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Employees' mental fatigue: the role of perception of job insecurity[1]

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Abstract. *Purpose*. The purpose of the study is to examine whether there is a significant relationship between the perception of job insecurity and mental fatigue in employees, and to determine the level and in which perceived job insecurity affects mental fatigue if there is a significant relationship. *Study design.* Data was obtained from employees in the assembly workshop of a company operating in the private sector by face-to-face survey method. In the study, the purpose among non-probable sampling methods has been used, and data has been received from 104 employees within the same organization. The data required to test the hypotheses suggested within the scope of the research were evaluated using SPSS 20.0 and AMOS 24.0 software. Confirmatory factor analysis, reliability analysis, normality test, correlation analysis and regression analysis were applied for the data obtained from the scales used in the study. *Findings*. As a result of the analysis, a positive and moderately significant relationship was found between job insecurity and mental fatigue. A positive and low-level significant relationship was determined between quantitative job insecurity and qualitative job insecurity with mental fatigue. In addition, according to the formula obtained as a result of regression analysis, a 1.0-unit increase in quantitative job insecurity was found to result in a 1.009-unit increase in mental fatigue and a 1.0-unit increase in qualitative job insecurity resulted in a 0.791-unit increase in mental fatigue.

Keywords: mental fatigue, job insecurity, workplace.

Introduction

Human resources are the most important and key source for the competitive advantage, success and sustainable performance of organizations. In the age of industry 4.0 and artificial intelligence, it is obvious that the outweighing aspects in terms of work are its cognitive and conceptual aspects. Therefore, the mental health of employees has become much more important for organizations. In today's industry, good management in organizations can be realized with highly motivated and highly energized employees. However, most employers and managers are still reluctant to understand and act on this fact. For organizations, fatigue is a problem that needs to be managed well. It can be argued

1 This article is the extended version of the statement presented as a summary in "7th International Symposium on Social Sciences".

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that the amount of production, which is the most important output of organizations, is directly proportional to the level of well-managed fatigue in terms of quality and quantity. Mental fatigue (MF) rather than physical fatigue is very important for managers and organizations in terms of reducing targeted behaviors. MF refers to a change in the psycho physiological state caused by prolonged difficult activity or sleep deprivation (Noe et al., 2021, p. 2273). MF reduces the psychological capacity of employees, reduces the energy of terminating the task.

Job insecurity (JI) has been defined as "perceived powerlessness to maintain desired continuity in a threatened job situation" (Greenhalgh, Rosenblatt, 1984, p. 483). In the literature, JI has been considered as quantitative JI expressed as concern about job loss and qualitative JI, which is expressed as concern about the loss of some important characteristics of the job (Seçer, 2007, p. 143; Köse and Baykal, 2018, p. 217; Yücel-Selvi and Sümer, 2018, p. 3). Mental health, on the other hand, is defined as the absence of disease, as a state of the organism that allows the full performance of all its functions or as a state of balance within oneself and between oneself and one's physical and social environment (Sartorius, 2002). JI is one of the most important stress factors for employees (Pienaar, et al. 2013). Both JI itself and stress alone directly affect the physical and mental health of individuals. Physical and mental health is an important risk factor for individuals to suffer from mental exhaustion. MF of employees is more important than thought in the working life, which rapidly evolves from muscle strength to cognitive strength. At this point, providing job security, which is one of the most important sources of stress in business life by employers or managers, is an important step that can be taken for mentally healthy employees. A job security that can be provided to employees will affect physical, mental and spiritual health by reducing stress levels. In addition, job security can be inclusive of the sought-after characteristics such as motivation, mental health, energy and purpose-oriented behaviors of employees. Stress and fatigue (mental, physical) caused by JI on employees can negatively affect many important characteristics such as employee performance, loyalty to the organization, organizational citizenship behavior, etc. Therefore, it has been hypothesized that the perception of job insecurity can affect mental fatigue in employees, and this research has sought to answer the question of whether an increase in job insecurity leads to an increase in mental fatigue.

The study aims to investigate the existence of a significant relationship between the perception of JI and MF in employees, to determine the extent and level of MF that perceived JI affects MF if there is a significant relationship, and to reveal the statistical difference of JI and MF according to demographic factors. Sustainability in performance and production is important for organizations to achieve their goals and ensure continuity. In this process, it is natural for employees to develop physical fatigue, but the development of MF is not desirable due to differentiation of employee behaviors, disruption of production plan, decreased productivity and work accidents. Accordingly, it is necessary to examine the factors that may cause MF in employees. Consequently, the research conducted is substantial in terms of regulating the optimal organizational atmosphere in organizations, in terms of minimizing undesirable work behaviors in employees, in terms of contributing to JI and MF issues that are rarely examined in the literature, and in connection bringing with a new factor that affects MF into the literature.

Theoretical framework

Job insecurity

Although A. Maslow's hierarchy of needs is not considered a theory of behavior for organizations, A. Maslow himself has stated that this theory is also suitable for organizations. It is a reliable business phenomenon that makes money, referring to the security need accepted from the basic needs of

this hierarchy (Tüzün, Öztürk, 2021, p. 550–551). However, when we look at the labor markets in the current period, it is observed that the general trend is in favor of reducing the number of employees who are called core labor force, that is, those with job security. In addition, organizations or employers are increasingly inclined towards a workforce profile that can be quickly hired and laid off at the same pace and without costs when things do not work out. As a result, millions of employees work without job security, especially in underdeveloped countries (Dereli, 2012, p. 238).

Job security, which is expressed as the protection of the right to work, ensures that employees are guaranteed in the face of unfair savings that may arise from the employer. The main element of job security is to prevent dependent working individuals who provide for themselves and their family from being stripped of their right to work without justification. Job security is the sum of assurances that argues that the guarantee obtained at the time of employment and the employment conditions cannot be arbitrarily changed by the employer after the work is done and that the contract of service cannot be arbitrarily terminated by the employer (Dereli, 2012, p. 238).

In response to increased global competition, organizations have benefited from a variety of measures, such as downsizing or restructuring. While such administrative practices are applied to increase effectiveness in organizations, they can also lead to dysfunctional results. Specifically, as a result of downsizing or restructuring, employees may experience JI. A large research group confirms that JI is negatively associated with employee attitudes (Sender et al., 2017, 2403–2404).

The researchers divided the determinants of JI into three categories. These categories include organizational and environmental conditions (e.g., flexible employment contracts, national and regional unemployment rates, changes in organizational structure), individual and positional characteristics (e.g., age, gender, socio-economic status, year of service and professional position) and personal characteristics (e.g., low self-esteem, low consistency, negative mood and intrinsic control focus) (Fullerton et al., 2020, p. 342).

