

## **FACTORS INFLUENCING WORKER COMPLIANCE WITH PERSONAL PROTECTIVE EQUIPMENT (PPE) USAGE**

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### **Abstract**

Study aims to identify and analyze factors influencing worker compliance with Personal Protective Equipment (PPE) usage through a Systematic Literature Review (SLR) approach. Data were obtained from scientific articles indexed in PubMed, ScienceDirect, SpringerLink, MDPI, and Google Scholar databases with publication dates ranging from 2020-2025. The research methodology followed PRISMA 2020 guidelines for article selection, resulting in 20 articles meeting inclusion criteria. Analysis results indicate that PPE compliance is influenced by individual factors (knowledge, attitudes, risk perception), organizational factors (company policies, training, supervision, PPE availability), and social factors (colleague support, safety culture). These factors interact to shape worker compliance behavior. It is concluded that improving PPE usage compliance requires a multidimensional approach encompassing continuous education, adequate facility provision, strict supervision, and fostering strong workplace safety culture. These efforts are expected to reduce accident rates and enhance overall occupational safety

**Keyword:** compliance 1; equipment 2; protective 3; personal 4; factor

### **INTRODUCTION**

Personal Protective Equipment (PPE) refers to equipment used to protect workers from hazards and risks in the workplace. PPE is designed to reduce exposure to physical, chemical, biological, ergonomic, and other hazards that may cause injury or illness. The types of PPE required vary depending on the type of work and potential hazards present. Examples of PPE include safety helmets, eye protection, hearing protection, respiratory masks, gloves, safety shoes, and protective clothing.

Although PPE is available and regulations regarding its use have been established, worker compliance rates with PPE usage remain a serious problem in many industries. Many workers do not use PPE correctly or do not use it at all. This may be caused by various factors, such as lack of knowledge, negative attitudes toward PPE, PPE discomfort, insufficient supervision, or poor workplace safety culture. Non-compliance with PPE usage can result in fatal consequences. Work accidents and occupational illnesses can cause physical injury, permanent disability, or even death. Additionally, non-compliance can result in financial losses for companies, such as medical costs, worker compensation, and reduced productivity.

Therefore, it is important to identify factors influencing worker compliance with PPE usage and develop effective strategies to improve it.

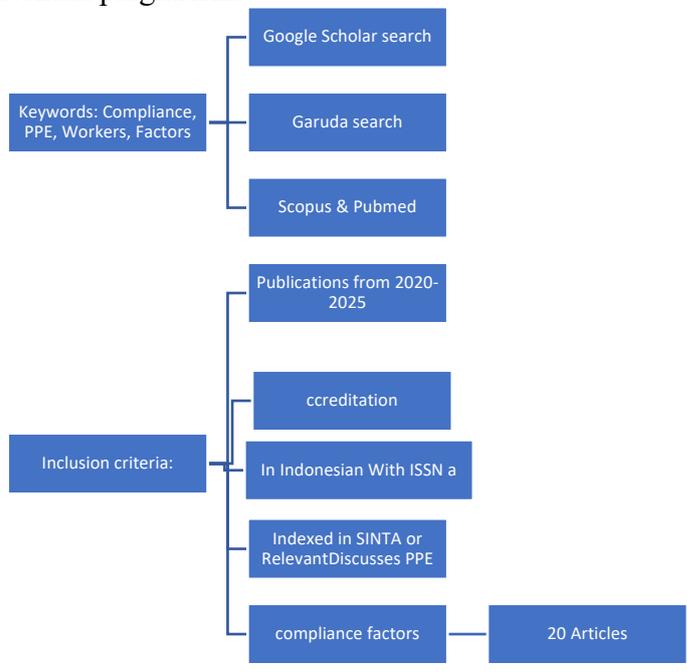
Addressing the problem of non-compliance with PPE usage requires a comprehensive and integrated approach. Intervention programs must be designed to address various factors affecting worker behavior, including increased knowledge, attitude change, increased motivation, stricter supervision, and improved workplace safety culture. Effective training programs can increase worker knowledge about occupational risks and benefits of PPE usage. Additionally, companies must ensure that provided PPE meets worker needs, is comfortable to

wear, and is easily accessible. Worker involvement in PPE selection can increase acceptance and compliance. Strict supervision and consistent rule enforcement are also important to ensure workers use PPE correctly. Furthermore, promoting a positive workplace safety culture can create an environment where workers feel motivated to protect themselves and their colleagues [1].

