THE INFLUENCING OF OCCUPATIONAL STRESS, EFFORT-REWARD IMBALANCE, WORK-FAMILY CONFLICT ON JOB BURNOUT AMONG COAL MINER COMPANIES IN INDONESIA

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Abstract. Coal miners tend to experience burnout symptoms because of their special working environment. There are only a few studies on the correlation between job burnout and occupational stress, effort-reward imbalance, and work-family conflicts, and 425 coal miners from 73 coal-mining companies using a non-probability sampling method in this cross-sectional study. This research uses a quantitative approach with the utilization of an instrument in the form of a questionnaire to obtain information from coal miners. It uses a five-stage Likert scale to look at the data, correlation analysis, and logistical regression methods to explore factors that influence job burnout using validity and reliability tests, as well as SPSS 29 and Smart-PLS analyses. The results of the research showed that these effort-reward imbalances had a positive effect on job burnout, higher than occupational stress and work-family conflict variables, which had a significant and positive impact on job burnout.

Keywords: *Job burnout, Occupational stress, Effort-reward imbalance, Work-family conflict*.

1. INTRODUCTION

Indonesia is a country with a considerable coal potential of the quantity of resources. The mining sector has played a significant role in driving economic growth in Indonesia for many years [1]. Meanwhile, the total workforce employed in the country's mining sector, including smelters, reaches 250,300 people [2]. Numerous employees articulate feelings of job burnout and an inclination to resign from their roles, citing the overwhelming workload imposed by their supervisors and clients. Furthermore, they feel that their diligent efforts to deliver exceptional service to their clients are not adequately rewarded, leading to dissatisfaction with their remuneration. Recently, there has been a significant rise in global uncertainty, resulting in difficult and perplexing circumstances at both individual and community levels of intensity [3]. They endure prolonged exposure to demanding mining circumstances, resulting in not only severe work burnout but also a heightened susceptibility to lumbago disease. Furthermore, they are particularly

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prone to experiencing significant pain in their shoulders and knees. Miners who experience burnout are more likely to have higher accident rates, resulting in decreased productivity and compromised safety. As a result, people go through substantial and rapid transformations in their personal and professional lives, leading to increased levels of stress, fostering the development of chronic stress, characterized by a persistent and distressing state of low intensity [3]. This chronic stress can escalate into a condition known as burnout; a work-related condition caused by continuous stress that has not been adequately managed [4].

Burnout is characterized by persistent emotional fatigue, detachment or negativity, and a sense of incompetence, all of which contribute to a situation where the usual methods of relaxation such as work breaks, weekends, and time off are insufficient for effectively coping with job-related stressors. The repercussions of burnout encompass workforce attrition, absenteeism, and employee disengagement. Burnout is a significant problem that can have significant consequences for both individuals and companies [5]. In the coal mining sector, burnout can have more severe consequences due to the inherently hazardous nature of the industry on a global scale.

The issue of job burnout is noteworthy among workers in the mining industry. Numerous employees articulate feelings of job burnout and an inclination to resign, citing the overwhelming workload imposed by their supervisors and clients. Furthermore, they feel that their diligent efforts to deliver exceptional service to their clients are not adequately rewarded, leading to dissatisfaction with their remuneration. They endure prolonged exposure to demanding mining circumstances, resulting in not only severe work burnout but also a heightened susceptibility to lumbago disease Furthermore, they are particularly prone to experiencing significant pain in their shoulders and knees. Studies have shown that occupational stress in this field can result in various adverse outcomes, including heightened absenteeism, reduced productivity, increased employee turnover, fatigue, errors, substance abuse, obesity, compromised immune systems, and other health and safety issues [6]. Burnout can result in decreased productivity, reduced innovation, and an uptick in errors [7]. Additionally, it can adversely affect service quality and the financial performance of a business.

The coal miners face challenging working conditions, including limited visibility, cramped spaces, the risk of landslides, high temperatures, humidity, noise, and vibration [8]. These conditions, coupled with demanding production targets, contribute to a high rate of occupational injuries such as pneumoconiosis and musculoskeletal diseases. As a consequence, miners often experience significant psychological issues such as depression and severe job burnout [9] which increases their susceptibility to accidents [10]. Such difficulties are encountered by workers in their duties in both their professional and familial realms [11]. Reports indicate that conflict between work and family, particularly in terms of working hours, has a substantial effect on causing work burnout [12]. The dynamic nature of the competitive mining industry necessitates that workers continually enhance their productivity and work quality. Consequently, the demanding work conditions and intense pressure exerted on mining workers contribute to the occurrence of job burnout.

There is a significant correlation regarding the relationship between occupational stress and job burnout [13]. Prolonged periods of work-related stress and excessive commitment have the potential to substantially contribute to the onset of job fatigue. Prior research has established that occupational stress increases the likelihood that an individual will experience job burnout. The development of employment burnout is influenced by occupational stress in both direct and indirect ways [14]. Jobs with high levels of stress are seven times more likely to result in burnout symptoms compared to those with a low level of stress [15].

The increased level of job tiredness and occupational stress are positively correlated with a higher probability of encountering psychiatric symptoms [16]. Both job burnout and occupational stress have a direct effect on psychological symptoms. Moreover, through its influence on job exhaustion, occupational stress may indirectly impact the psychological symptoms experienced by coal miners. An inequitable relationship between reward and effort in commitment was identified as a significant predictor of emotional exhaustion, depersonalization, and personal achievement [17]. Furthermore, the exertion put into work without corresponding benefits also contributes to an increase in job burnout [18], [19].

When the demands and expectations of their job exceed their capabilities, people in the workplace experience psychological strain known as occupational stress. This condition is closely associated with job burnout [20],[21]. Researchers have devoted considerable attention to examining and understanding the directionality of role conflict, specifically the conflict that arises between work and living, as well as between family and work [22]. Work-family conflict, denoting the arduous task of managing professional obligations alongside familial duties, has been recognized as a substantial determinant in individuals experiencing job fatigue. Work-family conflict may exhaust both physical and psychological resources [23].

Several things will become research questions that arise can be grouped as follows:
Question #1: Does occupational stress positively affect job burnout?
Question #2: Does effort-reward imbalance positively affect job burnout?
Question #3: Does work-family conflict positively affect job burnout?

2. LITERATURE REVIEW

2.1 Job Burnout

Burnout is a condition that arises in employees due to work-related factors. It is characterized by excessive fatigue, diminished capacity to control cognitive and emotional functions, and a sense of detachment from one's mental state [24]. Burnout occurs when individuals experience a dual challenge of being incapable of and lacking the drive to maintain the required degree of effort at work, hindering their ability to efficiently complete tasks. The five features listed below are the essential elements of burnout:

1) **Exhaustion**. A state characterized by a significant depletion of energy, leading to sensations of both bodily (fatigue, weakness) and mental (fatigued, depleted) tiredness.

