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Implementation of worker health monitoring through a health, safety, and environment system

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Abstract

Background: Work health monitoring is an important component in the management of occupational safety and health (OSH), especially in the electrical sector. The implementation of an effective health monitoring program contributes to the prevention of workplace accidents, enhances worker welfare, and increases productivity.
Purpose: To analyze the implementation of the worker health monitoring program through the health, safety, and environment (HSE) system.
Method: This study uses a descriptive qualitative design. Data were collected through in-depth interviews, focus group discussions (FGD), and observations involving five informants who were purposively selected. Data is analyzed based on four components, namely planning, implementation, reporting, and monitoring, evaluation, and follow-up.
Results: The planning component of the health monitoring program has generally been well implemented, supported by hazard identification procedures, HIRAC documentation, and the Wellness application. At the implementation stage, workers regularly undergo scheduled health check-ups, but special health examinations, health promotion, and on-site health services are still limited. The reporting system has not been implemented comprehensively because periodic health reporting, medical audits, and integrated health documentation are not yet available. Additionally, monitoring and evaluation activities have not been carried out systematically, with limitations in management reviews, follow-up mechanisms, and occupational health personnel, which reduce the program's effectiveness.
Conclusion: The implementation of the worker health monitoring program through the HSE system has been partially carried out, but it is not yet fully optimal. Improvements are needed in specialized occupational health services, integrated health reporting systems, monitoring and evaluation mechanisms, as well as a commitment to strengthening occupational health management and enhancing worker safety and well-being.

Keywords: Health Monitoring; HSE; Implementation; Occupational Health; Occupational Safety.

INTRODUCTION

Occupational safety and health (OSH) is a fundamental component of sustainable human resource management, particularly in industries with high occupational hazards such as the electricity sector. According to the international labour organization (ILO), occupational safety and health aims to promote and maintain the highest degree of physical, mental, and social well-being of workers, prevent occupational diseases, protect workers from workplace hazards, and ensure that work is adapted to workers' physiological and psychological capacities (Sujoso, 2022). An effective OSH system not only protects workers but also enhances organizational productivity, operational continuity, and overall corporate performance.

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Despite continuous improvements in occupational health policies, occupational accidents and diseases remain major global public health concerns. The ILO estimates that approximately 2.78 million workers die annually due to occupational accidents and work-related diseases. Of these deaths, nearly 86.3% are caused by occupational diseases, while 13.7% result from occupational accidents. In addition, an estimated 374 million non-fatal occupational accidents occur each year, some of which result in temporary or permanent disabilities, reduced productivity, and substantial economic losses for both workers and employers. These statistics indicate that occupational health surveillance should be regarded as a strategic investment rather than merely a regulatory obligation.

Indonesia continues to experience a relatively high number of occupational accidents. Data from the Social Security Agency for Employment indicate that occupational accident claims increased consistently from 182,835 cases in 2019 to 221,740 cases in 2020, 234,370 cases in 2021, 297,725 cases in 2022, and 360,635 cases from January to November 2023. This number increased further to 462,241 occupational accident cases in 2024, indicating that occupational safety remains a national challenge requiring stronger preventive strategies (Ministry of Manpower and Transmigration of the Republic of Indonesia, 2024). Most accidents occur in the industrial and plantation sectors and are generally associated with machinery, electrical equipment, transportation devices, hand tools, and unsafe work practices. These findings indicate that strengthening occupational health monitoring and preventive interventions is essential to reduce occupational risks.

The implementation of *a* health, safety, and environment (HSE) management system has become one of the primary approaches adopted by organizations to prevent occupational injuries and diseases. In Indonesia, HSE implementation is mandated through Law No. 1 of 1970 concerning occupational safety, which requires employers to provide a safe working environment and protect workers from occupational hazards. However, its implementation at the national level remains inconsistent due to limited management commitment, inadequate safety culture, limited financial resources, and weak regulatory enforcement. Consequently, many organizations continue to focus primarily on accident response rather than proactive occupational health surveillance and risk prevention (Ervianto, 2023).