Based on literature review results, a study by [2] found that risk perception of hazardous situations, safety training, on-site safety supervision, and employment status significantly predict PPE usage rates at construction sites. In this research context, "worker compliance with PPE usage" is defined as the degree of alignment between worker behavior and occupational safety regulations and procedures that require appropriate PPE usage based on the type of work and potential hazards present. This research, titled "Factors Influencing Worker Compliance with Personal Protective Equipment (PPE) Usage," aims to identify and analyze key factors affecting worker compliance rates with PPE usage. By understanding these factors, it is hoped that effective strategies can be formulated to improve worker compliance and reduce occupational accident and illness risks.

**RESEARCH METHODS**

The research methodology used is systematic literature review to identify and analyze factors influencing worker compliance with Personal Protective Equipment (PPE) usage. Primary data sources come from scientific articles indexed in Google Scholar, Garuda, Scopus, and PubMed databases. Selected articles are publications between 2020-2025, in Indonesian language, and possess ISSN accreditation and are indexed in SINTA or other relevant databases. Article selection process followed PRISMA 2020 guidelines to ensure transparency and reduce bias, including identification, screening, eligibility, and inclusion of articles meeting criteria. Data analysis was conducted qualitatively by grouping main themes emerging from various studies, comparing and synthesizing findings to generate comprehensive conclusions while avoiding potential plagiarism.



## RESEARCH RESULTS

The table below presents results of comprehensive analysis of 20 scientific articles discussing factors influencing worker compliance with Personal Protective Equipment (PPE) usage across various industrial and healthcare sectors. Each article is described in detail, including author names, publication year, research objectives, methodology used, data collection instruments, and main findings relevant to the study topic. This analysis aims to provide a clear and structured overview of key factors contributing to worker compliance behavior, and its implications for occupational safety and health improvement efforts

**Table 1. Literatur Review**

No	Author, Year & Article Title	Research Objective	Research Method	Research Instrument	Research Findings
1	Inge Wasty, Vanda Doda, Jeini Ester Nelwan, published February 2021 in KESMAS Journal with title "Relationship Between Knowledge and Compliance with PPE Usage Among Hospital Workers: Systematic Review"	This research aims to explore and understand the level of knowledge among hospital workers in Indonesia regarding their compliance in using appropriate PPE	This research uses Systematic Review method conducted from April to October 2020, with data search through two databases, namely Google Scholar and Pubmed, and uses PRISMA method in article search process.	The main instrument in this research is the use of keywords such as "hospital workers," "knowledge," and "PPE Compliance" to identify relevant articles, with a total of 16 articles used in the analysis.	Research findings show that knowledge has a significant influence on PPE compliance among hospital workers, where workers with good knowledge levels tend to be more compliant in PPE usage, demonstrating that knowledge is an important factor in shaping behavior that is compliant with PPE usage.
2	Alya Alfianti Balqis, Intan Andhani, Raduwi Wahyuni, Abdurrozzaq Hasibuan, year 2025, with title "LITERATU RE STUDY: FACTORS INFLUENCI	This research aims to identify and analyze factors influencing PPE compliance in construction workers	The article uses literature study method reviewing scientific articles indexed in Google Scholar from 2018-2024 discussing factors affecting	Data sources used come from research articles and literature reviews discussing factors influencing construction worker compliance	Literature study results show that construction worker compliance in PPE usage is influenced by internal factors such as knowledge, attitudes, motivation, and work experience, as well as external factors such as supervision, PPE availability, company policies, and social support. These factors

