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Impact of Mental Workload on Job Satisfaction and Job Stress: A Study on Occupational Safety Experts

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Abstract

Occupational safety experts lead individuals to work safely in their workplaces and try to monitor their health. In this context, occupational safety experts have great responsibilities in solving the safety problems that employees may face, especially health problems that may develop due to work. Within the scope of this study, the effectiveness of the mental workload of occupational safety experts on job stress and job satisfaction is discussed. In this context, it is aimed to explain the effects of mental workload on the job stress and job satisfaction of occupational safety experts; thus, it is estimated that as workload increases, job stress will increase and job satisfaction will decrease. This study, which tries to explain the relationship in question, and making suggestions for occupational safety experts is of great importance in terms of both their psychological and physiological health. At the same time, the fact that such a relationship has not been examined before reveals the original importance of the study.

The study was conducted through an online survey distributed to 623 participants, who were occupational safety experts, using random sampling via ISG Katip, social media, and WhatsApp groups. The findings indicate that A-class experts exhibit higher job satisfaction than other categories. A strong positive correlation was found between mental workload and job stress ($r=0.546$; $p<0.05$), while a strong negative correlation was observed between mental workload and job satisfaction ($r=-0.525$; $p<0.05$). In addition, it was determined that there was a strong negative relationship between the participants' job satisfaction and work-related stress levels ($r: -0.572$; $p<0.05$). This result means that when the participants' job satisfaction increases, their work-related stress levels decrease.

Keywords Job Stress · Job Satisfaction · Workload · Occupational Safety Expert

Author Note This study was produced from the doctoral thesis titled "The Mediating Role of Emotional Intelligence in the Effect of Mental Workload of Occupational Safety Specialists on Job Stress and Job Satisfaction" by Hüsre Gizem Akalp, a student at the Occupational Health and Safety Programme of Istanbul Gedik University Graduate Education Institute.

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Impact of Mental Workload on Job Satisfaction and Job Stress: A Study on Occupational Safety Experts

The hazards present in the work environment are determined not only by physical conditions but also by the organization and execution of tasks. Incidents that impose social and economic costs on business stakeholders are documented within national economies and have adverse effects on overall economic performance. Various methods and tools aimed at enhancing workplace safety and ergonomics continue to be developed, with ongoing research contributing to this dynamic field.

While measures to mitigate physical, chemical, biological, and ergonomic hazards are implemented and their improvements often become evident more rapidly, psychosocial hazards have long been overlooked. There is a growing body of research on the existence, impact, and outcomes of psychosocial risks—such as job stress, mobbing, workload and pace, interpersonal relations, organizational culture, and job roles—that are frequently encountered in business life. One of the primary outcomes of excessive psychosocial demands is job stress, which poses significant risks to mental and physical health.

Mental workload (MW) refers to the cognitive effort required by individuals to meet the demands of their job tasks. It plays a critical role in determining employees' ability to process information, make decisions, and maintain attention, particularly in high-demand or multitasking environments (Groenewegen & Hutten.1991). When mental workload exceeds an individual's cognitive resources, it may lead to fatigue, decreased performance, increased error rates, and the onset of stress (Wickens et al, 2021).

Job stress, which is often rooted in high mental workload and organizational dysfunctions, is a known precursor to various psychological, behavioral, and physiological disorders. One of its significant consequences is diminished job satisfaction, which can reduce employee well-being and productivity. Job satisfaction (JSat), defined as the overall affective reaction of individuals to their work experiences, is closely linked to organizational commitment, employee motivation, and performance. Higher levels of job satisfaction contribute to reduced turnover, increased loyalty, and better mental health among employees (Spector, 1997).

Health and safety, in a professional context, comprise a multidisciplinary field focused on protecting the well-being of everyone within the workplace. The concept of health encompasses both the physical and mental well-being of employees, subcontractors, and visitors, ensuring their protection from harm, such as injuries or illnesses. In contrast, safety pertains to the physical conditions of the workplace and denotes a state in which the risk of harm or damage is either eliminated or reduced to an acceptable level.

Considering that humans are the most valuable resource in any organization, the return on investment in safe and healthy working conditions is undeniable. As the business world evolves with technological advancements and automation, the human factor remains central to organizational success. The success of a business depends not only on financial capital or technological infrastructure but also on the knowledge, skills, and motivation of its employees. People are at the heart of production processes and play a decisive role in decision-making, problem-solving, and creativity. When the physical and psychological well-being of employees is safeguarded, both job satisfaction and organizational productivity increase. Therefore, it is imperative that businesses adopt human-centered strategies to ensure sustainable growth and competitive advantage.

Conceptual Framework

Workload refers to the effects of the time and energy required to complete a task on the emotional state of the employee (Öztürk & Erdem, 2020). The amount of work that must be completed in a limited period at a certain level of quality and performance is called workload. This load is determined by both the mental and physical demands of the job, time pressure, work environment, work tempo, and the individual's abilities, habits, and perceptions. Mental workload is defined as the level of perceived difficulty and is considered a critical factor affecting the person's interest in the job, degree of commitment, and motivation. At this point, as mental workload increases, performance generally decreases, the time it takes to complete the task increases, and errors increase (Akça, 2022).

The length of working hours, the emotional reactions felt at the end of the job, and the amount and quality of the outputs obtained determine how the workload is perceived. Therefore, even tasks perceived as simple by employers or customers can create a significant burden for employees (Öztürk & Erdem, 2020). With an increase in mental workload, there is usually a decrease in performance and loss of motivation, errors increase, the time to complete the job increases, and this causes feelings of stress, pressure and discomfort in other parts of the employee's work life. Such negative effects also reduce the individual's general quality of life.