In the electricity industry, occupational hazards are significantly higher than in many other sectors because workers are routinely exposed to electrical shock, work at heights, extreme environmental conditions, confined spaces, and hazardous equipment. Based on PLN's national safety report, 29 occupational accidents occurred in 2022, resulting in 14 worker fatalities. These incidents underscore the importance of implementing a comprehensive HSE system that integrates hazard identification, occupational health monitoring, incident reporting, and preventive interventions. HSE databases also play an important role in documenting accidents, identifying risk trends, evaluating organizational performance, and supporting evidence-based decision-making to prevent similar incidents in the future (Harnawati, 2024)

PT. PLN ULP Natar is one of the operational units responsible for electricity distribution and maintenance activities. Workers, particularly field workers, are exposed to various occupational hazards, including electrical shock, falls from heights, extreme environmental conditions, and disturbances from wildlife. Preliminary findings identified several occupational health problems among workers, including hypertension, diabetes mellitus, mild depression, and dyslipidemia. Although the company has implemented an annual medical check-up (MCU) program and utilizes the Wellness application to monitor workers' health records, routine daily health screening before work activities has not been implemented consistently. Consequently, early signs of health problems may remain undetected until workers require prolonged sick leave, thereby reducing productivity and increasing organizational healthcare costs.

Several occupational incidents further demonstrate the urgency of improving health monitoring practices. In January 2026, two field workers sustained severe electrical injuries accompanied by serious burns. Subsequently, in March 2026, several workers experienced dizziness and nausea after falling from elevated work locations, resulting in minor injuries. These incidents indicate that occupational health surveillance should not focus solely on compliance with annual medical examinations but should also include continuous

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health monitoring, early detection of medical conditions, and regular fitness-for-work assessments before workers perform high-risk tasks.

Previous research found that the occupational safety and health management system (SMK3) at PT. PLN Distribution Central Java and Yogyakarta, had generally been implemented effectively, although improvements were still required in inspection, monitoring, and evaluation activities. These studies primarily focused on the implementation of occupational safety management systems and workers' compliance with safety procedures. However, attention to the implementation of worker health monitoring programs, particularly those integrated within the HSE framework, remains limited (Salafudin et al., 2013).

This study addresses this research gap by analyzing the implementation of the worker health monitoring program through the HSE system. Unlike previous studies that emphasized occupational safety management, this study comprehensively analyzes four key components of occupational health monitoring: planning, implementation, reporting, and follow-up through monitoring and evaluation. The findings are expected to provide practical recommendations for strengthening occupational health surveillance, improving workers' health status, reducing occupational risks, and supporting continuous improvement in HSE implementation within Indonesia's electricity sector.

RESEARCH METHOD

This study employed a qualitative research design with a descriptive approach to analyze the implementation of the employee health monitoring program through the HSE system. The study was conducted at PT. PLN ULP Natar, Lampung, from May–June 2026. This approach was used to explore the experiences, perceptions, and information provided by respondents within the context of program implementation in the field. Respondents were selected using purposive sampling based on their roles, responsibilities, and involvement in the implementation of the health monitoring program through the HSE system. This study involves five respondents with varying characteristics, and to maintain confidentiality, the respondents were assigned codes ranging from 1.01 to 1.05. Respondent 1.01 is a manager serving as the primary informant, 1.02 is the head of the K3 unit serving as the source informant. The other three respondents, 1.03, 1.04, and 1.05, are field workers serving as supporting informants.

The inclusion criteria comprised workers or managers involved in the implementation of the health monitoring program through the HSE system; individuals with relevant experience and knowledge regarding the implementation of the employee health monitoring program; individuals with direct roles, responsibilities, or involvement in OSH activities and employee health monitoring; and individuals who were willing to participate as respondents and provide the information required for the study. The exclusion criteria comprised respondents who were not involved in the implementation of the employee health monitoring program, lacked relevant experience or information related to the research focus, were unable to complete the interview or a focus group discussion (FGD) process, or withdrew from the study during the data collection process.

The independent variable in this study was HSE system, whereas the dependent variable was the implementation of the employee health monitoring program. Data from the manager and the head of the OSH unit were collected through in-depth interviews, while data from the field workers were obtained through FGD. The study focused on the implementation of the employee health monitoring program through the HSE system, which was analyzed based on four aspects: planning, implementation, reporting, and evaluation. Planning included procedures for pre-employment health examinations, periodic health examinations, special health examinations, and environmental surveillance. Implementation focused on efforts to protect workers from occupational disease risks, improve physical fitness, and establish a safe working environment. Reporting included the results of program implementation in the form of data or documentation, whereas evaluation involved utilizing the reported results as a basis for determining improvement measures to be undertaken by the company.