No	Author, Year & Article Title	Research Objective	Research Method	Research Instrument	Research Findings
	NG PPE USAGE IN THE CONSTRUCTION SECTOR"[3]		worker PPE compliance in construction.	behavior in using PPE. Journals analyzed are publications that have been nationally indexed through Google Scholar, with publication range between 2018 and 2024.	interact in shaping workplace safety culture in construction project environments.
3	Sun Hee Park, published June 2020 in Infection & Chemotherapy with title "Personal Protective Equipment for Healthcare Workers during the COVID-19 Pandemic"[4]	The objective of this article is to review evidence on SARS-CoV-2 transmission methods, compare current PPE recommendations from the World Health Organization with those in Korea, and discuss standard requirements and appropriate PPE selection.	This article uses literature review method to discuss evidence on SARS-CoV-2 transmission methods, compare PPE recommendations, and discuss standard requirements and appropriate PPE selection.	The main instrument in this article is scientific literature and guidance from leading health organizations such as WHO, CDC, and ECDC.	This article discusses the importance of PPE for healthcare workers during the COVID-19 pandemic, highlighting various types of PPE available, and provides guidance on appropriate PPE selection based on transmission risk and types of procedures performed. The article also discusses standards and requirements for PPE, as well as the importance of training and proper usage.

No	Author, Year & Article Title	Research Objective	Research Method	Research Instrument	Research Findings
4	Aminu Darda'u Rafindadi, Madzlan Napiah, Idris Othman, Hamzh Alarifi, Usman Musa, and Musa Muhammad, published in 2022 in Ain Shams Engineering Journal with title "Significant factors that influence the use and non-use of personal protective equipment (PPE) on construction sites- Supervisors' perspective"[2]	The objective of this research is to investigate significant factors affecting PPE usage and non-usage from the supervisor perspective, and to assess general safety awareness regarding PPE.	This research uses quantitative method with survey approach. Data collected through questionnaire s from 96 construction supervisors in Malaysia. Data analyzed using descriptive analysis and multiple linear regression.	The research instrument includes questionnaires measuring factors influencing PPE usage, reasons for non-PPE usage, and general safety awareness. Questionnaires were evaluated for validity and reliability.	Research findings show that risk perception of hazardous situations, safety training, on-site safety supervision, and employment status significantly predict PPE usage rates at construction sites. The research also found that many supervisors are unaware of important safety aspects related to PPE.
5	Petros Galanis, Irene Vraka, Despoina Frangkou, Angeliki Bilali, and Daphne Kaitelidou, published in 2021 in American Journal of Infection	The objective of this research is to assess the impact of PPE use on healthcare workers' (HCW) physical health during the COVID-19	This research uses systematic review and meta-analysis method, with data search in PubMed, Medline, Scopus, ProQuest, CINAHL, and medRxiv from January	The main research instrument is frequency of adverse events among HCW due to PPE usage, including information about authors, location,	Research findings show that frequency of adverse events among HCW due to PPE usage is very high, with several risk factors related to these events, including obesity, diabetes mellitus, smoking, headaches previously present, longer shift duration with PPE, increased consecutive workdays with PPE, and increased exposure to

