding of job engagement for their job life.

These two aims often cannot be clearly separated, and most job workers probably pursue both to a certain extent. People who have undergone extensive job training for job characteristics and job stress have shown improvements in cognitive performance in job ethics and job engagement.

Despite the public's growing interest and an increasing number of studies on the impact of job characteristics and job stress, there is a surprising scarcity of empirical evidence, especially that which stems from research outside the therapeutic context within job ethics and job engagement.

Numerous studies have been conducted that investigate the effects on staff members of pharmaceutical companies in relation to their field of study, yet there is an even more surprising lack of elaborate psychological theories that make sound predictions about what to expect if one works.

This theoretical approach is frequently mirrored in the measures used in this study which include all kinds of dependent variables that are not specific to work research (such as job characteristics and job stress) as well as other kinds of research.

In this article, however, we place an emphasis on empirical evidence. We are convinced that real progress in understanding the effects of job characteristics and job stress cannot be made if future empirical studies are not guided by better theories.

Therefore, after briefly surveying previous attempts to summarize the literature on the effects of job characteristics, job stress, job ethics and job engagement, we introduce existing theoretical approaches from South Korea. Following our analysis of the empirical evidence, we return to the issue of how we might make progress in understanding the relationship and effects of job characteristics, job stress, job ethics and job engagement. Job characteristics and job stress, however, is perceived as positive cognition based on unconscious critical thought. It also causes psychological confusion and psychopathology. Kim reported the results of a positive correlation between job ethics and job engagement [4]. Furthermore, comparative studies on cognition types focusing on psychological intervention have reported that psychological interventions positively affect victims' mental health as well as job characteristics and job stress. In addition, in some cases, psychological interventions have positive and long-term effects compared to job ethics and job engagement. As a result, it is found that there is a lack of research on mediating effects of job characteristics, job stress, job ethics and job engagement.

This study, therefore, aims to investigate the relationship between characteristics and job stress, job ethics, and job engagement, and examines the mediating model between job ethics and job engagement, and between job characteristics and job stress.

This study is based on the assumption that the issues of cognitive maladjustment due to various job characteristics and job stress experienced by meditators living in South Korea are related to job ethics and job engagement.

First, this study examines whether job characteristics, job ethics, job engagement, and job stress have significant correlations. Second, the study examines whether job characteristics, in terms of their effect on job stress, will have a continuous mediating effect on job ethics and job engagement.

This study may be useful for enhancing the understanding of the factors affecting the meditator, and could provide the opportunity for clinicians to provide basic data on research and psychotherapy.

## 2. Methods

### 2.1. Respondents and Data Collection

This study was conducted from July 2019 to August 2019. Participants were male and female (adults) in Seoul, Korea. Finally, the data from a total of 366 participants was analyzed.

#### 2.1.1. Respondents by Gender

The genders of the participants are as follows. [Table 1]

Table 1. Respondents by Gender (N=366)

	N	%
Males	305	83.3
Females	61	16.7
Total	366	100

#### 2.1.2. Respondents by Age

The ages of the participants are as follows.[Table 2]

Table 2. Respondents by Age (N=366)

Age	N	%
20-29	36	9.8
30-39	204	55.7
40-49	114	31.1
50-59	11	3
60-69	1	0.3
Total	366	100

#### 2.1.3. Respondents by Position

The positions of the participants are as follows. [Table 3]

Table 3. Respondents by Position (N=366)

	N	%
Staff Member	89	24.3
Manager	58	15.8
Deputy Section Chief	73	19.9
Section Chief	60	16.4
Chief	56	15.3
Executives	24	6.6

Contract Employee	4	1.1
Missing Value	2	0.5
Total	366	100

#### 2.1.4. Respondents by Task

The tasks of the participants are as follows. [Table 4]

Table 4. Respondents by Task (N=366)