The study data consisted of primary and secondary data. Primary data were obtained through in-depth interviews and FGD, while secondary data were obtained through observations and document reviews, including records, reports, and program-related data. Data collection was conducted through

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several stages, including obtaining research permission, conducting initial observations, explaining the research objectives and procedures to prospective respondents, conducting in-depth interviews and FGD, and documenting the research activities. The interviews were audio-recorded to ensure data completeness, while the interview and documentation results were retained for subsequent analysis.

The research instruments included an interview guide, observation checklist, documentation guide, and voice recorder as an auxiliary data collection tool. Data validity was assessed through triangulation. Source triangulation was conducted by comparing observation findings with information obtained from respondents and comparing interview findings with actual field conditions and relevant documents related to the health monitoring program. In addition, researcher triangulation and theoretical triangulation were employed as part of the data validation process.

Data were analyzed interactively through the stages of data reduction, data display, conclusion drawing, and verification. Interview data were transcribed and subsequently combined with the findings from observations and document reviews. The data were then reduced and coded according to the research variables and presented in the form of narrative descriptions, matrices, tables, or relevant documentation to identify patterns, implementation processes, and challenges in the implementation of the HSE program. Finally, conclusions were drawn and the findings were re-verified against the available data to ensure their consistency with actual field conditions.

The study adhered to ethical principles, including beneficence, respect for human dignity, and justice. Respondents were provided with information regarding the research objectives, procedures, types of data required, benefits, and confidentiality before providing informed consent to participate. The confidentiality of respondents' identities was maintained through the use of codes. Participation in the study was voluntary, and respondents had the right to decide whether to participate and to withdraw from the study. This study received research approval from the Faculty of Health Sciences, Universitas Mitra Indonesia, under Approval No. S.24/252/FKES07/2026.

RESEARCH RESULTS

Table 1. Characteristics of the Informant

Informant Code	Informant Category	Age (year)	Educational Level
1.01	Manager	44	Bachelor's Degree (S1)
1.02	Head of the Occupational Safety and Health (OSH) Unit	39	Bachelor's Degree (S1)
1.03	Field Worker	27	Bachelor's Degree (S1)
1.04	Field Worker	30	Bachelor's Degree (S1)
1.05	Field Worker	34	Bachelor's Degree (S1)

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Table 2. Results of the Analysis of the Input/Planning Component of the Health Monitoring Program

Component and Indicator	Supporting Informants	Observation Findings
Planning		
Identification of potential hazards	1.01, 1.02, 1.03	Hazard identification was conducted through network inspections, safety briefings, and job sheets prior to the commencement of work. Identified hazards included electrical hazards, such as medium- and low-voltage electricity, as well as the risk of contact with electrical networks. During daily activities, workers' physical, mental, and spiritual readiness was also assessed before work.
Risk analysis	1.01, 1.02, 1.04	Risk analysis was conducted prior to work through job sheets containing potential occupational risks. Risks were classified according to their severity using the HIRAC system, ranging from low to extreme risk.
Evaluation of risk severity	1.01, 1.02, 1.05	High-severity risks included electric shock, falls from heights, and traffic accidents. Lower-severity risks included injuries caused by sharp objects.
Identification of workplace environmental hazards	1.01, 1.02, 1.03	Workplace environmental monitoring was conducted every semester and included measurements of noise, lighting, temperature, and humidity. Psychosocial hazards were addressed through consultation services or individual counseling.
Program coverage	1.01, 1.02, 1.03, 1.04	The health monitoring program applied to all workers. Monitoring was conducted through the PLN Wellness application, which recorded health data and was integrated with the results of the annual medical check-up (MCU).
Implementation		
Worker health programs	1.01, 1.02, 1.03, 1.04	The program included annual MCU, blood pressure monitoring, fitness monitoring through PLN Wellness, weekly physical activity, and workplace environmental monitoring every semester.
Health examinations before and during work	1.01, 1.02, 1.05	Health examinations were conducted through annual MCU and periodic blood pressure measurements. Before work, workers' physical, mental, and spiritual conditions were assessed through daily safety briefings.