No	Author, Year & Article Title	Research Objective	Research Method	Research Instrument	Research Findings
	Control with title "Impact of personal protective equipment use on healthcare workers' physical health during the COVID-19 pandemic: A systematic review and meta-analysis"	pandemic and to test factors related to increased risk of adverse events from PPE usage.	1, 2020 to December 27, 2020.	sample size, age, gender, study design, sampling method, adverse event assessment, response rate, data collection time, publication type, number and types of adverse events among HCW, and factors related to higher risk of adverse events.	confirmed or suspected COVID-19 patients, implying the need for preventive measures and changes in work conditions to minimize hazards for HCW.
6	Amir Hossein Khoshaklagh, Mahdi Malakoutikhan, JeeWoong Park, Mohammad Dehghani Kodnoueieh, Zakiyeh Rafieian Boroujeni, Maryam Bahrami, and Fatemeh Ramezani, published in 2024 in BMC Public Health with title "Assessing	The objective of this research is to investigate PPE utilization among small and medium-sized enterprise (SME) workers and its relationship with knowledge, attitudes, performanc	This research uses cross-sectional method with questionnaires distributed throughout SMEs in Kashan city in 2023. The tools used include three questionnaires: demographic, safety culture, and knowledge, attitudes, and performance. The research	Three questionnaires are used: demographic, safety culture, and knowledge, attitudes, and performance questionnaires designed by Toori et al.	Research findings show that 72.4% of participants use some PPE, although not all types. Lowest scores for safety culture dimension relate to safety training at 1.58. Final model results show that assumed relationships among variables, as described in research objectives, are well-established, with all connections statistically significant. It can be concluded that inadequate legal supervision for small industries exists. Therefore, it can be concluded that if supervision and

No	Author, Year & Article Title	Research Objective	Research Method	Research Instrument	Research Findings
	personal protective equipment usage and its correlation with knowledge, attitudes, performance, and safety culture among workers in small and medium-sized enterprises"[5]	e, and safety culture among workers.	population was 529 SMEs. Total sample size was 369 people and questionnaires were distributed among SME workers. Finally, SPSS software was used for statistical analysis and structural equation modeling.		regulations are increased for training and safety implementation, this can cause increased PPE usage.
7	Muzaffer Atasoy, Bayram Ali Temel, and Hasan Basri Basaga, published in 2024 in Buildings with title "A Study on the Use of Personal Protective Equipment among Construction Workers in Türkiye"[6]	The objective of this research is to test habits and attitudes of construction sector employees in Türkiye regarding PPE usage.	This research uses comprehensive face-to-face survey method conducted with 398 employees selected randomly from small and medium construction companies in various regions of Türkiye.	The research instrument includes a survey consisting of 22 questions designed to identify frequency of PPE usage and factors influencing its usage.	Research findings show that although most workers are aware of PPE importance, actual usage rates are inconsistent. Key factors influencing PPE usage include ergonomics and comfort of equipment as well as worker perceptions and attitudes.
8	Mohammad Ali Hossain, Md Utba Bin Rashid, Md Abdullah Saeed Khan, Sabrina	The objective of this research is to assess knowledge, attitudes,	This research uses cross-sectional method, where online and offline surveys were	A validated questionnaire consisting of five sections (socio-demographic	Research findings show that healthcare workers have good knowledge and attitudes regarding PPE overall, but poor practices related to PPE. The research also highlights

No	Author, Year & Article Title	Research Objective	Research Method	Research Instrument	Research Findings
	Sayeed, Md Abdul Kader, and Mohammad Delwer Hossain Hawlader, published in 2021 in Journal of Multidisciplinary Healthcare with title "Healthcare Workers' Knowledge, Attitude, and Practice Regarding Personal Protective Equipment for the Prevention of COVID-19"[7]	and practices (KAP) related to PPE among healthcare workers, and to survey about possible determinants.	conducted among a sample of 393 healthcare workers from five different districts in Bangladesh.	, work-related information, knowledge, attitudes, and practice) was used for data collection.	factors influencing KAP toward PPE that should be addressed in future education, awareness, and counseling programs.
9	Yohani Wahyu Kumala Aprilianti, Ratna Ayu Ratriwardhani, Abdul Hakim, and Zakkij Fassyal, published in 2022 in Indonesian Public Health Media with title "Literature Review:	The objective of this literature review is to analyze factors related to PPE usage behavior.	This research uses traditional literature review method, with article sources from Garuda Portal and Google Scholar from 2017-2021 time range.	The analysis focuses on similarities among cases (method of agreement) or differences in similar cases (method of difference). Average value calculations use Microsoft Excel.	Research findings show that there are 10 journals showing several variables with similarities but also differences in test results. Variables knowledge, attitudes, and work tenure are analyzed by all five articles. Thus it can be concluded that worker behavior and compliance in using PPE can be influenced by several factors including knowledge, attitudes, social support, work tenure and PPE availability.

