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Occupational health and safety risk perception: Comparison between permanent and temporary workers

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Abstract---The perception of risk is an important element of many theories about changing safety behavior. Perceived risk is often subject to survival behavior change interventions. The perception of risk to occupational safety and health is an important factor in the success of the work accident prevention program. Risk perception is an important determinant of safety behavior, although the nature of the relationship between risk perception and safety behavior may depend on the profile of different types of risk perception and the accuracy of the perception. The perception of workers, both permanent and non-permanent workers, on occupational safety and health and accident prevention with risk perceptions is an important factor in the success of this accident prevention program. This study aims to find out more about adapting the TRIRISK model for intentionally perceived risk in the context of perception. By assessing the role of the deliberative, affective, and experiential dimensions of safety and health risks in the workplace. Quantitative research was conducted by means of a survey with a questionnaire. The survey was conducted from November to December 2021 and obtained as many as 102 respondents. If it is seen from the perception of deliberative risk, it shows a comparison of the average rating of the perception of organic and temporary workers related to the perception of occupational safety and health risks. Overall, the average perception

rating of organic workers across all items tends to be higher than the perceptions of temporary workers, which means that organic workers respond better to perceptions of occupational safety and health risks. The results of different tests using the Mann Whitney test, statistically significant differences are seen in when workers think carefully about the use of Personal Protective Equipment (PPE), such as workers will experience work accidents, it appears that organic workers have more perceptions of safety risks and occupational health when compared to temporary workers.

Keywords---risk perception, temporary employees, deliberative, affective, experiential.

Introduction

The perception of risk is an important element of many theories about changing safety behavior. Perceived risk is often subject to safe behavior change interventions. Theories emphasizing the intentional perception of risk suggest that a person relies on a set of reason-based strategies to derive estimates of the likelihood of adverse consequences. The perception of intentional risk is usually absolute (e.g., percentage chance of an accident) or comparative (e.g., chance of an accident compared to others)(Ferrer and Klein, 2015). Recent models of risk awareness and decision making emphasize the difference between intentional and emotional or empirical factors. Awareness of influential risk refers to the impact associated with risk, and awareness of influential risk refers to preventive action (Susilawaty *et al.*, 2021) Experience-based risk awareness refers to the judgment that occurs through the thoughtful integration of emotional information, and empirical risk awareness refers to the content of the perception, not the process that produces it. Experienced risk perceptions often predict behavior more than risk perceptions. (Ferrer *et al.*, 2016)

The perception of risk to occupational safety and health is an important factor in the success of the work accident prevention program. Research on risk perception conducted by (Ferrer and Klein, 2015) Overall, existing research indicates that risk perception is an important determinant of health behavior, although the nature of the relationship between risk perception and health behavior may depend on the profile of different types of risk perception and the accuracy of the perception. (Ferrer *et al.*, 2016) The TRIRISK model offers a new conceptualization of the perception of health-related risk, and new measures that increase predictive validity beyond that posed by unidimensional and bidimensional models. These findings have implications for the way risk perception is targeted in health behavior change interventions, health communications, and decision tools (Jeong, Crompton and Lee, 2022) development of instruments to measure impact on travel avoidance intentions; testing a model that identifies the relationship between the perceived risk of contracting the virus, the expected severity of the medical and psychosocial consequences stemming from this risk, and the intention to avoid travel.

The perception of Occupational Safety and Health Risk is a key factor in the success of the work accident prevention program. Overall, risk perception assessment studies conducted by (Ferrer dan Klein, 2015) have shown that the nature of the relationship between risk perception and health behavior may depend on different types of profiles, but it is risk that is an important determinant of health behavior, (Ferrer et al., 2016) The TRIRISK model provides a new conceptualization of health-related risk perceptions and new measures that make predictions more relevant than 1 and 2 dimensional models. How is risk awareness targeted in health behavior change interventions, health communication, and decision support, (Jeong, Crompton, dan Lee, 2022) Development of tools to measure the impact of the COVID19 pandemic on intention to avoid travel. We tested a model that identified a relationship between awareness of the risk of being infected with the virus, the expected severity of the medical and psychosocial effects of the risk, and intention to avoid travel. In the TRIRISK concept Practical implications of the design of interventions that incorporate risk perceptions aimed at behavior change in the context of prevention (Riedinger *et al.*, 2022). Based on several previous studies, this study adapts the TRIRISK model developed by (Ferrer *et al.*, 2016, Ferrer *et al.*, 2018) for intentionally perceived risk in the context of perception. Assessing the role of the deliberative, affective, and experiential dimensions of risk related to safety and health risks in the workplace.

