Psychological and Organizational Factors Impacting Job Satisfaction during the COVID-19 Pandemic: A Study on Similar Exposure Groups in Indonesia

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ABSTRACT

Introduction. The COVID-19 pandemic has impacted technical workers who work more often in the field (e.g., engineering, mechanical, health safety environment (HSE), quality control, and production workers) with increasingly complex workloads and work pressures. Few studies have yet to examine the job satisfaction of such workers using a combination of psychological and organizational factors during difficult times, such as the current COVID-19 pandemic.

Objective. This study aims to explain whether psychological and organizational factors affect employee job satisfaction as a result of the COVID-19 pandemic.

Methods. This quantitative research uses Partial Least Square-Structural Equation Modeling. A survey with a questionnaire was used to collect data in this study. Using the non-probability sampling technique, data from 103 respondents spread throughout four Similar Exposure Groups (SEGs) in Indonesia were collected. Data analysis in this study used SmartPLS 3.0.

Results. Male workers in this study constituted more than 90% of the respondents, the majority with a long working period (more than five years). Worker experience was directly proportional to worker age; most workers were between 41 and 56 years old. The results, with a majority of SEGs from engineering, found that out of five hypotheses (H1–H5), four are accepted while one is rejected. Employee job satisfaction during this pandemic is influenced by the feeling of safety (H1) and work pressure (H3). Work pressure is further influenced by the feeling



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Corresponding author: Michael Christian, SE, MM Faculty of Social Sciences and Humanities Universitas Bunda Mulia Jl. Lodan Raya No. 2, Ancol, Jakarta Utara Email: michaelchristianid@gmail.com ORCiD: https://orcid.org/0000-0002-6817-6040 (H3). Work pressure is further influenced by the feeling of safety at work (H2). Moreover, work pressure acts as a mediator on the feeling of safety and job satisfaction (H4). However, job satisfaction is not influenced by management commitment (H5).

Conclusion. Management commitment to work safety during pandemic situations must be adjusted, especially regarding policies to ensure the availability of additional standards on health protocols to prevent the spread of COVID-19 in the workplace. In addition, the guarantee that the company is committed to ensuring that workers feel safe will be covered if exposed to COVID-19. Occupational safety and health standards are no longer fully focused on work equipment or facilities. The feeling of safety and work pressure during a pandemic require attention from companies in accordance with their existing limitations and capabilities.

Keywords: job satisfaction, work pressure, industrial and organizational psychology, SGEs, COVID-19 pandemic

INTRODUCTION

The prolonged COVID-19 pandemic has an impact on the industrial sector, especially the workforce in Indonesia. Many companies have reduced their number of workers, or even ceased operations altogether. Based on data published by the National Central Statistics Agency regarding the impact of the COVID-19 pandemic in Indonesia (Figure 1)¹, the accommodation, service, transportation, and warehousing business sectors have all been affected by the decline in business income. In addition, a survey conducted in mid-2020 explained that the electricity and gas business sectors were also affected by the decline in business income of more than 50%. This decrease in operating income, in the long term, can threaten the sustainability of a business, which in turn has an impact on the existence of working employees.

The ongoing COVID-19 pandemic in Indonesia will continue to have an impact on the business sector. Current government health protocols influencing the efforts of Indonesian companies, such as implementing work-fromhome or regulating the number of employees and working hours in the office, inevitably must be followed.² These regulations have been established by the government in order to, among other aims, help business sectors continue to operate even under pandemic limitations. These regulations also have an impact on the survival of the workers. Setting working hours, limiting the number of working employees, and possible termination of employment all affect the psychology and job satisfaction of employees.

The anxiety faced by workers as a result of this pandemic situation is becoming increasingly complex.³⁻⁵ Workload per employee increases when the number of workers decreases. Thus, work pressure due to this situation also increasingly affects the physical and mental health of workers.^{6,7} In this



Figure 1. Income decline in business sectors in Indonesia during COVID-19.

regard, one of the industries closest to the impact is technical and fieldwork, including construction, manufacturing, mining, oil, and gas. In this industry, specifically, many fields or Similar Exposure Groups (SEGs) have been significantly affected by workloads and work pressures at current conditions, such as technicians, engineers, mechanics, electrical parts, machine parts, occupational safety, and health.

These areas of work tend to have similar job risks due to field workload, pressure from internal and external aspects of the work location, as well as the ability to complete work with applicable standards. Yoon et. al⁸ explained that SEGs such as mechanical, engineering, and electrical have some of the highest frequencies of work-related death or accidents. In addition to these dangers, it is important for workers to feel safe when working amid the uncertainties of the COVID-19 pandemic. Recently, many scientific publications have examined the safety concerns of various SEGs, such as construction.9-11 Therefore, this area can be said to be a high-risk and dangerous SEG. This risk not only has an impact on employee job satisfaction, but also on the health and safety of the workers. Several studies¹²⁻¹⁴ have described this grouping of area profiles or fields of work using the term Similar Exposure Groups (SEGs). Therefore, this study will use SEGs in classifying job profiles. This is also considered appropriate to represent and explain several SEGs that have been exposed to the impact of this prolonged pandemic.

This study specifically aims to explain whether, during the ongoing COVID-19 pandemic in Indonesia, psychological factors (i.e., the feeling of safety and work pressure) affect the job satisfaction of workers. In addition, safety management, as an entity that cannot be separated from an organization, plays an important role in creating safe working conditions. Therefore, this study also aims to explain whether management commitment affects the work satisfaction of employees. The original contribution of this research lies in the up-to-date measurement of job satisfaction using job area profile grouping based on SEGs, such as in engineering, mechanic, electric; health, safety, environment; construction, building, mining, mill; and production, quality control. Such grouping jointly examines the areas of work with similar occupational characteristics and exposure to significant impacts in a prolonged and comprehensive pandemic situation, such as the current COVID-19 pandemic.

Hypothesis Development and Relationships between Variables

Psychological factors at work

The feeling of safety at work is closely related to psychological aspects that form a feeling of safety when performing work. This is in line with the views of Newman et al.¹⁵ who argued that psychological safety is closely related to behavior or actions such as behavior regarding learning, taking risks, and willingness to share information. In this study, **the feeling of safety** at work describes aspects of

safety while or after the workers do their jobs. These aspects are provided by the company to be experienced or obtained by workers. Therefore, this feeling of safety is reactionary, describing individual behavior towards the surrounding environment, including the team.¹⁶ Teams of people in the workplace are organizational entities that affect the way work is accomplished, work results, and job satisfaction as felt not only by the organization but also by the workers themselves.