No	Author, Year & Article Title	Research Objective	Research Method	Research Instrument	Research Findings
	Factors Related to PPE Usage Behavior"[8]				
10	"Analysis of Factors Affecting PPE Use Behavior in Machining Workshop Employees" or in English "Analysis of Factors Affecting PPE Use Behavior in Machining Workshop Employees" written by Muhamad Iqbal, Hana Gumiyarna, and Een Suhaenah. This journal is published in Journal of Occupational Safety, Health and Environment (JK3L) Volume 05 (1) in 2024.[9]	This research aims to analyze the influence of noise and other factors on PPE usage behavior in machining workshops at PT. X. The objective is to improve employee safety and occupational health in that environment.	This research uses quantitative method. Data collected from 95 machining workshop employees at PT. X.	Data collection instruments include questionnaires to gather information about PPE usage policies and worker knowledge, observations to observe supervision and PPE usage behavior, and noise measurements using a dosimeter for 2 hours for each worker.	Research findings show significant relationship between supervision and PPE usage behavior. Suboptimal company supervision correlates with low PPE usage compliance. Additionally, clear PPE policies also have significant relationship with PPE usage behavior. High knowledge levels about PPE increase awareness and compliance, although low noise levels actually reduce compliance.
11	Ratna Lestari, Agus Warseno, year 2021, with title "Analysis of Factors	This research aims to determine factors related to worker	This is a correlational research with cross-sectional approach. Sample in	The main instrument is a PPE compliance questionnaire and observation	Research findings show that 76.7% of workers are non-compliant in using PPE. All variables are not related to worker compliance in using PPE, namely age (p-value

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.	Related to Worker Compliance in Using PPE at PT Madubaru Yogyakarta"	compliance in using PPE at PT Madubaru Yogyakarta.	this research is workers in Steam Boiler Station and Grinding unit totaling 86 people using purposive sampling. Data collection uses PPE compliance questionnaires and analysis uses chi-square correlation test with 95% confidence level.	sheet created by the researcher based on Occupational Health Nursing (Oakley, 2008). Questionnaire and observation sheet have passed expert validation with content validity index from 3 experts.	0.942), education (p-value 0.300), and work tenure (p-value 0.077).
12	[1], with title "Factors Related to PPE Usage Compliance in Welding Workers at Hazardous Waste Storage Building Construction Project, Dumai Branch"	The objective of this research is to determine factors related to compliance with PPE usage among welding workers at the hazardous waste storage building construction project, Dumai branch.	This research is analytical quantitative in nature with cross-sectional design. Sample size is 47 people using total sampling technique. Data analysis uses chi-square test and logistic regression test.	The research instrument is a questionnaire to collect data on independent variables (age, work tenure, education, knowledge, attitudes, PPE availability, and supervision) and dependent variable (PPE usage compliance).	Research findings show significant relationships between age (p=0.008), education (p=0.034), work tenure (p=0.028), knowledge (p=0.045), attitudes (p=0.003), and supervision (p=0.002) with PPE usage compliance. From multivariate analysis, supervision is the variable significantly related to PPE usage compliance.