Materials and Methods

Quantitative research was conducted by means of a survey through a questionnaire sheet. The time of the survey was from November - December 2021 and obtained as many as 102 respondents. Data was collected by sending a questionnaire form to the workforce at a shipyard in Surabaya, Indonesia. Their responses will be recorded and further processed for data processing. Processing and analyzing data using a computer statistical program. The results of processing and statistical tests obtained are presented in the form of tables and graphs. Univariate analysis was conducted to obtain a description of the characteristics of the respondents. Descriptive analysis is also carried out on each variable that makes up risk perception with frequency distributions and percentages narrated. In this study using univariate analysis, namely the analysis used on each variable. From the results of research in this analysis, it produces the distribution and frequency of each variable studied, namely the variable demographic characteristics of the respondents. consisting of age, gender, last education, experience, exincome, and compared based on employment status.

Results

Characteristic Demografi

A total of 102 respondents participated in this study. The demographic characteristics of the respondents are presented in Table 1. Of the total respondents, overall most of them are in the age range of 26-35 years (Late Adults) as many as 47 people (46.1%), organic workers aged 36-45 years as much as 43.3% while non-permanent workers in the range of 26-35 years as much as 69%, by gender 96 respondents are male 96%, 74 people (72.6%) have a high

school education or equivalent, generally respondents are organic workers (58.8%). In terms of income, 75 people (73.5%) have an average income of > 4.3 million and 62 people (60.8%) have worked 1-10 years. Table 1 shows the results of the data homogeneity test conducted to see the uniformity of characteristics between groups of organic workers and temporary workers. The homogeneity test was carried out because there was an imbalance in the number of samples between groups. The test results show that all the characteristics of the samples between groups are homogeneous ($p < 0.05$), which means that the diversity is not much different.

Table 1 also shows the percentage distribution of respondents' characteristics, for the majority of organic workers are in the 36-45 year age group (43.3%) while the majority of temporary workers are 26-35 years old (69.1%). Most of the organic workers are male workers (91.7%) while the temporary workers are mostly male (97.6%). If you look at the level of education, most of them have a high school graduate education level (68.3%) while temporary workers have a high school graduate education level (78.6%). When viewed from work experience, most of them have experience (68.3%) while most temporary workers have experience (78.6%). %) If you look at work experience, most of the organic workers have income.

Table 1
Demographic characteristics of the subjects

Characteristics	Kelompok; n (%)		P Value
	Permanent (n=60)	Temporary Employees (n=42)	
<i>Age</i>			
18-25	0	5(11,9)	0,002
26-35	18 (30)	29(69)	
36-45	26 (43,3)	7(16,7)	
46-55	16(26,7)	1(2,4)	
<i>Gender</i>			
Male	55(91,7)	41(97,6)	0,010
Female	5(8,3)	1(2,4)	
<i>Education</i>			
High school graduate	41(68,3)	33(78,6)	0,163
Bachelor's degree	19(31,7)	9(21,4)	
<i>Employees Experience</i>			
1-10 (Years)	25(41,7)	37(88,1)	0,000
11-20 (Years)	5(8,3)	5(11,9)	
21-30 (Years)	27(45)	0	
>30 (Years)	3	0	
<i>Income</i>			
< 4.300.000	5(8,3)	22(52,4)	0,000
>4.300.000	55(91,7)	20(47,6)	

Table 2 shows that the constructs formed in the model have Cronbach's Alpha values > 0.6 (0.876), AVE scores > 0.5 (0.836), composite reliability (PC) values > 0.7 (0.911) which indicates that the variable construct It has a valid convergent validity in compiling the structural equations of this model. An indicator is said to be able to form a good (reliable) construct if it has a correlation value of 0.7 (Chin, 1998) Composite construct reliability is used as a measure of internal consistency which can only be used as a measure of internal consistency on reflective indicators, while the use of weights can only be used as a measure of internal consistency on formative indicators of the outer model. Table 2 states that the results of the composite reliability test for the exogenous latent variable resulted in a value (Pc) of more than 0.7. This means that the indicators used in measuring the construct are completely reliable and are strongly able to measure the construct. Table 2 states that the latent construct is reliable because it has a Chronbach's Alpha score of more than 0.6. So it can be concluded that the construct has a strong reliability.