	N	%
Seles Personnel	235	64.2
Administrative Position	91	24.9
Research Position	12	3.3
Production	18	4.9
The Others	10	2.7
Total	366	100

#### 2.1.5. Respondents by Employment Period

The employment periods of the participants are as follows. [Table 5]

Table 5. Employment Periods of Participants (N=366)

	N	%
Less Than Three Years	65	17.8
Less Than Five Years	66	18
Less Than Ten Years	105	28.7
Less Than Fifteen Years	83	22.7
Less Than Twenty Years	36	9.8
Less Than Twenty –Fifth Years	6	1.6
Less Than Thirty Years	4	1.1
More Than Thirty Years	1	0.3
Total	366	100

#### 2.1.6. Respondents by Annual Income

The annual incomes of the participants are as follows. [Table 6]

Table 6. Respondents by Annual Income (N=366)

	N	%
Less than 25.000\$	35	9.6
Less than 42.000\$	126	34.4
Less than 50.000\$	112	30.6
Less than 58.000\$	69	18.9
Less than 75.000	17	4.6
More than 90.000\$	6	1.6
Missing Value	1	0.3
Total	366	100

## 2.2. MEASUREMENT

### 2.2.1. Job Characteristics

In order to measure job characteristics, we used the Job Characteristics Questionnaire (JCQ) developed by Hackman and Oldham (1980) [11]. In the present study, Cronbach's  $\alpha$  of job characteristics was .825.

### 2.2.2. Job Stress

In order to measure job stress, we used the Job Stress Questionnaire (JSQ), which was developed by Chang, Koh, Kang, Kim, Kang, Lee, Chung, Cho, Son, Chae, Kim, Kim, Kim, Roh, Park, Woo, Kim, Kim, Ha, Park, Rhee, Kim, Kong, Kim, Kim, Park, Hyeon, Son [12] and Chang [13]. In the present study, the total of the job stress of Cronbach's  $\alpha$  was .896.

### 2.2.3. Job Ethics

In order to measure job ethics, we used the Job Ethics Questionnaire (JEQ), which was developed by Kang [14]. In the present study, the total of the job ethics of Cronbach's  $\alpha$  was .830.

### 2.2.3. Job Engagement Questionnaire

In order to measure job engagement, we used the Job Engagement Questionnaire (JEQ), which was developed by Kanugo [15] which was adapted by Kim [16]. In the present study, the total of the job engagement of Cronbach's  $\alpha$  was .924.

## 2.3. Data Analysis

Data collected for this study was analyzed using the IBM SPSS V.22 as follows: We used a 95% confidence interval based on the empirical distribution estimated by bootstrapping to verify the mediating effect. Bootstrapping interpreted the sample as statistically significant if it did not know the distribution of the population and if the 95% confidence interval did not include zero [17][18].

## 3. Results

### 3.1. Descriptive Statistics of Study Variables

Table 7. Job Characteristics, Job Ethics, Job Engagement, and Job Stress According to Position

Position	N	Job Characteristics		Job Ethics		Job Engagement		Job Stress	
		M	SD	M	SD	M	SD	M	SD
Staff Member	89	3.58	0.54	3.91	0.53	3.62	0.68	2.69	0.43
Manager	58	3.61	0.61	3.84	0.57	3.60	0.69	2.67	0.48
Deputy Section Chief	73	3.69	0.50	3.93	0.45	3.77	0.60	2.56	0.50
Section Chief	60	3.74	0.42	3.92	0.36	3.85	0.43	2.58	0.45
Chief	56	3.77	0.36	3.97	0.30	4.01	0.54	2.53	0.44
Executives	24	4.02	0.37	4.01	0.47	4.14	0.40	2.36	0.36
Contract Employee	4	3.58	1.02	3.86	0.87	3.89	0.82	2.45	0.63
Total	364	3.69	0.51	3.92	0.46	3.78	0.62	2.59	0.46

Staff members had median scores of 3.58 ( $SD=0.54$ ) for job characteristics, 3.91 ( $SD=0.53$ ) for job ethics, 3.62 ( $SD=0.68$ ) for job engagement, and 2.69 ( $SD=0.43$ ) for job stress. Managers had mean scores of 3.61 ( $SD=0.61$ ) for job characteristics, 3.84 ( $SD=0.57$ ) for job ethics, 3.6 ( $SD=0.69$ ) for job engagement, and 2.67 ( $SD=0.48$ ) for job stress.

