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Safety management framework for garments manufacturing company based on safety leadership, safety participation, and safety knowledge

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Abstract

Garments manufacturing poses inherent risks, jeopardizing worker safety. This study develops a novel framework, prioritizing safety leadership, safety participation, and safety knowledge to empower garments companies in ensuring a safer workplace. This study aimed to determine the safety leadership, safety participation, and safety knowledge among workers of garment manufacturing companies as inputs to the development of a safety management framework. The collected data were examined using a descriptive method, using an adopted modified questionnaire as the primary instruments for data collection. The participants were 364 workers from selected seven garments manufacturing companies in Pampanga, Philippines. Findings revealed strong agreement on the respondents' safety leadership as to leadership behavior, safety concern, and security control. They also strongly agreed on the importance of safety participation as to workers' involvement, safety motivation, and promotion policies. In terms of safety knowledge, garments manufacturing workers strongly agreed on the importance of safety training, safety communication, and safety rules and procedures. There was a significant relationship between safety leadership and safety participation. Moreover, there is a significant relationship between safety leadership and safety knowledge. Based on the result of the study, the researcher developed a model that can be used by garments manufacturing companies in implementing their safety management to establish safer workplace environment. The proposed Safety Management Framework can lead to safer workplaces, enhanced employee well-being, and improved efficiency for individual companies within the garments manufacturing industry. Moreover, the study contributes to broader improvements in industry-wide best practices and safety standards, potentially having a positive impact on the entire sector.

Keywords: safety leadership, safety participation, safety knowledge, safety management framework

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1. Introduction

Work-related injuries and diseases are a significant contributor to mortality and disability. Almost 2 million individuals die each year due to work-related accidents and diseases, contributing to a major economic burden. Despite attempts to address the issue, the number of fatalities continues to increase. The Philippine government reports that around 2.2 million Filipino employees in medium and large companies get sufficient occupational safety and health (OSH) protection and services. Simply put, just 2% of the country's 38.8 million workers enjoy satisfactory working conditions. Studies have shown that occupational safety and health conditions in small firms and the informal sector may be hazardous, according to the International Labour Organization.

Beginning in the early twentieth century, when occupational safety and health measures were first implemented in the Philippines, companies began to place a greater emphasis on the welfare of their employees. Numerous legal foundations have since been established to safeguard the public. Despite this, the nation is devoid of information regarding this subject. In 2018, the manufacturing sector consisted of over 28,968 enterprises and was a major economic contributor in the nation. In 2018, it had a workforce of 1, 260, 512 workers nationwide, establishing it as a leading industry in employment generation. According to the Philippine Statistics Authority, the industries with the highest number of employees were food product manufacturing with 151, 514 workers, electronic component manufacturing with 142, 340 workers, and donning apparel manufacturing (excluding mink apparel manufacturing) with 98,868 workers. In 2017, the Philippine Statistical Authority reported a 35.9 percent growth in the value of clothing production. The local apparel industry is thriving, leading to a rise in exports in the first four months of the year. Experts suggest that the garment industry in the Philippines has more promising opportunities for quick growth.

The idea of "safety leadership" is recognized as significantly influencing workplace security. The need of involvement in safety management for safety has been more widely acknowledged. The study indicates that the degree of employee involvement in safety protocols is influenced by their connection to the project, even when considering typical criteria associated with safety adherence (Choi, et. al., 2022). Safety knowledge refers to the understanding one gains in the workplace about the protection of oneself, others, and the surrounding context and environment. Hence, possessing a comprehensive understanding of safety protocols is essential for acquiring expertise and formulating effective approaches to manage work-related tasks, such as daily troubleshooting. This knowledge serves to avert occupational mishaps that may endanger the well-being of the worker, as well as others and the immediate surroundings, thereby safeguarding one's occupational health (Pereira et al., 2023). In the Philippines, workers in the garments industry are at risk for a variety of illnesses and injuries due to the physically demanding nature of their labor and the repetitive nature of their work environment.