JI is a multifaceted concept and is argued to consist of five components. The first is the level of perceived threat to the continuation of the work. If the employee feels more threatened about the characteristics of the job, the perception of JI is higher. For example, the opportunity to advance the employee's job or the threat to the freedom to work will increase the perception of JI. The other component is a threat to the characteristics of the job that will lead to a reaction to JI. The third component is the threat of the occurrent of various events that can adversely affect the employee's work completely. For example, the threat of dismissal in a short period of time will negatively affect the whole business. The fourth is the importance given to potentials that threaten the job. These potentials have as much business-related weight as the threatening factor. The fifth and final component of the model is expressed as weakness. Although employees perceive the job or the nature of the job as a threat, it is argued that those who have the power to resist these threats, i.e., those who have a lower perception of weakness, will not experience JI (Köse, Baykal, 2018, p. 217).

When the studies on JI are evaluated, it is observed that insecurity consists of different sub-dimensions. These dimensions are grouped into qualitative and quantitative JI, subjective and objective JI, and finally cognitive and emotional JI (Köse, Baykal, 2018, p. 217). JI has been considered as quantitative JI expressed as concern about job loss and qualitative JI, which is expressed as concern about the loss of some important characteristics of the job. Qualitative JI refers to perceived threats to the quality of employment relationships such as employment conditions, worsening working conditions, social environment, lack of career opportunities, autonomy, lack of wage improvements, status or self-esteem, resources (Seçer, 2007, p. 143; Köse, Baykal, 2018, p. 217; Yücel-Selvi, Sümer, 2018, p. 3). "Qualitative JI pertains to perceptions of potential loss of quality in the employment relationship, such as deterioration of working conditions, demotion, lack of career opportunities, decreasing salary development, and concerns about person–organisation fit in the future" (Sverke,

Hellgren, 2002, p. 30). Quantitative JI, which are different concepts, has similar meaning to the general concept of JI. Because there is a direct concern about job losses in both of these concepts. In qualitative JI, there is one or more loss of qualifications in the employment relationship (Selects, 2008, p. 143). However, according to J. Pienaar with collesgues evidence for different outcomes of the cognitive and affective dimensions of job insecurity is limited (Pienaar et al., 2013).

Upon examining the literature, C. Bernhard-Oettel with colleagues have investigated whether the will of the temporary contract and the expectations of the workers to renew the contract affected the feelings of JI and health of periodic workers. It is assumed that low will through high JI is indirectly associated with lower health (Bernhard-Oettel et al., 2013). According to the results, which is compiled using an international data set consisting of 1755 temporary workers working in sectors such as education, manufacturing, and service, periodic workers with high contract renewal expectations, low contract will and high feelings of JI, at risk of deterioration of their health. A. Richter with colleagues have investigated the relationship between JI and employee welfare and how dependence on work affects this relationship in a sample of Swedish accounting firm employees (Richter et al., 2014). In general, relative contribution to household income and subjective financial dependence have been investigated as two financial dependence types, along with greater psychological dependence on work (job participation) as an indicator. In their research, they have included both quantitative and qualitative JI. Subjective financial dependence, household contribution and job participation have all softened the relationship between both the dimensions of JI and job satisfaction. There is no relationship found with mental health. The results suggest that the extent of a person's commitment to their job is substantial for the relationship of JI with job satisfaction.

One study have examined the relationship between JI and mental health using data from Canada's National Population Health Survey (2000–2001 to 2010–2011) (Watson, Osberg's, 2018). JI is considered both subjective (perception of JI) and objective (possibility of unemployment), while mental health is measured using a standard psychological distress index. The results show that for men and women between the ages of 25 and 64, JI, no matter how measured, is associated with an increase in psychological distress. The consequences of unemployment are not so conclusive, suggesting that what is associated with high psychological distress is the threat of unemployment rather than the fact that job losses actually occur. Again et al. (2019) investigated the quality of the employee-employer relationship shown by the reported level of trust among employees regarding JI and how perceptions of trust affect job-related well-being (i.e., job satisfaction) as well as overall well-being (i.e., mental health). The study by Saquib et al. (2020) have assessed whether JI and fear of litigation among expatriate nurses in Saudi Arabia have been associated with depression, anxiety and stress and concluded that there have been statistically significant relationships between them.

Mental fatigue

Efficient expenditure and protection of energy is the biggest reason for the chance of survival and success. This makes the phenomenon of fatigue extremely important (Boksem, Tops, 2008, p. 133). The concept of fatigue has been extensively researched as a one-dimensional structure; however, the literature remains silent on the types of fatigue that can have different effects on the mental and behavioral functions of individuals (Mujeeb et al., 2021, p. 109). According to E. Grandjean, it is a reasonable distinction to put forth a generalization between physical (muscular) fatigue and MF (Grandjean, 1979, p. 175). The former can be classified as an acute painful condition that occurs in over-stretched muscle, on which it is also localized. MF, on the contrary, is a common sensation brought by feelings of laziness and reluctance for any activity. These two types of fatigue are caused by totally differentiating physiological processes and should be addressed individually.

Over the past decades, work has become a challenging mental endeavor, not a job that requires a great deal of physical effort. This led to a significant increase in complaints about MF (Boksem and Tops, 2008, p. 126). MF is a common feeling of fatigue and a functional condition defined as one of the few intermediary states between alarm and sleep, which are two endpoints (Grandjean, 1979, p. 175). MF refers to a change in the psycho physiological state caused by prolonged difficult activity or sleep deprivation. Symptoms are wide and varied, such as increased feeling of fatigue, increased resistance to more effort, lack of energy and (or) reduced motivation and alertness (Noe et al., 2021, p. 2273). There are three fatigue situations where definitions focus (Harnett, Kumaga, 2019, p. 12):

- subjective state — experiences of feeling fatigued, exhausted or sleepy. It includes lethargy;
- physical condition — a physiological weakness/deterioration caused by effort. Physically exhausted;
- mental state — decreased mental capacity (for attention, alertness and decision-making).

The concept of fatigue, which differs from individual to individual, is examined in four dimensions; acute, chronic, physical and MF. It can be said that it is temporary for acute fatigue or occurs due to the development of a period. Fatigue, which develops due to unresolved factors and continues its development course, is defined as chronic fatigue. Fatigue caused by activities performed by physical strength is physical fatigue. MF can be defined as fatigue due to long-term cognitive concentration or frustration. Cognitive performance decreases or disappears in the case of MF, which can occur as a result of overloading not only mental activities but also physical activities. MF, which is referred to as decreased psychological capacity and decreased desire to end the task resulting from previous mental or physical effort, leads to decreased ability to demonstrate purposeful behaviors. Therefore, MF reduces the motivation required to perform challenging activities and decreases task performance. Mental performance also reduces the capacity to work emotionally. In this process, the tension that disrupts the coordination between physical performance and cognitive performance also negatively affects employees and organizations (Uysal, Ofluoğlu, 2018, p. 120; Theofilou, 2021, p. 1).