Deputy section chiefs had median scores of 3.69 ( $SD=0.5$ ) for job characteristics, 3.93 ( $SD=0.45$ ) for job ethics, 3.77 ( $SD=0.6$ ) for job engagement, and 2.56 ( $SD=0.5$ ) for job stress.

Section chiefs had median scores of 3.74 ( $SD=0.42$ ) for job characteristics, 3.92 ( $SD=0.36$ ) for job ethics, 3.85 ( $SD=0.43$ ) for job engagement, and 2.58 ( $SD=0.45$ ) for job stress.

Chiefs had median scores of 3.77 ( $SD=0.36$ ) for job characteristics, 3.97 ( $SD=0.3$ ) for job ethics, 4.01 ( $SD=0.54$ ) for job engagement, and 2.53 ( $SD=0.44$ ) for job stress.

Executives had median scores of 4.02 ( $SD=0.37$ ) for job characteristics, 4.01 ( $SD=0.47$ ) for job ethics, 4.14 ( $SD=0.4$ ) for job engagement, and 2.36 ( $SD=0.36$ ) for job stress.

Contract employees had median scores of 3.58 ( $SD=1.02$ ) for job characteristics, 3.86 ( $SD=0.87$ ) for job ethics, 3.89 ( $SD=0.82$ ) for job engagement, and 2.45 ( $SD=0.63$ ) for job stress.

Overall, participants had median scores of 3.69 ( $SD=0.51$ ) for job characteristics, 3.92 ( $SD=0.46$ ) for job ethics, 3.78 ( $SD=0.62$ ) for job engagement, and 2.59 ( $SD=0.46$ ) for job stress.

Table 8. Job Characteristics, Job Ethics, Job Engagement, and Job Stress According to Task

Task	N	Job Characteristic		Job Ethics		Job Engagement		Job Stress	
		M	SD	M	SD	M	SD	M	SD
Sales Personnel	235	3.75	0.49	3.90	0.48	3.82	0.61	2.59	0.44
Administrative Position	91	3.63	0.51	4.00	0.44	3.69	0.67	2.63	0.52
Research Position	12	3.83	0.57	3.79	0.44	4.12	0.48	2.22	0.48
Production	18	3.48	0.56	3.93	0.40	3.75	0.47	2.55	0.45
Others	10	3.30	0.41	3.73	0.34	3.44	0.38	2.76	0.35
Total	366	3.70	0.51	3.92	0.46	3.78	0.61	2.59	0.46

Sales personnel had median scores of 3.75 ( $SD=0.49$ ) for job characteristics, 3.90 ( $SD=0.48$ ) for job ethics, 3.82 ( $SD=0.61$ ) for job engagement, 2.59 ( $SD=0.44$ ) for job stress, and 3.29 ( $SD=0.38$ ) for job satisfaction.

Participants with administrative positions had median scores of 3.63 ( $SD=0.51$ ) for job characteristics, 4.00 ( $SD=0.44$ ) for job ethics, 3.69 ( $SD=0.67$ ) for job engagement, and 2.63 ( $SD=0.52$ ) for job stress.

Participants with research positions had median scores of 3.83 ( $SD=0.57$ ) for job characteristics, 3.79 ( $SD=0.44$ ) for job ethics, 4.12 ( $SD=0.48$ ) for job engagement, and 2.22 ( $SD=0.48$ ) for job stress.