No	Author, Year & Article Title	Research Objective	Research Method	Research Instrument	Research Findings
13	[10], with title "Factors Influencing Workers in Using PPE at PT. X"	This research aims to examine factors affecting workers in PPE usage at PT. X.	This is analytical research with cross-sectional approach. Research population is all workers at PT X while research sample is 77 PT X workers. Sampling technique uses purposive sampling based on inclusion criteria.	The research instrument is a questionnaire. Data collection technique through interviews. Data analyzed using chi-square statistical test.	Results obtained show that workers who are non-compliant in PPE usage are categorized as poor at 61.0%. Bivariate results show variables affecting workers in PPE usage is supervision (p-value=0.001). Variables not affecting PPE usage behavior are colleagues (p-value=0.522) and punishment (p-value=0.281). From above results it can be concluded that PPE usage compliance at PT. X is affected by supervision.
14	[11]with title "Relationship Between Work Duration, Supervision, and PPE Comfort with Compliance Behavior of PPE Usage (APD) in PA Plant Workers PT X"	The objective of this research is to determine the relationship between work tenure, supervision, and PPE comfort with compliance behavior of PPE usage.	The method used in this research is observational analytical with cross-sectional approach with 37 workers selected randomly.	Data collected using questionnaires and PPE usage compliance checklists. Data then analyzed using Spearman's rho test.	Research findings show majority have long work tenure (62.2%), feel comfortable using PPE (75.7%), have good supervision (67.6%), and are compliant with PPE usage (64.9%). No relationship between PPE usage compliance behavior and work tenure (p=0.527). There is relationship between PPE usage compliance behavior and PPE comfort (p=0.000), and supervision (p=0.000).
15	Asril, Muh. Caesar Sapto Widodo, Sumardi Sudarman,	The objective of this research is to	This research type is analytic survey with cross-	The main research instrument is a	Research findings show there is relationship between knowledge (p=0.002), PPE availability (p=0.001)

No	Author, Year & Article Title	Research Objective	Research Method	Research Instrument	Research Findings
	Muharti Syamsul, Rama Nur Kurniawan K, year 2024, with title "Factors Related to PPE Usage Compliance Among Firefighters in Jeneponto Regency"	determine factors related to PPE usage compliance among firefighters in Jeneponto Regency.	sectional study design with 96 respondents using purposive sampling method and results obtained from survey using questionnaires.	questionnaire.	toward PPE usage compliance, and training (p=0.673) and work tenure (p=0.953). It is concluded that there is relationship between knowledge and PPE availability toward PPE usage compliance, and no relationship between training and work tenure toward PPE usage compliance among firefighters in Jeneponto Regency.
16	[12], year 2024, with title "PPE Usage Compliance Among Informal Sector Workers in Indonesia: A Literature Review"	To identify components that can influence worker compliance behavior regarding PPE usage in the informal sector.	This research uses literature review method with article search strategy in research journals and searches through Google Scholar with 2022-2023 time range using keywords Personal Protective Equipment (PPE), workers, and informal sector. Searches found 796 articles, then selected using PRISMA-ScR until 5	The research gathers data through search from Google Scholar database. Data collection conducted through search with several stages. First stage conducted journal search by setting theme then conducted article exploration by applying keywords namely personal protective equipment (personal	Informant compliance remains low, proven by observation and interview results stating that all informants do not completely use required PPE while working. Thus need to increase knowledge and attitudes related to PPE usage compliance in informal sector.

No	Author, Year & Article Title	Research Objective	Research Method	Research Instrument	Research Findings
			articles remained matching the topic.	protective equipment); workers (worker), and informal industry (informal industry).	
17	KSartika, Febriana, Muh. Khidri Alwi, Nur Ulmy Mahmud, Rahman, year 2024, with title "FACTORS OF EMPLOYEE COMPLIANCE WITH PPE USAGE DURING COVID-19 PT. INDONESIA N SHIPPING INDUSTRY"	This research aims to determine factors related to employee compliance toward PPE usage during Covid-19.	This research type is quantitative with cross-sectional study approach. Sample number in this research is 82 people at PT. Indonesian Shipping Industry (State-Owned Enterprise) Makassar with purposive sampling method.	Data collection uses questionnaires, then analyzed using chi-square test at 95% confidence level (a=0.05).	Research findings show significant relationships between knowledge (p-value = 0.000) and employee compliance, attitudes (p-value= 0.000) and employee compliance, and work tenure (p-value 0.001) and employee compliance at PT. Indonesian Shipping Industry (State-Owned Enterprise) Makassar.
18	Novel Yunus Runtuwarow, Paul Arthur Tennov Kawatu, Sri Seprianto Maddusa, year 2020, with title "Relationship Between PPE Usage Compliance and Occupational	This research aims to determine relationship between PPE usage compliance and occupational accident incidents at PT. Tropica Cocoprime Lelema	This research type is observational that is cross-sectional, conducted in November 2019 -- February 2020. Population is all workers in open area section totaling 99	The questionnaire from Barizqi (2015) used with construction workers at PT. Adhi Karya TBK Telogorejo Semarang. Questionnaire contains 12 questions.	Results measured PPE gloves with non-compliant respondents totaling 50 (50.5%) and compliant totaling 49 (49.5%), measured PPE safety shoes with non-compliant respondents totaling 54 (54.5%) and compliant totaling 45 (45.5%), measured occupational accident events with respondents having experienced accidents totaling 60

