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Analysis of safety talks or safety communication in industry: a literature review

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ABSTRACT
Improving safe and healthy working conditions is a must, with an emphasis on identifying and mitigating workplace hazards. Safety Communication or Safety Talk plays a key role in preventing work accidents and increasing workers' understanding of Occupational Safety and Health (K3). This research focuses on the analysis of Safety Talk or Safety Communication in industry as a response to the urgency of occupational health and safety. In a systematic review, applying the PRISMA method to search and analyze recent papers (2018-2023) on Safety Talk or Safety Communication in various search engines, including Google Scholar and Pubmed. Eligibility criteria and a review process were used to select 7 high-quality articles, and Mendeley was used for reference management. The research results confirm the important role of safety communications in improving compliance and performance in various industries. A positive relationship was seen between safety discussions, PPE compliance, and PPE understanding. Safety cultures vary across the construction industry, and climate and crew cohesion support safety communication. Safety messages via text messages were successful in increasing supervisor compliance. Safety communication mediates the relationship between safety culture and performance in the petrochemical industry. Conclusions emphasize expanding safety communication efforts to strengthen safety culture and improve performance in the work environment.

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INTRODUCTION

Workplace health and safety are crucial aspects in creating suitable working conditions (International Labour Organization, 2023). The importance of occupational health and safety lies in its ability to identify and control potential workplace hazards, with the aim of minimizing the likelihood of work accidents (Febrianti & Syaiful, 2022). One individual-level approach that can be undertaken, such as communication and education, is key to enhancing safety culture and preventing job-related injuries (Laroche et al., 2020).

Diseases and injuries caused by working conditions in 2016 were a major cause of 1.9 million deaths (WHO, 2021). Non-communicable diseases contributed to 81% of the total deaths, with chronic obstructive pulmonary disease reaching 450,000 cases, followed by stroke with 400,000 cases, and ischemic heart disease with 350,000 cases, all being major

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causes. On the other hand, injuries resulting from work accidents contributed 19% of the total deaths, reaching 360,000 (WHO, 2021).

Safety Communication is an important aspect in preventing work accidents. It involves the exchange of information, ideas, and feedback between individuals and teams to ensure a safe and secure work environment. Safety communication methods not only improve working conditions but also have a positive impact on employees' behavior and attitudes towards safety, thereby reducing incidents in the workplace (Naji et al., 2022). Regular implementation of Safety Talks can enhance workers' understanding and awareness of occupational health and safety (Romy Ananda Muslim & Feri Harianto, 2021). Furthermore, the implementation of Safety Talks ensures that workers understand safety permissions and procedures and comply with them, helping to prevent accidents and promote a safe working environment (Yudhana, 2017). However, excessive communication can negatively impact productivity and workers' concentration (Barrett et al., 2023).

To improve Safety Communication, companies can focus on developing employees' communication skills. This will ensure that the influence of psychological capital on safety behavior can be conveyed more effectively through competent communication (Mashi et al., 2020). Workplace leaders play a crucial role in Safety Communication, where team leaders can stimulate employee voices through empowerment and monitoring (Curcuruto & Griffin, 2023). The implementation of Safety Communication by supervisors not only enhances safety communication but also strengthens teamwork (Curcuruto & Griffin, 2023). The language used in workplace safety communication also significantly impacts post-accident error attribution among various parties (Obenauer & Kalsher, 2023).

Safety communication is a key factor in determining a positive and safe work environment, and innovative technologies such as social networks and mobile emergency response systems can improve communication and safety outcomes (Musarat et al., 2021). Safety voice is a proactive communication action that identifies hazards and dangerous ways of working in advance, and provides constructive suggestions to generate positive change in the workplace (Curcuruto et al., 2020).

Thus, the implementation of effective workplace safety communication is expected to make a positive contribution in creating a safe and productive work environment. The focus of this research is on the analysis of Safety Talks or Safety Communication in industry in responding to the urgency of occupational health and safety. This research can help highlight certain aspects of safety communications that have previously been overlooked or poorly understood, which in turn helps allocate attention to areas that require improvement or further development.