Naturally, working conditions affect job satisfaction.¹⁷ Not only are working conditions formed by the team in the workplace, but the safety of the work environment can also shape working conditions.¹⁸ Work environment safety can be associated with the availability of work equipment or equipment that meets safety standards in terms of quantity, placement location, and use. COVID-19 pandemic conditions have resulted in the establishment of stricter work standards, especially for safety standards in the workplace and the use of work equipment. Companies must meet not only work safety standards but also occupational health standards in pandemic conditions. Therefore, it is necessary to conduct further studies on workers' feelings of safety in carrying out work during such difficult times. Based on these explanations, this study proposes the following hypotheses (H):

H1: Feeling of safety affects job satisfaction in SEGs.H2: Feeling of safety affects work pressure on SEGs.

In addition to the feeling of safety, safe working conditions can also impact the workload or pressure experienced by workers. Work pressure in this study describes the pressure of the limitations or incompatibility of conditions (e.g., number of workers with workloads, workloads with working hours, or workloads with work targets) felt by workers when completing work. Workloads that are excessive or too difficult can contribute to work pressure. Excessiveness in this case can be caused by the quantity of the work itself or by a shortage of workers resulting in a heavy workload borne by one worker. One of the reasons for such a lack of employees is a high employee turnover rate. Such suboptimal conditions should be avoided because, in the long term, excessive work pressure and workload can reduce work productivity.¹⁹ In such cases, workers can experience symptoms such as physical fatigue, injury, or the emergence of diseases, placing worker health at risk.²⁰

Thus, productive completion of all work is highly dependent on both the worker's internal factors (age or nutrition) and external factors (environment).²¹ In addition, the various roles of good leader, superior, or subordinate provide different work pressures from each other. The combination of work pressure or excessive workload and poor working conditions can reduce the job satisfaction of workers in the workplace.²² An examination of the workplace and the characteristics of the SEG can provide a different analysis of the feeling safety at work. Again, the prolonged COVID-19 pandemic has created unique uncertainties regarding normal working conditions. Therefore, it is necessary to conduct studies to enrich academic and industry understanding of the effects of safety aspects in the workplace, both direct and indirect, especially on SEGs. Based on these explanations, this study proposes the following hypotheses (H):

- H3: Work pressure affects job satisfaction in SEGs.
- H4: Work pressure mediates feeling of safety on job satisfaction in SEGs.

Organizational factors at work

One of the organizational factors most closely related to safety in the workplace (referred to in this study as management commitment) is management's commitment to safety aspects in the workplace, and this must be felt in employee perceptions. Management commitment in this study emphasizes safety commitment, where the organization has and continues to carry out a commitment to maintain safety principles for carrying out work in the workplace. As stated by Huang,²³ the perception of workers regarding management's commitment to safety is an important dimension of a safety climate in an organization. Management must view occupational health and safety as an important factor in the organization because it involves aspects of management performance such as working conditions, quality of work, human resource development, and organizational culture development.^{24,25} The position of workers has a close relationship with management commitment. This has been further explained by Pinion et al.²⁶ who determined that the work control of each employee will be different. Employee perception of management commitment will be low if employees have low job control. This can further result in a safety risk in the workplace. On the other hand, organizations generally perceive that management's commitment to safety is useful for regulating worker safety.²⁷

In the construction sector, for example, safety management is not only beneficial for project productivity but can also reduce worker accidents rates.28 Research conducted by Skeepers and Mbohwa²⁹ suggested that safety management systems can be improved through the support of leadership behavior and organizational commitment. In the field of oil and gas mining, Lelo and Purba³⁰ explained that safety management influences worker performance. In addition, their study also concluded that organizational culture affects employee performance. Safety management and organizational culture can simultaneously have an impact on worker performance. Worker performance in this case indirectly supports organizational performance. Mazrouei et al.³¹ similarly found that, in the oil refining industry, management commitment has an impact on employee safety performance. In other SEGs, such as field operations, for example, truck drivers will experience job satisfaction if the worker safety climate created by the organization runs well. This not only promotes job satisfaction, but also encourages the workers of this group to create more optimal work engagement.³² Job satisfaction in this study explains the sense of relief felt by workers for their confidence in doing

work, liking for the work being done, the results of the work done, and evaluation of the work achieved.

In difficult conditions, such as a pandemic, organizations are faced with more complex problems. The limited number of workers and working hours have had negative impacts on company production and operations. In the long term, this is highly likely to have an impact on the survival of many companies. On the other hand, the existence of COVID-19 has made companies more concerned about the safety of their employees in doing their jobs. Occupational safety standards may have been met long before the pandemic. However, the current conditions have shaped the awareness of organizational management, making them more concerned about their commitment to work safety factors. Therefore, this study attempts to explain the impact of these factors on workers. Based on the issues described above, this study proposes the following hypothesis:

H5: Management commitment affects job satisfaction in SEGs.

Based on these explanations of the relationships between variables and the development of hypotheses, the framework of this research is shown in Figure 2.

MATERIALS AND METHODS

The questionnaire uses items adapted from Hashiguchi et al.³³ (the sense of security and job satisfaction) and previous research by Chen et al.⁹ (management commitment and work pressure). The questionnaire was then translated into Indonesian and distributed to the participants. The validity of these items was then tested using SmartPLS 3.0.

This quantitative research was conducted using a survey in the form of an online questionnaire. This online instrument was chosen due to the COVID-19 pandemic conditions, which continue to enforce distance. The questionnaire used a 5-point Likert scale (from 1=strongly disagree to 5=strongly agree). The items in the questionnaire (Appendix 1) contain measurements of the participants' general opinions regarding the feeling of safety, work pressure, management commitment, and job satisfaction.

The questionnaires were distributed online, and the participants filled out the questionnaire voluntarily. Participants may stop filling out the questionnaire at any time, keeping ethical considerations in mind. The participants were also informed that all responses were confidential, used only for



Figure 2. Conceptual framework.

scientific research purposes, and would not affect the conditions or continuation of their employment. The questionnaire also included contact information of the researcher.