Occupational stress is defined as exposure to stressors associated with one's job and is recognized as a global phenomenon. Research has revealed the adverse social and structural impacts of stress on employees' physical, behavioral, and mental health. The concept of stress is generally understood as emotional or physical reactions caused by demands that exceed an individual's capabilities. Accordingly, work-related stress is often described as a state of tension that arises when the physiological, psychological, or managerial demands of an organization are not aligned with the employees' capacity to meet those demands. Job stressors, which are the primary causes of occupational stress, play a central role in employees' experience of stress. These include excessive workload, time pressure, role ambiguity, role conflicts, low levels of autonomy, job insecurity, insufficient support, inadequate compensation, career uncertainty, and unfair performance evaluation systems. Such stressors can lead to significant consequences on both the individual and organizational levels. Stress manifests in various forms within organizations, making it difficult to establish a standardized definition that can be used to examine its impact on corporate well-being and productivity. Indicators of work-related stress include employees frequently finding excuses to be absent, making unusually frequent errors, arriving late to work, leaving before the end of their shift, experiencing difficulties focusing, and facing interpersonal issues with colleagues. These outcomes highlight the importance of managerial awareness and proactive intervention to address the existing stress conditions. Work-related stress can also be conceptualized as a systemic issue. Certain job roles have a high potential to induce stress and pose a risk of trauma. Stress observed in such positions can lead to both short- and long-term physiological and psychological responses that may harm human health. Furthermore, stress may suppress employees' immune systems, paving the way for cardiovascular issues, headaches, sleep disorders, anxiety, depression, and general tension. In conclusion, the presence of occupational stress negatively affects not only individual health but also job satisfaction and overall quality of life.

Job satisfaction, as stated by Locke (1969), is a multifaceted phenomenon resulting from employees' own experiences, emotional reactions and behaviors. At the same time, Locke emphasized that these perceptions are shaped by the combination of psychological and physiological factors (Locke, 1969). The satisfaction that employees feel from a job is accepted as a criterion of job satisfaction. The employee's belief that their job

meets their social, psychological and material needs forms the basis of this feeling, and some individuals achieve satisfaction in their jobs when their needs are met and their emotions are under control. The concept of job satisfaction is defined as a multidimensional structure that includes different components related to the job (Howard & Frick, 1996). In the literature, job satisfaction is widely recognized as a multidimensional construct, with each dimension reflecting employees' perceptions of different aspects of their work. First, the pay and rewards dimension encompasses employees' satisfaction with their salary, bonuses, fringe benefits, and overall financial compensation. Perceived fairness and the adequacy of remuneration are especially critical in societies where economic security is a prominent concern (Locke, 1976; Judge et al., 2010).

Second, the nature of the work itself pertains to how meaningful, engaging, and personally enriching employees find their tasks. When the work is seen as creative, instructive, and conducive to personal development, satisfaction within this domain increases (Hackman & Oldham, 1976; Herzberg, 1966).

The relationship with the supervisor's dimension refers to the extent to which managers are perceived as supportive, fair, and open to communication. Constructive feedback and managerial fairness contribute significantly to both psychological safety and organizational commitment (Yukl, 2012; Robbins & Judge, 2017).

Relationships with coworkers represent another key dimension, reflecting the social climate of the workplace. Collegiality, cooperation, and peer support are essential for promoting emotional resilience and overall job satisfaction (McShane & Glinow, 2015). Promotion and career advancement opportunities relate to employees' perceptions of fair and merit-based systems for career development. Opportunities for upward mobility and skill utilization significantly enhance satisfaction (Spector, 1997). The job security dimension captures employees' perceptions of stability and continuity in employment. The absence of fear regarding job loss plays a vital role in sustaining satisfaction, especially during times of economic uncertainty (Witte, 1999; Sverke et al., 2002). Autonomy refers to the degree of freedom employees have in making decisions regarding how to perform their work. This dimension aligns with motivation theories, suggesting that autonomy supports intrinsic satisfaction (Hackman & Oldham, 1980; Deci & Ryan, 2000).

Working conditions include physical aspects of the workplace, such as ergonomics, break schedules, working hours, and occupational safety. A safe and comfortable environment enhances both well-being and performance (Schaufeli & Bakker, 2004; Kristensen et al., 2005).

Finally, the organizational values and policies dimension reflects the alignment between employees' values and those of the organization, particularly concerning ethics, fairness, transparency, and social responsibility. Employees in value-congruent environments are more likely to report higher levels of commitment and satisfaction (Meyer & Allen, 1997; Colquitt et al., 2001). The level at which workers' expectations from the workplace are met in general reflects their level of job satisfaction.

The purpose of this study was to reveal the effect of the mental workload of occupational safety specialists, who have a lot of responsibilities, on job stress and job satisfaction (Cranny et al.,1992).

Method Of The Research

For this research, the quantitative analysis method was used, and the general screening model was patterned with the relational screening model (Büyüköztürk et al., 2008). The questions prepared online in the research were sent through the software system called ISG Katip, which has become mandatory within the scope of the Occupational Health and Safety Law No. 6331 and enables the online monitoring of Occupational Health and Safety services in our country, and also through social media and WhatsApp

groups. The application was started with the random sampling method and feedback was received from 678 people. When those who gave incorrect or incomplete answers were eliminated from the data, 623 data were subjected to analysis. This number represents a meaningful dimension showing the general situation of occupational safety experts.

However, there may be some limitations in the representative power due to the voluntary participation and open access to online access. Access to users who work in certain sectors or at regular intervals may be limited. However, their high presence and deregistration from different freedom classes (these are Class A) is an important advantage in terms of reflecting the general tendencies of the elderly.

Data Collection Tools

A personal information form and 3 different scales were used in the study. Permissions for use from all researchers who adapted the scales to Turkish and the ethics committee permissions of the study were obtained with the approval of the University (dated 25.12.2023 and numbered 2023/11). In addition to the demographic questions consisting of 7 questions including information on age, gender, level of education, occupational health and safety (OHS) specialization classes, sector of employment, marital status and work experience, the CarMen-Q Mental Workload Scale, developed by Rubio-Valdehita et al. (2017) and adapted to Turkish by Akca et al. (2020), was used to measure mental workload. The scale has a four-dimensional structure as in its original form. These dimensions are cognitive workload, temporary workload, emotional workload, and performance-related workload demands. The scale consists of 25 items and is a 5-point Likert type. The item-total correlation coefficients of the Turkish Mental Workload Scale were observed to be between 0.12 and 0.74, and the internal consistency coefficient was calculated as Cronbach α = 0.90.