The evidence on predictive role of fatigue, both direct and indirect, regarding the determination of cognitive failures have been put forth by many studies. For example, it was shown that any fatigue can cause errors, incidents or accidents, and organizational elements including shift scheduling practices, safety culture, and the lack of a suitable risk plan for managing fatigue will increase fatigue among professional employees (Belenky et al., 2014). Similarly, research shows that MF reduces alertness, which leads to attention deficit. An additional set of studies have shown that MF may have an influence of individuals' cognitive processes. People enduing mental exhaustion have been found to experience trouble maintaining their concentration, and their capability to perform difficult tasks decreases (Mujeeb et al., 2021, p. 106). One of the most researched cognitive functions, working memory, refers to the ability to temporarily store and modify the information necessary to complete complex tasks in a short period of time (Pergher et al., 2021, p. 1). However, in case of MF, symptoms appear that will negatively affect working memory. Symptoms of fatigue are both subjective and objective, and the most important are (Grandjean, 1979, p. 180):

(1) subjective feelings of fatigue, lethargy, fainting and disgust with work;
(2) slow thinking;
(3) decreased alertness;
(4) weakness and slowness in perception;
(5) reluctance to work;
(6) decreased performance mentally and physically.

Among such symptoms, some cause a decrease that can be measured in terms of physical and mental productivity (Grandjean, 1979, p. 180). Decreased alertness after fatigue has negative effects on performance as well as increases the likelihood of accidents. Fatigue associated with decreased alertness differs from physical fatigue or wear caused by difficult and prolonged physical work. In

case of MF, the employee's tasks that require mental and physical interactions such as response time to events, hand and eye coordination and fine motor skills are at risk. In addition, the ability to be cautious, attention, concentration, ability to communicate information clearly and accurately and the ability to make decisions is also weakened. As a result, unmanageable incidents, accidents and injuries may increase (Çelikkol, 2017, p. 78–79).

Although studies show that fatigue only harms performance and targeted behavior, some researchers argue otherwise (Boksem, Tops, 2008, p. 133). Instead, they suggest that fatigue can be seen as a sign that the current behavioral strategy may no longer be optimal. Because a significant amount of effort has been made, the goal has still not been reached and it is necessary to continue to strive. In this case, fatigue can serve as a signal to the cognitive system both encouraging the organism to decrease available targets and/or pursuing alternating strategies with less effort.

From an overview, MF is the direct consequence of having a long-term employment: the longer you work on a challenging task, the more exhaustion occurs. However, it has been observed that this is not the case. Fatigue can occur after working a relatively short period of time, working long hours does not always lead to fatigue. Indeed, when work-related rewards (in terms of pay, but also in terms of being appreciated by peers and colleagues) are perceived as high, it has been shown that fatigue is not the result of working long after all. That is to say, a high workload merely causes fatigue when work-related rewards are low (Boksem, Tops, 2008, p. 126).

There are not any differentiations made between boredom and fatigue by authors. They see boredom as a special type of fatigue. Because boredom is caused by a decrease in the level of activation of the brain. In the literature, the physiological aspects of boredom are summarized as follows: Situations characterized by low stimulation levels, regular occurrence of the same stimuli or demanding only a few mental or physical things from the operator (company or manager), a functional state of the central nervous system characterized by fatigue, a feeling of sleepiness, decreased alertness, reluctance to task, with a decrease in the level of cerebral activation. It is clear that these symptoms are almost identical to the state of fatigue. Therefore, many authors, presents no significant distinction between the concepts of fatigue and boredom, which indicate the low level of activation of the brain (Grandjean, 1979, p. 182; Hashimoto, 1969).

In the literature, some researchers have examined two groups of female visual display operators to determine whether MF associated with high and low stimuli in the workplace affected pain perception (Marek et al., 1988). The first group performed tasks with a high level of stimulation, while the second group performed tasks with low levels of stimulation. It has been found that MF due to high levels of stimulation led to an increase in pain ratings, while MF caused by low stimulation levels led to a decrease in pain ratings. In their study, S. Stansfeld and B. Candy have examined the relationship between psychosocial work stresses and mental health (Stansfeld, Candy, 2006). They have clarified that the strongest effects are due to workload and effort-reward imbalance. This meta-analysis suggests that high demands and low decision-making and high effort and low rewards are possible risk factors for common mental disorders, and that the psychosocial work environment is important for mental health. In their study, authors have aimed to investigate the effect of MF on decision-making (Smith et al., 2016). Performance in the decision-making task has been evaluated using response accuracy and response time. In the case of MF, decision-making accuracy and speed have been found to be lower. It was investigated the effects of MF on the biomechanics of shifts (Lew, Qu, 2014). A total of 44 healthy young participants have been divided into two groups equally and MF has been established on one group by performing AX-continuous performance testing. Participants in both groups have been instructed to walk on a linear walkway and unexpected shifts have been performed during the walk. The findings confirmed that MF is a risk factor for slippage and falls. To prevent slippage-related falls, employees engaged in cognitively challenging activities have been recommended to take more frequent rest breaks.

The overall aim of the 2010 study is to examine the comparative strength of relationships between quantitative and qualitative JI and work-related- (job satisfaction and burnout) and general well-being (psychological distress and psychosomatic complaints) and health-related behavior (absence) (Witte de et al., 2010). These relationships, which control socio-demographic elements, negative sentiment and business characteristics, have been tested in a sample of 7,146 Belgian employees in the banking sector. The results show that both quantitative and qualitative JI are important sources of stress. The aim of another study is to determine the extent to which cognitive assessments of JI can mediate the link between JI and well-being among employees (Charkhabi, 2019). According to the theory of cognitive evaluation, no mediation effect has been found in the occupational insecurity-well-being relationship, only those employees who have been hampered by JI have been more likely to be emotionally exhausted. In their study, I. Urbanaviciute with colleagues have first assumed that quantitative JI would occur cumulatively with qualitative JI, but vice versa (Urbanaviciute et al., 2021). Secondly, they aimed to test whether different combinations of quantitative and qualitative JI reflected differently on employees' professional characteristics and health and well-being outcomes. They concluded that employees with predominant qualitative JI have been significantly less in mental health and well-being (Urbanaviciute et al., 2021). Based on this approach, hypotheses H1a, H1b and H1c have been created.