Participants with positions in production had median scores of 3.48 ( $SD=0.56$ ) for job characteristics, 3.93 ( $SD=0.40$ ) for job ethics, 3.75 ( $SD=0.47$ ) for job engagement, and 2.55 ( $SD=0.45$ ) for job stress.

Participants whose positions were categorized as 'Others' had median scores of 3.3 ( $SD=0.41$ ) for job characteristics, 3.73 ( $SD=0.34$ ) for job ethics, 3.44 ( $SD=0.38$ ) for job engagement, and 2.76 ( $SD=0.35$ ) for job stress.

Overall, the variables based on task had median values of 3.70 ( $SD=0.51$ ) for job characteristics, 3.92 ( $SD=0.46$ ) job ethics,  $M=3.78$  ( $SD=0.61$ ) for job engagement, and 2.59 ( $SD=0.46$ ) for job stress.

Table 8. Job Characteristics, Job Ethics, Job Engagement, and Job Stress According to Employment Period

Employment Period	N	Job characteristics		Job Ethics		Job Engagement		Job Stress	
		M	SD	M	SD	M	SD	M	SD
Less Than Three Years	65	3.60	0.53	3.94	0.54	3.76	0.69	2.61	0.45
Three Years ~ Less Than Five Years	66	3.58	0.67	3.76	0.61	3.48	0.76	2.70	0.46
Five Years ~ Less Than Ten Years	105	3.73	0.43	3.94	0.37	3.82	0.53	2.53	0.49
Ten Years ~ Less Than Fifteen Years	83	3.77	0.45	3.95	0.38	3.87	0.50	2.57	0.48
Fifteen Years ~ Less Than Twenty Years	36	3.75	0.41	4.02	0.43	3.98	0.54	2.59	0.35
Twenty years ~ Less Than Twenty-five Years	6	4.13	0.22	3.91	0.38	4.14	0.34	2.33	0.22
Twenty-five Years ~ Less Than Thirty Years	4	3.89	0.46	4.08	0.17	4.11	0.43	2.60	0.42
Thirty Years or More	1	4.00	.	4.33	.	4.43	.	2.40	.
Total	366	3.70	0.51	3.92	0.46	3.78	0.61	2.59	0.46

Participants who were employed for 'less than three years' had median scores of 3.60 ( $SD=0.53$ ) for job characteristics, 3.94 ( $SD=0.54$ ) for job ethics, 3.76 ( $SD=0.69$ ) for job engagement, and 2.61 ( $SD=0.45$ ) for job stress.

Those who were employed from three years to less than five years had median scores of 3.58 ( $SD=0.67$ ) for job characteristics, 3.76 ( $SD=0.61$ ) for job ethics, 3.48 ( $SD=0.76$ ) for job engagement, and 2.70 ( $SD=0.46$ ) for job stress.

Participants employed for five years to less than ten years had median scores of 3.73 ( $SD=0.43$ ) for job characteristics, 3.94 ( $SD=0.37$ ) for job ethics, 3.82 ( $SD=0.53$ ) for job engagement, and 2.53 ( $SD=0.49$ ) for job stress.

Those who had been employed for ten years to less than fifteen years had median scores of 3.77 ( $SD=0.45$ ) for job characteristics, 3.95 ( $SD=0.38$ ) for job ethics, 3.87 ( $SD=0.50$ ) for job engagement, and 2.57 ( $SD=0.48$ ) for job stress.



Those employed for fifteen years to less than twenty years had median scores of 3.75 ( $SD=0.41$ ) for job characteristics, 4.02 ( $SD=0.43$ ) for job ethics, 3.98 ( $SD=0.54$ ) for job engagement and 2.59 ( $SD=0.35$ ) for job stress.

Participants employed for twenty years to less than twenty-five years had median scores of 4.13 ( $SD=0.22$ ) for job characteristics,  $M=3.91$  ( $SD=0.38$ ) job ethics, 4.14 ( $SD=0.34$ ) for job engagement, and 2.33 ( $SD=0.22$ ) for job stress.