The Job Stress Scale, originally developed by House and Rizzo (1972) and adapted into Turkish by Efeoğlu (2006), has been utilized to measure job stress, as it has been widely employed in various research studies (Efeoğlu, 2006). This scale consists of seven items and a single dimension, with responses measured on a five-point Likert scale.

To assess job satisfaction, the Job Satisfaction Scale, initially developed by Brayfield and Rothe (1951) and later updated by Judge, Locke, Durham, and Kluger (1998), has been employed. The Turkish adaptation of this scale was conducted by Keser and Öngen Bilir (2019). The scale comprises five items and measures job satisfaction as a unidimensional construct (Judge & Kluger, 2008).

This study aimed to examine the impact of occupational safety specialists' mental workload on job stress and job satisfaction.

The hypotheses of the research are stated below.

H1: The mental workload of occupational safety specialists has a significant and positive effect on job stress.

H2: The mental workload of occupational safety specialists has a significant and negative effect on job satisfaction.

H3: There is a significant relationship between job satisfaction and job stress.

Data Analysis and Findings

The data obtained in this study were analyzed using SPSS 25.0 and LISREL 8.7. Frequency and percentage analyses were conducted to examine the demographic characteristics of the participants, while the relia-

bility of the scales used in the study was assessed through Cronbach's alpha reliability analysis. Confirmatory factor analysis (CFA) was performed to evaluate the validity of the scales, and the model's fit was assessed using various fit indices, including X^2/df, IFI, CFI, RMSEA, GFI, and RMR. Structural equation modeling (SEM) was used to test the research hypotheses.

Table 1

Findings on the demographic characteristics of the participants

Demographic	Group	n	%
Gender	Male	331	53,13
	Female	292	46,87
Age	18-25	130	20,87
	26-29	131	21,03
	30-35	118	18,94
	36-45	128	20,55
	45+	116	18,62
Education Level	Associate's degree	82	13,16
	Bachelor's degree	425	68,22
	Master's degree	83	13,32
	Doctorate	33	5,30
Marital status	Married	360	57,78
	Single	263	42,22
Work Experience	0-5 year	200	32,10
	5-10 years	113	18,14
	10-15 tear	147	23,60
	More than 15 years	163	26,16
Type of Specialization Certificate	A certificated	420	67,42
	B certificated	130	20,87
	C certificated	73	11,72
Sector	Manufacturing	136	21,83
	Automotive	79	12,68
	Energy	85	13,64
	Healthcare	99	15,89
	Construction	97	15,57
	Textile	127	20,39
	Total	**623**	**100,00**

An analysis of the demographic data collected from 623 participants revealed that 53.13% (n = 331) were male, while 46.87% (n = 292) were female. The majority of participants fall within the 26-29 age range (21.03%; n = 131), hold a bachelor's degree (68.22%; n = 425), and are married (57.78%; n = 360). Additionally, 32.10% (n=200) have 0-5 years of work experience, 67.42% (n=420) possessed a Class A specialty certificate, and 21.83% (n=136) were employed in the production sector.

This study analyzed the effects of demographic variables on mental workload, job-related stress, and job satisfaction among occupational safety specialists. Significant differences based on statistical tests are presented in the following tables and discussed below.

Table 2

Demographic variables and mental workload levels

Variable	Group	n	Mean	SD	Statistic	Interpretation
Age	18–25	130	3.68	0.7		
	26–29	131	2.8	0.78		
	30–35	118	2.86	0.77	F=30.013, p=0.001*	18–25 > 26–45
	36–45	128	2.82	0.79		
	45+	116	3.18	0.86		
Education	Associate	82	3.1	0.85		
	Bachelor	425	3.14	0.85	F=5.324, p=0.001*	Bachelor > Master
	Master	83	2.75	0.76		
	Doctorate	33	2.92	0.84		
Experience	0–5 Years	200	3.36	0.84		
	5–10 Years	113	2.81	0.77	F=13.421, p=0.001*	0–5 > Others
	10–15 Years	147	2.93	0.79		
	15+ Years	163	3.02	0.87		
Marital Status	Married	360	2.95	0.8	t=-4.096, p=0.001*	Married < Single
	Single	263	3.23	0.88		
Certificate Level	Class A	420	2.81	0.76		
	Class B	130	3.57	0.77	F=79.360, p=0.001*	A < B, C
	Class C	73	3.71	0.7		
Sector	Manufacturing	136	3.24	0.86		
	Automotive	79	2.85	0.7	F=3.471, p=0.004*	Automotive < Manufacturing, Textile
	Energy	85	2.99	0.83		
	Health	99	3.02	0.87		
	Construction	97	2.96	0.83		
	Textile	127	3.21	0.88		

Table 2 shows that participants aged 18–25 years reported significantly higher levels of mental workload compared to other age groups, which may be attributed to lack of professional experience and adaptation challenges. As the education level increases, the perceived mental workload tends to decrease—particularly among those with postgraduate degrees. Participants with 0–5 years of experience reported the highest mental workload, suggesting that experience reduces perceived demands. Single individuals reported higher workload than married ones, and Class A safety specialists reported lower workload than those with

Class B and C certificates. Those working in the automotive industry reported lower mental workload than those in the production and textile sectors.

Table 3

Demographic variables and job-related stress levels

Variable	Group	n	Mean	SD	Statistic	Interpretation
Age	18–25	130	3.88	0.79		
	26–29	131	2.57	0.98		
	30–35	118	2.69	1.03	F=42.713, p=0.001*	18–25 > all others
	36–45	128	2.59	0.95		
	45+	116	3.19	1.09		
Education	Associate	82	3.12	1.03		
	Bachelor	425	3.07	1.1	F=5.978, p=0.001*	Master, Doctorate < Associate, Bachelor
	Master	83	2.61	1.01		
	Doctorate	33	2.6	1.0		
Marital Status	Married	360	2.81	1.06	t=-4.774, p=0.001*	Married < Single
	Single	263	3.23	1.09		
Experience	0–5 Years	200	3.42	1.07		
	5–10 Years	113	2.61	0.95	F=19.305, p=0.001*	0–5 > Others
	10–15 Years	147	2.74	1.08		
	15+ Years	163	2.94	1.05		
Certificate Level	Class A	420	2.61	0.98		
	Class B	130	3.64	0.97	F=102.015, p=0.001*	A < B, C
	Class C	73	3.96	0.69		

Table 3 presents the relationship between job-related stress and demographic characteristics. Participants aged 18–25 years experienced significantly higher stress levels compared to the older groups, likely due to limited experience. Higher education levels were associated with lower job-related stress, particularly among those holding postgraduate degrees. Single participants experienced higher stress than married ones, possibly due to differences in social support. Less experienced professionals (0–5 years) reported higher stress levels than their more experienced counterparts. Class A experts reported significantly lower stress compared with Class B and C experts, likely due to experience, responsibility levels, and expertise.