H1a: There is a significant relationship between mental fatigue and job insecurity.

H1b: Mental fatigue increases as quantitative job insecurity increases.

H1c: Mental fatigue increases as qualitative job insecurity increases.

J. H. Loge with colleagues have investigated the relationship of fatigue with socio-demographic variables on a randomly selected sample of 3,500 Norwegians aged 19–80 (Loge et al., 1998). It has been concluded that women (total fatigue: 12.6) are more fatigued than men (total fatigue: 11.9), and there is a low correlation between total fatigue and age (men: r = 0.17; women: r = 0.09). S. Jaydari Fard and A. P. Lavender have investigated whether there is a significant difference in the level of MF between male and female employees (Jaydari Fard, Lavender, 2019). Participants performed a three-block reaction time task that lasted 17 minutes without any rest time between the blocks. Without any significant difference between men and women, MF increased after each 17-minute block for both genders. The women showed slower reaction time in the first block, but showed slightly faster reaction time in the second and third blocks. Although there is no significant difference between the male and female groups in terms of MF, the results suggest that not being familiar with the task has a more negative effect on women's response times than in men. Based on these approaches, hypotheses H1d1, H1d2, H1d3, H1d4 and H1d5 have been created.

H1d1: Mental fatigue varies substantially by gender.

H1d2: Mental fatigue varies substantially by age.

H1d3: Mental fatigue varies substantially depending on educational status.

H1d4: Mental fatigue varies substantially according to monthly income level.

H1d5: Mental fatigue varies substantially according to work experience.

Many studies have been carried out to test the hypothesis that the perception of JI varies substantially according to demographic variables. O. Yüksel with colleagues have concluded that the perceptions of JI of employees in a private hospital in Yalova do not differ significantly according to age, education status, gender and marital status, but differ significantly according to working time (Yüksel et al., 2017). It was found that the perceptions of JI and employability in the four- and five-star accommodation business employees in Nevşehir varied in a statistically significant manner according to the level of education, age and working time (Çalışkan, Özkoç, 2020). In their study of bank employees, P. Tüzün and M. Öztürk have concluded that gender does not affect the perception of JI, that age affects quantitative JI (employees aged 26-30 years who feel the most), and that the level of education has no significant effect (Tüzün, Öztürk, 2021). In the study conducted

by B. Dereli in the banking sector, it has been examined whether the perceptions of JI vary depending on the demographic characteristics of individuals (Dereli, 2012). According to the results of the study, qualitative JI has been found to affect the level of education, whether or not the child is responsible for caring, age and working time in the institution at a statistically significant level. For quantitative JI, it has been concluded that only age affects significantly. Based on these approaches, the hypotheses H1e1, H1e2, H1e3, H1e4, H1e5, H1g1, H1g2, H1g3, H1g4 and Hg5 have been formed.

H1e1: The perception of quantitative job insecurity varies substantially by gender.
H1e2: The perception of quantitative job insecurity varies substantially by age.
H1e3: The perception of quantitative job insecurity varies substantially according to the level of education
H1e4: The perception of quantitative job insecurity varies substantially according to monthly income.
H1e5: The perception of quantitative job insecurity varies substantially according to work experience.
H1g1: The perception of qualitative job insecurity varies substantially by gender.
H1g2: The perception of qualitative job insecurity varies substantially by age.
H1g3: The perception of qualitative job insecurity varies substantially according to educational status
H1g4: The perception of qualitative job insecurity varies substantially according to monthly income.
H1g5: The perception of qualitative job insecurity varies substantially according to work experience.

Research methodology

The population and sample of the research

The population of research consists of private sector employees. The sample of the research consists of employees in the assembly workshop of a company operating in the private sector. In the study, the purpose among non-probable sampling methods has been used, and data has been received from 104 employees within the same organization and this data has been not evaluated because the data obtained from 4 employees doesn't have integrity. The reason why private sector employees are selected for the sample is that JI is high in the private sector and the perception of JI comes to the forefront in employees, even if it varies by the company. The reason why the assembly workshop is preferred in this sector is that there is a working group directed towards error-oriented production within the busy working pace.

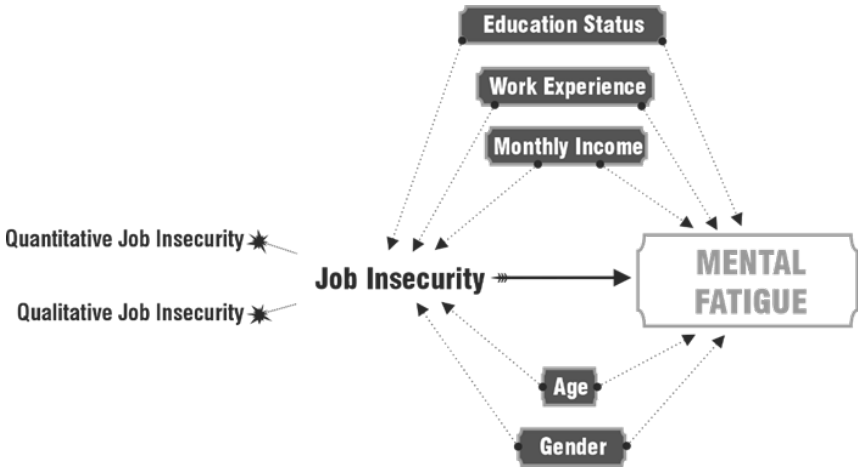

Figure 1. Conceptual model of the research

The data collection method of the research

The data to be used in the research have been obtained by implementing a method of face-to-face survey. The survey used to get the data includes two scales in the 5-way Likert structure, JI

and MF. A 14-point scale designed by H. T. Uysal and G. Ofluoğlu has been used to measure MF in employees, and a 9-point scale developed by J. Hellgren with colleagues and adapted to Turkish by B. Şeker has been used to gauge JI (Hellgren et al., 1999; Şeker, 2011; Uysal, Ofluoğlu, 2018).

The research model

The research's dependent variable that uses the screening model is MF, its main independent variable is JI, and the sub-independent variables are quantitative JI and qualitative JI (Figure 1).

Data analysis of the research

The software named SPSS 20.0 and (Statistical Package for Social Sciences) and AMOS 24.0 (Analysis of Moment Structures) have been utilized to assess the data needed to test the hypotheses put forth in the research. Confirmatory Factor Analysis (CFA) has been leveraged to determine the structural validity of the scales used in the study, reliability analysis to ascertain internal consistency, correlation analysis to establish the direction and severity of the relationship between variables, multiple regression analysis to examine the relationship between variables, and MANOVA (Multivariate ANOVA) analysis, Independent Sample T Test and One-Way ANOVA Test to establish differences.