To achieve a predetermined SEG profile, in considering the sample, this study used a non-probability sampling method. Furthermore, all submitted questionnaires were filtered to obtain the specified sample criteria [engineering, mechanic, electric, machine, health safety environment (HSE), construction, mining, quality control, production, and other SEGs]. For an unknown population, the sample size in this study used the technique of multiplying the number of indicators (16 indicators) in the study by a minimum of 5 to a maximum of 10.34-36 Thus, the 103 samples collected in this study have met the requirements of the sample size used. We interpreted the age groups of participants as less productive (<27 years), productive (27-40 years), experienced (41-56 years), and senior (>56 years). Purposive sampling was used to collect the sample for this study. In this study, the sample criteria described above were used as inclusion criteria. The analysis of this study used Partial Least Square-Structural Equation Modeling (PLS-SEM) with SmartPLS 3.0. This analytical tool can accommodate analysis using structural modeling with causal relationships when the sample size is small.³⁷⁻³⁹

This study incorporated one dependent variable and three independent variables. For one of the independent variables, namely work pressure, this variable also acts as a mediating variable. The variables of feeling of safety and job satisfaction in this study used a self-administered questionnaire adapted from previous research by Hashiguchi et al.³³ In this study, feelings of safety are defined as all aspects of safety while doing work or afterward. The feeling of safety variable consists of three indicators, namely organizational awareness of safety in the workplace, organizational awareness of the temperature in the workplace, and workers having an adequate night's sleep. Job satisfaction is defined in this study as a sense of relief that workers feel because they are confident in their work, enjoy the work they do, are pleased with the results of their work, and can evaluate the work they have done. The job satisfaction variable consists of working with confidence, evaluating the work done, and working under healthy conditions. The variables of management commitment and work pressure on workers in this study adapted previous research by Chen et al.⁹ This study defines management commitment as a "safety commitment," in which the organization has and continues to carry out a commitment to maintain safety principles while carrying out work in the workplace. Management commitment in this study was measured using six indicators, namely sufficient availability of work safety training, work safety inspections carried out, sufficient availability of work equipment that met safety standards, occupational safety aspects as a priority, and priority for resolving work accidents with safety aspects. Next, work pressure is defined as conditions that make it difficult or impossible for employees to perform their duties. Work pressure consists of four

indicators, namely the availability of a sufficient number of workers to do the existing work, sufficient time duration to do the work, workload resulting in irregular break times, and a feeling of being too busy or having excessive work to be done.

Ethical Considerations

The participants in this study were required to be in good health and able to continue filling out the questionnaires obtained. There was no obligation to complete the questionnaire. Participants can stop filling out the questionnaire at any time if they are uncomfortable.

RESULTS

Profile of Workers

Out of 103 respondents in this study, the profile of workers (Table 1) shows that male workers represent more

Table 1. Profile of Respondents

	Drafia	Freq	uency
	Profile	Ν	%
Gender	Male	98	95.15
	Female	5	4.85
Age	<27 years old	4	3.88
	27-40 years old	43	41.75
	41-56 years old	54	52.43
	>56 years old	2	1.94
SEGs	Engineer, mechanic, electric	76	73.79
	Health, safety, environment	15	14.56
	Construction, building, mining, mill	9	8.74
	Production, quality control	3	2.91
Working	≤1 year	3	2.91
period	2-3 years	9	8.74
	4-5 years	8	7.77
	>5 years	83	80.58

than 95%. This indicates that the profile of workers in these areas is still the target job for men as compared to women. This is in line with the workload and work risks in Indonesia where many have heavy work equipment and extreme SEGs tend to be dominated by male workers. Based on worker age, 41–56-year-olds dominate this study, at more than 50%. This is followed by workers in the 27–40 age group. Productive age with work experience is indeed quite reliable in these SEGs. This is also supported by the results of respondent data, where more than 80% of the workers in this study have more than five years of experience. The largest SEG in this research consists of the engineering, mechanic, and electric areas (more than 70%). Furthermore, the HSE area is 14.56%, while the construction, building, mining, mill, and production and quality control groups are each below 10%.

PLS-SEM Measurement

Initial tests conducted prior to any further analysis were the reliability and validity tests⁴⁰ by using SmartPLS 3.0. The measurement of reliability in this study used the provisions of numbers >0.7 on Cronbach's Alpha (CA) and Composite Reliability (CR), while validity used the provisions of numbers >0.5 on Average Variance Extracted (AVE) and >0.7 on Outer Loading (OL)41-45 (Appendix 2). During the first processing, there was one item in the Feeling of Safety (FOS) variable, namely FOS3 (CA=0.519), which had a CA number <0.7. In addition, the Work Pressure (WP) variable had two items, namely WP3 and WP4, with CA 0.05 and 0.273, respectively, i.e., a CA number <0.7. Items that did not meet the specified thresholds were discarded and reprocessed. During the second processing, all variables' measurements in this study were determined to be valid and reliable, as shown below in Table 2.

In the structural model test results, this study tested the Variance Inflation Factor (VIF) and R Square, as shown in

	Variable – Item	CA	CR	OL	AVE
FOS	FOS1: The company for which I work takes workplace safety into account.	0.829	0.921	0.927	0.854
	FOS2: My boss takes the temperature of the workplace into account.			0.921	
JOS	JOS1: I work with confidence.	0.763	0.864	0.822	0.679
	JOS2: My supervisor evaluates my job performance.			0.857	
	JOS3: At work, I feel generally well.			0.791	
МС	MC1: The company offers an adequate safety training program.	0.941	0.953	0.901	0.773
	MC2: The company conducts regular safety inspections.			0.902	
	MC3: The company provides safe work equipment.			0.936	
	MC4: Despite the fact that the work is behind schedule, the company prioritizes the safety aspect of the work in order to complete it.			0.809	
	MC5: The company provides adequate insight into workplace safety issues.			0.893	
	MC6: When a safety incident occurs, the company focuses on how to solve the problem rather than blaming a specific employee.			0.826	
WP	WP1: In my opinion, there are enough workers to complete the required work.	0.877	0.942	0.947	0.890
	WP2: There is enough preparation time for workers to plan or carry out the required work.			0.940	
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Note: Cronbach's Alpha (CA)>0.7; Composite Reliability (CR)>0.7; Outer Loading (OL)>0.7; Average Variance Extracted (AVE)>0.5