The results of this research have direct practical implications for industry and organizations in improving safety communications. Effective communication about safety is important to ensure that a company complies with all applicable safety regulations and standards. A literature review can highlight the relationship between good safety communication and a company's level of compliance with rules and regulations. Therefore, the research problem focused on in this study is how to analyze Safety Talks or Safety Communication in industry?

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METHODS

Strategy

In order to conduct a systematic review, the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) approach was applied to search for and analyze papers published in the last 5 years, from 2018 to 2023, related to Safety Talk or Safety Communication. The process of searching for articles was conducted through various search engines, including Google Scholar and PubMed, using keywords such as "Safety Talk in Industry," "Safety Communication in Industry," and "Safety Talk in Companies." Then, in the publication date filter menu, articles published in the last 5 years were selected. The steps of evaluating and analyzing articles can be seen in Figure 1, which is presented to provide a visual overview of the stages taken during this research.

Eligibility Criteria

In the article selection process, several inclusion criteria were applied, including: 1) articles specifically exploring Safety Talk or safety communication, 2) articles written in Indonesian or English, 3) articles published within the last five years, within the period from 2018 to 2023. Conversely, exclusion criteria involved: 1) articles that could not be accessed in full, 2) articles not indexed in Sinta or Scopus.

Review Process

In conducting the database search, the keywords "Safety Talk in Industry," "Safety Communication in Industry," and "Safety Talk di Perusahaan" were used. Articles were selected based on their titles and abstracts. Duplicate articles were identified and eliminated from consideration. After that, articles were filtered using the inclusion and exclusion criteria. Subsequently, the list of selected articles was evaluated to find the most relevant studies, while irrelevant articles were deleted.

Mendeley software was utilized in this process for review, title preparation, abstract preparation, identification of duplicate articles, and elimination of articles that did not meet the established criteria. The method ensures that important and high-quality research is preserved while systematically eliminating duplicate articles and irrelevant information. This approach is expected to produce accurate and high-quality research results.

Quality Assessment

After downloading and extracting articles from the specific database, evaluation was conducted according to the established inclusion criteria. Articles that did not meet the quality requirements for reporting were excluded from further consideration.

Data Extraction

After evaluating the quality of articles, selected 7 articles. The results are presented in the form of a data table that includes information such as author names, publication years, research titles, research designs, research findings, and article links. This information can be found in Table 1.

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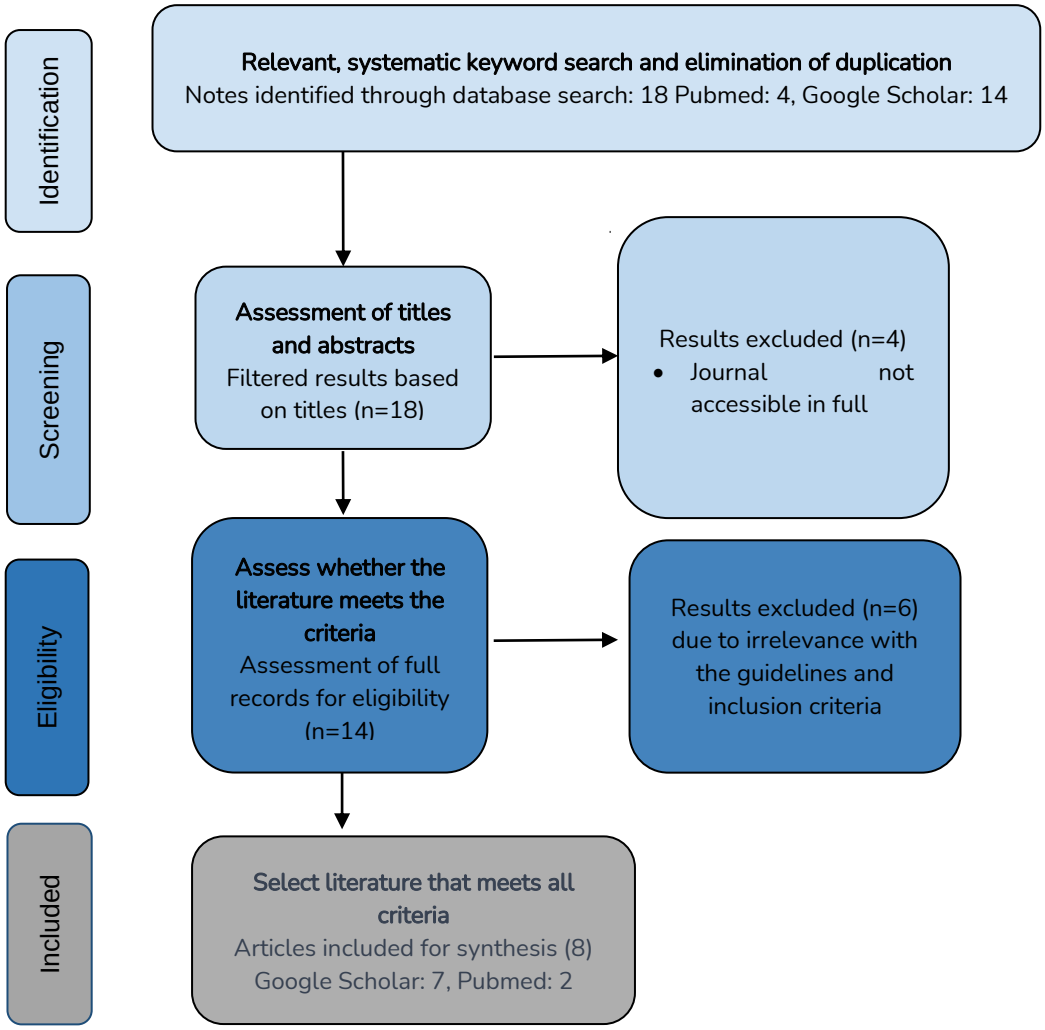