Results

Based on the descriptive statistics related to sampling in Table 1; 46% of the sample consists of male and 54% female employees. Only private sector employees are involved in the sample due to the purpose and scope of the research. Upon reviewing the age distribution of these employees, it is observed that 76% of the employees aged 21-40 are employees. It has been determined that only 28% of the employees who took part in the study had a university degree and a majority of 46% have been primary school graduates. Upon reviewing the monthly income level of private sector employees; it is seen that 64% have monthly income equal to minimum wage level. When the work experience periods in the table are taken into account, it has been found that 97% of the sample has more work experience than the year and this rate is significantly higher in terms of creating the perception of JI.

Table 1. Descriptive statistics

Parameters	Frequency	Percentage
Gender		
Male	46	46.0 %
Female	54	54.0 %
Age		
21-30	37	37.0 %
31-40	39	39.0 %
41-50	24	24.0 %
Education status		
Primary school	46	46.0 %
High school	26	26.0 %
Associate	19	19.0 %
Undergraduate	6	6.0 %
Post-graduate	3	3.0 %
Monthly income level		
Between TRY 1001 - 2000	64	64.0 %
Between TRY 2001 - 3000	19	19.0 %
Between TRY 3001 - 4000	14	14.0 %
TRY 5001 or more	3	3.0 %
Work experience		
Less than 1 year	3	3.0 %
1-2 years	10	10.0 %
2-3 years	12	12.0 %
3-4 years	16	16.0 %
4 years and above	59	59.0 %

Confirmatory factor analysis has been leveraged to ascertain the structural validity of the scales utilized in the study, and the fit values obtained after factor analysis conducted for the JI scale consisting of 2 dimensions and 25 items are presented in Table 2.

Table 2. Job Insecurity Scale: fit values

Fit criteria	χ^2	χ^2 / df	RMSEA	CFI	SRMR	NFI	GFI
Fit values	48 393	1 861	.08	.955	.05	.910	.918

Upon examining the fit values expressed in Table 2; it has been ascertained that chi-square value is 48.393; p value is 0.005; RMSEA value is 0.08; GFI value is 0.918; chi-square/degree of freedom is 1.861; SRMR value is 0.05; CFI value is 0.955 and the NFI value is 0.910. Standardized solution values for the JI scale tested in Figure 2 have been demonstrated.

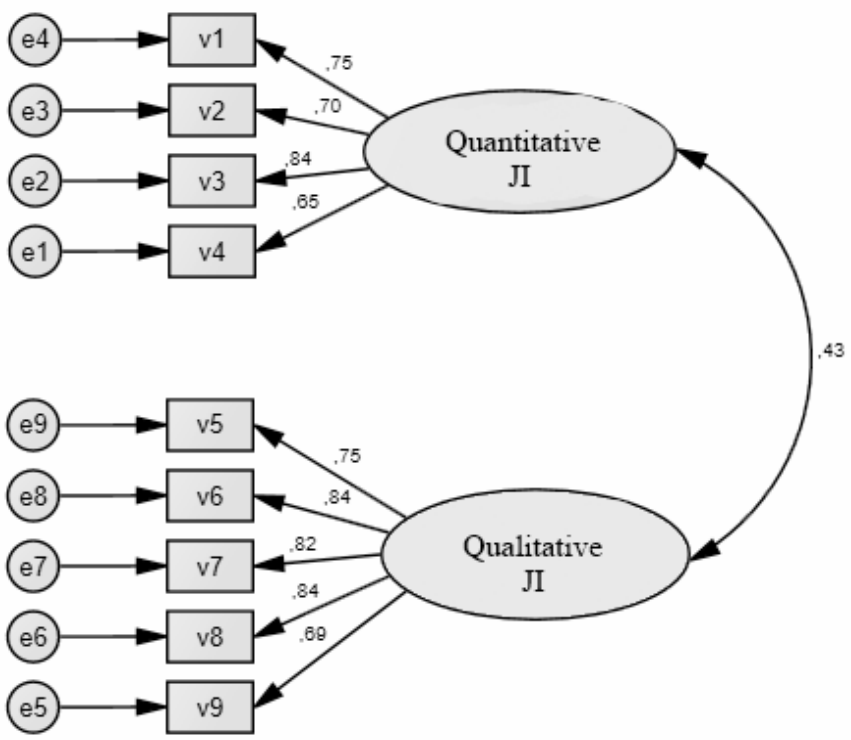

Figure 2. Job Insecurity Scale: Standardized analysis values

Utilizing the Confirmatory Factor Analysis, 16 items have been eliminated from the scale, and the reliability analysis results for the dimensions of the revised scale are demonstrated in Table 3.

Table 3. Job Insecurity Scale: reliability analysis

Variance	Cronbach's Alpha	N of Items
Quantitative job insecurity	.787	4
Qualitative job insecurity	.860	5

The analyses carried out resulted in Cronbach's Alpha coefficient being 0.787 for quantitative JI and 0.860 for qualitative JI. According to these values; it has been found that all dimensions possess internal consistency.

Another scale utilized in the study is MF scale. The fit values achieved as a result of applying Confirmatory Factor Analysis to this scale including one dimension and 14 items are expressed in Table 4.

Table 4. Mental Fatigue Scale: fit values

Fit criteria	*χ2*	*χ² / df*	RMSEA	CFI	SRMR	NFI	GFI
Fit values	29 032	1 613	.07	.976	.06	.941	.940

Upon examining the fit values in Table 4; it has been observed that chi-square equals to 29.032; p value equals to 0.048; RMSEA value equals to 0.07; GFI value is 0.940; chi-square/degree of freedom equals to 1.613; SRMR value equals to 0.06; CFI value equals to 0.976 and the NFI value equals to 0.941. Figure 3 exhibits the standardized solution values for the MF scale in the tested work.