2) **Cognitive impairment**. A condition is defined by problems with memory, difficulties paying attention and focusing, and impaired cognitive abilities.
3) **Mental distance**. A clear indication of psychologically disconnecting oneself from work is the presence of A strong aversion or intense dislike towards it
4) **Psychological distress**. This pertains to psychosomatic symptoms, which are manifestations of psychological issues rather than physical ailments
5) **Psychological factors cause psychosomatic complaints**. Psychological issues influence or stem from bodily ailments known as somatic symptoms, which lack a clear physical cause.

2.2 Occupational Stress

Stress is an interplay between job requirements and individual control [25]. Stressors in the workplace are characteristics or occurrences that cause strain or tension. Occupational stress is a self-administered tool specifically created to assess the social and psychological attributes of occupations. Psychological needs, social support at work, decision latitude authority, and skill discretion are the most extensively used psychological metrics [25].

1) **Decision latitude**. It refers to the degree to which people may actively engage in the process of making decisions and exert control over their work, including the ability to contribute to decisions, have autonomy in performing tasks, and determine their work schedule
2) **Psychological demands**. They refer to the cognitive and emotional qualities of a job that necessitate mental exertion and involvement [25].
3) **Social support**. It refers to the socio-emotional integration and trust between supervisors and co-workers, as well as the level of assistance and aid supplied by others during task performance.
4) **Skill discretion**. It refers to the range of abilities and creativity that are necessary for a particular profession

2.3 Effort-reward imbalance

The effort-reward imbalance model defines stress as a transaction between an individual and their environment. It assumes that there should be a reciprocal exchange between the two parties, where the individual receives appropriate rewards (such as money, esteem, or career opportunities) in return for the effort they put into completing tasks [26].

There are three dimensions of effort-reward imbalance:

1) **Effort.** Effort refers to the difficult characteristics of the working environment.
2) **Reward.** Theoretical expectations suggest that factor analysis will yield three factors financial compensation, recognition, advancement opportunities, and job stability rewards.
3) **Overcommitment.** An individual's intrinsic need to labor excessively increases the possibility of experiencing negative health consequences.

2.4 Work-Family Conflict

Work-family conflict refers to a disturbance that occurs when an individual's professional obligations conflict with their domestic responsibilities (known as work interference family) or when their domestic duties disrupt their ability to perform their duties as an employee (referred to as family interference work) [27]. Researchers in the work-family literature have identified three main categories of work-family conflict: time-based conflict, strain-based conflict, and behavior-based conflict.

1) **Time-based conflict.** Time-based conflict pertains to the distribution of limited human resources, such as time, attention, and energy, across different roles.
2) **Strain-based conflict.** Strain-based conflict happens when the presence of tiredness and anxiety, which are effects of one role's responsibilities, gets in the way of performing another role, making it harder to meet its own needs [27],[28].
3) **Behavior-based conflict.** Behavior-based conflict refers to a certain pattern of activities associated with a position that is not in line with the expected behavior of another role [29].

From the explanation of the literature and the study above, this study proposes a hypothesis:

H_1 #1: Occupational stress has a positive and significant effect on job burnout.
H_2 #2: Effort-reward imbalance has a positive and significant effect on job burnout.
H_3 #3: Work-family conflict has a positive and significant effect on job burnout.

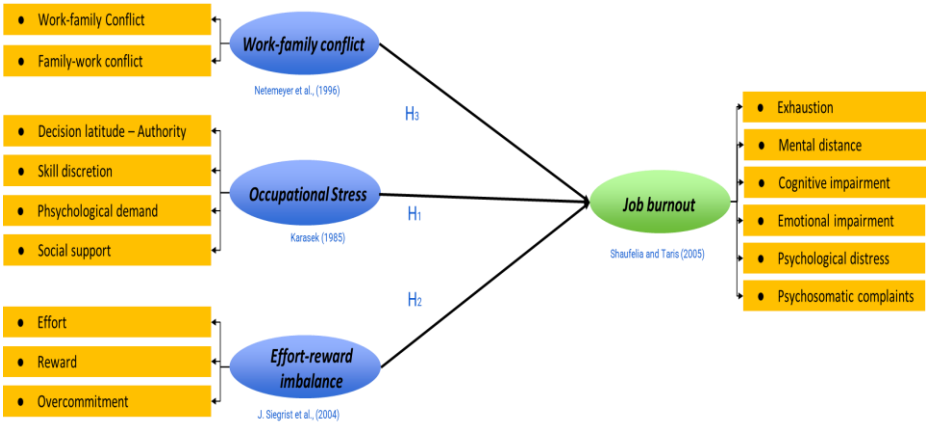


Figure 1. Research Model of the Study with Hypotheses

3. RESEARCH METHOD

3.1. Sample and Data Collection

In this study, the sample employees of coal miner companies from 73 companies in Indonesia included employees aged between 18 and 55 years by individuals using media social platforms. The target population consists of a collection of entities that possess similar attributes. Elements are tangible entities that encompass the precise data

that the investigator necessitates. Malhotra et al. (2017) outline four essential components for selecting the target population: elements, sample units, location, and time frame. This investigation encompasses all personnel employed at an Indonesian coal mine, including the manager and owner. The statistical data for 2022 indicated that the population of area coal mining laborers, upon which the study was centered, exceeded 250,300 individuals. Researchers classify sampling strategies as either non-probability sampling approaches or probability sampling methods (Malhotra et al., 2017). While a probability sampling strategy ensures that each individual in the population has an identical opportunity to be sampled, researchers who employ non-probability sampling limit the likelihood of selecting specific members of the population to participate in a research sample due to the establishment of certain criteria in the sample selection. In this investigation, the authors employed convenience sampling, a non-probability sampling method wherein samples were selected based on their simplicity of access and practicality for the researchers. Furthermore, authors employ juridical sampling, a technique wherein the sample is selected according to predetermined criteria that correspond to the attributes of the individuals comprising the sample.

The criteria for the selection of participants are that they are between the ages of 18 and 55. This age range was selected since coal mining is a physically demanding occupation that often necessitates working in challenging environments. Younger individuals are generally perceived as possessing greater physical stamina and adaptability to arduous conditions. Safety is another important factor and the length of their experience would translate to their safety consideration. Thus, another criterion is that the participants would have had a minimum of five years of work experience.

This research translated the survey questionnaire into English and Indonesian. The data was obtained from the respondents through an online questionnaire using the Likert scale in two stages:

1) Stage 1: A pre-test, including data preparation and screening, was conducted via Google Forms. A statistical measure, Mahalanobis distance, was used to identify multivariate outliers for validity and reliability testing. After conducting tests in Excel, the researcher transferred the pre-test data to SPSS. The construct validity of the questionnaire will be verified using the SPSS software in this stage
2) Stage 2: In this study, this combined data is then tested in SPSS including the outliers test, normality test, correlation test, and multi-collinearity test. After the data is completed, testing in SPSS will produce final data which is then used to perform hypothesis testing using SEM which in this study uses SMART PLS.