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Component and Indicator	Supporting Informants	Observation Findings
Periodic health examinations	1.01, 1.02, 1.05	MCU was conducted once a year. Blood pressure measurements were generally conducted monthly, although implementation had not been consistent in recent months.
Special health examinations	1.01, 1.02, 1.05	No special health examinations specifically based on occupational risks had been implemented. Special examinations or programs were occasionally organized by the head office.
Health-care facilities	1.01, 1.02, 1.04, 1.05	The company did not have an on-site health clinic. Health-care services were centralized at Klinik Lisna in Rajabasa.
Worker compliance	1.01, 1.02, 1.03	No formal sanctions were imposed on workers who did not participate in the program. Workers received reminders from the manager and the application. Missed MCU appointments could be rescheduled, while certain violations could result in verbal warnings.
Perceptions of program implementation	1.01, 1.02, 1.03	Informants generally perceived the program implementation as good, particularly in promoting healthy lifestyles, physical activity, annual MCU, and health monitoring through the PLN Wellness application.
Supporting programs and health promotion	1.01, 1.02, 1.03	Supporting programs included group exercise, promotion of healthy lifestyles through PLN Wellness and WhatsApp groups, annual MCU, blood pressure measurements, and physical activities.
Reporting		
Health record system	1.01, 1.02, 1.04	Health records were automatically integrated into PLN Wellness and linked to the attendance system. The system provided notifications when examination results indicated potential health problems.
Individual medical records	1.01, 1.02, 1.04	No physical medical record books were maintained at the workplace unit. Examination results from Prodia Laboratory were digitally synchronized with the PLN Wellness application.

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Component and Indicator	Supporting Informants	Observation Findings
Medical/operational audits	1.01, 1.02, 1.04	Information differed among informants. Informants 1.01 and 1.02 stated that audits were conducted or monitored through the application system, whereas informant 1.04 reported being unaware of such audits.
Evaluation/Follow-up		
Program improvement efforts	1.01, 1.02, 1.05	Improvement efforts were undertaken through the promotion of and increased worker awareness regarding the importance of health monitoring, as well as efforts to improve consistency in physical activity. PLN Wellness activities were routinely reported every Friday.
Monitoring and evaluation	1.01, 1.02, 1.05	Monitoring and evaluation were conducted through the application by a higher-level unit. However, some informants were unaware of any specific evaluation conducted at the workplace-unit level.
Monitoring schedule	1.01, 1.02, 1.05	Physical activity was monitored weekly. MCU evaluation was based on annual examination results and followed by further medical examinations for workers identified as having specific health risks.

Table 3. Conclusion Matrix

Variable	FGD	Observation	Conclusion
Planning of the Health Monitoring Program			
The planning process has been implemented well. The management team possesses the necessary competencies to analyze occupational risks within their respective work areas, and the health monitoring application functions effectively.	The planning process has been carried out effectively, supported by competent human resources and a dedicated health monitoring application.	The researcher observed that all employees understood how to analyze workplace risks and consistently complied with the health monitoring program through the PLN Wellness application.	According to the researcher, the planning of the health monitoring program at PT PLN ULP Natar has been implemented effectively because most employees understand hazard identification procedures and respond appropriately to health alerts provided through the application.