Table 4

Demographic variables and job satisfaction levels

Variable	Group	n	Mean	SD	Statistic	Interpretation
Age	18–25	130	1.7	0.39		
	26–29	131	3.63	1.12		
	30–35	118	3.28	1.03	F=148.993, p=0.001*	18–25 < all others

Variable	Group	n	Mean	SD	Statistic	Interpretation
	36–45	128	3.36	0.27		
	45+	116	2.59	0.22		
Education	Associate	82	2.82	1.05		
	Bachelor	425	2.85	1.03	F=4.368, p=0.005*	Master, Doctorate > Associate, Bachelor
	Master	83	3.24	0.9		
	Doctorate	33	3.13	0.61		
Marital Status	Married	360	3.12	0.83	t=5.808, p=0.001*	Married > Single
	Single	263	2.63	1.15		
Experience	0–5 Years	200	2.4	1.18		
	5–10 Years	113	3.44	1.11	F=40.036, p=0.001*	0–5 < Others
	10–15 Years	147	3.27	0.76		
	15+ Years	163	2.86	0.43		
Certificate Level	Class A	420	3.48	0.69		
	Class B	130	1.94	0.19	F=646.898, p=0.001*	A > B, C
	Class C	73	1.39	0.17		
Sector	Manufacturing	136	2.67	1.02		
	Automotive	79	3.19	1.01	F=4.864, p=0.001*	Manufacturing, Textile < Automotive, Construction
	Energy	85	2.89	1.0		
	Health	99	3.06	0.99		
	Construction	97	3.11	0.91		
	Textile	127	2.74	1.01		

According to Table 4, participants aged 18–25 years reported significantly lower job satisfaction compared to other age groups, possibly due to lack of experience and adjustment difficulties. Job satisfaction increased with the education level, with postgraduate degree holders reporting the highest satisfaction. Married individuals reported higher job satisfaction than singles, which may reflect the role of family support. Those with 0–5 years of experience showed the lowest satisfaction, while satisfaction levels increased with experience. Class A specialists were significantly more satisfied with their jobs than those in Classes B and C, potentially due to broader responsibilities and greater expertise. Participants in the production and textile sectors reported lower satisfaction compared to those in the automotive and construction sectors, indicating that sectoral differences should be considered.

Confirmatory Factor Analysis and Reliability Results of the Measurement Tools Used in the Research

The confirmatory factor analysis results performed for the scales used in the research show that the factor structure explained for all scales used in the research is confirmed within the scope of this research (Table 5).

Table 5

Overall reliability results (C. Alpha)

Scales	C. Alpha Değerleri
Workload	.949
Job Stress	.922
Job Satisfaction	.896

Cronbach's Alpha (C. Alpha) values calculated to evaluate the internal consistency of the scales used in the study were found to be Workload (.949), Job Stress (.922) and Job Satisfaction (.896), respectively.

These values are well above the limits accepted in the literature. Nunnally (1978) stated that Cronbach's Alpha values of .70 and above in social sciences show satisfactory internal consistency. Similarly, in the classification made by George and Mallery (2019): ≥ .90 → Excellent, ≥ .80 → Very good, ≥ .70 → Acceptable, < .70 → Weak.

Therefore, the reliability coefficients obtained in this study show that the scales used are highly reliable.

CFA and Reliability Results of the Workload Scale.

An examination of the source from which the 25-item Workload Scale was obtained reveals that the scale comprises 25 items and exhibits a four-factor structure. To determine whether this factor structure is confirmed within the scope of this study, a confirmatory factor analysis (CFA) was conducted (Figure 1).

Figure 1

Standardized CFA loadings of the workload scale

ZIHY_F1: Cognitive Workload, ZIHY_F2: Temporal Workload, ZIHY_F3: Performance-Related Workload: ZIHY_F4: Emotional Workload