Table 2. Test of Reliability and Validity

Table 3. Structural Model Test	Table 4. Significance Test					
Description	Path	P-value	Remark			
Variance Inflation Factor (VIF)	Direct Effect					
The feeling of Safety \rightarrow Job Satisfaction = 2.263	The feeling of safety $ ightarrow$ Job satisfaction	0.000	significant			
The feeling of Safety \rightarrow VVork Pressure = 1.000 Management Commitment N lab Satisfaction = 2.200	The feeling of safety \rightarrow Work pressure	0.000	significant			
Wanagement Communent \rightarrow Job Satisfaction = 3.308 Work Pressure \rightarrow Job Satisfaction = 1.810	Work pressure $ ightarrow$ Job satisfaction	0.016	significant			
P Square	Management commitment $ ightarrow$ Job satisfaction	0.133	not significant			
Job Satisfaction = 0.459	Indirect Effect					
Work Pressure = 0.258	Feeling of safety \rightarrow Work pressure \rightarrow Job satisfaction	0.024	as a mediator			



Figure 3. T-values.

Table 3. The VIF results show that the Feeling of Safety to Job Satisfaction is 2.263; the Feeling of Safety to Work pressure is 1.000; Management Commitment to Job Satisfaction is 3.308; and Work Pressure to Job Satisfaction is 1.810. All these results indicate that the VIF result is <5 so that there is no collinearity symptom, and the model is fit. Furthermore, the results on R square show Job Satisfaction of 0.459; Work Pressure of 0.258. These results explain that the Feeling of Safety, Work Pressure, and Management Commitment can explain the relationship with Job Satisfaction by 45.9%. Meanwhile, Feeling of Safety can explain its relationship to Work Pressure by 25.8%.

The results of the hypotheses in this study can be seen from the results of the t-value in the path analysis. As illustrated by Figure 3, the t-value of Feeling of Safety to Job Satisfaction=2.586, the t-value of Feeling of Safety to Work Pressure=6.772, and the t-value of Management Commitment to Job Satisfaction=1.505. To determine whether there is an effect between paths, the t-value results must be compared with 1.96. Thus, if the value of t>1.96, then the path formed has an influence. From these results, it can be determined that the Feeling of Safety to Job Satisfaction (H1), the Feeling of Safety to Work Pressure (H2), Work Pressure to Job Satisfaction (H3), and the Feeling of Safety to Job Satisfaction mediated by Work Pressure (H4) are significant. Meanwhile, Management Commitment to Job Satisfaction (H5) is not significant. In addition, the hypotheses tests in this study can also be explained from the P-value results, as shown in Table 4. The effect of a path will be significant if it has a P-value <0.05. Thus, it can be determined that Job Satisfaction is directly influenced by Feelings of Safety and Work Pressure. On the other hand, the existence of management's commitment to work safety factors does not affect Job Satisfaction. Meanwhile, Work Pressure is influenced by the feeling of safety at work. Furthermore, Work Pressure in its relationship between Feeling of Safety and Job Satisfaction has succeeded in mediating this path relationship. With the results described, this study accepts hypothesis 1, hypothesis 2, hypothesis 3, and hypothesis 5. However, this study rejects hypothesis 4.

DISCUSSION

Feeling of safety on Job satisfaction

SEGs as described in this study are part of most laborintensive industries, which very often have workloads that exceed the physical capabilities of the workers.9 The physical condition of workers, especially those related to physical health, greatly affects job satisfaction, which in turn has an impact on the level of work productivity.^{46,47} In this study, the variable of Feeling of Safety consists of statements regarding workers' feeling that their organization considers the principle of safety aspects in the workplace, and whether workers feel that the organization has tried to provide solutions so that the temperature in the workplace remains within safe and comfortable limits for doing work. The temperature level that is considered safe and comfortable for doing work depends on the dry temperature, humidity level, wind speed, and level of physical activity carried out by workers. Generally, field workers are exposed to high temperatures and humidity because Indonesia is located on the equator and is an archipelagic country. From the research results, it is evident that workers prioritize whether an organization considers the availability or implementation of the principles of safety aspects in the workplace. The two items in this variable play an important role in shaping worker job satisfaction, especially in terms of maintaining the confidence of workers to successfully accomplish their work (JOS1), feeling happy with the assessment or evaluation of the work done (JOS2), and remaining in a healthy physical condition after doing the job (JOS3).

The level of worker resilience in overcoming difficulties or changes in work situations can determine the level of focus in prioritizing safety when doing work in the workplace.48 Measuring the heart health of workers regularly, for example, can help in completing workloads, especially those that use physical exertion.49-52 Under COVID-19 pandemic conditions, when working hours and the number of employees are limited, the work situation can have an impact on both the performance of the organization⁵³ and employees in doing work. This is associated with the aspect of the feeling of safety at work, which has an impact on the form of satisfaction in doing work. A person's intention to remain loyal to something can be influenced by their level of satisfaction.⁵⁴ This supports research by Chen et al.9 who concluded that aspects of the safety climate affect the safety of workers in Ontario. In addition, this study also explains that aspects of the safety climate formed by the organization influence the psychology of the workers. Likewise, prior research results^{17,22} explain that the feeling of safety at work has a direct effect on the job satisfaction of workers in the workplace. This is also corroborated by other studies,^{18,55} which have explained that the feeling of safety has an impact on job performance or productivity, which promotes worker job satisfaction in the workplace.