The researcher conducted this study to fill the gap in knowledge on the levels of safety leadership, safety participation, and safety knowledge in the implementation of effective safety management programs, aiming at ensuring a safe place to work. The link between safety leadership, safety participation, and safety knowledge will be evident if a correlation can be established, potentially leading to improvements in occupational safety and health for garment manufacturing workers. Given the researcher's background as an industrial engineer, safety practitioner, and educator, the knowledge and experience obtained from this study will enable him to effectively integrate the findings into his safety initiatives at work. In addition, he may impart his thoughts to his students who are likely to pursue careers in manufacturing organizations, emphasizing the significance of ensuring a safe workplace environment.

This study aimed to determine the safety leadership, safety participation, and safety knowledge among

employees of garment manufacturing companies as inputs to the development of a safety management framework. Specifically, it sought to determine the safety leadership in terms of leadership behavior, safety concern, and security control; determine the safety participation in terms of workers' involvement, safety motivation, and safety promotion policies; determine the safety knowledge in terms of safety training, safety communication, and safety rules and procedures; test the significant relationship among the safety leadership, safety communication, and safety rules and procedures; and lastly, to develop a framework for effective safety management which shall serve as an input to garment manufacturing companies safety management strategies.

2. Methods

This study used a descriptive research methodology to ensure a thorough and precise interpretation of the results. Descriptive research is a study method that aims to provide a complete account of the phenomena being examined to provide an accurate description. The study used descriptive research because of its ability to clearly portray, document, and develop a foundational understanding of a topic or phenomenon. It lays the groundwork for further investigation and acts as the cornerstone for other analytical and strategic processes. The researcher gathered the through questionnaire administration executed by means of manual distribution. The utilization of descriptive research facilitated the effective collection of data from the respondents.

The research surveyed garment manufacturing enterprises in Pampanga, Philippines, totaling 6,802 individuals involved in the operation and production of each company. The sample size was 364, determined using the Raosoft sample size calculator, with a 95% confidence level and a 5% margin of error. This study purposely selected seven (7) garments manufacturing companies in Pampanga, these includes Malpitic Garments Manufacturing, Provocative Quality Apparel, The Street market garment manufacturer, Power hoops pinas sportswear apparel, BW Manufacturing, Custom Sports & Leisure, and Jerry Tan garments manufacturing. The researcher used convenience sampling to distribute the questionnaire.

The necessary data to fulfill the aims of this research were collected using a modified survey instrument. The research employed a questionnaire comprising four primary sections to gather the requisite data. In Part I, respondent profiles are presented. Part II comprises the safety leadership evaluation. There are seventeen questions in total that comprise the evaluation of these categories. The evaluation for safety participation is included in Part III (Vinodkumar et. al., 2010). The three primary categories utilized were worker involvement, safety motivation, and promotion policies. There are eleven questions in total that constitute the evaluation of these categories. The evaluation of safety knowledge is comprised of Part IV (Vinodkumar et. al., 2010). Safety training, safety communication, and safety rules and procedures were the three determinants utilized. There are eleven questions in total that comprise the evaluation of these categories. A rating system consisting of four points (was employed to assess Parts II-IV. Modifications were implemented by simplifying, rephrasing, removing, and substituting certain elements subsequent to a thorough examination of each detail. The model comprises three factors: leadership behavior (Cronbach alpha = 0.983), safety concerns (Cronbach alpha = 0.965), and security control (Cronbach alpha = 0.948). The second instrument used in measuring safety participation was adapted from the studies of Vinodkumar et. al., (2010). This is a three-factor model consisting of worker's involvement with Cronbach alpha of 0.953, safety motivation with Cronbach alpha of 0.95, and promotion policies with Cronbach alpha of 0.908. Finally, an additional safety knowledge instrument was incorporated into the research, which was derived from the works of Neal et al. (2000) and Vinodkumar et. al., (2010). Safety training (Cronbach alpha = 0.956), safety communication (Cronbach alpha = 0.975), and safety norms and procedures (Cronbach alpha = 0.986) comprise this three-factor model.