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Variable	FGD	Observation	Conclusion
Implementation of the Health Monitoring Program			
The health monitoring program has been implemented very well. Employees actively participate in annual Medical Check-Ups (MCUs), semester-based examinations, and other health monitoring activities. PT PLN also provides basic health equipment, such as blood pressure monitors and thermometers, while healthcare personnel are available at the partner clinic. Daily health screening, including blood pressure checks before work, is routinely conducted. Special examinations are performed during MCUs, semester-based assessments, and routine blood pressure checks before work. Health promotion activities include healthy lifestyle campaigns covering physical exercise, stress management, nutrition, and adequate sleep. Participation in the health monitoring program is mandatory, and employees who fail to comply receive verbal warnings.	Employees comply with all health monitoring activities organized by PT PLN. Standard health equipment is available, and healthcare personnel are provided through the partner clinic. Blood pressure screening before work, however, has not been conducted for some time for unknown reasons. Special health examinations are performed before work and during MCUs. Health promotion activities mainly consist of exercise programs and routine health examinations. No formal sanctions are imposed on employees who do not participate in health monitoring activities.	The researcher observed that employees regularly participated in the health monitoring program through their individual PLN Wellness application accounts. PT PLN ULP Natar only provides basic health examination equipment, such as blood pressure monitors and thermometers, while healthcare personnel are available only at the partner clinic. Routine blood pressure checks before work are no longer conducted. There are no occupation-specific health surveillance programs for electrical workers, such as audiometric testing or neurological and vision examinations. No specific health promotion activities addressing healthy eating, stress management, sleep hygiene, or physical activity were identified. Furthermore, no firm sanctions are imposed on employees who fail to consistently participate in routine health monitoring activities.	The implementation of the health monitoring program at PT PLN ULP Natar has generally been satisfactory. Employees routinely undergo scheduled health examinations and basic health screening before work. However, the company has not yet implemented specialized occupational health surveillance programs for electrical workers, such as audiometric testing and neurological or visual function assessments. PT PLN ULP Natar does not have its own health clinic but collaborates with a clinic located relatively far from the workplace. Health promotion activities related to workplace lifestyle, including sleep hygiene, personal hygiene, and physical activity, remain limited. In addition, the absence of firm sanctions for employees who fail to comply with routine health examinations reduces the overall effectiveness of the program.

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Variable	FGD	Observation	Conclusion
Reporting of the Health Monitoring Program			
Employees access and monitor their health records through the PLN Wellness application. Medical and operational audits are considered to be conducted through the application.	Medical records generated by the partner laboratory are automatically synchronized with the PLN Wellness application. Participants were uncertain whether formal audits were conducted.	The researcher observed that PT PLN ULP Natar does not maintain official employee medical records, as the information stored in the application is considered sufficient. No evidence of medical or operational audits was found.	PT PLN ULP Natar has not yet established a comprehensive and periodic health reporting system to monitor employees' health status over time. Furthermore, no formal medical or internal operational audits are conducted to evaluate and improve the quality of occupational health services or standard operating procedures (SOPs).
Follow-up and Evaluation			
Monitoring and evaluation activities are conducted by the head office.	Monitoring and evaluation are performed through the PLN Wellness application.	The researcher observed that there is no follow-up to medical or operational audits at PT PLN ULP Natar. Employee health issues are also not discussed during routine weekly or monthly internal meetings.	Monitoring and evaluation of the health monitoring program at PT PLN ULP Natar have not been fully implemented at the unit level. Employees perceive that monitoring can be conducted individually through the PLN Wellness application; therefore, comprehensive discussions and evaluations are not routinely carried out during internal meetings.

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DISCUSSION

Planning

The results showed that the planning stage of the employee health monitoring program had been implemented effectively. Most workers understood how to identify occupational hazards in their respective divisions. The company had established a daily workflow outlining work activities and associated hazards and had also implemented a dedicated health monitoring application, namely Wellness. The company had prepared hazard identification, risk assessment, and control (HIRAC) documents for various OSH hazards, including exposure to dust, noise, and explosion risks.

In health program planning: an educational and ecological approach, effective health program planning should begin by identifying the desired health and quality-of-life outcomes and then determining the underlying factors that influence these outcomes. Successful health programs do not rely solely on individual health education but should also incorporate improvements in the work environment through an ecological approach supported by evidence-based data. In the context of occupational health, this approach emphasizes that planning should integrate behavioral, environmental, and organizational factors to ensure sustainable improvements in workers' health (Green & Kreuter, 2005).

Similarly, Dr. John Howard, director of the national institute for occupational safety and health (NIOSH), together with the occupational health surveillance framework adopted by the ILO, emphasized that worker protection should integrate workplace hazard control and individual health monitoring. Occupational health surveillance encompasses two complementary components. First, health protection focuses on monitoring the adverse effects of occupational exposures, such as hazardous chemicals, excessive noise, ergonomic risks, and other workplace hazards. Second, health promotion involves monitoring workers' general health conditions, including obesity, hypertension, stress, and mental health, to prevent non-communicable diseases that may reduce productivity and work performance.