Work pressure on Job satisfaction

To maintain the productivity and performance of workers, organizations usually carry out annual health checks for workers, including tests on blood pressure, heart rate, and weight.56 The development and ability to do all kinds of work in the workplace an also support the formation of job satisfaction for workers.55,57 In a pandemic, when the company's financial health is easily exhausted, workers' anxieties can increase stress levels. The ability of workers to manage stress levels can have an impact not only on the health of workers but also on the optimization of performance.⁵⁸ This anxiety can form excessive work pressure, and thus cause work safety risks. In addition, this study reveals that the two items involved with the feeling of safety have an impact on the suitability of the number of workers for an existing workload (WP1) and the suitability of working time for an existing workload (WP2). Furthermore, the results of this study determine that work pressure plays an important role as a mediator between the feeling of safety at work and job satisfaction. Workers who are under high psychological pressure are more likely to exhibit unsafe behaviors at work⁵⁹ and thus are more likely to be the cause of workplace accidents. Previous researchers have similarly examined pressure at work using a dimension approach, such as support from fellow workers at work, work equipment or equipment that meets safety aspects at work, and the balance between work performance and safety at work.^{10,60}

Management commitment on Job satisfaction

As workers age, health and safety aspects in the workplace not only increasingly become important factors in proactive

work behavior,⁵⁶ but can also support productivity and job satisfaction.18,19,22,57 Previous studies have explained work productivity from the perspective of workers' psychological awareness, both the physical condition of workers and the health risks of workers.^{9,33,61} A conclusive definition of job satisfaction has not yet been determined, because it depends on many discrete aspects.⁶² Therefore, additional studies on this issue are required. The results of this study are ultimately inconsistent with several studies^{60,63,64} which concluded that management commitment will have an impact on worker safety at work. The current state of the COVID-19 pandemic is not optimal for either workers or organizations. Under these conditions, organizational management related to safety aspects in the workplace is seen as an expendable concern. From this perspective, the danger of COVID-19 becomes the main responsibility of each individual worker. In this regard, the results of this study explain that workers prioritize management commitment to providing standard equipment that meets safety aspects at work (MC3). However, other aspects of this variable are also considered important by workers, such as inspections (MC2), training (MC1), periodic briefings/socialization (MC5) regarding safety at work, focusing on how to resolve cases of work accidents (MC6), and prioritizing safety aspects over forcing the rapid completion of work.

The limitations on companies' ability to support the commitment to safety aspects exist only for aspects of basic occupational safety and health standards, not for occupational safety and health standards due to the prolonged COVID-19 pandemic. It must be understood that companies have a limited ability to commit to providing safety aspects in the workplace that come from external factors, such as the current pandemic (for example, limited company budgets, limited employees who understand COVID-19, or limitations in handling the number of employees one by one). Therefore, the awareness of each worker is an integral part of the safety climate, where the psychological aspect is integrated with the behavioral and organizational aspects of safety culture.²⁵ In this difficult pandemic period, even with a mastery of equipment or systems that support work methods, positive interactions between workers in the workplace can be an important factor in improving worker performance.65

Limitations and Recommendations for further study

This study realizes that workplace psychological and organizational factors during the COVID-19 pandemic are two exceptionally large and complex issues with multifaceted interrelationships between factors. Therefore, this study has limitations on the factors used in both the psychological and organizational aspects. The factors used as indicators in this study only focus on factors that are directly or easily visible as part of the impact of current conditions. Other psychological factors, such as news about COVID-19 in the mass media, which tend to inform worker concerns, or factors of household conditions (e.g., children's learning system at home) can be complementary factors that affect the psychological or stress level of workers at work. In addition, other factors that can also be used as additional research variables are aspects of the family economy. This is closely related to the ongoing COVID-19 pandemic, where the psychological condition of workers becomes vulnerable when threated by the termination of employment from the company.

CONCLUSION

This study concludes that under COVID-19 pandemic conditions, workers in the SEGs in this study tend to experience increasingly complex work safety risks. Anxiety about a seemingly endless pandemic psychologically affects workers. Work pressure under these conditions is strongly influenced by the feeling of safety in the workplace (H2). In addition, job satisfaction in this working group during the pandemic is no longer dependent on management commitment related to occupational safety and health aspects (H5). Factors that determine employee job satisfaction in difficult times such as the COVID-19 pandemic are related to the feeling of safety at work (H1) and work pressure (H3). This study succeeded in explaining that work pressure during a pandemic in the SEGs of workers formed a mediating relationship between the feeling of safety and job satisfaction (H4). It is undeniable that work pressures, especially those formed from the psychological challenges of the COVID-19 pandemic, are becoming more complex and stronger.

Statement of Authorship

All authors have been sufficiently involved in this work to take public responsibility for its validity and final presentation as an original publication.

Author Disclosure

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REFERENCES

- BPS-Statistics Indonesia. Analysis on COVID-19 Impact on Businesses Owners [Internet]. Jakarta; 2020 [cited 2021 Jun 30]. Available from: https://www.bps.go.id/publication/2020/09/15/ 9efe2fbda7d674c09ffd0978/analisis-hasil-survei-dampak-covid-19-terhadap-pelaku-usaha.html.
- Irawanto DW, Novianti KR, Roz K. Work from home: Measuring satisfaction between work–life balance and work stress during the COVID-19 pandemic in Indonesia. Economies. 2021 Jun;9(3):1–13. doi: 10.3390/economies9030096.
- Aguiar-Quintana T, Nguyen THH, Araujo-Cabrera Y, Sanabria-Díaz JM. Do job insecurity, anxiety and depression caused by the COVID-19 pandemic influence hotel employees' self-rated task performance? The moderating role of employee resilience. Int J Hosp Manag. 2021 Apr;94: 102868. doi: 10.1016/j.ijhm.2021. 102868.