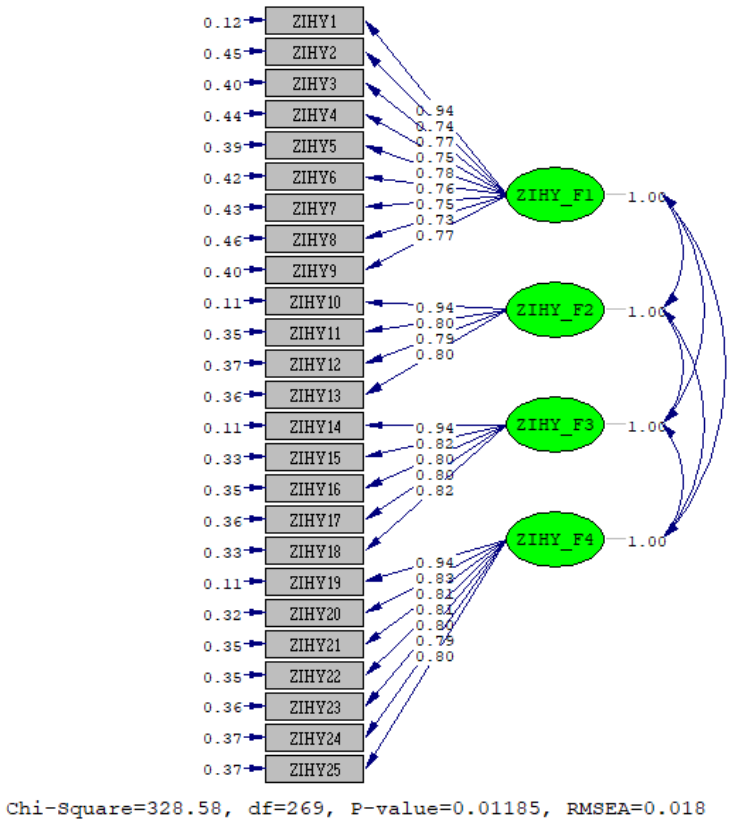
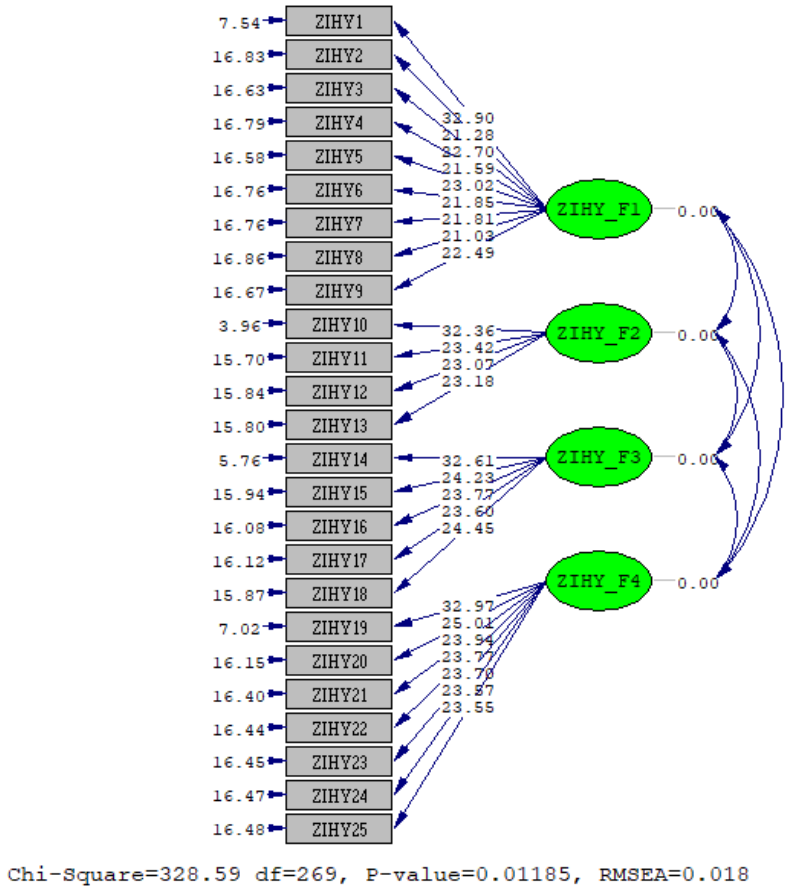


Figure 2

T Levels of CFA Loadings of Workload Scale

ZIHY_F1: Cognitive Workload, ZIHY_F2: Temporary Workload, ZIHY_F3: Performance-Related Workload: ZIHY_F4: Emotional Workload



An analysis of Figure 2 reveals that the factor loadings of the items range from 0.74 to 0.94 based on the CFA results, indicating that these values fall within acceptable limits. Additionally, the fact that the t-values for all items exceeded 1.96 suggests that the factor loadings were statistically significant at the 95% confidence level (Figure 2). The fit index results obtained from the CFA are presented in Table 6.

Table 6

Workload Scale Fit Indices

X²/df	RMSEA	CFI	GFI	AGFI	NNFI	NFI	RMR	SRMR
1,221	0,018	0,99	0,96	0,95	0,99	0,99	0,032	0,020

An examination of the fit indices obtained from the CFA indicates that the X²/df value is 1.221, representing a perfect fit, while the RMSEA value is 0.018. In addition, the remaining fit indices fall within the range of perfect or acceptable fit thresholds. These findings confirm that the factor structure of the scale used in the study is validated within the scope of this research.

Table 7

AVE, CR and Reliability Level of the Workload Scale

Measurements	CR	AVE	Croncbah's Alpha
Cognitive Workload	0,932	0,607	0,933
Temporary Workload	0,901	0,697	0,901
Performance Workload	0,921	0,702	0,921
Emotional Workload	0,938	0,684	0,937
Mental Workload General Reliability: 0,949			

Since the AVE and CR values for the workload scale were found to meet the adequacy criterion, it is thought that the measurement tool provides convergent validity. To examine the reliability level of the scale, Cronbach's alpha internal consistency coefficient was examined, and it was determined that the reliability levels for all dimensions and the scale in general were greater than 0.70, and this result shows that the reliability of the scale is quite sufficient.

CFA and Reliability Results of the Job Stress Scale.

To assess participants' job stress levels, a 7-item job stress scale was used. An examination of the scale's source indicates that it retains 7 items and follows a single-factor structure. Accordingly, this study adheres to the original scale adaptation by employing the same single-factor, 7-item structure. The results of the confirmatory factor analysis (CFA) are presented in Figure 3 to determine whether the proposed factor structure is validated within the scope of this research.

