

The Experiences of Waste Collection Workers in Implementing an Occupational Safety and Health Culture: A Qualitative Study

Yusrianto

Occupational Safety Engineering Study Program, ITEKES Tri Tunas Nasional, Makassar, Indonesia

ABSTRACT

Background: Waste collection workers face biological, physical, mechanical, ergonomic, and environmental hazards during their daily activities. However, their experiences in implementing occupational safety and health culture remain underexplored.

Research Objective: This study aimed to explore the experiences of waste collection workers in implementing occupational safety and health culture.

Methods: This qualitative descriptive study involved 15 waste collection workers selected through purposive sampling. Data were collected through face-to-face semi-structured interviews and non-participant observations. The data were analysed thematically through familiarisation, coding, categorisation, theme development, review, and interpretation. Trustworthiness was ensured through triangulation, member checking, peer discussion, and an audit trail.

Results: Four themes were identified: daily exposure to multiple occupational hazards, inconsistent use of personal protective equipment, experience-based safety practices and peer support, and the need for stronger organisational support. Workers understood the importance of workplace safety and developed practical strategies to prevent injuries. Nevertheless, safety implementation was constrained by inadequate and uncomfortable protective equipment, limited training, hazardous working conditions, and insufficient supervision.

Conclusion: Occupational safety culture among waste collection workers is shaped by individual awareness, practical experience, peer relationships, organisational commitment, and community waste-disposal practices. Adequate protective equipment, continuous training, health monitoring, supportive supervision, and community education are necessary to establish safer and more sustainable working conditions.

Keywords: Occupational Safety; Safety Culture; Waste Collection Workers

*Corresponding author email : yusrianto@gmail.com

Occupational Safety Engineering Study Program, ITEKES Tri Tunas Nasional, Makassar, Indonesia



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BACKGROUND

Occupational safety and health are fundamental components of decent work and essential prerequisites for protecting workers from injuries, illnesses, disabilities, and fatalities associated with workplace activities. However, occupational safety concerns are often concentrated in formal industries, while workers in informal and public-service sectors receive comparatively limited attention (Nasrallah et al., 2023). Waste collection workers represent one of the occupational groups with substantial exposure to workplace hazards because their duties involve collecting, lifting, transporting, sorting, and disposing of various types of waste (Umeokafor et al., 2022). These activities frequently take place in uncontrolled environments, including residential areas, markets, roads, temporary waste collection points, and final disposal sites. Consequently, waste collection workers may experience biological, chemical, physical, ergonomic, mechanical, and psychosocial hazards during their daily work. Exposure to sharp objects, contaminated materials, toxic substances, dust, smoke, extreme weather, heavy loads, traffic accidents, repetitive movements, unpleasant odours, and infectious waste can increase the likelihood of occupational injuries and diseases (Jilcha, 2023).

Globally, the increasing volume of municipal solid waste has intensified the occupational burden experienced by waste collection workers. Rapid urbanisation, population growth, changing consumption patterns, and inadequate waste separation at the household level contribute to the complexity of waste collection activities (Gonçalves et al., 2023). Waste collectors commonly handle mixed waste containing food residues, broken glass, metal objects, used needles, household chemicals, disposable masks, and other potentially hazardous materials. Although personal protective equipment, safety procedures, vaccination, regular health examinations, and occupational safety training can reduce these risks, their implementation remains inconsistent in many settings. Some workers do not use complete personal protective equipment because of discomfort, limited availability, unsuitable sizes, hot weather, restricted movement, or the perception that protective equipment slows down their work. These conditions demonstrate that occupational safety cannot be understood only as compliance with formal rules; it is also influenced by workers' experiences, beliefs, habits, workplace relationships, and organisational support (Zimmerman et al., 2023).

In Indonesia, waste collection services are essential for maintaining environmental sanitation and preventing public health problems. Nevertheless, waste collection workers often perform physically demanding tasks under conditions that may not fully meet occupational safety and health standards. Workers may lift heavy waste containers manually, stand on moving collection vehicles, work during unfavourable weather, and come into direct contact with unsorted waste (Wild et al., 2023). The inconsistent use of gloves, masks, protective footwear, reflective clothing, and other protective equipment may increase their vulnerability to cuts, puncture wounds, skin disorders, respiratory problems, musculoskeletal complaints, and traffic-related injuries. In addition, limited safety supervision, insufficient training, inadequate sanitation facilities, time pressure, and a lack of public awareness regarding household waste segregation can create further challenges. Despite their important contribution to community health and urban cleanliness, the occupational experiences and safety needs of waste collection workers are frequently overlooked (Pilbeam & Karanikas, 2023a).