No	Author, Year & Article Title	Research Objective	Research Method	Research Instrument	Research Findings
	Accidents" [13]	Village, South Minahasa Regency.	people, instrument used is research questionnaire . Analysis used is Chi Square statistical test.		(60.6%) and never experienced totaling 39 (39.4%). Statistical test shows there is relationship between PPE glove usage compliance and occupational accidents (p = 0.000) and PPE safety shoe usage compliance and occupational accidents (p = 0.000).
19	Siti Aifatul Solekhah, year 2020, with title "Compliance Behavior Factors in PPE Usage Among Workers in Machining Crank Shaft Section and Plastic Painting Section Based on Bang Zero Observation Program (B-Zop)"	The objective of this research is to determine factors related to employee compliance toward PPE usage during Covid-19.	This research type is quantitative with cross-sectional study approach. Sample number in this research is 82 people at PT. Indonesian Shipping Industry (State-Owned Enterprise) Makassar with purposive sampling method.	Data collection uses questionnaires, then analyzed using chi-square test at 95% confidence level (a=0.05). Observation sheet from company XY.	Research findings show significant relationships between knowledge (p-value = 0.000) and employee compliance, attitudes (p-value= 0.000) and employee compliance, and work tenure (p-value 0.001) and employee compliance at PT. Indonesian Shipping Industry (State-Owned Enterprise) Makassar. Conclusion from this research is there is relationship between attitudes, knowledge, work tenure and PPE condition with employee compliance toward PPE usage during Covid-19 at PT. Indonesian Shipping Industry (State-Owned Enterprise) Makassar.
20	This article written by Hairil Akbar, Darmawansyah, Agung Sutriyawan, Herman Hatta, and Moh. Rizki	This research aims to determine whether there is relationship between welding	This research type is observational analytic with cross-sectional approach. This approach	The statistical instrument used in this research is Chi-Square test. This test is used to analyze	Research findings show significant relationship between knowledge and welding worker behavior in PPE usage, with p value (p value) = 0.003. This means welding workers with good knowledge levels tend to

No	Author, Year & Article Title	Research Objective	Research Method	Research Instrument	Research Findings
.	Fauzan. Published December 2020, with title "The Relationship Between Knowledge and Behavior of Using Personal Protective Equipment (PPE) among Welding Workers in Balongan District" or in English "The Relationship Between Knowledge and Behavior of Using Personal Protective Equipment (PPE) among Welding Workers in Balongan District." [14]	worker knowledge levels and their behavior in using PPE in Balongan District. In other words, this research wants to examine whether workers with good PPE knowledge tend to be more compliant in using it while working.	involves data collection at one point in time to examine relationship between knowledge and PPE usage behavior among welding workers in Balongan District. Sample number used is 43 welding workers.	data that has been collected and determine whether there is statistically significant relationship between knowledge and PPE usage behavior among welding workers.	be more compliant in using PPE while working.