Figure 3

Standardized CFA loadings of the job stress scale

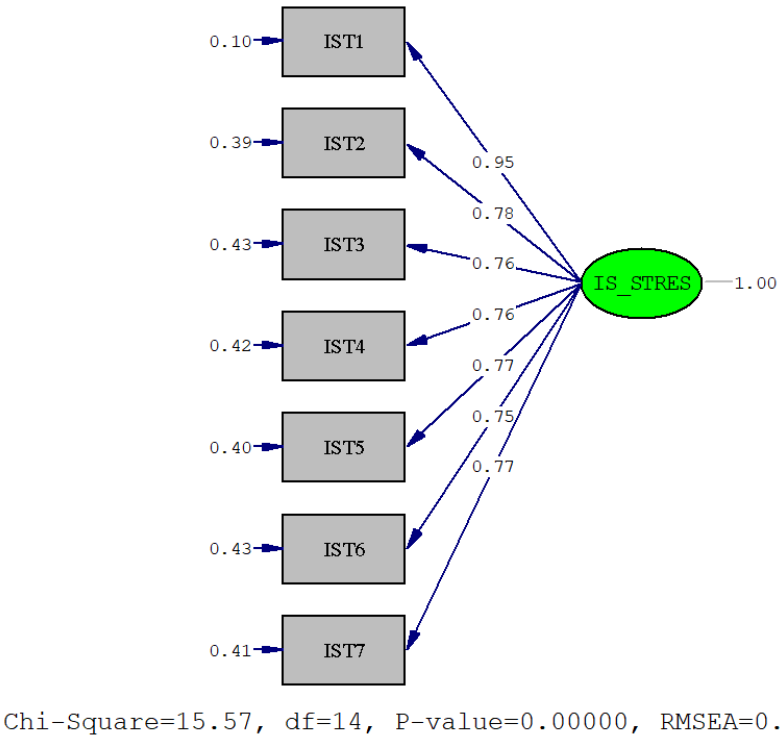
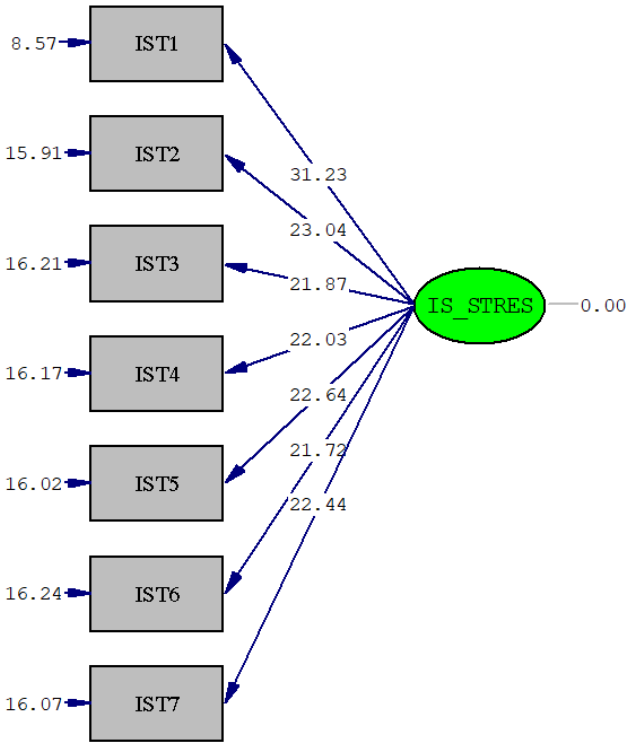


Figure 4

T Levels of CFA Loadings of Workload Scale



An analysis of Figure 4 reveals that the factor loadings for the items range from 0.75 to 0.95 based on the CFA results, which fall within the acceptable limits. Additionally, since the t-values for all items exceed 1.96, this indicates that the factor loadings for all items are statistically significant at the 95% confidence level (Figure 4). The fit index results derived from the CFA are presented in Table 8.

Table 8

Work Stress Scale Fit Indices

X²/df	RMSEA	CFI	GFI	AGFI	NNFI	NFI	RMR	SRMR
1,112	0,013	0,99	0,98	0,98	0,99	0,99	0,020	0,012

An examination of the fit indices obtained from the CFA reveals that the X²/df value is 1.112, indicating a perfect fit, while the RMSEA value is 0.013, also reflecting a perfect fit. The remaining fit indices fall within the thresholds for either perfect or acceptable fit values. These results confirm that the factor structure of the scale used in this study is validated within the context of this research.

Table 9

AVE, CR and Reliability Level of the Job Stress Scale

Measurements	CR	AVE	Croncbah's Alpha
Work-related stress	0,922	0,631	0,922

Since the AVE and CR values for the job stress scale were found to meet the adequacy criterion, it is thought that the measurement tool provides convergent validity. Cronbach's alpha internal consistency

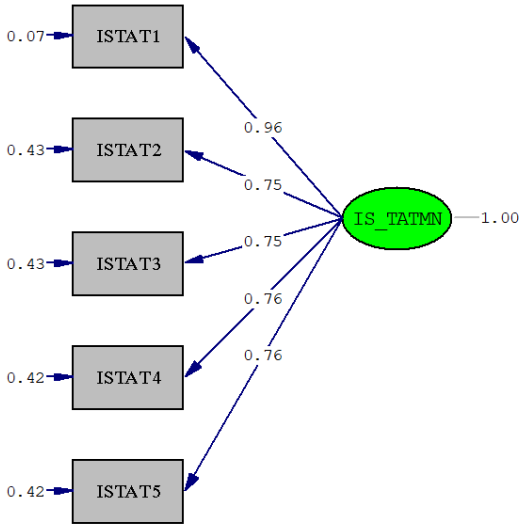
coefficient was examined to examine the reliability level of the scale, and it was determined that the reliability levels of the scale were greater than 0.70, and this result shows that the reliability of the scale is quite sufficient.

CFA and Reliability Results of the Job Satisfaction Scale.

A 5-item, 5-question job satisfaction scale, which was determined to have a single-factor structure, was used to determine the job satisfaction levels of the participants. The results of the CFA analysis are given in Figure 5 to test whether the explained factor structure is confirmed within the scope of this research.

Figure 5

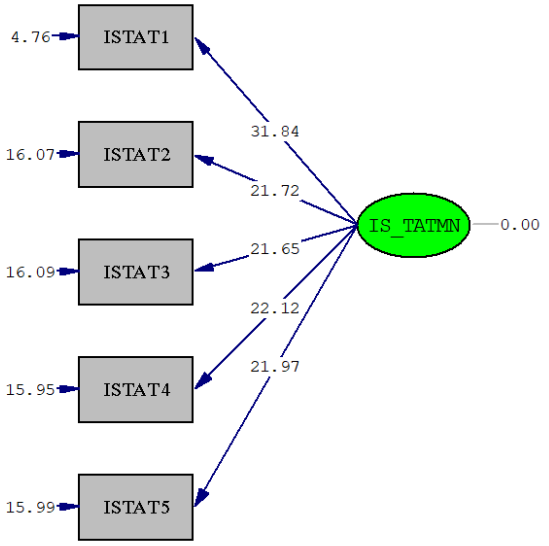
Standardized CFA Loadings of the Job Satisfaction Scale



Chi-Square=8.49, df=5, P-value=0.00000, RMSEA=0.034

Figure 6

T Levels of CFA Loadings of the Job Satisfaction Scale



Chi-Square=8.49, df=5, P-value=0.00000, RMSEA=0.034

An analysis of Figure 6 shows that the factor loadings for the items range from 0.75 to 0.96 according to the CFA results, which fall within the acceptable range. Moreover, since the t-values for all items exceed 1.96, this indicates that the factor loadings for all items are statistically significant at the 95% confidence level (Figure 6). The fit index results derived from the CFA are presented in Table 10.