The researcher utilized published theses, books, articles, and journals as sources to gather and compile data or information. The contents of the questionnaires were further validated with safety professionals and professors in safety management. To get feedback on the survey's reliability test, a pilot survey was administered to a sample of 20 employees of garments manufacturing workers located in Pampanga area as respondents. Emails were sent to the human resources departments of the seven garment manufacturing companies requesting permission to

conduct research. For academic purposes, it was emphasized that the survey is conducted exclusively in writing, and that all information obtained is kept strictly confidential. The researcher successfully obtained approval to proceed with the study. Subsequently, enough time was provided for the chosen individuals to complete the printed questionnaires. The researcher obtained the required data for the study within the specified period for distributing and gathering the survey questionnaire. The researcher retrieved, documented, assessed, and analyzed the gathered data.

Statistical tools were used for data analysis. Frequency count was used to describe the profile of the respondents. The Safety Leadership, Safety Participation and Safety Knowledge was assessed using weighted mean and rank. All variables in the data set were found to have p-values less than 0.05 in the Shapiro-Wilk Test, indicating that the data was not normally distributed. Spearman's rank correlation coefficient was used in non-parametric testing to establish the presence of a meaningful association. The analyses were conducted using SPSS version 28. Ethics was considered throughout the course of this study. This includes the procedures for granting consent and divulging pertinent information. In response to a letter from the researcher requesting participation in the study, the employers agreed to the research. In order to ensure the transparency of the discussions, no names or personal identifiers were included.

3. Results and discussion

Table 1

Summary Table on Safety Leadership

Key Result Areas	Composite Mean	VI	Rank
Leadership Behavior	3.61	Strongly Agree	1
Safety Concern	3.57	Strongly Agree	2
Security Control	3.53	Strongly Agree	3
Grand Composite Mean	3.57	Strongly Agree	

Legend:3.50-4.00=Strongly Agree;2.50-3.49=Agree;1.50-2.49=Disagree;1.00-1.49=Strongly Disagree

The responses of garment manufacturing workers regarding safety leadership were summarized in Table 1. The overall assessment received a grand composite mean of 3.57, which was interpreted as strongly agree. Safety leadership encompasses the provision of training and resources to workers, enabling them to perform their job duties with both confidence and safety. Organizations may enhance workplace safety, increase productivity, and mitigate expenses related to accidents or injuries by allocating resources towards employee safety (Paredes, 2023). Establishing a work environment that is both safe and secure is crucial for safeguarding individuals, assets, and reputations. Implementing safety leadership in the workplace enables managers to uphold a secure working environment and effectively handle persistent dangers. The significance of safety leadership is in its ability to enable a business to evaluate its existing safety policies while ensuring that personnel adhere to established safety protocols. In order to foster a happy and secure work environment with minimal safety concerns, vigilant safety leaders apply positive reinforcement to encourage employees to maintain awareness of their behaviors. Safety leadership aims to internally shift the culture to prioritize safety, which includes fostering a psychologically safe environment (Bruce, 2023).

Table 2

Summary Table on Safety Participation

Key Result Areas	Composite Mean	VI	Rank
Workers' Involvement	3.53	Strongly Agree	2
Safety Motivation	3.78	Strongly Agree	1
Safety Promotion Policies	3.51	Strongly Agree	3
Grand Composite Mean	3.61	Strongly Agree	

Legend:3.50-4.00=Strongly Agree;2.50-3.49=Agree;1.50-2.49=Disagree;1.00-1.49=Strongly Disagree

Table 2 displays the summarized outcome of the respondents' perspective about the influence of safety participation as a variable in the establishment of a safety management framework. The grand composite mean of

3.61 indicates a substantial consensus among respondents about the indicators of safety involvement. Safety motivation received the greatest score of 3.78 for the rank indication. Employees are more inclined to comply with safety regulations, engage in safety-related endeavors, and support organizational safety initiatives when they hold the perception that their managers and organizations are committed to safety, promote employee participation in safety-related decision-making processes, and give safety training priority (Lu et al., 2020). The worker involvement indicator gained the second ranking with a composite mean score of 3.53. With a composite mean of 3.51, the safety promotion policies indicator received the lowest ranking. The California Joint Powers Insurance Authority emphasizes that employee engagement is essential for the efficacy of a safety program. Encouraging employee involvement in safety at all levels of a company is considered a recommended strategy by the Occupational Safety and Health Administration (OSHA). OSHA says that a significant level of worker involvement in safety initiatives has been shown to enhance morale, decrease absenteeism, and boost productivity, while simultaneously mitigating the likelihood of injuries. Moreover, this endeavor has the potential to enhance employee receptiveness towards forthcoming alterations in workplace safety and health regulations

