

Factors Influencing Safe Work Behavior in Thai Food Industry

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Abstract. Thai food industry employs a massive number of skilled and unskilled workers; this causes the industry high incidences and accident rate. To improve safety, this paper investigates key factors influencing safe work behavior in Thai food industry. The exploratory factor analysis extracts five factors, including 'Management Commitment', 'Workers and Partners' Role', 'Safety Information and Communication', 'Supportive Environment', and 'Risk', with a total of the 21 associated attributes to improve safe work behavior. The food companies can use these four factors as a guideline for safety improvement.

Keywords: exploratory factor analysis, safe work behavior, Thai food industry

1. Introduction

The food industry comprises a complex network of activities pertaining to the supply, consumption, and catering of food products and services across the world. According to Thailand Board of Investment (2008), Thailand is one of the world's largest and most advanced producers and exporters of processed food products, such as canned pineapple, processed chicken, and frozen seafood. However, it is found that the industry is one of the highest incidences and injuries industries (Bureau of Labor Statistics, 2010). This is due to the unique characteristics of the food industry, such as the work environment, the levels of physical activities required, the prevalence of travel, and the workplace culture. To improve safety and reduce the injury rate, it is important that safety culture is emphasized. Zhang et al. (2002) stated that positive safety culture of an organization has an impact on its members' behavior at work.

2. The Attributes Associated with Safe Work Behavior

Based on literature review frequently cited in recent food-related literature, a total of 26 attributes associated with safe work behavior are extracted.

- Role overload (ROL): According to Mullen (2004), individuals who experienced role overload tend to focus on performance rather than safety.
- Safety training (STN): Lingard et al. (2009) claimed that safety training assists operatives to work more safety.
- Safety resources (STR): An effective safety program results from the commitment of the top management to providing an appropriate level of resources (Abudayyeh et al., 2006).
- Perceived risk (PCR): Seo et al. (2004) stated that perceived risk affects unsafe work behavior.
- Risk assessment (RAS): Risk assessment should be performed industry by industry, and protective measures should be provided (Ruhl et al., 2002).
- Competence (CPT): Mohamed and Fang (2002) stated that workers' adequate knowledge, skill and ability to their works, especially toward risks and dangers in their work, may minimize accidents.
- Worker's relationship (WRL): Close relationships between workers should be encouraged to avoid a negative consequence. For example, some workers choose not to use safety equipment or they tend to

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perform work unsafely to avoid being teased or made fun of by their coworkers, and occasionally by the boss (Mullen, 2004).

- Work environment (WEV): Bad working environment leads workers, as an individual or a team, to initiate unsafe behavior (Andi, 2008).
- Safety information (SIF): Antonsen (2009) stated that to improve safety, workers should have an access to important safety information.
- Communication (CMN): Little (2002) stated that two-way communication is one of the key factors in improving safety culture.
- Management support (MGT): It is not just management participation and involvement in safety activity that is important, but also the extent to which management encourages the involvement of the workforce (Meshkati, 1997).
- Top management commitment (TMC): According to Rowlinson (1997), safety program should be initiated from top management of an organization.
- Feedback (FDB): Monitoring the performance of the workers and using reliable feedback give safety manager a tool to improve their safety programs and technique (Abudayyeh et al., 2006).
- Supervision (SPV): It is very obvious that any successful safety program must necessary involve the supervisors. If supervisors could convince worker that safety has to be considered all the time, then worker will do everything to prevent accidents (Akson and Hadikusumo, 2008).
- Employee's attitude (EAT): Employee's attitude demonstrates the company and employee values, and determines whether a job will be performed safety (Abudayyeh et al., 2006).
- Accidents report (ACR): In a positive safety environment, workers are not blamed when they report safety incidents, as those incidents are regarded as learning opportunities (Taylor, 2003).
- Safety budget (STB): Budget is an essential factor to enhance safety (Abudayyeh et al., 2006).
- Clear safety goal (CSG): To reduce risk, the company should have clear and practical safety goals and standards (Akson and Hadikusumo, 2008).
- Employee empowerment (EEP): Abudayyeh et al. (2006) mentioned that when people feel empowered, safety becomes their own personal goal and responsibility.
- Safety documentation (DCM): Chan et al. (2004) described that the inadequacy of the safety data collection leads to the lack of focus in safety campaign, and the inability to measure the effectiveness of the efforts.
- Safety accountability (STC): Any one individual cannot make a safety program successful. Therefore, safety responsibilities must be transferred to individuals at lower levels of authority (Akson and Hadikusumo, 2008).
- Worker involvement (WIN): Workers' involvement is very important in building workers' awareness of safety (Andi, 2008).
- Teamwork (TMW): A safety program succeeds when all concerned parties from top to bottom hierarchical levels realize that preventing accidents is everyone's responsibility (Akson and Hadikusumo, 2008).
- Safety incentive (SFN): Langford et al. (2000) defined that reward system that compensates the workers for safe working whilst achieving desired levels of productivity must be encouraged.
- Organization learning (ORG): Feedback and suggestions should be encouraged to facilitate the organization learning (Abudayyeh et al., 2006).
- Partners' involvement (PIN): Cooper (2000) stated that success in occupational health and safety management can only be achieved through teamwork especially between all project stakeholders.