Table 10

Job satisfaction scale fit indices

X²/df	RMSEA	CFI	GFI	AGFI	NNFI	NFI	RMR	SRMR
1,698	0,034	0,99	0,98	0,98	0,99	0,99	0,018	0,013

An examination of the fit indices obtained from the CFA reveals that the X²/df value is 1.112, indicating a perfect fit, and the RMSEA value is 0.013, which also reflects a perfect fit. The remaining fit indices fall within the thresholds for either perfect or acceptable fit. These results confirm that the factor structure of the scale used in this study is validated within the context of this research.

Table 11

AVE, CR and Reliability Level of the Job Satisfaction Scale

Measurements	CR	AVE	Croncbah's Alpha
Job Satisfaction	0,898	0,640	0,896

Since it was seen that the AVE and CR values for the job satisfaction scale met the adequacy criterion, it is thought that the measurement tool provides convergent validity. To examine the reliability level of the scale, Cronbach's alpha internal consistency coefficient was examined, and it was determined that the reliability levels of the scale were greater than 0.70, which shows that the reliability of the scale is quite sufficient.

In this part of the research, the descriptive findings of the research and the findings regarding the distribution of the data belonging to the scales were included through the data obtained because of the research.

Table 12

Descriptive Findings and the Distribution of Data

Measurements	Measures of the Central Tendency			Kurtosis-Skewness	
	Mean	S.D	Median	Kurtosis	Skewness
Job-Related Stress	2,987	1,090	2,571	0,269	−1,451
Cognitive Workload	3,164	0,967	3,111	−0,001	−1,262
Temporary Workload	2,987	1,134	2,750	0,193	−1,293
Performance-Related Workload	3,022	1,157	2,800	0,174	−1,449
Emotional Workload	3,034	1,103	3,000	0,151	−1,461
Mental Workload General	3,071	0,848	3,000	0,266	−1,154
Job Satisfaction	2,913	1,008	2,800	−0,023	−1,271

The data were determined to follow a normal distribution, as indicated by the close proximity of the mean and median values, along with kurtosis and skewness falling within the ±2 range (George & Mallery, 2019).

When the participants' mental workload levels were examined in the medium level with 3.071±0.848 sub-dimensions, it was determined that their cognitive workload levels were 3.164±0.967, temporary workload levels were 2.987±1.134, performance-related workload levels were 3.022±1.157 and emotional workload levels were 3.034±1.103. It was determined that the participants' work-related stress levels were 2.987±1.090 and

medium level. It was determined that the participants' job satisfaction levels were 2.913±1.008 and medium level.

Table 13

Analysis Results of the Relationship Between Variables

No	Measurements	1	2	3	4	5	6	7
1	Job-Related Stress	1	,558*	,302*	,393*	,397*	,546	-,572*
2	Cognitive Workload		1	,541*	,585*	,533*	,880*	-,566*
3	Temporary Workload			1	,409*	,400*	,693*	-,288
4	Performance-Related Workload				1	,416*	,752*	-,368*
5	Emotional Workload					1	,782*	-,359*
6	Mental Workload General						1	-,525*
7	Job Satisfaction							1

The correlation analysis results presented in Table 10 reveal a strong positive relationship between participants' mental workloads and job stress ($r = 0.546$; $p < 0.05$), indicating that as participants' mental workloads increase, their job stress also increases. Additionally, a strong negative relationship was found between participants' mental workloads and job satisfaction ($r = -0.525$; $p < 0.05$), suggesting that as mental workloads increase, job satisfaction decreases.

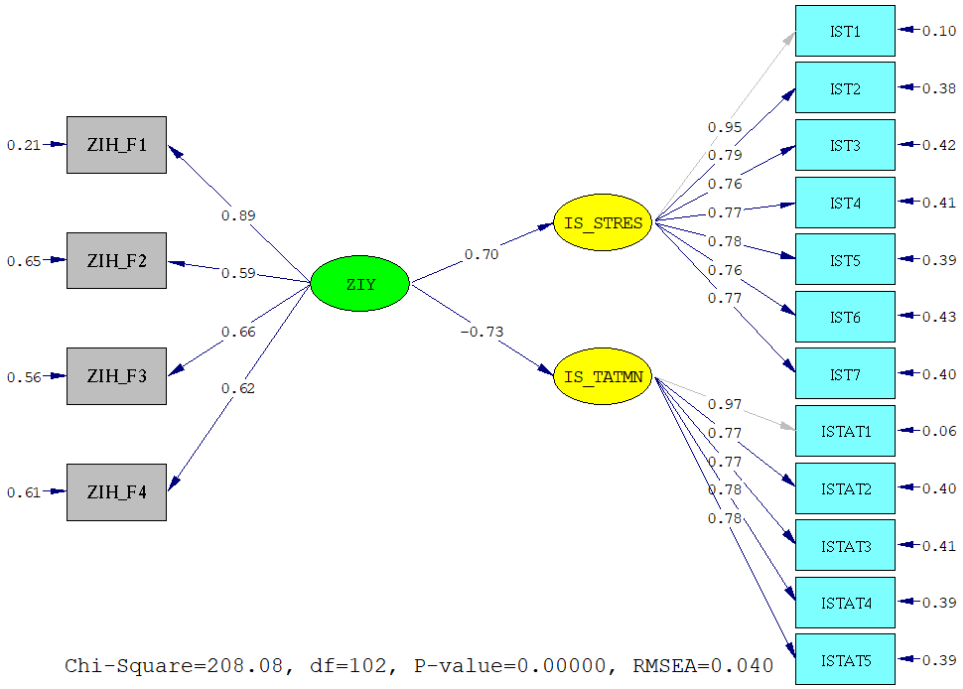
Findings of the Research Model

In the first model of the study, structural equation modeling (SEM) was employed to test the first and second hypotheses. The path diagram for the SEM is presented in Figure 7, and the statistical values of the analysis results are summarized in Table 11.