Previous research analyzed the implementation of periodic health examinations in accordance with occupational health regulations (Rengganis, 2013). A qualitative study conducted at PT. Frisian Flag Indonesia found that large-scale companies generally implement three mandatory stages of worker health examinations, namely pre-employment examinations, periodic examinations, and special examinations for workers operating in high-risk areas. However, the study also identified scheduling coordination as a major challenge because health examinations must be conducted without disrupting daily operational activities. These findings were also supported by previous research evaluating occupational health monitoring management using the context, input, process, output, and impact (CIPOI) evaluation model (Santoso et al., 2023). The study found that although occupational safety training programs had been effectively implemented in chemical manufacturing companies, delays in following up on health examination results and workers' lack of understanding of chemical hazards remained significant challenges requiring management attention.

The findings of this study concluded that the planning process for the employee health monitoring program had been implemented reasonably well. Workers in each division had a good understanding of occupational risks associated with their daily tasks and possessed competencies appropriate to their job responsibilities. Therefore, hazard identification procedures and health monitoring practices differed according to the characteristics of work in each division. In addition, the company had implemented the Wellness application as a worker health monitoring system that stored health records, provided reminders for physical activity, and maintained workers' medical histories. These findings indicate that the planning component had provided a strong foundation for the implementation of occupational health monitoring. However, continuous improvement remains necessary to ensure that planning is consistently translated into effective program implementation, monitoring, and evaluation.

Implementation

The results showed that the implementation of the employee health monitoring program had been relatively good. Workers routinely participated in scheduled health examinations and underwent basic health checks before starting work activities. However, several important aspects of occupational health monitoring remained inadequate. The

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company had not implemented special health examination programs specifically designed for electrical workers, such as audiometric examinations, peripheral nerve function examinations, and vision examinations. In addition, the company did not have an occupational health clinic at the worksite and relied on partner clinics located relatively far from the workplace. Occupational health promotion activities addressing healthy behaviors, including sleep hygiene, clean and healthy living behaviors (PHBS), and physical activity, had also not been conducted routinely. The absence of clear sanctions for workers who did not comply with routine health examinations also reduced the effectiveness of the health monitoring program.

These findings need to be considered in relation to the Regulation of the Minister of Manpower and Transmigration of the Republic of Indonesia Number PER.02/MEN/1980 concerning medical examinations of workers in the implementation of occupational safety, which requires employers to provide three types of health examinations. First, pre-employment health examinations are conducted before workers begin employment to ensure that individuals are in optimal health, free from communicable diseases, and medically fit for the assigned work. Second, periodic health examinations are conducted routinely to maintain workers' health status, detect early signs of occupational diseases, and implement preventive measures. These examinations generally include comprehensive physical examinations, physical fitness assessments, chest radiography when necessary, routine laboratory examinations, and other examinations based on occupational risks. Third, special health examinations are intended for workers exposed to specific occupational hazards to determine the effects of work-related exposures on their health. The absence of several of these components indicates that the current program implementation is not yet fully aligned with national occupational health regulations.

These findings are consistent with previous research examining workers' compliance with periodic health examinations at PKU Muhammadiyah Yogyakarta Hospital. The qualitative findings showed that heavy workloads and limited time were the main barriers preventing workers from participating in routine health examinations, despite their awareness of the importance of such examinations in protecting themselves from occupational health risks. This indicates that organizational support is an important factor determining workers' compliance with health monitoring programs (Nusantara et al., 2025). Another study conducted at the center for occupational safety and health development (BBPK3) Makassar found that many organizations focused more on annual periodic health examinations while paying less attention to pre-employment and special examinations for workers operating in high-risk environments. Consequently, occupational health surveillance was unable to comprehensively identify work-related health risks (Ridwan & Kamariah, 2019).

This study concluded that the implementation of the health monitoring program was generally adequate. The Wellness application enabled workers to monitor their medical histories, receive reminders to maintain physical activity, and monitor healthy behaviors, including sleep patterns. However, several important gaps remained. As an electricity distribution company whose workers are exposed to electrical, physical, and environmental hazards, the company needs to strengthen occupational health surveillance by introducing special health examinations relevant to electrical work, improving access to occupational health services, expanding workplace health promotion activities, and establishing clear policies to ensure workers' compliance with routine health examinations. Strengthening these components will improve the effectiveness of the health monitoring program and contribute to improved occupational safety and health outcomes.