Table 3

Summary Table on Safety Knowledge

Key Result Areas	Composite Mean	VI	Rank
Safety Training	3.47	Agree	3
Safety Communication	3.50	Strongly Agree	2
Safety Rules and Procedures	3.52	Strongly Agree	1
Grand Composite Mean	3.50	Strongly Agree	

Legend:3.50-4.00=Strongly Agree;2.50-3.49=Agree;1.50-2.49=Disagree;1.00-1.49=Strongly Disagree

Table 3 displays the summary results on the indicators of safety knowledge with grand composite mean of 3.50. The indicator with highest mean score is safety rules and procedures (3.52). This shows that garments manufacturing workers believes that safety knowledge provides a great impact in establishing a safety management framework. Work procedures are established by companies to ensure adherence to safety regulations and best practices. By adhering to these work processes, it is very probable that safety requirements will be reached. Adhering to protocols is crucial, even if you believe that doing a work in a different manner may perhaps be more time-efficient. The indicator safety communication got the second rank with a composite mean of 3.50 and the indicator safety training got the last rank with a composite mean of 3.47. Facilitating the sharing of knowledge among workers through upward communication to management is crucial for organizational learning, improvement, and ensuring safe operations. Common obstacles to upward communication often stem from apprehension and a sense of guilt, as individuals believe that their messages may be altered or hindered as they ascend the communication hierarchy. Failure to resolve these communication hurdles can have detrimental effects on the interchange of information, organizational learning, and ultimately the safety of performance. Neglecting to implement an adequate safety training program might have detrimental effects on your organization. The reason is that small to medium business owners lack the same resources as giant firms. An individual sustains severe injuries, which might subsequently trigger a chain reaction of consequences. An efficient safety training program in the workplace may decrease employee attrition, enhance productivity, and boost morale (Regan, 2023).

The correlation between safety leadership and safety participation is depicted in Table 4. The computed rho-values, which range from 0.422 to 0.703, as presented in the table, suggest that the sub-variables safety leadership and safety participation are associated in a moderate to strong direct relationship. A statistically significant correlation was observed between safety leadership and safety participation, as evidenced by the p-values acquired being all below 0.01. A positive correlation exists between the level of safety participation that garment manufacturing employees perceive and their perception of safety leadership. The empirical findings demonstrate a positive correlation between each aspect of safety leadership and each aspect of safety participation. This provides substantial evidence in favor of the claim that safety leadership is instrumental in encouraging safety participation. Furthermore, safety participation serves as an effective means to enhance the safety leadership of garment manufacturing companies. According to Basahel (2021), effective safety leadership behavior may

enhance safety performance by engaging in conversations about safety concerns with employees and offering helpful counsel and direction to provide a secure work environment. The proactive and visible safety behavior exhibited by leaders results in enhanced workforce safety performance, specifically in terms of adherence to rules and regulations and active engagement in safety training and meetings.

Table 4

Relationship between Safety Leadership and Safety Participation

Variables	rho	p-value	Interpretation
Leadership Behavior			
Workers' Involvement	0.628**	0.000	Highly Significant
Safety Motivation	0.422**	0.000	Highly Significant
Safety Promotion Policies	0.564**	0.000	Highly Significant
Safety Concern			
Workers' Involvement	0.672**	0.000	Highly Significant
Safety Motivation	0.465**	0.000	Highly Significant
Safety Promotion Policies	0.586**	0.000	Highly Significant
Security Control			
Workers' Involvement	0.703**	0.000	Highly Significant
Safety Motivation	0.456**	0.000	Highly Significant
Safety Promotion Policies	0.612**	0.000	Highly Significant