3.2. Research Variable

Independent Variable. Occupational stress (O) is measured with 21 items across the four dimensions by using the Karasek Job Content Questionnaire (K-JCQ) [30]. Effort-reward imbalance (E) is measured with 16 items across three dimensions by using the Effort–Reward Imbalance Questionnaire (ERI) [31]. Work-family conflict (W) is

measured with 10 items across three dimensions using the Work-Family Conflict Questionnaire (WFC) [27]. Details of the construct, dimensions, and indicator or observed variable of research can be seen in Table 1.

Table 1. Constructs, Dimensions, and Indicators

Variables		Dimensions		Operationalization
Variables	Coding	Dimension	Coding	Variable / Indicators
Job Burnout	B	Exhaustion	EX	EX1 s.d. EX6
		Mental distance	MD	MD1 s.d. MD5
		Cognitive impairment	CI	CI1 s.d. CI5
		Emotional impairment	EI	EI1 s.d. EI4
		Psychological distress	PD	PD1 s.d. PD5
		Psychosomatic complaints	PC	PC1 s.d. PC5
Effort -Reward Imbalance	E	Effort	EE	EE1 s.d. EE6
		Rewards	ER	ER1 s.d. ER8
		Overcommitment	EO	EO1 s.d. EO5
Occupational Stress	O	Decision latitude – Authority	DL	DL1 s.d. DL5
		Skill discretion	SD	SD1 s.d. SD6
		Psychological demands	OP	OP1 s.d. OP6
		Social support at work	OS	OS1 s.d. OS8
Work-family conflict	W	Work-family conflict	WF	WF1 s.d. WF6
		Family-work conflict	FW	FW1 s.d. FW6

Dependence Variable. Job burnout (B) is measured with 24 24-item questionnaires referring to the Maslach Burnout Inventory- General Survey (MBI-GS) from [32],[33].
Control Variable. This study has some control variables such as demographic, age, gender, education, experience, type of work, and the respective positions of the respondents to ensure that they have the necessary qualifications to answer the questions in the survey representing their respective coal mining companies.

4. RESULT AND DISCUSSION

4.1 Demographic of Respondents

Demographic respondents of coal mining companies in this study can be grouped into several groups. The gender group is dominated by the male gender with 416 respondents (98%). The age group is dominated by the age range of 31-45 years with 276 respondents (64%). Furthermore, when viewed from the group position is dominated by mechanic positions as 179 respondents (42%). The level of education is dominated by high school graduates and its equivalence with 259 respondents (61%). Lastly, the duration of the work experience group is mostly over 10 years with 264 respondents (62%). The type of work is dominated by those working in the maintenance department

with 264 respondents (62%). The demographic of the respondents can be seen in Table 2 below.

Table 2. Demographic of Respondents

Level	Variable	Measured Variable	Qty	%
Individual	Gender	Male	416	98%
		Female	9	2%
	Age	< 24 years old	38	9%
		24-30 years old	85	20%
		31-45 years old	276	64%
		46-55 years old	25	6%
		>56 years old	5	1%
	Education	SMA/SMK	259	61%
		D3/S1	158	37%
		S2	8	2%
	Position	Operator	8	2%
		Mechanic	179	42%
		Staff	77	18%
		Supervisor	55	13%
		Superintendent	25	6%
		Manager	30	7%
		Others	51	12%
	Experience	1-3 years	64	15%
		3-5 years	42	10%
		5-10 years	55	13%
		>10 years	264	62%
	Type of work	Safety department	4	1%
		Infrastructure department	5	1%
		Production department	12	3%
		Logistic department	25	6%
		Maintenance department	264	62%
		Others	115	27%

Source: SPSS IBM 29, Author, 2023

4.2 Data Analysis

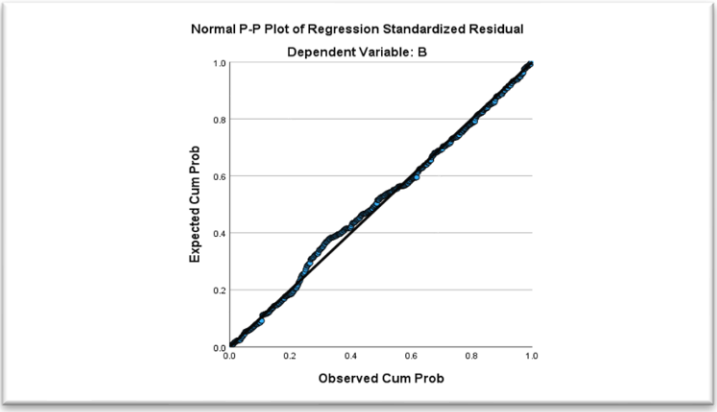
The existing sample data was then further examined to see outliers using SPSS software version 29, the data was checked to see multivariate outliers using the Mahalanobis Distance (MD) analysis. A multivariate outlier is classified as having a probability value below 0.001 due to the conservative estimation of the MD [34]. This MD will map the sample data and find the furthest distance from the center that is acceptable.

Multivariate outliers will be indicated with a probability value less than 0.001. From the initial screening process, it was found that 73 respondent data had outliers below the threshold value which were then removed from the respondent sample. With the

data removed from the sample, there are 502 respondents with a sample of 425 respondents.

Normality Test. The normality test to determines whether or not the residuals in the regression model utilized in this study have a normal distribution [35]. The way to determine the normality of the data is to use the Kolmogorov-Smirnov and Monte Carlo analysis did not predict the data to be normal, but the regression approach utilized in this study does satisfy the assumption of normality. The data will be determined as abnormal (sig score < 0.05), and the results of the normality test with Kolmogorov-Smirnov showed that the index of all constructs 0.09 > 0.05 in this study was from the minimum required limit. This confirms that the data is more accurately analyzed using an examination of the aforementioned normal probability plot graph are normally distributed as evidenced by the dispersion of the points around the diagonal line and the fact that the distribution adheres to the direction of the diagonal line can be seen in Figure 2 below.

Figure 2. Histogram of Normality Test



Source: SPSS IBM 29, Author, 2023

Collinearity Test. Evaluate multicollinearity to determine if the regression model has detected any correlation among the independent variables [35]. The calculations presented in the table indicate that the VIF value for every independent variable is below 10, and the tolerance value exceeds 0.10. These results suggest that there are no indications of multicollinearity in the regression model.