- Alnazly E, Khraisat OM, Al-Bashaireh AM, Bryant CL. Anxiety, depression, stress, fear and social support during COVID-19 pandemic among Jordanian healthcare workers. PLoS One. 2021 Mar;16(3): e0247679. doi: 10.1371/journal.pone.0247679.
- Trougakos JP, Chawla N, McCarthy JM. Working in a pandemic: Exploring the impact of COVID-19 health anxiety on work, family, and health outcomes. J Appl Psychol. 2020 Nov;105(11):1234-45. doi: 10.1037/apl0000739.
- Sadovyy M, Sánchez-Gómez M, Bresó E. COVID-19: How the stress generated by the pandemic may affect work performance through the moderating role of emotional intelligence. Pers Individ Dif. 2021 Oct;180: 110986. doi: 10.1016/j.paid.2021.110986.
- Yu J, Park J, Hyun SS. Impacts of the COVID-19 pandemic on employees' work stress, well-being, mental health, organizational citizenship behavior, and employee-customer identification. J Hosp Mark Manag. 2021;30(5):529–48. doi: 10.1080/19368623.2021. 1867283.
- Yoon SJ, Lin HK, Chen G, Yi S, Choi J, Rui Z. Effect of occupational health and safety management system on work-related accident rate and differences of occupational health and safety management system awareness between managers in South Korea's construction industry. Saf Health Work. 2013 Dec;4(4):201–9. doi: 10.1016/ j.shaw.2013.10.002.
- Chen Y, McCabe B, Hyatt D. Impact of individual resilience and safety climate on safety performance and psychological stress of construction workers: A case study of the Ontario construction industry. J Safety Res. 2017 Jun;61:167–76. doi: 10.1016/j.jsr. 2017.02.014.
- Guo BHW, Yiu TW, González VA. Predicting safety behavior in the construction industry: Development and test of an integrative model. Saf Sci. 2016 Apr;84:1–11. doi: 10.1016/j.ssci.2015.11.020.
- Becerik-Gerber B, Siddiqui MK, Brilakis I, El-Anwar O, El-Gohary N, Mahfouz T, et al. Civil engineering grand challenges: Opportunities for data sensing, information analysis, and knowledge discovery. J Comput Civ Eng. 2014 Jul;28(4):1–13. doi: 10.1061/ (ASCE)CP.1943-5487.0000290.
- Miyauchi H, Nakano M, Hirata M, Tanaka A, Iwasawa S, Etoh N, et al. Study on the establishment of a specific Similar Exposure Group (SEG) in personal exposure monitoring: A case report of indium tin oxide target surface grinding process. J UOEH. 2018; 40(4):323–9. doi: 10.7888/juoeh.40.323.
- Mino J, Quémerais B. Using a particle counter to inform the creation of similar exposure groups and sampling protocols in a structural steel fabrication facility. Toxics. 2017 Nov;5(4):34. doi: 10.3390/ toxics5040034.
- Petit P, Bicout DJ, Persoons R, Bonneterre V, Barbeau D, Maître A. Constructing a database of similar exposure groups: The application of the Exporisq-HAP Database from 1995 to 2015. Ann Work Expo Health. 2017 May;61(4):440–56. doi: 10.1093/annweh/wxx017.
- Newman A, Donohue R, Eva N. Psychological safety: A systematic review of the literature. Hum Resour Manag Rev. 2017 Sep;27(3): 521–35. doi: 10.1016/j.hrmr.2017.01.001.
- Schaubroeck JM, Hannah ST, Avolio BJ, Kozlowski SWJ, Lord RG, Treviño LK, et al. Embedding ethical leadership within and across organization levels. Acad Manag J. 2012;55(5):1053–78. doi: 10.5465/amj.2011.0064.
- Goetz K, Musselmann B, Szecsenyi J, Joos S. The Influence of workload and health behavior on job satisfaction of general practitioners. Fam Med. 2013 Feb;45(2):95–101.
- Bergheim K, Nielsen MB, Mearns K, Eid J. The relationship between psychological capital, job satisfaction, and safety perceptions in the maritime industry. Saf Sci. 2015 Apr;74:27–36. doi: 10.1016/ j.ssci.2014.11.024.
- Obakpolo P. Improving interpersonal relationship in workplaces. IOSR J Res Method Educ. 2015 Nov-Dec;5(6):115–25. doi: 10.9790/ 7388-0562115125.
- 20. Tamura N, Tanaka T. Japan's recent tendencies of accidents in building facilities and workers' accidents in the environment of

extreme temperature. Procedia Eng. 2016;146:278-87. doi: 10.1016/j.proeng.2016.06.389.

- McCambridge J, Witton J, Elbourne DR. Systematic review of the Hawthorne effect: New concepts are needed to study research participation effects. J Clin Epidemiol. 2014 Mar;67(3):267–77. doi: 10.1016/j.jclinepi.2013.08.015.
- 22. Aktepe A, Ersoz S. A quantitative performance evaluation model based on a job satisfaction-performance matrix and application in a manufacturing company. Int J Ind Eng. 2012;19(6):264–277. doi:10.23055/ijietap.2012.19.6.637
- 23. Huang Y-H, Verma SK, Chang W-R, Courtney TK, Lombardi DA, Brennan MJ, et al. Management commitment to safety vs. employee perceived safety training and association with future injury. Accid Anal Prev. 2012 Jul;47:94–101. doi: 10.1016/j.aap.2011.12.001.
- Kuimet K, Järvis M, Virovere A, Hartšenko J. Linking human resource management and knowledge management via commitment to safety. Saf Technog Environ. 2015;7:17–25. doi: 10.1515/ste-2015-0003.
- Järvis M, Virovere A, Tint P. Knowledge management a neglected dimension in discourse on safety management and safety culture – evidence from Estonia. Saf Technog Environ. 2014;5:5–17. doi: 10.7250/ste.2014.001.
- Pinion C, Brewer S, Douphrate D, Whitehead L, DelliFraine J, Taylor WC, et al. The impact of job control on employee perception of management commitment to safety. Saf Sci. 2017 Mar;93:70–5. doi: 10.1016/j.ssci.2016.11.015.
- McGonagle AK, Childress NM, Walsh BM, Bauerle TJ. Can civility norms boost positive effects of management commitment to safety? J Psychol. 2016 Jul;150(5):591–605. doi: 10.1080/00223980.2016.1143798.
- Chen Q, Jin R. Safety4Site commitment to enhance jobsite safety management and performance. J Constr Eng Manag. 2012 Apr;138(4):509–19. doi: 10.1061/(ASCE)CO.1943-7862.0000453.
- Skeepers NC, Mbohwa C. A study on the leadership behaviour, safety leadership and safety performance in the construction industry in South Africa. Procedia Manuf. 2015;4:10–16. doi: 10.1016/j. promfg.2015.11.008.
- 30. Lelo D, Purba JH V. The Effect of Occupational Safety Health Management (OSH) and Organizational Culture on Employee Performance in Oil and Gas Mining. Survey on PT Caltex, Pekan Baru [Internet]. Int Conf Account Manag Sci. Bogor: STIE Kesatuan; 2018 [cited 2021 Jun 30]. p. 286–294. Available from: https://jurnal.stiekesatuan.ac.id/index.php/e-proceeding/article/ view/657/507.
- Al Mazrouei MA, Khalid K, Davidson R. Modeling the impact of safety climate on process safety in a modern process industry: The case of the UAE's oil-refining industry. Cogent Bus Manag. 2019;6: 1–21. doi: 10.1080/23311975.2019.1647591.
- 32. Huang Y-H, Lee J, McFadden AC, Murphy LA, Robertson MM, Cheung JH, et al. Beyond safety outcomes: An investigation of the impact of safety climate on job satisfaction, employee engagement and turnover using social exchange theory as the theoretical framework. Appl Ergon. 2016 Jul;55:248–57. doi: 10.1016/j.apergo.2015.10.007.
- 33. Hashiguchi N, Cao J, Lim Y, Kubota Y, Kitahara S, Ishida S, et al. The effects of psychological factors on perceptions of productivity in construction sites in Japan by worker age. Int J Environ Res Public Health. 2020 May;17(10):3517. doi: 10.3390/ijerph17103517.
- 34. Hair JF, Anderson RE, Black WC. Multivariate Data Analysis, 7th ed. Essex: Pearson Education Limited; 2014.
- Indriyarti ER, Christian M, Yulita H, Ruminda M, Sunarno S, Wibowo S. Online food delivery app distribution and determinants of Jakarta's Gen Z spending habits. J Distrib Sci. 2022;20:73–86. doi: 10.15722/jds.20.07.202207.73.
- Christian M, Pardede R, Indriyarti ER. Generation Z in Jakarta's attitude towards COVID-19 Ad distribution on YouTube. J Distrib Sci. 2022;20:13–22. doi: 10.15722/jds.20.03.202203.13.
- Al Idrus S, Ahmar AS, Abdussakir. The effect of organizational learning on market orientation moderated by job satisfaction. Cogent Bus Manag. 2018;5(1):1–12. doi: 10.1080/23311975.2018.1475048.