A total of sixteen statements were used to see the perception of risk using the answer choices from very inappropriate (score 1) to very appropriate with the conditions experienced by the respondent (score 5) measured by a semantic differential scale arranged in a continuum line. On average, organic workers have a higher risk perception compared to non-permanent workers, but they are worried about future accidents because they still have the certainty that they will work in the same place. In principle, the average workforce feels ready to face risks as long as the workforce gets the information and safety guarantees that will be provided to the workforce with clear benefits and effectiveness, and it has been proven that the benefits are greater than biased information and guarantees. The average community answers are presented in Table 3.

Table 4 shows a comparison of the average ratings of the perceptions of organic workers and temporary workers related to perceptions of occupational safety and health risks. Overall, the average perception rating of organic workers across all items tends to be higher than the perceptions of temporary workers, which means that organic workers respond better to perceptions of occupational safety and health risks. From the results of different tests using the Mann Whitney test, statistically significant differences are seen in When workers think carefully about the use of PPE, such as workers will experience work accidents, it appears that organic workers have more perceptions of occupational safety and health risks when compared with temporary workers.

Table 2
Average value, number of items Cronbach alpha, AVE and composite reliability (Pc)

	Means	Number of items	Cronbach's Alpha	AVE	Composite Reliability (Pc)
Risk Perception	57,6	16	0,876	0.836	0.911

Table 3 presents the mean, standard deviation, and intercorrelation for the three risk components for the overall sample and by occupational safety and health.

Analysis of correlation variance showed a reliable effect of occupational safety and health across the combined risk components, 0.430, $p < 0.001$. Univariate test showed that the perception of occupational safety and health risk was significant for each component of deliberative, affective, and experiential risk, 0.437, 0.437 and 0.692, respectively, $p < 0.001$. Consistent with predictions, workers with occupational safety and health risk perceptions show higher deliberative, affective, and experiential risk perceptions compared to temporary workers.

Table 3
Means, standard deviations, and inter-correlations for the overall sample

Variable	1	2	3	M	SD
Overall sample					
1. Deliberative	1	0.430**	0.437**	10.9216	2,11869
2. Affective	0.430**	1	0.692**	16.3824	4.41654
3. Experiential	0.437**	0.692**	1	16.1569	3.36183

** Correlation is significant at 0.01 level (2-tailed)

Table 4
Distribution of respondents regarding the perception of risk in the workforce

Risk Perception	Mean Rank		P Value*
	Organic (n=60)	Temporary (n=42)	
Deliberative			
1. The probability that I will have a work accident in the future is very small.	52,22	50,48	0,753
2. When I think carefully about using PPE, it looks like I will have an accident at work	56,77	43,98	0,020
3. If I see myself as if I were a doctor, I realize that my behavior puts me at risk for a work accident	53,30	50,36	0,726
4. The chance that I will have an accident at work in the future compared to Employees with the same type of work as me is high.	53,52	48,62	0,377
Affective			
1. I am worried that I will have an accident at work in the future.	53,05	49,29	0,501
2. I am afraid of having an accident at work in the future.	50,88	52,39	0,787
3. I feel nervous about having a work accident in the future.	54,39	47,37	0,205
4. When I think for a moment about the work accident that happened to me, I feel scared	50,28	53,25	0,593
5. When I think for a moment about the work accident that happened to me, I feel worried	50,53	52,88	0,672
6. When I think for a moment about the work accident that happened to me, I feel anxious	50,97	52,26	0,815
Experiential			
1. I am worried about the work accident that has happened to me.	53,53	48,61	0,379
2. It is easy for me to imagine myself having a work accident in the future	55,08	46,38	0,102

Risk Perception	Mean Rank		P Value*
	Organic (n=60)	Temporary (n=42)	
3. I am sure that I will not have an accident at work	52,88	49,52	0,553
4. I'd be lying if I said it's impossible for me to have a work accident	54,58	47,11	0,183
5. I would be lying if I said There's no way I could have an accident at work	53,85	48,14	0,308
6. My first reaction when I hear someone has an accident at work is that it could happen to me one day	55,08	46,39	0,118

**mann-whitney test*

Discussion

This study provides strong initial support for differentiating deliberative, affective, and experiential factors from perceived risk. This study provides the first evidence to support the Tripartite Risk Recognition Model (TRIRISK). Confirmatory factor analysis showed that three-part models fit the data better than multifactorial or single-factor models. The observation that the deliberative, affective, and experiential elements are more strongly correlated than the deliberative, affective elements underscores the difference between the latter two types of unintentional risk perception. These results interpret risk perception as a unified structure or, at best, carefully distinguish it from other factors, but incorporate deliberative, affective, risk perceptions in the health behavior change literature. This contradicts the current conceptualization (Ferrer *et al.*, 2016).