**. Correlation is significant at the 0.01 level

Table 5

Relationship between Safety Leadership and Safety Knowledge

Variables	rho	p-value	Interpretation
Leadership Behavior			
Safety Training	0.609**	0.000	Highly Significant
Safety Communication	0.559**	0.000	Highly Significant
Safety Rules and Procedures	0.595**	0.000	Highly Significant
Safety Concern			
Safety Training	0.654**	0.000	Highly Significant
Safety Communication	0.624**	0.000	Highly Significant
Safety Rules and Procedures	0.610**	0.000	Highly Significant
Security Control			
Safety Training	0.686**	0.000	Highly Significant
Safety Communication	0.644**	0.000	Highly Significant
Safety Rules and Procedures	0.652**	0.000	Highly Significant

**. Correlation is significant at the 0.01 level

The correlation between safety knowledge and safety leadership is illustrated in Table 5. The computed rho-values, which range from 0.559 to 0.686, as shown in the table, indicate that the sub-variables safety leadership and safety knowledge have a moderate to strong direct relationship. A statistically significant correlation was observed between safety leadership and safety knowledge, as evidenced by the p-values obtained being all below 0.01. This indicates the discovery of a significant relationship between the variables. This suggests that as an organization allocates greater resources towards safety leadership, there is a corresponding enhancement in safety knowledge within the organization. The safety leadership factor is a factor at the group level that can influence the safety performance at the individual level. Effective safety leadership behavior may enhance safety performance by engaging in talks about safety concerns with workers and offering helpful counsel and direction to ensure a safe workplace. Employee safety performance is enhanced when leaders demonstrate proactive and conspicuous safety conduct, particularly with regard to compliance with regulations and laws, as well as active participation in safety meetings and training (Basahel, 2021). Competent safety leaders actively foster a safety-oriented culture within the workplace, ensuring that employees are well-informed about possible risks and hazards, and consistently practice preventive measures to mitigate accidents and injuries. Safety leaders do this by providing guidance to staff members on safety rules and procedures, exemplifying safe behaviors, and motivating people to voice concerns when they observe potential safety dangers.

Table 6

Relationship between Safety Participation and Safety Knowledge

Variables	rho	p-value	Interpretation
Workers' Involvement			
Safety Training	0.745**	0.000	Highly Significant
Safety Communication	0.703**	0.000	Highly Significant
Safety Rules and Procedures	0.716**	0.000	Highly Significant
Safety Motivation			
Safety Training	0.423**	0.000	Highly Significant
Safety Communication	0.408**	0.000	Highly Significant
Safety Rules and Procedures	0.438**	0.000	Highly Significant
Safety Promotion Policies			
Safety Training	0.692**	0.000	Highly Significant
Safety Communication	0.647**	0.000	Highly Significant
Safety Rules and Procedures	0.668**	0.000	Highly Significant

The correlation between safety knowledge and safety participation is illustrated in Table 6. The computed rho-values, which span from 0.408 to 0.745, as presented in the table, suggest that there exists a moderate to strong direct relationship between the sub-variables of safety knowledge and safety participation. A statistically significant correlation was observed between safety knowledge and safety participation, as evidenced by the derived p-values being below 0.01. This finding indicates the presence of a significant correlation, suggesting that increased worker engagement in safety management activities correlates with enhanced safety knowledge. From a safety standpoint, effective knowledge administration is critical for facilitating learning and, consequently, averting recurrent errors. According to the U.S. Department of Labor, substantive participation of workers and their representatives is essential for the success of any safety and health program. Employees stand to benefit the most from a program's success and stand to lose the most in the event of its failure. Frequently, they are also the most informed regarding prospective dangers associated with their employment. Proficient programs leverage this reservoir of knowledge. Safety and health concerns and program deficiencies, including emerging workplace hazards, hazardous conditions, close calls/near misses, and actual incidents, are frequently best identified by employees. Employers can prevent illness or injury to personnel by encouraging the reporting of incidents and promptly following up on all reports.