Those who were employed for twenty-five years to less than thirty years had median scores of 3.89 ( $SD=0.46$ ) for job characteristics, 4.08 ( $SD=0.17$ ) for job ethics, 4.11 ( $SD=0.43$ ) for job engagement, and 2.60 ( $SD=0.42$ ) for job stress.

Those employed for thirty years or more had median scores of 4 ( $SD=.$ ) for job characteristics, 4.33 ( $SD=.$ ) for job ethics, 4.43 ( $SD=.$ ) for job engagement, and 2.4 ( $SD=.$ ) for job stress (1 subject).

Overall, the median scores based on employment period were 3.70 ( $SD=0.51$ ) for job characteristics, 3.92 ( $SD=0.46$ ) for job ethics, 3.78 ( $SD=0.61$ ) for job engagement, and 2.59 ( $SD=0.46$ ) for job stress.

### 3.2. Correlation Analysis of Research Variables

Table 9. Results of Correlation Analysis of Job Characteristics, Job Ethics, Job Engagement, and Job Stress

	Job Characteristics	Job Ethics	Job Engagement	Job Stress
Job Characteristics	1			
Job Ethics	.482**	1		
Job Engagement	.573**	.457**	1	
Job Stress	-.507**	-.213**	-.663**	1

\*  $p<.05$  \*\*  $p<0.01$  \*\*\*  $p<.001$

The results of the correlation analysis show that job characteristics have statistically significant positive correlations with job ethics ( $r=.482$ ,  $p<.01$ ) and job engagement ( $r=.573$ ,  $p<.01$ ), and a statistically significant negative correlation with job stress ( $r=-.507$ ,  $p<.01$ ). Job ethics have a statistically significant positive correlation with job engagement ( $r=.457$ ,  $p<.01$ ) and a statistically significant negative correlation with job stress ( $r=-.213$ ,  $p<.01$ ). Job engagement has a statistically significant negative correlation with job stress ( $r=-.663$ ,  $p<.01$ ).

### 3.3. Path Model

A job characteristics analysis was conducted to confirm the effects of job stress. Specifically, job characteristics and job stress had a significant effect on job ethics and engagement. In addition, job characteristics were found to have a significant effect on job ethics ( $\beta=.482$ ,  $p<.001$ ), and job characteristics were found to have a significant effect on job engagement ( $\beta=.460$ ,  $p<.001$ ), and job characteristics were found to have a significant effect on job stress ( $\beta=-.248$ ,  $p<.001$ ). A significant correlation was found between job ethics and job engagement ( $\beta=.236$ ,  $p<.001$ ) and job stress ( $\beta=.183$ ,  $p<.001$ ), and job ethics were found to have a significant effect on job stress ( $\beta=-.605$ ,  $p<.001$ ). [Table 10].

Table 10. Path Model

Path			B	B	s.e	t	p
Job Characteristics	→	Job Ethics	0.441	.482	.042	10.488	.000
		Job Engagement	0.558	.460	.058	9.680	.000
		Job Stress	-0.226	-.248	0.44	-5.161	.000
Job Ethics	→	Job Engagement	0.312	.236	.063	4.964	.000
		Job Stress	0.182	.183	.044	4.130	.000
Job Engagement	→	Job Stress	-0.454	-.605	.036	-12.748	.000

\* p<.05 \*\* p<0.01 \*\*\* p<.001

### 3.4. Measurement Model

We performed bootstrapping by extracting 2,000 parts of the escapism of job characteristics to the job stress through the job ethics and job engagement.

As a result, the indirect effect was significant because the path through the job ethics and job engagement included 0 in the 95% confidence interval of the indirect effect ( $\beta=-.226$ , C.I[-.312~-.140]).