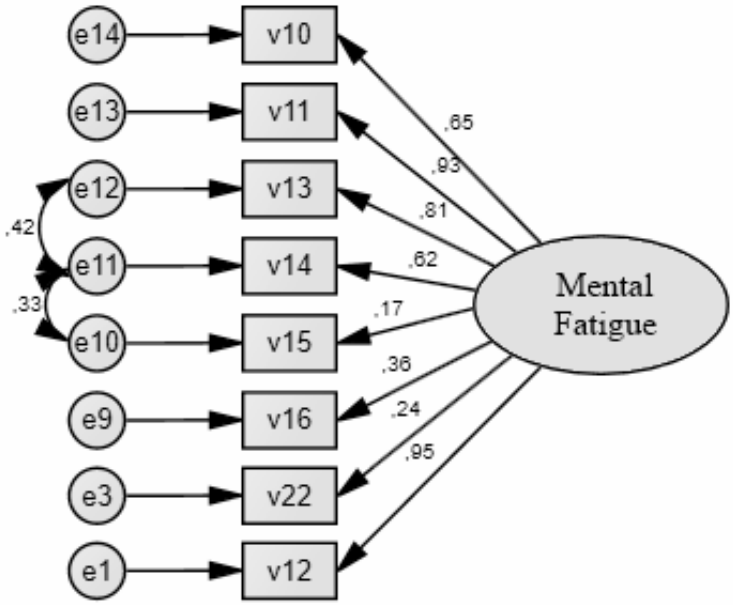

Figure 3. Mental Fatigue Scale: standardized analysis values

Confirmatory factor analysis helped remove 6 items from the scale and the reliability analysis results for the scale have been exhibited in Table 5. As a result of the analyses carried out; Cronbach's Alpha coefficient is determined to be 0.819 for the entire scale and the scale has internal consistency according to this value obtained.

Table 5. Mental Fatigue Scale: reliability analysis

Cronbach's Alpha	N of Items
.819	8

It has been determined that the proposed fit values of the JI scale exhibited in Table 2 and the proposed fit values of the MF scale in Table 4 are in line with the goodness of fit statistics, and that the structural validity of aforementioned scales is acceptable (Schermelleh-Engel, Moosbrugger, Müler, 2003).

Following the normality test on the data obtained during the research, Kolmogorov — Smirnov and Shapiro — Wilk values determined are presented in Table 6. When interpreted by taking into account Shapiro — Wilk values due to sample size, it is observed that the data obtained from both scales used in the research has not indicated normal distribution. This results in the fact that skewness and kurtosis values related to the relevant dimensions should also be examined.

Table 6. Normality test results

	Kolmogorov - Smirnov			Shapiro - Wilk		
	Statistics	*df*	Sig.	Statistics	*df*	Sig.
Quantitative job insecurity	.321	100	.000	.725	100	.000
Qualitative job insecurity	.128	100	.000	.960	100	.004
Mental Fatigue	.119	100	.001	.929	100	.000

The skewness and kurtosis values of the data, which have been obtained from the scales utilized in the study, are detailed in Table 7. Upon reviewing the table; according to the Kolmogorov-Smirnov value, the skewness and kurtosis values of the data sets that do not exhibit normal distribution are observed to be between -2 and +2, and based on the classification by D. George and P. Mallery (2003), normal distribution is exhibited by these data sets (George, Mallery, 2003).

Table 7. Normality tests — kurtosis and skewness values

		Statistics	Std. error
Quantitative job insecurity	Skewness	1 547	0.241
	Kurtosis	1 875	0.478
Qualitative job insecurity	Skewness	-0.261	0.241
	Kurtosis	-0.431	0.478
Mental Fatigue	Skewness	-0.462	0.241
	Kurtosis	-0.972	0.478

The results of Pearson correlation analysis of the research variables are displayed in Table 8. This information indicates that a positive and moderately significant relationship has been determined between the main independent variable JI and dependent variable MF. Sub-independent variables have a positive and low level of significant relationship between quantitative JI and qualitative JI and MF.

Table 8. Correlation analysis results

Variable		JI	JI Dimensions	
			Quantitative JI	Qualitative JI
Mental fatigue	Correlation	***0.478***	***0.322***	***0.212***
	Sig. (2-tailed)	0.000	0.001	0.034

Table 9 shows the ANOVA results of multiple regression analysis of JI dimensions and MF. As a result of the regression analysis performed; the regression model has been found to be statistically significant because the p value of the model created is less than 0.05.

Table 9. Mental fatigue and job insecurity — ANOVA

	Sum of squares		Mean square	F	Sig.
MF	Regression	1 525 968	762 984	14 908	0.000
	Residual	4 964 472	51 180		
	Total	6 490 440			

The results of the analysis performed are exhibited in Table 10. When this table is examined; percentage 21.9 of the variance in MF has been explained by the variance in quantitative and qualitative JI perceived by employees. These results indicate that the value that MF can take is formulated as follows:

$$MF = 9.938 + (1.009 \times \text{Quantitative JI}) + (0.791 \times \text{Qualitative JI})$$

Based on the formula obtained via regression analysis, a 1-unit increase in quantitative JI was found to result in a 1,009-unit increase in MF and a 1-unit increase in qualitative JI resulted in a 0.791-unit increase in MF.

Table 10. Mental fatigue and job insecurity — model

Variable		β	t	Sig.	R^2	Adjusted R^2
Mental fatigue	Constant	9 938	3 266	0.003	0.235	0.219
	Quantitative job insecurity	1 009	0.247	0.000		
	Qua;itative job insecuruty	0.791	0.161	0.000		

Table 11 investigates the relationship between quantitative/qualitative JI and MF and the gender of the participants. Upon examining this table; the significance values obtained as a result of the test for all three variables are higher than 0.05. Therefore, it has been found that MF, quantitative and qualitative JI did not vary statistically significantly by gender.

Table 11. Quantitative and qualitative job insurance, mental fatigue — Gender

				Levene's test for equality of variances		t-test for Equality of Means				
				F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
	Gender	Mean								
	Male	261 957	Equal variances assumed	2 357	.128	-1 309	98	.194	-211 916	161 876
MF	Female	283 148	Equal variances not assumed			-1 326	98 000	.188	-211 916	159 807
	Gender	Mean								
	Male	61 087	Equal variances assumed	1 360	.246	-0.062	98	.951	-0.03945	.63425
Quantitative JI	Female	61 481	Equal variances not assumed			-0.063	97 092	.950	-0.03945	.62135
	Gender	Mean								
	Male	133 261	Equal variances assumed	0.092	.762	-1 648	98	.103	-158 132	.95940

Table 12 investigates the relationship between quantitative/qualitative JI and MF and the age of employees. Upon examining this table, the analysis of MF and qualitative JI indicates that the value of significance has been greater than 0.05, and the value of significance has been less than 0.05 as a result of quantitative JI analysis. Accordingly, it has been found that the perception of MF and qualitative JI does not vary significantly based on employee age, while the perception of quantitative JI vary significantly based on age. However, post-hoc analysis has been performed to ascertain which age groups have been different.