The study provides evidence supporting the concurrent, predictive, and discriminant pre-validity of the TRIRISK model. The relationship between deliberative and affective has the highest relationship compared to the relationship between deliberative and experiential and affective relationship with experiential. The workforce as a whole has a significantly lower correlation between the three components than those who have no direct experience with accidents. Deliberative, affective, and experiential risk perceptions each predict variance for engaging in survivor behavior. Experiential risk predicts intention when people approach influence, deliberative risk predicts intention when people avoid influence, and predictable affective risk between perceived deliberative risk and intention could reflect individuals' accurate assessments of their risk behavior and thus do not necessarily suggest that interventions should seek to decrease perceived risk. deliberative to facilitate behavior change. A key goal in future interventions targeting risk perception is to examine the magnitude and direction of change for each construct that will maximize the impact on behavior.(Jeong, Crompton and Lee, 2022).

Respondents with productive age are expected to be able to carry out their work safely so that they can avoid or prevent accidents that may occur. In line with research Almani et al., (2014) in research on the perception of workers about the Occupational Health and Safety Management System that at a young age employees have a good perception as much as 85.4% and there is a relationship between age and workforce perception. In line with research Riley & Chow, (1992) suggests that at the age of sixty-five, people will avoid risk, however Basha &

Maiti, (2013) in his research on the relationship of demographic factors, perceptions of occupational risk and occupational injuries in steel mills in India did not find a relationship between age and perceived risk.

Gender in this study shows that the workforce is dominated by male workers with details of 94% of the total respondents, with 88.2% having a good risk perception. This research is in line with research Short et al., (2004) which explains that men and women have different perceptions of risk overall, men perceive risk as lower than women in sports, in line with research Rizkiyah et al., (2016) the perception of risk for men is lower than women in mountaineering activities, because it is based on research Barber & Odean, (2005) obtain empirical evidence that men are more daring to the risks that will be faced than women, this is because the level of self-confidence of men is higher than women, but the opposite when viewed from the awareness of men is lower in the case of using personal protective equipment (Pramana *et al.*, 2020).

The categorization of education in this study is in accordance with the national education system, which is adjusted to the employment law regarding the age of the workforce, based on this the education level of the workforce is included in the level of senior secondary education and higher education. Based on the results of research that has been carried out, it was found that workers with a high school education level were 74 workers or equivalent to 72.6% of which 11 workers 10.8% had a good risk perception, for workers with a higher education level A total of 27 workers is equivalent to 26.5%, of which 4 workers 3.9% have a good risk perception. This is in accordance with research conducted by Siburian, (2012) Education is an effort made to develop personality and abilities in nature and outside school and lasts throughout life. The higher a person's education, the easier it is for that person to receive information, the wider his knowledge will be. The educational factor is the level of mastery of knowledge possessed by a person about his ability to understand something well. Deaves, (2006) explained that the investor's tolerance for risk is also influenced by the level of education, the higher the level of education, the higher the level of tolerance for risk (risk seeker). So it can be concluded that a high level of education is considered to have good knowledge in investing both in analysing and calculating the risks faced.

Judging from experience that most organic workers are more experienced than temporary workers and have more attention to risk perceptions and this is in line with research Wang, Zou and Li, (2016) it was found that the influence of external factors (safety management and work characteristics) on risk tolerance was greater than the influence of internal factors (personal subjective perception and knowledge & work experience). In particular, safety management contributes the most to worker safety risk tolerance through its direct and indirect effects; whereas personal subjective perception ranks second and can act as an intermediary for job characteristics.

Conclusion

The conclusion of this study is that almost all workers (88.2%) agree with the work accident prevention program with a good risk perception. Organic workers

are better at perceiving risks to occupational safety and health than temporary workers.

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