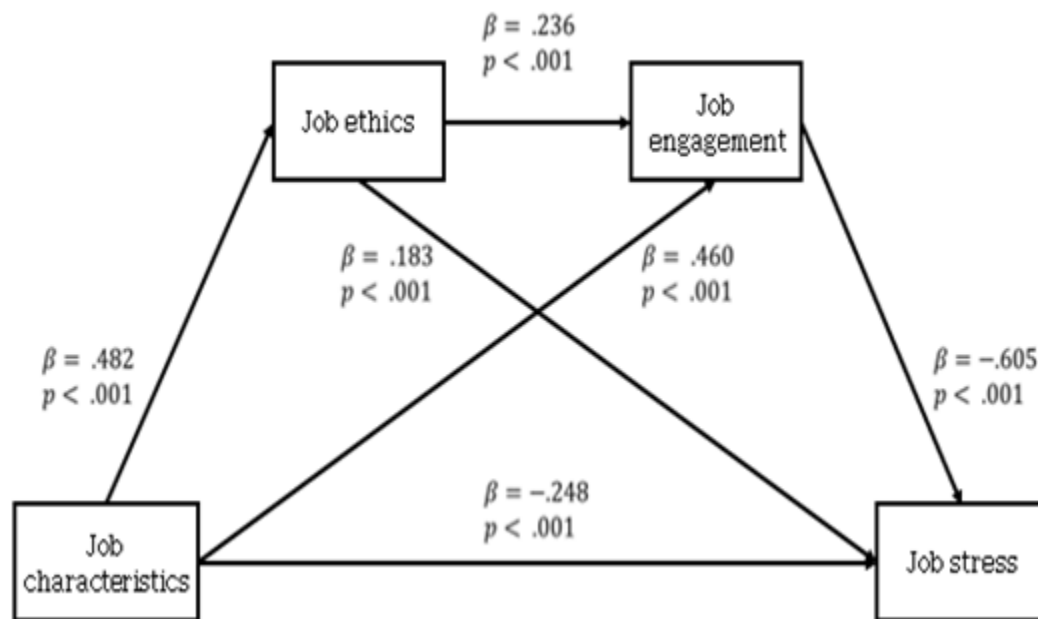
As a result, the indirect effect was significant because the path through the job ethics included 0 in the 95% confidence interval of the indirect effect ( $\beta=.080$ , C.I[.032~.137]).

In addition, the indirect effect was significant because the path through the job engagement included 0 in the 95% confidence interval of the indirect effect ( $\beta=-.226$ , C.I[-.312~-.140]). [Table 8] [Figure 1].

Table 11. Measurement Model

Independent variable	Parameter 1	Parameter 2	Dependent Variable	Total Effect [bootstrapping CI 95%]	Direct Effect [bootstrapping CI 95%]	Total Indirect Effect [bootstrapping CI 95%]	Indirect Effect [bootstrapping CI 95%]
Job Characteristics	Job Ethics	Job Engagement	Job Stress				-.063 [-.103~-.031]
Job Characteristics	Job Ethics	-	Job Stress	-.461 [-.542 ~-.381]	-	-.235 [-.306~-.165]	.080 [.032~.137]
Job Characteristics	-	Job Engagement	Job Stress				-.253 [-.323~-.185]
Job Characteristics	-		Job Stress		-.226 [-.312~-.140]	-	-

Figure 1. Path Model



#### 4. Conclusions

The results of this study suggest that job characteristics of K pharmaceutical company's staff have a significant effect on job stress through the job ethics and job engagement.

Meanwhile, a simple correlation analysis revealed that there was a significant correlation between job characteristics, job stress, job ethics, and job engagement, whereas the path search for the median model analysis was significant.

This is consistent with a previous study, which reported a significant correlation between job characteristics and job stress [19].

Lee [20] discovered that most causes of job characteristics that interfere with job ethics are experienced in work life.