Figure 1. Flowchart of Screening Process

RESULTS AND DISCUSSION

Result

Based on Table 1, it is evident that overall, research affirms that safety communication, such as safety discussions and safety culture, plays a crucial role in enhancing compliance, understanding, and safety performance across various industries. Positive findings include the relationship between safety discussions and compliance with the use of personal protective equipment (PPE) and understanding of PPE. Safety culture varies across the construction industry, and safety climate and crew cohesion contribute positively to safety communication. Delivering safety messages through text messages successfully increased supervisor compliance with safety meeting standards. Safety communication also mediates between safety culture and safety performance in the petrochemical industry. The conclusion of this research emphasizes the importance of efforts to enhance safety communication as a key strategy in building an effective safety culture and improving safety performance in the workplace.

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Table 1 Analysis of Safety Talks or Safety Communication in Industries

No	Name (Year)	Title	Field	Method	Result	Conclusion
1	Gumelar and Ardyanto (2018)	Hubungan Kepatuhan Dan Pengetahuan Tentang APD Dengan *Safety Talk* di Unit Maintenance Perusahaan Semen	Manufacture	This research is observational in nature with a cross-sectional design. By employing a basic random sampling approach, data were collected from 67 workers through interviews and questionnaires. The independent variable is conversation safety, while the dependent variables include awareness and consciousness of PPE usage.	Analysis of the Safety Talks program in this industry shows effective results with 85.1% of companies receiving a good rating. The level of compliance in the use of personal protective equipment (PPE) is high, reaching 56.7%, and awareness of PPE is also high, namely 89.6%. Through statistical analysis using Pearson Chi Square, a relationship was found between Safety Talks and the level of compliance (p=0.001), as well as a relationship between Safety Talks and understanding of PPE (p=0.000). The conclusion of this study is that there is a positive relationship between Safety Talks and the level of compliance in using PPE, as well as the level of understanding of PPE.	Safety Talks program positively correlates with both the compliance level in using personal protective equipment (PPE) and the understanding of PPE among employees in the industry.
2	Cunningham and Jacobson (2018)	*Safety Talk* and Safety Culture: Discursive Repertoires as Indicators of Workplace Safety and Health Practice and Readiness to Change	Construction	This research was conducted through semi-structured interviews with 30 small and medium-sized construction business owners-managers (SCBs). Respondents self-assessed their involvement in safety programs on a 5-point scale from unaware to actively alert, and discussed	This analysis compares respondents' self-assessments regarding safety program activities with the results of analysis of Safety Talks or Safety Communication in industry. Using safety culture and behavior theory, variations in safety culture descriptions and levels of readiness for change were identified. Some owners/managers who consider their	The utilization of safety culture and behavior theory to juxtapose respondents' self-assessments regarding safety program activities with the findings from the Safety