Reporting

The results showed that the company did not yet have a comprehensive and periodic occupational health reporting system for monitoring workers' health status over time. In addition, the company had not conducted periodic medical audits or internal audits to evaluate and improve the quality of occupational health services or to review and update SOP. Occupational health issues were also rarely discussed in weekly or monthly internal management meetings, resulting in limited attention to workers' health and reduced worker awareness of the importance of maintaining their health status.

Occupational health reporting is an integral component of OSH management. Occupational health is defined as a systematic effort to protect and

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improve workers' health, safety, and well-being. Within this framework, occupational health reporting serves as a basic surveillance mechanism for monitoring workers' health conditions, identifying emerging occupational health risks, and ensuring that preventive interventions can be implemented in a timely manner. In addition to fulfilling legal and regulatory requirements, health reporting provides essential information for continuous improvement of workplace conditions, ultimately enhancing organizational safety, health, and performance (Ananto et al., 2026). The primary objectives of occupational health reporting are closely interrelated, one of which is to periodically monitor workers' health status to ensure that workers remain in optimal health throughout their employment. In addition, occupational health reporting facilitates the early identification of workplace health risks, enabling organizations to implement preventive and corrective measures before occupational diseases or work-related injuries occur (Putri & Amalia, 2026). An effective reporting system also helps organizations comply with national regulations and international occupational health standards and provides reliable evidence for evaluating occupational health programs and improving safety and operational efficiency.

Previous research found that the effectiveness of health reporting depends heavily on the competence of personnel responsible for data management and the integration of digital information systems (Anwar, 2019). Poor system integration often results in repeated manual data entry, thereby increasing the administrative burden and reducing reporting efficiency. Another study concerning the implementation of occupational health examinations at BBPK3 Makassar found that occupational health reporting systems in many partner organizations had not been fully optimized. Most companies only documented the results of annual periodic health examinations and did not have structured reporting systems for pre-employment and special examinations. Consequently, follow-up actions to prevent occupational diseases were often delayed or inadequately implemented.

The findings concluded that the health reporting system had not been implemented effectively. The main challenges included continued heavy reliance on conventional paper-based reporting systems, limited integration of workers' health data, and low participation among field workers in conducting self-reporting. In addition, workers and technical personnel did not have a uniform understanding of the procedures and importance of routinely reporting occupational hazards and health conditions. Another significant challenge was the limited number of certified OSH supervisors in operational units, particularly in technical service units (Yantek), which limited the effectiveness of supervision and timely follow-up of occupational health issues. Therefore, strengthening digital health reporting systems, integrating health databases, increasing worker awareness, and increasing the number of competent OSH personnel are essential to improving the effectiveness of occupational health reporting and supporting continuous improvement in occupational health management.

Follow-up (Monitoring and Evaluation)

The results showed that monitoring and evaluation (M&E) of the employee health monitoring program had not been formally implemented. Most workers perceived that monitoring could be conducted independently through the Wellness application, and therefore formal discussion or evaluation during weekly or monthly management meetings was considered unnecessary. Consequently, information generated from the health monitoring system was rarely analyzed collectively to identify health trends, evaluate program performance, or develop strategies to improve workers' health and occupational safety.

Monitoring and evaluation are important components of occupational health program management because they determine whether implemented interventions have achieved the expected objectives. The evaluation process should assess the effectiveness of workplace health programs using measurable performance indicators, such as worker participation rates, reductions in sickness-related absenteeism, improvements in worker well-being, and overall job satisfaction (Occupational Safety and Health Administration, 2016). Continuous monitoring also provides management with timely information regarding program implementation, thereby enabling corrective action and continuous quality improvement. Therefore, monitoring and evaluation contribute not only to the refinement of organizational strategies but

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also to the creation of healthier, safer, and more productive work environments (Juarsa et al., 2023).