Table 12. Quantitative and qualitative job insurance, mental fatigue — age

		N	Mean	Std. Deviation	Std. Error	F	Sig.
	21-30	37	278 649	723 864	119 002		
	31-40	39	262 564	884 878	141 694		
MF	41-50	24	282 917	821 176	167 622	0.588	.558
	21-30	37	72 703	373 905	.61470		
	31-40	39	52 821	236 141	.37813		
Quantitative JI	41-50	24	57 500	283 227	.57813	4 292	.016
	21-30	37	128 649	488 855			
	31-40	39	153 590	442 771	.70900		
Qualitative JI	41-50	24	142 917	501 718	102 413	2 631	.077

Table 13 presents the homogeneity test results made to find out the proper technique in selected in the post-hoc analysis are presented in Table 13.

Table 13. Homogeneity test of variances

Levene statistic	*df1*	*df2*	Sig.
4 329	2	97	.016

Upon reviewing in table 13 are reviewed, it is observed that the variances are not homogeneous. Nevertheless, given the fact that group distributions are not equal, Tamhane's T2 test has been preferred in the post-hoc analysis. When the statistical difference of the perception of quantitative JI by age is examined in detail; it has been determined that there has been a significant difference

between employees between 21-30 years of age and employees between the ages of 31 and 40, and that the perception of quantitative JI is highest in employees between the ages of 21 and 30.

Table 14 investigates the relationship between quantitative/qualitative JI and MF and the level of education of employees. Upon reviewing the table, the analysis of MF and qualitative JI ascertains that the value of significance is lower than 0.05, and the value of significance is higher than 0.05 following quantitative JI analysis. Accordingly, it has been determined that the perception of MF and qualitative JI varied significantly according to the level of education of employees, while the perception of quantitative JI did not vary significantly according to the level of education. However, post-hoc analysis has been conducted with the purpose of determining which education levels vary significantly.

Table 14: Quantitative and qualitative job insurance, mental fatigue — education level

		N	Mean	Std. Deviation	Std. error	F	Sig.
	Primary school	46	284 130	797 099	117 526		
	High school	26	276 154	777 214	152 424		
	Associate	19	280 526	801 023	183 767		
	Undergraduate	6	208 333	621 021	253 531		
MF	Post-graduate	3	170 000	818 535	472 582	2 595	.041
	Primary school	46	61 087	335 479	0.49464		
	High school	26	60 385	378 926	0.74313		
	Associate	19	62 632	188 096	0.43152		
	Undergraduate	6	61 667	285 774	116 667		
Quantitative JI	Post-graduate	3	63 333	208 167	120 185	.017	.999
	Primary school	46	150 652	468 284	0.69045		
	High school	26	143 077	488 073	0.95719		
	Associate	19	140 526	385 103	0.88349		
	Undergraduate	6	75 000	314 643	128 452		
Qualitative JI	Post-graduate	3	136 667	702 377	405 518	3 630	.008

Table 15 presents the homogeneity test results made to find out the proper technique in selected in the post-hoc analysis.

Table 15. Homogeneity test of variances

	Levene Statistic	df1	df2	Sig.
MF	0.344	4	95	0.848
Qualitative JI	0.562	4	95	0.691

Upon reviewing the results of Table 15, it is seen that the variances have homogeneity for both analyses. However, given the inequality amongst the distributions in the groups, the Scheffe test has been selected in post-hoc analysis. Following the results of the MF test, the significance value is determined as higher than 0.05 in all groups and it is determined that the difference of MF according to the level of education has been not due to the groups but from within the group (among groups = 639.3 and within groups = 5851). When the statistical difference of the perception of qualitative JI according to the level of education is examined in detail; it has been found that there is a significant difference between primary school graduate employees and undergraduate employees and high school graduate employees and undergraduate employees. Accordingly, it has been found that the perception of qualitative JI is higher in elementary school graduate employees than in undergraduate employees, while high school graduate employees had a greater perception of qualitative JI compared to undergraduate employees.

Table 16. Quantitative and Qualitative job insurance, mental fatigue — monthly income level

		N	Mean	Std. Deviation	Std. Error	F	Sig.
MF	Between TRY 1001 - 2000	64	287 969	809 307	101 163	5 245	0.002
	Between TRY 2001 - 3000	19	282 105	632 964	145 212		
	Between TRY 3001 - 4000	14	217 143	676 448	180 788		
	TRY 5001 or more	3	170 000	818 535	472 582		
Quantitative JI	Between TRY 1001 - 2000	64	64 063	346 739	0.43342	1 123	0.344
	Between TRY 2001 - 3000	19	62 105	289 787	0.66482		
	Between TRY 3001 - 4000	14	47 143	148 989	0.39819		
	TRY 5001 or more	3	63 333	208 167	120 185		
Qualitative JI	Between TRY 1001 - 2000	64	140 625	506 740	0.63343	0.605	0.613
	Between TRY 2001 - 3000	19	135 263	458 704	105 234		
	Between TRY 3001 - 4000	14	157 143	356 108	0.95174		
	TRY 5001 or more	3	136 667	702 377	405 518		

Table 16 investigates the relationship between quantitative/qualitative JI and MF and the monthly income level of employees. Upon reviewing this table, the results of the quantitative and qualitative JI analysis indicates that that the value of significance is greater than 0.05, and as a result of the analysis for MF, the value of significance is less than 0.05. Therefore, it has been ascertained that the perception of quantitative JI and qualitative JI do not vary significantly according to the monthly income level of the employees, while MF vary significantly according to the monthly income level. However, post-hoc analysis has been conducted to find out which income levels vary.

Table 17 exhibits the homogeneity test results made to find out the proper technique in selected in the post-hoc analysis.

Table 17. Homogeneity test of variances

	Levene Statistic	df1	df2	Sig.
MF	0.751	3	96	0.524

Upon reviewing the results in table 17, it is observed that the variances have homogeneity. However, considering that the distributions in the groups are not equal, the Scheffe test has been preferred in post-hoc analysis. When the statistical difference of MF according to the monthly income level is examined in detail; it has been determined that there is a significant difference between employees with monthly incomes of TRY 1000-2000 and TRY 3001-4000, and that MF is much greater in employees with a monthly income of TRY 1000-2000 than employees with an income of TRY 3001-4000.