				the significance of Occupational Health and Safety (OHS) and their attitudes toward improving safety practices in their businesses.	safety programs to be effective are actually less active in implementing safety values in the business.	Talks analysis.
3	Pandit *et al.* (2019)	Fostering Safety Communication among Construction Workers: Role of Safety Climate and Crew-Level Cohesion	Construction	Data was collected from 57 construction workplaces in the United States through direct visits. Questionnaire surveys were used to gather information about safety climate and crew cohesion. Subsequently, safety communication survey instruments were provided, and the necessary data to calculate network density - a metric of social network indicating the level of safety communication - were collected.	The results of data analysis show that there is a positive relationship between safety climate and the effectiveness of safety communication. Additionally, construction teams with stronger coherence show improvements in safety communication. Furthermore, there is evidence to suggest a joint positive impact of safety climate and crew coherence in increasing levels of safety communication.	There exists a positive correlation between safety climate and the effectiveness of safety communications.
4	Rice *et al.*, (2022)	Does sending Safety Toolbox Talks by text message to Residential Construction Supervisors increase Safety Meeting Compliance?	Construction	A pre/post single-subject design was planned to evaluate the feasibility of the intervention and its initial effects on supervisor compliance with safety meeting frequency. Our target sample size after attrition was 60 supervisors, calculated to detect a	Research results showed that supervisor compliance with OR-OSHA safety meeting standards increased by 19.39% during the text message intervention period. However, self-reported safety communication quality and employee safety performance assessed by supervisors did not change significantly. Supervisors expressed general appreciation for the	There was a notable increase in supervisor compliance with OR-OSHA safety meeting standards during the text message intervention period.

				pre/post intervention shift of 20% in the proportion of supervisors meeting OR-OSHA safety meeting standards. A larger cluster design was deemed impractical given funding constraints, project staff limitations, and challenges in recruiting participants in the residential construction industry.	mobile-based "toolbox talk" format, expressed interest in receiving it in the future, and indicated they would recommend it to other supervisors.	
5	Naji *et al.* (2022)	Assessing the Mediating Role of Safety Communication Between Safety Culture and Employees Safety Performance	Construction	Hierarchical sampling method was used to collect data in the petrochemical industry in Malaysia. Structural Equation Modeling (SEM) was employed to analyze the hypothesis model, using data from 320 participants.	The analysis results show that safety communication partially mediates the relationship between safety culture and safety performance. In addition, safety culture was found to have a positive and significant influence on safety performance.	Safety communication partially mediates the relationship between safety culture and safety performance.
6	Curcuruto and Griffin (2023)	Upward safety communication in the workplace: How team leaders stimulate employees' voice through empowering and monitoring supervision	Chemical Industry	A survey research was conducted in a multinational chemical industry with a total of 192 participants.	The study's statistical findings show that promotive and preventive safety voices are influenced solely by empowering supervision, whereas prescriptive voices are affected by both empowering and monitoring supervision. This highlights significant conceptual independence among safety voice categories, suggesting the need for tailored approaches in both research and organizational programs to foster open safety communication	Promotional and preventive safety voices are exclusively influenced by empowerment supervision, while prescriptive voices are influenced by both empowerment

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					at work.	supervision and monitoring.
7	Obenauer and Kalsher (2023)	Does blame always shift? Examining the impact of workplace safety communication language on post-accident blame attributions for multiple entities	Construction	The research used a 3x3 between-subjects design (warning language and employee ethnicity) through vignettes, depicting work accidents among construction workers. The warning language was manipulated into English only or English and Spanish, with statements regarding the percentage of Hispanic workers. The study involved 202 university students in a vignette experiment, manipulating warning language and employee ethnicity.	In three separate studies, it was found that factors such as the language used to convey safety warnings (Studies 1 & 2) and employee ethnicity (Studies 2 & 3) influenced the responsibilities attributed to lower-level leaders (job leaders). However, these factors have no relationship to the responsibility attributed to the injured employee who is the target of the communication. Therefore, these findings differ from attribution theory research which says that responsibility shifts from one entity to another.	Factors such as language and employee ethnicity influenced the responsibility attributed to lower-level leaders, but had no influence on the responsibility of injured employees.