Proposed Safety Management Framework

A safety management framework was developed with the intention of promoting greater employee participation in safety-related activities within garment manufacturing companies in Pampanga. Safety management is enhanced by the implementation of a safety management framework. Employers can determine the optimal method for performing each crucial task and ensure that employees consistently adhere to that approach. Adopting a systematic approach in this manner effectively mitigates errors and costs associated with rectifying safety-related issues. In addition to the ethical considerations, the implementation of a safety management framework can yield financial advantages for employers through cost reductions attributable to a decrease in work-related incidents and operational delay caused by workplace injuries. The figure below illustrates that for safety management to be effective, organizations require safety leadership, safety participation, and safety knowledge. Security knowledge and safety participation are both impacted by safety leadership. Additionally, companies' safety knowledge may be affected by safety participation.

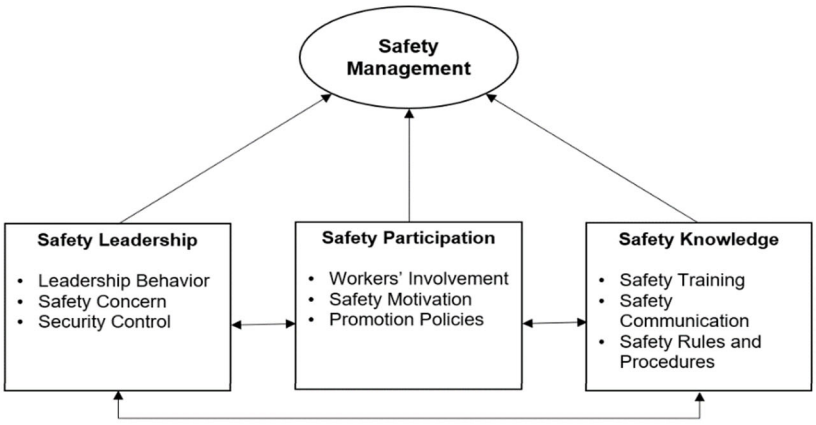

Figure 1. Proposed Framework for Safety Management of Garments Manufacturing Companies

4. Conclusions and recommendations

The research reveals that in terms of safety leadership, garments manufacturing workers strongly agreed on the importance of leadership behavior, safety concern, and security control. In terms of safety participation, garments manufacturing workers strongly agreed on the importance of workers' involvement, safety motivation, and promotion policies. In terms of safety knowledge, garments manufacturing workers strongly agreed on the importance of safety training, safety communication, and safety rules and procedures. There was a significant relationship between safety leadership and safety participation. Moreover, there is a significant relationship between safety leadership and safety knowledge. Based on the results of the study, the researcher developed a model that can be used by garments manufacturing companies in implementing their safety management to establish safer workplace environment.

Within the scope of garment manufacturing companies, it is recommended that safety professionals and training managers may thoroughly develop a structured training plan tailored specifically for supervisors. This plan should aim to cultivate leadership behaviors conducive to addressing safety concerns and proficiently implementing security controls, thereby fostering a workplace environment characterized by heightened safety standards. It is essential for safety professionals and training managers operating within garment manufacturing enterprises to undertake determined efforts to augment worker's involvement in safety-related activities. This can be achieved through the careful execution of safety promotion policies, coupled with strategies to ensure sustained motivation among workers to achieve predetermined safety objectives. In the context of garment manufacturing companies, it is advisable for safety professionals and training managers to institute comprehensive safety training initiatives. These initiatives should prioritize familiarity with organizational safety protocols and procedures, employing communication strategies optimized for effective knowledge transfer. Supervisors within garment manufacturing establishments are encouraged to prioritize the provision of timely feedback and the swift rectification of any lapses in safety performance. This proactive approach serves to underscore the paramount importance of maintaining a safe and secure work environment. In the pursuit of enhancing workplace safety within garment manufacturing companies, safety professionals and training managers may consider adopting the proposed safety management framework. This framework offers a systematic approach to strengthening safety protocols, with particular emphasis on fostering safety leadership, safety participation, and safety knowledge. Future researchers may explore the landscape of safety management practices across diverse manufacturing sectors, beyond the confines of garment manufacturing companies.

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