Table 3. Test of Multicollinearity Test

Variable	Collinearity Tolerance	Statistics VIF
E	0.593	1.687
O	0.601	1.663
W	0.607	1.646

Source: SPSS IBM 29, Author, 2023

Homogeneity. In this research, Levene's and post-hoc Bonferoni's tests are utilized to analyze whether or not there are any variations in response between the control variables. Values that are lower than 0.05 suggest that the responses to several different factors differ.

Table 4. Test of Homogeneity of Variances

Variable	B	E	O	W
Sex	0,526	0,715	0,390	0,715
Age	0,050	0,049	0,259	0,267
Education	0,583	0,040	0,084	0,180
Marital	<0,001	0,007	0,027	<0,001
Position	0,001	0,767	0,728	0,249
Experience	<0,001	0,138	0,359	0,003
Type of work	0,012	0,019	0,556	0,976

Source: SPSS IBM 29, Author, 2023

Reliability. Cronbach's alpha is regarded by researchers as an indicator of reliability to meet the criteria for recognized reliability, the alpha coefficient must exceed 0.70, which signifies that the items possess a substantial degree of internal consistency [36]. The result of the reliability test can be seen in Table 5.

Table 5. Cronbach's Alpha

Variable	Cronbach's Alpha
B	0.763
E	0.773
O	0.775
W	0.847

Source: SPSS IBM 29, Author, 2023

Descriptive Statistics Analysis. Using descriptive statistics, the characteristics of data, including the mean and standard deviation of variables, are summarized or described. Instead of serving as a means to derive conclusions, descriptive statistics aid in the provision of a plain and concise interpretation of the data. This shows result can be seen in Table 6.

Table 6. Descriptive Statistics of Occupational Stress

Descriptive Statistics					
	N	Min	Max	Mean	Std. Deviation
DL-1	425	2	4	2.84	0.773
DL-2	425	2	4	2.78	0.737
DL-3	425	2	4	2.88	0.767
DL-4	425	2	4	2.81	0.744
SD-1	425	2	4	2.88	0.775
SD-2	425	2	4	2.86	0.761
SD-3	425	2	4	2.86	0.769
SD-4	425	2	4	2.76	0.725
SD-5	425	2	4	2.83	0.759

Descriptive Statistics					
	N	Min	Max	Mean	Std. Deviation
OP-1	425	2	4	2.79	0.735
OP-2	425	2	4	2.80	0.746
OP-3	425	2	4	2.76	0.739
OP-4	425	2	4	2.77	0.729
OP-5	425	2	4	2.80	0.735
OS-1	425	2	4	2.87	0.768
OS-2	425	2	4	2.85	0.749
OS-3	425	2	4	2.89	0.777
OS-4	425	2	4	2.80	0.738
OS-5	425	2	4	2.79	0.743
OS-6	425	2	4	2.79	0.735
OS-7	425	2	4	2.78	0.726
Valid N (listwise)	425				

Source: SPSS IBM 29, Author, 2023

According to the descriptive statistical analysis of this occupational stress variable, it is evident that the items related to OS-3 of social support at work ("supervisor has a clear picture of how I work") have a higher average value compared to the other items within the same variable. This indicates that most respondents perceived that their supervisor did not have a clear picture of how they worked.

Table 7. Descriptive Statistics of Effort-Reward Imbalance

Descriptive Statistics					
	N	Min	Max	Mean	Std. Deviation
EE-1	425	2	4	2.82	0.758
EE-2	425	2	4	2.82	0.740
EE-3	425	2	4	2.88	0.759
EE-4	425	2	4	2.88	0.757
EE-5	425	2	4	2.89	0.771
ER-1	425	2	4	2.88	0.770
ER-2	425	2	4	2.92	0.772
ER-3	425	2	4	2.88	0.755
ER-4	425	2	4	2.93	0.783
ER-5	425	2	4	2.85	0.755
ER-6	425	2	4	2.82	0.747
ER-7	425	2	4	2.71	0.689
EO-1	425	2	4	2.66	0.642
EO-2	425	2	4	2.86	0.752
EO-3	425	2	4	2.86	0.753
EO-4	425	2	4	2.97	0.785
Valid N (listwise)	425				

Source: SPSS IBM 29, Author, 2023

The descriptive statistical study of job burnout shows that items EO-4 of overcommitment ("I sacrifice too much for my job") have a higher mean value than other items in the same variable. This implies that the respondents perceived that there are people close to them who say that they sacrificed too much for their work.

Table 8. Descriptive Statistics of Work-Family Conflict

Descriptive Statistics					
	N	Min	Max	Mean	Std. Deviation
WF-1	425	2	4	2.81	0.756
WF-2	425	2	4	2.84	0.743
WF-3	425	2	4	2.69	0.695
WF-4	425	2	4	2.67	0.686
WF-5	425	2	4	2.79	0.736
FW-1	425	2	4	2.88	0.738
FW-2	425	2	4	2.81	0.748
FW-3	425	2	4	2.89	0.734
FW-4	425	2	4	2.88	0.730
FW-5	425	2	4	2.89	0.734
Valid N (listwise)	425				

Source: SPSS IBM 29, Author, 2023

According to this descriptive statistical analysis of the work-family conflict variable, it is evident that items FW-3 of time-based conflict (time-based family interference with work) and FW-5 of strain-based conflict (family-related strain interferes with ability on work) have a larger average value compared to the other items in the same variable. This demonstrates that numerous tasks remain unfinished as a result of familial or partner obligations and familial conflicts that impede the respondents' capacity to fulfill their job responsibilities.

Table 9. Descriptive Statistics of Job Burnout

Descriptive Statistics					
	N	Min	Max	Mean	Std. Deviation
EX-1	425	2	4	2.75	0.719
EX-2	425	2	4	2.73	0.755
EX-3	425	2	4	2.72	0.747
EX-4	425	2	4	2.73	0.757
EX-5	425	2	4	2.72	0.751
MD-1	425	2	4	2.73	0.745
MD-2	425	2	4	2.76	0.710
MD-3	425	2	4	2.83	0.658
MD-4	425	2	4	2.80	0.666
CI-1	425	2	4	2.75	0.765
CI-2	425	2	4	2.73	0.742
CI-3	425	2	4	2.80	0.755
CI-4	425	2	4	2.76	0.728
EI-1	425	2	4	2.78	0.746

Descriptive Statistics					
	N	Min	Max	Mean	Std. Deviation
EI-2	425	2	4	2.80	0.746
EI-3	425	2	4	2.80	0.718
PD-1	425	2	4	2.81	0.768
PD-2	425	2	4	2.94	0.778
PD-3	425	2	4	2.88	0.755
PD-4	425	2	4	2.84	0.755
PC-1	425	2	4	2.94	0.776
PC-2	425	2	4	2.86	0.764
PC-3	425	2	4	2.85	0.769
PC-4	425	2	4	2.84	0.752
Valid N (listwise)	425				

Source: SPSS IBM 29, Author, 2023

The descriptive statistical study of job burnout shows that items PD-2 of psychological distress (tend to worry) and PC-1 of psychological distress (palpitations or chest pain) have a higher mean value than other items in the same variable. This implies that they tend to worry about their employment and suffer from palpitations or chest pain.