In addition, the active involvement of all stakeholders is considered fundamental to effective monitoring and evaluation processes. Workers should participate in providing feedback through surveys, interviews, or other evaluation methods so that their experiences and perceptions can be incorporated into program improvement. Such participation not only improves the quality and accuracy of evaluation data but also strengthens workers' sense of ownership of occupational health initiatives. Workplace health programs that involve workers in the evaluation process are generally more successful because they promote an organizational culture that values health and safety (Al Balushi et al., 2024). Therefore, a combination of quantitative performance indicators and qualitative feedback is recommended to obtain a comprehensive assessment of workplace health program outcomes.

Previous research evaluating an OSH program using the CIPOI model found that although organizational commitment at the policy level was adequate, significant challenges remained in the input and process components, particularly shortages of competent occupational health personnel and delayed management responses to reported worker health risks (Handoko, 2025). The implementation of an occupational safety and health management system (OSHMS) for the prevention of occupational diseases using the rapid assessment procedures (RAP) approach showed that worker health monitoring systems had not been integrated into a comprehensive information management system. The researchers recommended strengthening the health information system to enable *real-time* monitoring of workers' health trends, particularly among workers exposed to occupational and environmental hazards, so that early interventions could be implemented and permanent occupational disabilities could be prevented (Nugroho et al., 2024; Amanda, 2024).

This study concluded that monitoring and evaluation of the occupational health program had not been implemented effectively. Occupational health monitoring and hazard reporting processes were still largely conducted manually or in a fragmented manner, resulting in dispersed data, limited integration, and difficulties in data verification and analysis. In addition, limited direct supervision and weak verification procedures reduced the effectiveness of program evaluation and follow-up. Although the Wellness application provided workers with access to personal health information, its potential as a management tool for organizational decision-making had not been optimally utilized. Therefore, a structured monitoring and evaluation system needs to be established by integrating digital health reporting, periodic management reviews, performance indicators, and routine program evaluations. These improvements will enable more effective monitoring of workers' health trends, strengthen occupational health prevention efforts, and improve the overall quality of occupational health services within the organization.

CONCLUSION

The implementation of the employee health monitoring program through the HSE system has been carried out but is not yet fully optimal across all components. In the planning aspect, the program is supported by hazard identification and risk analysis through network inspections, safety briefings, job sheets, and the HIRAC system. Workplace environmental monitoring is conducted periodically, and the health monitoring program covers all employees through the PLN Wellness application and annual MCU. In terms of implementation, the program has generally been conducted adequately; however, several limitations remain, including the inconsistent implementation of pre-employment health examinations, the absence of health examinations specifically tailored to electrical occupational risks, and the lack of an on-site occupational health clinic. Health services remain dependent on partner clinics, health promotion activities are limited, and no formal sanctions are imposed on employees who do not participate in the health monitoring program.

In terms of reporting, PLN Wellness is used as a health record system integrated with health examination results from partner laboratories. However, the health reporting system at the unit level is not yet fully comprehensive. No physical medical records are maintained at the workplace unit, and there are differences in informants' understanding regarding the implementation of medical and operational audits. Regarding monitoring, evaluation, and follow-up, these activities have been conducted through PLN Wellness and monitoring by higher-level units, including physical

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activity monitoring and follow-up of MCU results for employees identified as having specific health risks. However, there is no routine and structured internal evaluation mechanism to discuss health monitoring results, trends in employees' health conditions, program effectiveness, and subsequent improvement measures.

SUGGESTION

For the company, it is necessary to consistently enhance the implementation and development of the occupational health monitoring system, including daily pre-employment health checks, integrating occupational health issues into regular management meetings, enforcing clear policies for non-compliance, promoting healthy lifestyle programs, assigning dedicated occupational health personnel, and expanding routine medical examinations to include specialized tests such as audiometry, peripheral nerve function, and vision screening.

There is a need to increase workers' awareness of the importance of health monitoring, by actively utilizing health monitoring applications as early warning tools and consistently adhering to all scheduled medical examinations. For future research, it is recommended to involve a more diverse number of informants and expand the data sources, including healthcare workers, HSE managers, and higher-level management. It can combine qualitative approaches with quantitative data, such as MCU coverage, the prevalence of health risk factors, compliance rates with examinations, and work accident data, so that the effectiveness of the health monitoring program can be evaluated more comprehensively.

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