**DISCUSSION**

Analysis of 20 scientific articles shows significant variation in sample sizes and characteristics. Some studies used small samples focused on specific sectors, such as research by [11] involving 37 workers at PA Plant PT X. Conversely, other studies used larger samples for broader representation, such as research by [5] involving 369 workers across various SMEs. This variation reflects the complexity of factors affecting PPE compliance across different industrial contexts.

Literature review from 2020 to 2025 reveals interesting trends in factors influencing PPE usage. During early COVID-19 pandemic (2020-2021), the main focus was on worker knowledge and attitudes toward PPE, as shown in research by [15]. However, over time, research began highlighting the importance of organizational and workplace environmental factors, such as comfortable PPE availability and effective supervision, as found by A [6]

Of the 20 analyzed articles, 13 came from nationally indexed journals and 7 from international journals. National journals include publications such as Journal of Occupational Safety, Health and Environment (JK3L) and Indonesian Public Health Media. International journals include Ain Shams Engineering Journal and American Journal of Infection Control. Publications in these journals demonstrate relevance and scientific validity of research on factors influencing PPE usage.

Adequate and appropriate PPE availability is an important factor in influencing worker compliance. Research by [16] emphasizes that readily accessible and appropriate PPE availability contributes significantly to compliance increase. Additionally, PPE comfort is also a determining factor, as found by [17], that workers tend to be more compliant if used PPE is comfortable.

#### **Individual Factors**

Individual factors play an important role in determining PPE usage compliance. Knowledge about occupational risks and PPE benefits, positive attitudes toward safety, and relevant work experience contribute significantly to compliant behavior. Research by [18] shows that workers with good knowledge levels tend to be more compliant in using PPE

#### **Social Factors**

Social support from colleagues and strong workplace safety culture also influence PPE usage compliance. Research by [19] shows that colleague support and positive social norms can increase worker awareness and motivation to use PPE. Strong safety culture creates an environment where workers feel motivated to protect themselves and their colleagues.

#### **Education Factors**

Adequate education and training levels also contribute to PPE usage compliance. Research by [20] found that workers with higher education levels tend to be more compliant in using PPE. Effective training can increase worker knowledge about occupational risks and benefits of PPE usage, as well as skills in using PPE correctly.

#### **Age and Work Tenure Factors**

Age and work tenure can also influence PPE usage compliance. Research by [21] found that age and work tenure are significantly related to PPE usage compliance. Younger workers and those with longer work tenure tend to be more compliant in using PPE. This may be due to more work experience and higher awareness of occupational risks.

Using systematic review method, it was found that knowledge has significant influence on PPE usage compliance among hospital workers. Workers with good knowledge levels tend to be more compliant in PPE usage, showing that knowledge is an important factor in shaping behavior compliant with PPE usage.

Research by [16] shows that construction worker compliance in PPE usage is influenced by internal factors such as knowledge, attitudes, motivation, and work experience, as well as external factors such as supervision, PPE availability, company policies, and social support. These factors interact in shaping occupational safety culture in construction project environments.

Research by [2] found that risk perception of hazardous situations, safety training, on-site safety supervision, and employment status significantly predict PPE usage rates at construction sites. This research also found that many supervisors are unaware of important safety aspects related to PPE.

Research by [5] shows that 72.4% of participants use some PPE, although not all types. Final model results show that assumed relationships among variables, as described in research objectives, are well-established, with all connections statistically significant.

## **CONCLUSION**

Based on literature analysis of 20 articles, the main problem faced is low worker compliance rates with Personal Protective Equipment (PPE) usage, which threatens occupational safety and health with potential to cause occupational accidents and illnesses. Addressing this problem requires a multidimensional approach encompassing increased worker knowledge and awareness, provision of ergonomic and comfortable PPE, effective supervision, and fostering strong workplace safety culture. Factors influencing compliance include individual factors (knowledge, attitudes, risk perception), organizational factors (policies, training, PPE availability), and social factors (colleague support, safety culture), which interact in shaping worker compliance behavior toward PPE usage.

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