Structural Equation Modelling Analysis. Structural Equation Modelling (SEM) is a statistical method that allows for the simultaneous examination of correlations among many variables as well as the relationships between variables and their observed variables [37].

Convergent Validity. This test assesses the degree of correlation between measurements of the same construct [38]. The loading score quantifies the degree of association between each indicator and the notion [37]. The test is considered to have fulfilled the convergent validity criterion if the outer loading score exceeds 0.7. This result shows that all indicators have an outer loading value exceeding 0.7 of all variables, none of the indicators were removed from the research model.

Table 10. Convergent Validity

	Occupational Stress	Effort-Reward Imbalance	Work-Family conflict	Job Burnout
DL-1	0,908			
DL-2	0,925			
DL-3	0,845			
DL-4	0,919			
OP-1	0,828			
OP-2	0,953			
OP-3	0,796			
OP-4	0,915			
OP-5	0,853			

	Occupational Stress	Effort-Reward Imbalance	Work-Family conflict	Job Burnout
OS-1	0,941			
OS-2	0,843			
OS-3	0,917			
OS-4	0,949			
OS-5	0,942			
OS-6	0,940			
OS-7	0,882			
SD-1	0,888			
SD-2	0,881			
SD-3	0,942			
SD-4	0,856			
SD-5	0,878			
EE-1		0,827		
EE-2		0,879		
EE-3		0,838		
EE-4		0,844		
EE-5		0,775		
EO-1		0,835		
EO-2		0,881		
EO-3		0,861		
EO-4		0,772		
ER-1		0,884		
ER-2		0,825		
ER-3		0,863		
ER-4		0,828		
ER-5		0,878		
ER-6		0,799		
ER-7		0,870		
WF-1			0,864	
WF-2			0,850	
WF-3			0,801	
WF-4			0,792	
WF-5			0,956	
FW-1			0,908	
FW-2			0,795	

	Occupational Stress	Effort-Reward Imbalance	Work-Family conflict	Job Burnout
FW-3			0,917	
FW-4			0,915	
FW-5			0,915	
EX-1				0,735
EX-2				0,833
EX-3				0,827
EX-4				0,832
EX-5				0,844
MD-1				0,737
MD-2				0,750
MD-3				0,735
MD-4				0,736
EI-1				0,787
EI-2				0,775
EI-3				0,807
CI-1				0,881
CI-2				0,845
CI-3				0,769
CI-4				0,709
PC-1				0,722
PC-2				0,740
PC-3				0,735
PC-4				0,758
PD-1				0,729
PD-2				0,713
PD-3				0,770
PD-4				0,790

Source: SmartPLS, Author, 2023

Discriminant Validity. The AVE values for occupational stress (O), effort-reward imbalance (E), work-family conflict (W), and job burnout (B) are all greater than 0.5. Specifically, the AVE values are 0.709, 0.601, 0.804, and 0.962, respectively. According to Hair et al. (2018), the lowest acceptable value for Average Variance Extracted (AVE) is 0.5. Thus, this suggests that the construct's convergent validity is sufficient, as all variables satisfy the criterion of being greater than 0.5.

Reliability Construct. Cronbach's alpha and composite reliability scores are both higher than 0.7. According to the Reliability Test, each variable has a significant level

of reliability [39],[40].

Table 11. AVE & Cronbach Alpha

Variable	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Effort-Reward Imbalance	0,972	0,974	0,975	0,709
Job Burnout	0,971	0,972	0,973	0,600
Occupational Stress	0,988	0,989	0,988	0,804
Work-Family conflict	0,965	0,969	0,970	0,762

Source: SmartPLS, Author, 2023

SEM – Collinearity. Collinearity is the occurrence of two or more identical indicators in a block indicator [41]. A model is considered collinear if the inner variance inflation factor (VIF) is between the range of 0.2 and greater than 5. The table below demonstrates the presence of collinearity in the model, as indicated by the values obtained from each construct.

Table 12. VIF Table

Variable	Job Burnout
Effort-Reward Imbalance	1,691
Occupational Stress	1,652
Work-family conflict	1,623

Source: SmartPLS, Author, 2023

SEM – R Square. Using SMartPLS version 3 for data processing, the endogenous job burnout variable has an R-square value of 0.685, which is greater than the heavily weighted R-square value of 0.67.

SEM – F Square. The F-square statistic is employed to assess the significance of the impact of independent variables on dependent variables when there is a modification, such as by removing exogenous variables. According to the data, effort-reward imbalance is the most significant factor in job burnout, as indicated by the highest value of F-squared (0.353).

Hypotheses Testing Result. This study has three hypotheses, after testing the hypothesis with SEM, it was found that 3 hypotheses were supported. Detailed hypothesis results can be seen in Table 13 below.

Table 13. Direct Result

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values	Result
E>B	0,434	0,433	0,042	10,240	0,000	Accepted
O>B	0,253	0,253	0,040	6,322	0,000	Accepted
W>B	0,294	0,296	0,041	7,215	0,000	Accepted

Source: SmartPLS, Author, 2023

Overall Model Fit Analysis. This portion evaluated the overall adequacy of the model by assessing its fit, as indicated by the value of the model fit index. The study exhibits a well-fitting model, as seen by the conclusive results presented in Table 14 below.

Table 14. Overall Model Fit Analysis Result

	Saturated Model	Estimated Model
SRMR	0,066	0,066
d_ULS	11,118	11,118
d_G	12,633	12,633
Chi-Square	16967,518	16967,518
NFI	0,657	0,657

Source: SmartPLS, Author, 2023

The researcher employs a two-tailed hypothesis test with a significance threshold of 5%. If the *t* value exceeds 1.96, the researcher will accept the hypothesis. Researchers carried out an experiment using the bootstrapping method, employing 5000 subsamples (Hair et al., 2014). The PLS approach uses simulation to do a statistical test for each hypothesized link. This study employed the bootstrap method with the given sample to mitigate the atypicality of the research data. The use of the bootstrap approach was intended to mitigate the atypicality of the research data. Here is a concise overview of the outcome of the hypothesis:

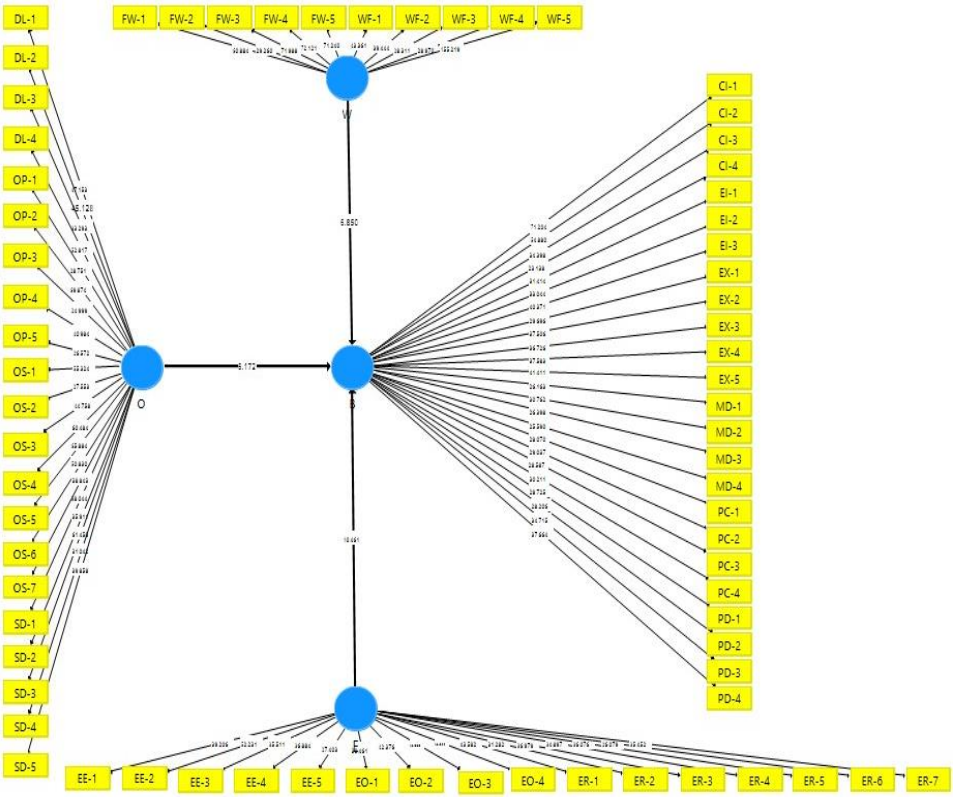


Figure 3. Bootstrapping Result

Sources: Smart-PLS, Researcher 2023.

According to Hair et al. (2010), the *t* statistic value must exceed 1.96 and the *p* value must exceed 0.05.

4.3 Discussion

The results of the investigation provide support for three hypotheses. A discussion of each possibility will proceed as follows:

Occupational Stress and Job Burnout. the first hypothesis is supported because the *t* statistic value of 10.240 is greater than 1.96 and the *p* value of 0.000 is lower than 0.05. This outcome suggests a direct correlation between both constructs. The study's findings emphasize the association between occupational stress and job burnout. Occupational stress has a significant impact on all aspects of burnout through direct effects. The results of our research align with prior studies that have shown a correlation between occupational stress and job burnout. To address these issues, research has proposed interventions aimed at mitigating occupational stress through the implementation of a preventative strategy and the provision of depression treatment for employees. These interventions involve fostering effective communication between management and staff, as well as effectively managing employee workloads.

One specific indicator of work stress (OP-2 with a factor loading value of 0.953) which is higher than other factors is the concentration of intense psychological demands, which can contribute to work fatigue. Work that requires intense concentration over long periods is a complex stressor with diverse implications for employee well-being. This is in line with the statement of the work demand-control paradigm states that psychological risk factors (job demand) cause occupational stress. Excessive occupational stress can lead to hypertension, immune system dysfunction, nervous system dysfunction, digestive system dysfunction, depression, ischemic heart disease, and a reduced ability of employees to handle their work. Recognizing and addressing these factors is critical to improving employee well-being, preventing burnout, and creating a healthier work environment. This may involve implementing strategies to manage workload, providing support and resources to cope with stress, fostering a culture of work-life balance, and increasing autonomy and control over one's work. High workloads and tight deadlines trigger workers to concentrate highly, these conditions create a sense of urgency and pressure, thereby exacerbating the stress experienced by individuals in psychologically demanding jobs. The constant need to meet deadlines and deliver results can lead to chronic stress and burnout [32].

In the realm of information-related stress, the literature emphasizes the critical role of effective communication, technological support, and organizational culture. The link between job burnout and work engagement sheds light on the importance of addressing stressors, including those related to information accessibility [42]. Management support plays a crucial role in influencing the level of stress experienced by employees, whether it increases or decreases. Consistent with other studies, our investigation confirmed that occupational stress significantly influenced burnout in coal miners. Our investigation found a significant correlation between elevated work stress and increased burnout among coal miners. The study findings revealed a strong and positive correlation between occupational stress and job burnout among coal miners. This discovery supports the findings of prior studies that have shown that occupational stress has a beneficial and significant impact on job burnout across many industries. Evidence indicates that coal miners experience a significantly elevated incidence of burnout. Moreover, there exists a correlation between demographic attributes and the prevalence of job burnout among coal miners. Occupational stress heightens the likelihood of experiencing job burnout. There is a hypothesis that suggests that coal miners have a direct relationship between burnout and work stress. Prior research demonstrates the substantial impact of occupational stress on job burnout, aligning with this study's findings [43]. Workplace burnout is also found to harm employee engagement [44]. Several employees have observed that work-related stress has led to employee burnout and discovered a direct association between job burnout and work stress [45]. The authors analyzed the findings to develop efficacious interventions that could mitigate the adverse consequences of stress and burnout.

Effort-Reward Imbalance and Job Burnout. This study utilizes the effort-reward imbalance model of job burnout to forecast cognitive impairment, emotional impairment, weariness, mental detachment, psychological distress, and psychosomatic problems. The findings of this study indicate that an imbalance between effort and reward

has a substantial and statistically significant impact on job burnout, as evidenced by a coefficient of 6.322 and a *p* value of 0.000. The authors employed the Effort-Reward Imbalance (ERI) model to examine burnout in coal miners. Miners perceive a disparity between the effort they put in and the rewards they receive, significantly increasing the likelihood of experiencing symptoms of burnout.

One specific indicator of occupational stress (ER-1 with factor loading value 0,884) found to be higher than other factors was the inadequate respect given by superiors at work, contributing to respondents' job burnout. Respect is a significant component of the rewards employees receive when their efforts at work are weighed in this model. When individuals perceive an imbalance where their exerted efforts are met with insufficient respect from superiors, a detrimental chain reaction unfolds. This perceived lack of acknowledgment can result in emotional exhaustion, a central element of burnout, as employees feel drained and undervalued. The absence of respect may foster cynicism and detachment as coping mechanisms, leading to negative attitudes and behaviors that further contribute to burnout. The resulting reduction in job satisfaction, increased perceived stress, and potential health implications collectively form an environment conducive to burnout. Moreover, the impact extends to organizational commitment, with employees becoming less engaged as their efforts seem unappreciated and motivation dwindling as the intrinsic drive to excel diminishes. Addressing these dynamics is crucial to creating a workplace that not only prevents the detrimental effects of burnout but also fosters a culture of respect and recognition, enhancing overall employee well-being.