Kim [21] discovered that among work experienced people, most of the causes of job characteristics that interfere with thinking are related to job engagement, individual cognition, a healthy work style, and experiences of job satisfaction in citizenship behavior.

Kim, Lee, and Lim [22] discovered among work experienced people that most of the causes of job characteristics that interfere with thinking are related to job stress, job ethics, and job engagement.

Therefore, objective perception of changes in these cognition conditions could lead to a deterioration of psychological function.

In conclusion, the mediating effect of job characteristics, job stress, job ethics, and job engagement of a pharmaceutical company's staff was solely analyzed in South Korea, and significant results were obtained. Nevertheless, it is important to note that results from this study could be used in reference to cognitive work style, especially during counseling interventions and in clinical settings.

This study is significant because it collected data from employees of K pharmaceutical company, a large corporation, to establish a path model and record correlations among job characteristics, job stress, job

ethics, and job engagement and verify these findings through a continuous mediation model analysis. Second, it verified the mediating effects of job ethics and job engagement on the relationship between job characteristics and job stress. Through this, it was confirmed that job characteristics influence job stress through job ethics and job engagement. Third, it verified the significance of the indirect effect of job ethics and job engagement on the relationship between job characteristics and job stress. Through this, it was confirmed that job characteristics influenced job stress through job ethics and job engagement.

The limitations of this study and suggestions for follow-up studies are as follows. First, it was expected that the employees of K pharmaceutical company included in the study showed social desirability in the questionnaire since they knew that the researcher of this study was a main executive of their company. Thus, the sincerity of their answers cannot be verified. Second, the study found that job ethics and job engagement acted as mediating factors in job characteristics affecting job stress and job satisfaction, but failed to discover a structural equation model, which entails a more detailed research method.

Third, a mediation model consistent with the results of the study could not be found among domestic and foreign research data. A research model was constructed based on configurations presented in a prior study showing the correlation between each variable. However, there was no previous research on a path model that combined job characteristics, job stress, job satisfaction, job ethics, and job engagement for employees at domestic or foreign pharmaceutical companies. Thus, there was a limitation in discussing the significance of the results as it failed to reflect the results of previous studies with consistent results.

Fourth, this study did not construct a program reflecting job characteristics, job stress, job satisfaction, job ethics, and job engagement. Instead, it merely set up a study model by simply reflecting the correlation results of previous studies and the results were not confirmed through experimental groups.

The suggestions for follow-up research based on the results of this study are as follows. First, this study showed significant correlations between job characteristics, job stress, job ethics, and job engagement. This indicates that job stress levels may be lowered with appropriate job characteristic factors. It also indicates that changes to job ethics and job engagement can be elicited as well. In follow-up studies, it is necessary to measure the job characteristics, job stress, job ethics, and job engagement of various subjects, not just the employees of a specific company, in order to clearly compare and verify their relationships with the variables used in this study.

Second, studies on job characteristics, job stress, job ethics, and job engagement in Korea are insufficient. Most studies only measured job characteristics, job stress, job ethics, and job engagement independently. Moreover, there have been no studies on how job characteristics lead to job stress through job ethics and job engagement, and none that verify this through quantitative measurements. Therefore, it is necessary to repeatedly verify whether the derived path model is appropriate within the scope of variables such as job characteristics, job stress, job ethics, and job engagement.

Third, this study used a path model to validate the results of the continuous mediating model. A path model is a good quantitative research method that reduces errors and finds a hypothesis that is connected to the real world. In order to supplement this study, it is necessary to conduct more detailed research through structural equation model validation in order to clarify the relationship between each element constituting the model or the relationships between each element and the whole through statistical techniques.

Fourth, more research methods should be considered, such as experimental studies, observation methods, interview methods, or longitudinal studies rather than cross-sectional studies. Lastly, in the follow-up

studies, it is necessary to develop a program that can be applied to employees in the company and verify its effectiveness by reflecting the path model in this study.

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These should be brief and placed at the end of the text before the references.

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