- Hair J, Hollingsworth CL, Randolph AB, Chong AYL. An updated and expanded assessment of PLS-SEM in information systems research. Ind Manag Data Syst. 2017;117(3):442–58. doi: 10.1108/ IMDS-04-2016-0130.
- Wong KK-K. Partial Least Squares Structural Equation Modeling (PLS-SEM) Techniques using SmartPLS. Mark Bull. 2013;24:1–32.
- Doloi H, Iyer KC, Sawhney A. Structural equation model for assessing impacts of contractor's performance on project success. Int J Proj Manag. 2011 Aug;29(6):687–95. doi: 10.1016/j.ijproman. 2010.05.007.
- Barati M, Taheri-Kharameh Z, Farghadani Z, Rásky É. Validity and reliability evaluation of the Persian version of the Heart Failure-Specific Health Literacy Scale. Int J Community Based Nurs Midwifery. 2019 Jul;7(3):222–30. doi: 10.30476/IJCBNM.2019.44997.
- 42. Memon AH, Rahman IA. SEM-PLS Analysis of Inhibiting factors of cost performance for large construction projects in Malaysia: perspective of clients and consultants. Scientific World Journal. 2014 Feb;2014:165158. doi: 10.1155/2014/165158.
- Tavakol M, Dennick R. Making sense of Cronbach's alpha. Int J Med Educ. 2011 Jun;2:53–5. doi: 10.5116/ijme.4dfb.8dfd.
- Indriyarti ER, Christian M, Yulita H, Aryati T, Arsjah RJ. Digital bank channel distribution: Predictors of usage attitudes in Jakarta's Gen Z. J Distrib Sci. 2023;21:21–34. doi: 10.15722/jds. 21.02.202302.21.
- Christian M, Haris K, Indriyarti ER, Wibowo S, Sunarno S. Service distribution strategy on business performance of Padang restaurants in North Jakarta. J Distrib Sci. 2021;19:57–69. doi: 10.15722/jds. 19.12.202112.57.
- Lindberg CM, Srinivasan K, Gilligan B, Razjouyan J, Lee H, Najafi B, et al. Effects of office workstation type on physical activity and stress. Occup Environ Med. 2018 Oct;75(10):689–95. doi: 10.1136/ oemed-2018-105077.
- 47. Föhr T, Pietilä J, Helander E, Myllymäki T, Lindholm H, Rusko H, et al. Physical activity, body mass index and heart rate variability-based stress and recovery in 16 275 Finnish employees: a cross- sectional study. BMC Public Health. 2016 Aug;16:701. doi: 10.1186/s12889-016-3391-4.
- Eid J, Mearns K, Larsson G, Laberg JC, Johnsen BH. Leadership, psychological capital and safety research: Conceptual issues and future research questions. Saf Sci. 2012 Jan;50(1):55–61. doi: 10.1016/j. ssci.2011.07.001.
- Coenen P, Korshøj M, Hallman DM, Huysmans MA, van der Beek AJ, Straker LM, et al. Differences in heart rate reserve of similar physical activities during work and in leisure time – A study among Danish blue-collar workers. Physiol Behav. 2018 Mar;186:45–51. doi: 10.1016/j.physbeh.2018.01.011.
- 50. Aryal A, Ghahramani A, Becerik-Gerber B. Monitoring fatigue in construction workers using physiological measurements. Autom Constr. 2017 Oct;82:154–65. doi: 10.1016/j.autcon.2017.03.003.
- Lee W, Migliaccio GC. Physiological cost of concrete construction activities. Constr Innov. 2016;16(3):281–306. doi: 10.1108/CI-10-2015-0051.
- 52. Gatti UC, Migliaccio GC, Bogus SM, Schneider S. An exploratory study of the relationship between construction workforce physical strain and task level productivity. Constr Manag Econ. 2014;32(6): 548–64. doi: 10.1080/01446193.2013.831463.
- Christian M, Dewi D, Rembulan GD, Indriyarti ER, Wibowo S, Yuniarto Y. Business performance determinants of salted fish distribution in Kapuk during the COVID-19. J Distrib Sci. 2021;19: 29–39. doi: 10.15722/jds.19.6.202106.29.
- 54. Christian M, Wibowo S, Indriyarti ER, Sunarno S, Yuniarto Y. Do service quality and satisfaction affect the intention of using application-based land transportation? A study on Generation YZ in Jakarta. In: Hamdan A, Shoaib HM, Alareeni B, Hamdan R. (eds) The Implementation of Smart Technologies for Business Success and Sustainability. Studies in Systems, Decision and Control, vol 216. Springer, Cham; 2023. pp.737-746. doi: 10.1007/978-3-031-10212-7_60.