Table 18. Quantitative and qualitative job insurance, mental fatigue — work experience

		N	Mean	Std. Deviation	Std. Error	F	Sig.
MF	Less than 1 year	3	260 000	692 820	400 000	1 954	0.108
	1-2 years	10	312 000	619 677	195 959		
	2-3 years	12	312 500	455 522	131 498		
	3-4 years	16	244 375	806 613	201 653		
	4 years and above	59	267 458	866 143	112 762		
Quantitative JI	Less than 1 year	3	126 667	577 350	333 333	7 585	0.000
	1-2 years	10	79 000	296 086	0.93630		
	2-3 years	12	75 833	394 181	113 790		
	3-4 years	16	46 250	140 831	.35208		
	4 years and above	59	56 102	261 308	0.34019		
Qualitative JI	Less than 1 year	3	80 000	346 410	200 000	1 792	0.137
	1-2 years	10	133 000	365 300	115 518		
	2-3 years	12	158 333	428 174	123 603		
	3-4 years	16	137 500	495 984	123 996		
	4 years and above	59	144 237	495 916	0.64563		

Table 18 investigates the relationship between quantitative/qualitative JI and MF and employees' work experience. When this table is examined, as a result of the analysis of MF and qualitative JI, it has been determined that the value of significance has been higher than 0.05, and the value of significance has been lower than 0.05 as a result of the analysis of quantitative JI. Accordingly, the perception of MF and qualitative JI has been determined not to vary significantly according to work experience, while the perception of quantitative JI varied significantly according to work experience. Nevertheless, post-hoc analysis has been conducted to determine which work experience times there has been a difference.

Table 19 exhibits the results of the homogeneity test conducted to ascertain the technique for post-hoc analysis.

Table 19. Homogeneity test of variances

	Levene Statistic	**df1**	**df2**	**Sig.**
Quantitative job insecurity	4 121	4	95	0.004

Upon reviewing the results of Table 19, it is observed that the variances do not have homogeneity. Nevertheless, given the fact that the group distributions are not equal, Tamhane's T2 test has been selected in the post-hoc analysis. When the statistical difference of the perception of quantitative JI according to work experience has been examined according to the 5 margins of error, it has been determined that this difference is due to the group, not the groups. However, when this difference is examined according to the 10 margins of error; it has been found that there is a significant difference between employees with 1-2 years of work experience and employees with 3-4 years of work experience, and the perception of quantitative JI in employees with 1-2 years of work experience is higher than that of employees with 3-4 years of work experience.

Conclusions and recommendations

The research examines the MF in employees with the perception of JI. As a result of the research, it has been found that a significant relationship exists between JI and MF, and MF increases as the perception of JI increases. The results of multiple regression analyses indicate that the quantitative and qualitative dimensions of JI of organizational cohesion had a significant effect on MF, and the quantitative JI dimension had the most effect. Quantitative and qualitative JI may vary in terms of their relationship with the consequences of JI. Qualitative JI, which refers to part of JI, can be said to be less effective because it is a perceived threat to the loss of a significant feature of the job. Because there is no loss for the members of the organization, i.e., all employees. However, since there is a loss of employment in quantitative JI, everyone who works in the relevant job will suffer and therefore the severity of perception will be felt more.

Two of the best documented outcomes of JI are poor job satisfaction and poor mental or mental health (Richter, Naswall, 2019, p. 23). According to S. Stansfeld and B. Candy, mental health or mental disorders are in the group of possible risk factors for MF (Stansfeld, Candy, 2006, p. 443). JI felt in employees can cause MF or increase this fatigue to serious levels through stress and mental disorders. It is the basic hypothesis of this study that JI can affect mental and mental health conditions and create MF. JI and stress felt by employees affect the health of individuals in the long or short term. Mental and mental health disorders as a pillar of this health are risk factors that affect the formation of MF. It can be said that MF creates many noticeable and unnoticed costs for organizations. Employees are more vulnerable to accidents and injuries when they are mentally and mentally unhealthy. In addition, performance losses in jobs requiring attention and speed can reach

much larger dimensions than anticipated. In addition, mental health is one of the most important factors for the performance that working memory can reveal in business life.

The most important source of MF defended in the literature is effort-reward imbalance, especially workload, high demands, low decision-making freedom, etc. From here, job security that is not provided to him or her employer in response to the effort of the employee can create an effort-reward imbalance. This imbalance can also cause the employee to feel MF. When the employee feels the reward he deserves, he or she may not feel fatigue, even if he or she works long hours. However, it is argued that if there is an effort-reward imbalance in the organizations, excess workload and long working hours will not always create fatigue. At this point, job security provided to employees will be one of the important factors that reduce fatigue, which is felt both as a reward and as an element of appreciation by the manager or employer. If managers or employers want to work with physically and mentally healthy and high-energy individuals, the job security they can provide is a powerful catalyst at this point. The results of this study show that JI affects MF, as supported by the literature. Quantitative JI has been found to affect MF more than qualitative JI. A job security that can be provided to employees will affect organizational performance and sustainability and minimize high physical and mental health and possible costs, accidents and injuries. It will also strengthen the working memory, which is very important on the basis of high physical and mental health organizations and the employees they invest in and will be able to provide a competitive advantage.

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Умственное утомление сотрудников: роль восприятия трудовой незащищённости

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Аннотация. *Цель*. Целью исследования является изучение того, существует ли значимая связь между восприятием трудовой незащищённостью и умственным утомлением у сотрудников, а также определение уровня того, в какой степени воспринимаемая трудовая незащищённость влияет на умственное утомление, если существует значимая связь. *Дизайн исследования*. Данные были получены от сотрудников сборочного цеха компании, работающей в частном секторе экономики, методом личного опроса. В исследовании использовались методы формирования выборки с неопределённой вероятностью, в опросе приняли участие 104 сотрудника одной организации. Данные, необходимые для проверки гипотез, предложенных в рамках исследования, были оценены с использованием программного обеспечения SPSS 20.0 и AMOS 24.0. Для данных, полученных с помощью соответствующих шкал («Шкала воспринимаемой трудовой незащищённости» и «Шкала умственного утомления»), использованных в исследовании, были применены подтверждающий факторный анализ, анализ надёжности, тест на нормальность, корреляционный анализ и регрессионный анализ. *Результаты*. В результате анализа была обнаружена положительная и умеренно значимая связь между трудовой незащищённостью и умственным утомлением. Была обнаружена положительная и низкоуровневая значимая связь между количественной трудовой незащищённостью и качественной трудовой незащищённостью с умственным утомлением. Кроме того, согласно формуле, полученной в результате регрессионного анализа, было обнаружено, что увеличение количественной трудовой незащищённости на 1,0 единицу приводит к увеличению умственного утомления на 1,009 единицы, а увеличение качественной трудовой незащищённости на 1,0 единицу приводит к увеличению умственного утомления на 0,791 единицы.

Ключевые слова: умственное утомление; трудовая незащищённость; рабочее место.