The objective of this study was to provide a more detailed and comprehensive analysis of past research on burnout among coal miners, as well as to examine the correlation between their exertion and the benefits they receive. This study revealed that this particular subgroup experiences an inequilibrium characterized by excessive effort and insufficient reward [46]. Workers perceive a disparity between the effort they put in and the rewards they receive, marking the working conditions. Workers who experience this imbalance are more likely to develop symptoms of burnout. This study conducted a study that identified a correlation between overcommitment in the workplace and burnout [47]. Both males and females were at risk of overcommitment at work [48]. Additionally, it discovered a correlation between the disparity in effort and reward and the presence of depressive symptoms and/or psychiatric problems.

Work-Family Conflict and Job Burnout. Research examining the long-term prognostic significance of burnout on both the imbalance between effort and reward inside the workplace and the conflict between work and private life in mining businesses. Prior cross-sectional research has demonstrated a correlation between effort-reward imbalance and work-family conflict, as well as an increased risk of burnout in some industries. This study aimed to examine the effects of work-family conflict and job burnout on coal miners. The third hypothesis indicates that there is a strong and positive relationship between work-family conflict and job burnout. This relationship is statistically significant, as evidenced by a *t* statistic value of 7.215 and a *p* value of 0.000.

One specific indicator of occupational stress (WF-1 with factor loading value 0,956) higher than with other factors is particularly the demands of work interfere with family, so this can contribute to job burnout. Work-family conflict, especially when manifested through changes in family activity plans due to work-related tasks, is a complex and high-impact stressor that contributes significantly to job burnout. This conflict stems from the inherent struggle that individuals face in reconciling the demands of their professional roles with commitments to family life. Work obligations forcing individuals to change family plans create a domino effect with devastating consequences. Constant changes in family activities create a chronic state of emotional exhaustion, which depletes the individual's emotional resources needed to navigate both domains effectively. Additionally, the conflict diminishes job satisfaction since individuals are unable to fully engage in family life, thereby reducing overall satisfaction derived from their professional role. Interpersonal relationships within families bear the brunt of these changes, experiencing strain and potential breakdown as individuals grapple with conflicting demands. Importantly, these conflicts spill over into the workplace, disrupting work performance and creating a sense of inefficiency. Feelings of guilt and negative emotions arise from the inability to meet family expectations, thereby exacerbating the psychological impact of work-family conflict. Sleep disturbances and loss of enjoyment in work and family activities contribute to the physical and mental strain associated with burnout. Ultimately, these interrelated factors form an escalating cycle, culminating in a comprehensive experience of burnout that affects multiple dimensions of family life. Addressing these dynamics requires strategic interventions that prioritize work-life balance, foster a supportive work culture, and provide resources to assist individuals in meeting the complex challenges to effectively balance work and family roles.

This study replicates the findings of [49] study, which identified a correlation between burnout and work-family conflict across various industries. Another study demonstrates a notable disparity in the level of work-family conflict compared to family-work conflict [50], while another study looks on factors that contribute to work-home conflict [51]. The study revealed that quantitative demands, which include the level of job intensity, consistency of working hours, and the pressure to work overtime, were the most influential factors in predicting work-family conflict. A correlation between work-family conflict and the management of fatigue [52]. These findings suggest that implementing shift arrangements, field break schedules, small gathering forums, and work-life balance programs are essential to mitigating work-family conflict.

4.4 Research Contribution

This study enhances the existing understanding of the occurrences in coal mining firms in Indonesia by addressing the research questions and elucidating the connections among occupational stress, effort-reward imbalance, work-family conflict, and job burnout. The results of this study can elucidate the phenomena and discrepancies while providing a pragmatic contribution from a commercial standpoint. The results of this study would assist policymakers, managers, and practitioners in developing strategies to reduce occupational stress, effort-reward imbalance, work-family conflict, and job burnout among coal miners.

4.4.1 Theoretical Contribution

The results of this investigation have theoretical implications for current concepts. This study not only confirms the link between constructs but also improves upon earlier studies that have not undertaken comprehensive research on the considered constructs, to the best of the researcher's knowledge. The findings of this study indicate that occupational stress, effort-reward imbalance, and work-family conflict exert a notable and affirmative impact on job burnout. Therefore, occupational stress, the imbalance between effort exerted and rewards received, and conflicts between work and family responsibilities significantly impact job burnout in coal mining firms. Assessing the extent of cognitive and emotional impairment, weariness, mental detachment, psychological discomfort, and psychosomatic problems quantifies job burnout. This implies that as these factors increase in severity, so does the degree of job burnout.

The study's conclusions have significant theoretical implications for current concepts. This study not only confirms the connections between the considered concepts, but it also highlights that prior studies have not yet conducted comprehensive research on these concepts, as far as the researcher knows. The researcher's analysis of the study's results leads to the conclusion that there is a positive correlation between occupational stress and job burnout.

4.4.2 Managerial or Practical Contribution

In addition, the research provides a practical contribution from the standpoint of the enterprise under consideration. This research aims to provide valuable insights to mining company proprietors and decision-makers involved in coal mining in Indonesia regarding the construction relationship assessed in this study. The findings of this research indicate a positive correlation between work-family conflict, business-reward imbalance, job tension, and job burnout within the coal mining sector of Indonesia. In this study, we used the levels of cognitive impairment, emotional exhaustion, mental distance, psychological distress, and psychosomatic complaints to quantify job burnout. By knowing the factors that affect job burnout, the mining company industry can prevent and overcome accidents that negatively impact productivity.

Indonesia's mining industry contributes significantly to the country's gross domestic product; however, escalating job fatigue resulting from work-family conflict, effort-reward imbalance, and occupational stress may impede economic expansion. Mitigating these effects through enhancing procedures would concurrently diminish the likelihood of exhaustion. We deliberated upon the outcomes of developing efficacious initiatives to avert the adverse consequences of stress and burnout. For this reason, the researcher suggests that management at the head office, especially the human resources department, can focus on ensuring that job burnout can be managed.

Based on the findings of the study, to prevent the difficulty in finding information at work, which can contribute to occupational stress and job burnout,

1) **Centralized Knowledge Base**: Establish a centralized knowledge base or intranet where essential information, documents, and resources are stored and categorized logically. This is a go-to source for employees, reducing the time and effort required to locate information.

2) **Collaborative platforms:** Foster the use of collaborative platforms where teams can share information in real-time. This promotes transparency, reduces duplication of efforts, and enhances overall efficiency in information exchange.
3) **Task Management Tools:** Task management tools that integrate with information systems. This enables employees to organize and prioritize tasks efficiently, ensuring that critical information is readily available when needed.