- Phonthanukitithaworn C, Ketkaew C, Naruetharadhol P. Skill development and job satisfaction: perspectives of workers in the industrial sector of Thailand. Knowl Manag. 2017;17(2):1–10. doi: 10.18848/2327-7998/CGP/v17i02/1-10.
- Hakro S, Jinshan L. Workplace employees' annual physical checkup and during hire on the job to increase health-care awareness perception to prevent disease risk: A work for policy-implementable option globally. Saf Health Work. 2019 Jun;10(2):132–40. doi: 10.1016/j. shaw.2018.08.005.
- 57. Shevchuk A, Strebkov D, Davis SN. Skill mismatch and worklife conflict: the mediating role of job satisfaction. J Educ Work. 2019;32(2):181–195. doi: 10.1080/13639080.2019.1616281.
- Cattell K, Bowen P, Edwards P. Stress among South African construction professionals: a job demand-control-support survey. Constr Manag Econ. 2016;34(10):700–23. doi: 10.1080/01446193.2016.1203967.
- Leung M-Y, Liang Q, Olomolaiye P. Impact of job stressors and stress on the safety behavior and accidents of construction workers. J Manag Eng. 2016;32(1). doi:10.1061/%28ASCE%29ME.1943-5479. 0000373.
- Cigularov KP, Lancaster PG, Chen PY, Gittleman J, Haile E. Measurement equivalence of a safety climate measure among Hispanic and white non-Hispanic construction workers. Saf Sci. 2013 Apr;54: 58–68. doi: 10.1016/j.ssci.2012.11.006.

APPENDICES

Appendix 1. Questionnaires

A. Introduction		
Instructions: You are asked to answer the questions truthform a checkmark (\checkmark) in the choices.	ully by	/ providing
Are you currently in good health and able to		Yes
complete this questionnaire?		No

If you answered "No", you could now stop.

B. Profile

Instructions: You must provide a checkmark (\checkmark) in the choices to answer the questions truthfully.

Gender	Male
	Female
Age	<27 years old
	27-40 years old
	41-56 years old
	>56 years old
SEGs	Engineer, mechanic, electric
	Health, safety, environment
	Construction, building, mining, mill
	Production, quality control
Working period	≤1 year
	2-3 years
	4-5 years
	>5 years

- Idrees MD, Hafeez M, Kim J-Y. Workers' age and the impact of psychological factors on the perception of safety at construction sites. Sustainability. 2017;9:745. doi: 10.3390/su9050745.
- Aziri B. Job satisfaction: a literature review. Manag Res Pract. 2011;3(4):77–86.
- Hon CKH, Chan APC, Yam MCH. Relationships between safety climate and safety performance of building repair, maintenance, minor alteration, and addition (RMAA) works. Saf Sci. 2014 Jun;65: 10–9. doi: 10.1016/j.ssci.2013.12.012.
- Tholén SL, Pousette A, Törner M. Causal relations between psychosocial conditions, safety climate and safety behaviour – A multi-level investigation. Saf Sci. 2013 Jun;55:62–9. doi: 10.1016/ j.ssci.2012.12.013.
- Andersson D, Rankin A, Diptee D. Approaches to team performance assessment: a comparison of self-assessment reports and behavioral observer scales. Cogn Tech Work. 2017;19:517–28. doi: 10.1007/ s10111-017-0428-0.

C. Item

Participants are to answer each item in an honest manner and are to follow the instructions given.

Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA) are the five possible responses to the questions. You may choose any one of these answers.

Participants are given the option of placing a checkmark ($\sqrt{}$) to one of the available answer choices.

No.	Item	SD	D	Ν	Α	SA
1.	FOS1: The company for which I work takes workplace safety into account.					
2.	FOS2: My boss takes the temperature of the workplace into account.					
3.	FOS3:I believe I get enough sleep at night.					
4.	JOS1: I work with confidence.					
5.	JOS2: My supervisor evaluates my job performance.					
6.	JOS3: At work, I feel generally well.					
7.	MC1: The company offers an adequate safety training program.					
8.	MC2: The company conducts regular safety inspections.					
9.	MC3: The company provides safe work equipment.					
10.	MC4: Despite the fact that the work is behind schedule, the company prioritizes the safety aspect of the work to complete it.					
11.	MC5: The company provides adequate insight into workplace safety issues.					
12.	MC6: When a safety incident occurs, the company focuses on how to solve the problem rather than blaming a specific employee.					
13.	WP1: In my opinion, there are enough workers to complete the required work.					
14.	WP2: There is enough preparation time for workers to plan or carry out the required work.					
15.	WP3: Work interferes with my ability to rest normally.					
16.	WP4: I have an abundance of work that must be completed one by one.					

Appendix 2. Questionnaire validation

After getting all the answers to the questionnaire from the participants, the data were processed using SmartPLS 3.0 to find out if the question-naire was valid for each item used. The provisions of >0.7 on the average variance extracted (AVE) and >0.7 on the outer loading (OL) were used to measure the validity of each item. Items that did not meet the specified thresholds were discarded and reprocessed.

Item	OL	AVE	
FOS1:The company for which I work takes workplace safety into account.			
FOS2:My boss takes the temperature of the workplace into account.	0.921		
JOS1: I work with confidence.	0.822	0.679	
JOS2: My supervisor evaluates my job performance.	0.857		
JOS3: At work, I feel generally well.	0.791		
MC1: The company offers an adequate safety training program.	0.901	0.773	
MC2: The company conducts regular safety inspections.	0.902		
MC3: The company provides safe work equipment.	0.936		
MC4: Despite the fact that the work is behind schedule, the company prioritizes the safety aspect of the work in order to complete it.	0.809		
MC5: The company provides adequate insight into workplace safety issues.	0.893		
MC6: When a safety incident occurs, the company focuses on how to solve the problem rather than blaming a specific employee.	0.826		
WP1: In my opinion, there are enough workers to complete the required work.	0.947	0.890	
WP2: There is enough preparation time for workers to plan or carry out the required work.	0.940		

*Eliminated: FOS3 (CA=0.519); WP3 (CA=0.05); WP4 (CA= 0.273)