Figure 7

Path diagram of the effect of mental workload on job stress and job satisfaction

ZIY: mental workload, IS_STRES: job stress, IS_TATMN: job satisfaction



Upon examining Figure 7, it is evident that the model exhibits an excellent fit, with X^2 = 208.08, of = 102, and X^2/df = 2.040. Additionally, the other fit indices demonstrated acceptable or perfect fit levels, including RMSEA = 0.040, CFI = 0.99, GFI = 0.96, AGFI = 0.95, NFI = 0.99, NNFI = 0.99, RMR = 0.094, and SRMR = 0.062. These results permit the interpretation of the coefficients in the path diagram of the model. The findings for the first and second hypotheses of the study are presented below.

Table 14

SEM results of the effect of mental workload (MWL) on job stress (JStress) and job satisfaction (JS)

Hypotheses	Roads	S.P.T	t	Conclusion
H_1: Participants' mental workload has a significant effect on their job stress.	**(MWL)→(JStress)**	0,70	17.30*	**Verified**
H_2: Participants' mental workload has a significant effect on their job satisfaction.	**(ZIY)→(JS)**	−0,73	−17.40*	**Verified**

*p<0.05

When Table 14 is examined, it was determined that the mental workload of the participants had a positive effect of 0.70 on their job stress and this effect was significant (β:0.70; t=17.30>1.96). This result indicates that a one-unit improvement (increase) in the mental workload of the participants will cause a 0.70-unit increase in their job stress levels. It was determined that the mental workload of the participants had a negative effect of 0.73 on their job satisfaction, and this effect was significant (β:−0.73; t=17.40>1.96). This result indicates that a one-unit improvement (increase) in the mental workload of the participants will cause a 0.73-unit decrease in their job satisfaction levels.

Conclusion

It is seen that all hypotheses are confirmed within the framework of the structural equation model established in accordance with the purpose of the research.

Creating healthy and safe working environments in businesses is one of the most important studies that should be carried out for the development and progress of both employees, organizations and countries. The fact that the human factor is among the most important causes of accidents, together with the constantly developing technological conditions, adds a human dimension to the studies. To prevent occupational accidents and occupational diseases due to the constant change in human emotional states, personal flaws, etc., comprehensive research of all human characteristics should form the basis of OHS studies. Although it is easier to evaluate, measure and eliminate physical, biological, chemical, etc. hazards and risks, it is more difficult for Occupational Safety Specialists to intervene in human-specific and human-related risks.

When the studies conducted on this subject in our country in the last ten years are examined, no study examining mental workload, job stress and job satisfaction together has been found. Therefore, this study is original in its field and can be a source that guides occupational safety experts who specialize in the sector in terms of its results. When similar studies are examined, similar results were obtained in the study conducted by Mukesh and Narval on academicians in 2023 and examined how job stress and job satisfaction affect job performance. According to the results of the study, job stress and job satisfaction have a significant effect on employee performance (Mukesh a& Narval, 2023). Furthermore, the study by Chen et al. (2024) with nursing assistants highlighted the significance of mutual support between employees and supervisors in enhancing job satisfaction and reducing job stress. The results also indicated that job values were a significant predictor of job satisfaction, accounting for 48.4% of the explanatory power (Chen et al., 2024).

The results of Gede's study, which aimed to analyze the effect of job stress on employees' job satisfaction and performance, also show that job stress has a negative and significant effect on job satisfaction (Gede, 2018). Tekingunduz et al. conducted a study in 2015 to determine the relationship between the performance of hospital employees, job stress, job satisfaction and turnover intentions and found significant relationships between employees' performance, job satisfaction, job stress and turnover intentions. It was found that job satisfaction and job stress are important determinants of performance and that performance is an important determinant of turnover intention (Tekingunduz et al., 2015).

Many studies examining the effects of job stress and workload on employees' job satisfaction have determined that workload has a negative effect on job satisfaction. There are also many studies showing that job stress has a negative effect on job satisfaction and that workload and job stress also affect job satisfaction. Job stress and workload simultaneously affect job satisfaction. (Kirana et al, 2021, Adrianto et al, 2021, Manalu et al, 2022).

The findings obtained in the study have valuable application areas, especially for the Ministry of Labor and Social Security (ÇSGB), Joint Health and Safety Units (OSGB), and large-scale enterprises. In line with these findings:

- The effect of mental workload on job stress and job satisfaction shows that occupational safety experts should perform their duties not only in accordance with the legislation but also with psychosocial support.
- The ÇSGB should revise the legislation and inspection systems with policies based on balancing workload and sharing tasks, not only document and time focused.
- OSGBs should provide regular psychological support services and mentoring systems for working experts; they should also develop organizational measures (e.g., case sharing, periodic trainings, support groups) to reduce mental workload.
- Institutions can restructure job descriptions and workload distribution according to the level of expertise, based on the fact that Class A experts have higher job satisfaction levels.

The stress load of occupational safety specialists is also increasing due to the responsibilities they have, which has become increasingly important in recent years, the mental workload of them, the fact that the deficiencies in the legislation on this issue have not yet been fully resolved in our country, and unfortunately the lack of a safety culture in our country.

This study filled an important gap by revealing the relationships between mental workload and job stress and the satisfaction of occupational safety experts. However, when evaluated in terms of future research, longitudinal studies can be used to examine the change in mental workload over time and its long-term effects on job stress/satisfaction. In addition, sectoral differences can be determined by conducting comparative analyses between different sectors (construction, health, heavy industry, etc.).

As another suggestion, qualitative data collection methods (focus group discussions, in-depth interviews) can be integrated into the study to analyze the personal experiences of experts in more depth, and similar models can be applied to occupational physicians, environmental officers, or other OSH professionals to create a more comprehensive OSH psychosocial risk map.

Ethics Committee Approval: İstanbul Gedik University Scientific Research and Publication Ethics Committee, Session Date: 22.12.2023, Decision No: 2023/11.
Informed Consent: Informed consent was obtained from all participants, and the interviews were recorded with their permission.
Peer Review: Externally peer-reviewed.
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