These 26 attributes are used in questionnaire survey to gather data for the analyses. The details are explained in the next section.

3. Exploratory Factor Analysis

3.1. Questionnaire Survey and Preliminary Analyses

A total of 450 questionnaires are launched to Thai food companies, with 383 returns, representing 85.11% in the respond rate. From the returned responds, 23 are unusable due to data incompleteness,

resulting in a total of 360 questionnaires for further analyses. The respondents are from top (such as manager and owner) to bottom (such as workers) levels. The majority of the respondents have at least five years working experience, both in their current organization and in the food industry. This indicates the reasonably high working experience of the respondents.

The preliminary analyses are then conducted, including the normality and the outlier tests, to increase the confidence in the data collected. No skewness and kurtosis values exceed the upper limits, concluding the normal distribution of the data collected. The results, however, show one data that has the z-score exceeds the limit of ± 3.29 . According to Tabachnick and Fidell (2007), this data represents the univariate outliers, and is deleted from the data file, leading to the 359 data set for the exploratory factor analysis.

3.2. Questionnaire Survey and Preliminary Analyses

Principle components analysis method, together with the eigenvalue over one, factor loading of 0.35, and varimax rotation, are used to perform the exploratory factor analysis. The first run results in deleting one attribute, namely 'teamwork' (TMW), as it has factor loading less than 0.35. The analysis of the remaining 25 attributes extracts seven factors, with the total variance of 45% (as shown in Table 1).

Table 1: Exploratory factor analysis of the 25 attributes.

Attribute	Factor						
	1	2	3	4	5	6	7
SPV	.60						
EEP	.59						
MGT	.56						
EAT	.56						
RAC	.45						
TMC	.41						
PIN		.68					
ORG		.66					
WIN		.61					
CSG		.40					
SIF			.75				
CMN			.71				
FDB			.50				
STN				.68			
CPT				.60			
ROL				.58			
STR				.48			
RAS					.75		
WRL					.60		
WEV					.58		
PCR					.49		
DCM						.68	
STC						.56	
STB							.66
SFN							.51

To confirm these seven factors extracted, a reliability test is performed. According to Flynn et al. (1990), the alpha value of 0.6 is considered acceptable. The results show the alpha values of Factors 6 and 7 of less than 0.6. These two factors, with a total of four attributes (DCM, STC, STB, and SFN attributes), are then deleted from the data file. The remaining 21 attributes are then reperformed with the exploratory factor analysis to confirm their five remaining constructs. The results confirm the five factors extracted (as shown in Table 2).

Table 2: Exploratory factor analysis of the 21 attributes.

Attribute	Factor				
	1	2	3	4	5
SPV	.65				
EAT	.64				
EEP	.63				
MGT	.55				
RAC	.50				
TMC	.48				
ORG		.70			
PIN		.69			
WIN		.60			
CSG		.42			
SIF			.72		
CMN			.68		
FDB			.63		
CPT				.66	
STN				.62	
ROL				.57	
STR				.49	
RAS					.70
WRL					.61
PCR					.55
WEV					.55

Factor 1 consists of six attributes that describe mainly on management support and commitment. Therefore, this factor is called ‘Management Commitment’ (MCM) factor. This is confirmed by Rowlinson (1997) that successful safety program should be initiated from top management. Factor 2 consists of four attributes initially measuring workers’ and partners’ role of safety, therefore, it is called ‘Workers and Partners’ Role’ (WPR) factor. Factor 3 consists of three attributes that explain mainly on safety information and communication. It is, then, called ‘Safety Information and Communication’ (SIC) factor. Factor 4 consists of four attributes measuring safety support. It is called ‘Supportive Environment’ (SUE) factor. Lastly, the four attributes are grouped into Factor 5, and is called ‘Risk’ (RSK) factor. This is confirmed by Seo (2005) that perceived risk affects unsafe work behaviour, and that risk assessment should be performed to ensure safety in the organization.

The five factors extracted are confirmed with the reliability test. The results, as shown in Table 3, prove all five factors as reliable.

Table 3: The reliability results.

Factor	Alpha value
Management Commitment	0.69
Workers and Partners’ Role	0.61
Safety Information and Communication	0.65
Supportive Environment	0.60
Risk	0.62

4. Conclusion

Thai food industry has high incident and accident records. To reduce the accidents, it is important that safe work behavior is promoted within the organization. It is found that five key safety factors, namely ‘Management Commitment’, ‘Workers and Partners’ Role’, ‘Safety Information and Communication’, ‘Supportive Environment’, and ‘Risk’, are important in improving safety. These five factors, with a total of

21 associated attributes, are confirmed with the reliability. The organization can use these five key safety factors in planning for safety improvement.

5. References

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