Preventing the detrimental effects of insufficient respect within the Effort-Reward Imbalance (ERI) model involves implementing targeted strategies to address these challenges. Here are several recommendations for preventing or mitigating the impact of insufficient respect on job burnout, such as

1) **Provide leadership training programs:** that emphasize the importance of effective communication, recognition, and respect. Equip managers with the skills to acknowledge and appreciate the efforts of their team members, fostering a positive and supportive work environment.
2) **Recognition programs:** establish formal and informal recognition programs to celebrate employees' achievements and contributions. Regularly acknowledging employees' hard work and accomplishments can make them feel valued. It also reinforces a positive organizational culture.
3) **Feedback mechanisms:** create channels for constructive feedback between supervisors and employees. Encourage regular performance evaluations and open discussions about career growth, allowing employees to voice concerns and receive guidance.

The last one, to prevent work-related duties overload of work-family conflict and mitigate its potential contribution to job burnout, involves a proactive and multifaceted approach that addresses various aspects of the work environment and individual well-being.

1) **Flexible Work Arrangements:** advocate for and implement flexible work arrangements, such as telecommuting or flexible hours, allowing employees greater control over their schedules and reducing conflict between work and family responsibilities.
2) **Regular Check-Ins:** Encourage regular check-ins between employees and supervisors to discuss workload, priorities, and potential challenges. These discussions can help identify early signs of work-family conflict and allow for timely adjustments.
3) **Family Support Resources:** provide resources and information on family support programs, parenting workshops, or external services that employees can access to navigate family responsibilities more effectively.

The findings potentially benefit organizations with similar job roles, but it is crucial to consider each organization's unique needs and circumstances. Implementing these recommendations requires a thorough assessment of potential barriers and the creation of strategies to overcome them.

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The coal mining industry poses a significant global danger, and chronic exhaustion can increase the risk of accidents and injuries. The mining industry has been a major driver of economic growth in Indonesia for a long time [1]. In addition, the BANI organization climate promotes the development of chronic stress, characterized by persistent and low-intensity conditions [53]. Therefore, companies must adopt strategies to reduce fatigue and improve employee well-being. Recognize burnout as a significant danger that generates long-term stress, especially when stress at work is unmanaged [54]. This tension evolved into a condition known as fatigue. The dynamic nature of the competitive mining industry requires workers to continue to improve their productivity and quality of work. As a result, demanding working conditions and heavy pressure on miners contribute to the occurrence of labor exhaustion. Based on initial survey interviews conducted by researchers with company employees, the majority of staff members work six days a week, with an average of 10 hours a day. The company expects staff members to work at least 60 hours a week and arrive at work 1 hour before the scheduled shift to ensure timing accuracy. As a result, employees have significant psychological problems, such as depression and intense job burnout [56], which increase the likelihood of accidents among miners [55]. It threatens the productivity and safety of miners, as well as undermines the profits of the organization and society at large [57].

The study examines the effects of work stress, imbalances between efforts and gifts, and work-family conflicts on labor exhaustion among coal miners working in Indonesia. The study used quantitative methodology, with 425 participants who are workers employed by the coal mining business. The study evaluates data measurements using a method widely used in various research studies: a five-level Likert scale. For validity and reliability, the study employed tests using SPSS and Smart-PLS SEM analysis (Structural Equation Modeling).

The study shows that the three variables have a substantial and beneficial influence: Work stress, imbalances between effort and appreciation, and conflicts between work and family significantly impacted work exhaustion. Researchers anticipate the occurrence of replication in future studies to reaffirm the explanation of unfounded assumptions. In addition, researchers can use productivity as a metric to assess labor exhaustion in various sectors, especially those involving nickel or gold mining in Indonesia. Unmanaged stress at work can lead to the development of a condition known as job burnout. The dynamic nature of the competitive mining industry requires workers to continue to improve their productivity and quality of work. As a result, demanding working conditions and heavy pressure on miners contribute to the occurrence of labor exhaustion.

Based on initial survey interviews conducted by researchers with company employees, the majority of staff members work six days a week, with an average of 10 hours a day. The company expects staff members to work at least 60 hours a week and arrive at work 1 hour before the scheduled shift to ensure timing accuracy. As a result, employees have significant psychological problems, such as depression and intense job burnout [56], which increase the likelihood of accidents among miners [55]. It threatens the productivity and safety of miners, as well as undermines the profits of the organization

and society at large [57]. The study examines the effects of work stress, imbalances between efforts and gifts, and work-family conflicts on labor exhaustion among coal miners working in Indonesia.

This research has examined and clarified the relationships between all of the planned constructions as part of an integrated research model. This study affirms, clarifies, and fills gaps in previous research. Table 15 shows a summary of research gaps, research questions, and hypothesis test results.

Table 15. Research Findings Summary, Research Gap, and Questions

No	Construct	Research Gap	Research Question	Hypothesis Testing Result
1	Occupational stress	Lack of empirical study on the relationships among occupational stress, effort-reward imbalance, work-family conflict and job burnout in the context of coal mining companies in Indonesia	Does occupational stress positively affect job burnout?	Occupational Stress has a positive effect on Job Burnout. H_1 is supported with *t* value 6,322.
2	Effort-reward imbalance		Does an imbalance between effort and reward positively affect job burnout?	Effort-reward has a positive effect on job burnout. H_2 is supported with *t* value 10,240.
3	Work-family conflict		Does work-family conflict positively affect job burnout?	Work-family conflict has a positive effect on job burnout. H_3 is supported with *t* value 7,215.

5.2 Recommendation

In order to demonstrate supported and unsupported hypothetical explanations, as well as the reasons why existing evidence does not support these assumptions, researchers expect future investigations to contain some overlap. Notwithstanding prior positive discoveries, the most intriguing research pertains to the impact of occupational stress, effort-reward imbalance, and work-family conflict on job burnout. Additional research may be warranted due to the positive correlation between the independent and dependent variables, as suggested by the study's findings. However, further investigation is required regarding the influence of the job burnout variable and the moderating effect of the job burnout-correlated variable. One approach to assisting organizations in de-

veloping strategies to thrive in an increasingly competitive and uncertain business environment is to employ moderate variables and mediate independent influences on job burnout. Further investigations might encompass additional research variables, including but not limited to religion, flexible work schedules, employee attrition, working experience, generation Z, and productivity.

Subsequent investigations may find utility across diverse sectors, including manufacturing, transportation, automotive, construction, nickel mining, gold mining, and more, with a particular emphasis on high-risk occupations, in support of sustainable business practices. Due to the intensifying business competition in Indonesia, given the current economic instability and rapid technological advancements, this also adds to the intrigue surrounding future research.

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