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Discussion

The research findings indicate several advantages and efficiencies in safety communication strategies. Safety communication enhances compliance with the use of personal protective equipment (PPE) (Gumelar & Ardyanto, 2018). Mobile-based safety message delivery is known to effectively increase supervisor compliance (Rice et al., 2022). Safety climate and crew cohesion contribute to the efficiency of safety communication in the workplace (Pandit et al., 2019). Differential supervision has proven effective in stimulating various types of safety voices (Curcuruto & Griffin, 2023). Additionally, the use of warning language can influence post-accident attribution of responsibility (Obenauer & Kalsher, 2023). Thus, these research results suggest that diverse and efficient safety communication approaches can improve safety behavior and performance in various industrial contexts.

Effective safety communication methods include fostering a positive safety climate, encouraging informal communication, and using valid assessment tools. Research in construction emphasizes safety climate and team cohesion's role in fostering communication, along with the importance of informal communication and developing assessment tools (Cong et al., 2022). The Safety Talk program aims to prevent accidents and work-related illnesses, as well as to create a safe and healthy work environment (Anggraeni, 2019). Safety Talks are usually conducted before work activities begin and are carried out by the safety team (Kartika Syarif et al., 2019). During safety discussions, workers are informed about the use of personal protective equipment (PPE), the placement of warning signs, and the provision of first aid kits (Pratama, 2022). Safety Talks also provide an opportunity for workers to ask questions and clarify any doubts they may have regarding safety measures (Kartika Syarif et al., 2019).

Safety Talks have many benefits in improving the awareness and understanding of occupational health and safety (OHS) among workers. Some studies indicate that regularly conducting Safety Talks can help enhance workers' understanding and awareness of OHS (Romy Ananda Muslim & Feri Harianto, 2021). Furthermore, Safety Talks have also been proven effective in reducing the number of work-related accidents, demonstrating that workers' awareness and understanding of OHS have improved through the implementation of Safety Talks (Febrianti & Syaiful, 2022).

Safety discussions and safety communication are typically conducted before workers perform tasks to enhance communication, empower workers, reduce injuries, and improve safety (Kaskutas et al., 2016). Toolbox Talks (TBT) have the potential to improve safety by delivering important safety messages within the context of construction. TBTs can be participatory, context-based, and delivered in a manner that connects information with workers and involves them in identifying safety-related issues and solutions (Kaskutas et al., 2016). Virtual Huddles (morning meetings at the worksite with VDC assistance) can also be used to enhance communication at the worksite by focusing on specific tasks, not just general training or safety discussions (Mourgues et al., 2007).

The effectiveness and efficiency of safety discussions in a company are crucial for promoting a safety culture and ensuring compliance with safety protocols. Research has

shown that several factors influence safety culture compliance in the workplace, including management commitment to safety, availability of safety regulations and procedures, safety communication and feedback, effectiveness of safety training, and acquisition of safety knowledge (Isa et al., 2021). Safety Talks contribute to the development of a strong safety culture, which is important for reducing the number of incidents and ensuring employee well-being (Isa et al., 2021).

Safety Talks provide a platform for communicating important safety information, such as hazard identification, risk mitigation, and best practices, to employees at all levels of the organization (Smallwood, 2022). Safety Talks can empower employees to identify hazards and participate in the development of risk mitigation solutions, thereby contributing to a culture of active participation in workplace safety (Knode, 2020).

CONCLUSION

The results and discussion highlight the key role of Safety Talk and safety communication in enhancing compliance, understanding, and safety performance across various industrial sectors. Positive findings include the relationship between Safety Talk, compliance with the use of personal protective equipment (PPE), and understanding of PPE. Safety communication also acts as a mediator between safety culture and safety performance in specific industries.

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