An occupational safety and health culture refers to the shared values, attitudes, perceptions, knowledge, and practices that influence how safety is understood and implemented in the workplace (Pilbeam & Karanikas, 2023b). A strong safety culture is reflected not merely in the availability of regulations and protective equipment but also in workers' awareness, management commitment, effective communication, supportive supervision, and consistent safe behaviour. Waste collection workers may develop practical

knowledge and informal strategies based on repeated exposure to hazards (Asikainen et al., 2024). For example, they may use specific techniques when lifting heavy loads, identify dangerous waste through visual inspection, avoid certain materials, or remind colleagues about risky conditions. Conversely, prolonged familiarity with occupational hazards may normalise unsafe practices, leading workers to view injuries, direct contact with waste, and incomplete use of protective equipment as unavoidable parts of their occupation (Laroche, 2024). Exploring these experiences is therefore essential to understand how workplace safety culture is formed, negotiated, and maintained in everyday working situations.

Previous studies on occupational safety among waste collection workers have predominantly used quantitative approaches to measure hazard exposure, personal protective equipment compliance, occupational injuries, or health complaints (Li et al., 2023). Although these studies provide important information regarding the magnitude and determinants of occupational risks, they may not fully explain how workers interpret safety, respond to hazards, and experience organisational safety policies in their daily routines. Limited qualitative evidence is available concerning workers' perceptions of safety culture, reasons for adopting or rejecting safety procedures, informal protective strategies, relationships with supervisors and colleagues, and expectations for safer working conditions. This gap indicates the need for an in-depth exploration that places workers' voices and lived experiences at the centre of the analysis (Ishengoma, 2024).

The novelty of this study lies in examining occupational safety and health culture from the experiential perspective of waste collection workers rather than focusing solely on compliance rates or the prevalence of occupational injuries. This approach enables the identification of personal, social, organisational, and environmental factors shaping safety practices. The findings are expected to provide contextual evidence for developing worker-centred safety programmes, improving the provision and suitability of protective equipment, strengthening safety communication and supervision, and designing relevant occupational health education. Therefore, this study aims to explore the experiences of waste collection workers in implementing an occupational safety and health culture, including their perceptions of workplace hazards, safety practices, barriers, coping strategies, organisational support, and recommendations for creating safer working conditions.

METHODS

This study employed a qualitative descriptive design (Arbaein et al., 2024) to explore the experiences of waste collection workers in implementing an occupational safety and health culture. The study involved 15 informants who were actively employed as waste collection workers in a municipal waste management service. Informants were recruited using purposive sampling, based on their experience and ability to provide relevant and comprehensive information regarding occupational safety practices. The inclusion criteria were waste collection workers who had at least one year of work experience, were directly involved in waste collection and transportation activities, were able to communicate their experiences effectively, and voluntarily agreed to participate. Recruitment continued until data saturation was achieved.

Data were collected through face-to-face, semi-structured, in-depth interviews and non-participant observations. The interview guide explored informants' perceptions of occupational hazards, experiences of work-related injuries and illnesses, use of personal protective equipment, safe working practices, communication with supervisors and colleagues, organisational support, barriers to implementing safety procedures, and recommendations for improving workplace safety. Each interview lasted approximately 30–60 minutes and was conducted in a private and convenient location. With the informants' permission, interviews were audio-recorded and supplemented with field notes.

Observations were conducted during waste collection and transportation activities to assess safety practices, working conditions, use of protective equipment, and interactions among workers.

The data were analysed thematically through six stages: familiarisation with the data, generation of initial codes, grouping of codes into categories, development of potential themes, review and definition of themes, and preparation of the research report. All audio recordings were transcribed verbatim, and the transcripts were read repeatedly to identify patterns and meanings related to occupational safety and health culture.

Trustworthiness was ensured through data-source and method triangulation, member checking, peer discussion, and maintenance of an audit trail. The interview findings were compared with observational data, while selected informants were invited to confirm the accuracy of the researchers' interpretations. Ethical approval was obtained from the relevant research ethics committee. All informants received information about the study and provided written informed consent. Participation was voluntary, and confidentiality, anonymity, and the right to withdraw from the study at any time were maintained throughout the research process.

RESULTS

Informant Characteristics

The study involved 15 waste collection workers. Most informants were male, aged between 25 and 56 years, and had worked as waste collectors for 2-18 years. Their main responsibilities included collecting household waste, lifting waste containers, separating certain waste materials, and transporting waste to temporary or final disposal sites.

Table 1.
Baseline Characteristics of Respondents (n = 42)

Characteristic	Category	n
Sex	Male	13
	Female	2
Age	25–35 years	5
	36–45 years	6
	46–56 years	4
Work experience	2–5 years	5
	6–10 years	6
	More than 10 years	4
Employment status	Permanent worker	6
	Contract worker	9

The thematic analysis identified four major themes: daily exposure to multiple occupational hazards, inconsistent implementation of personal protective equipment, experience-based safety practices and peer support, and the need for stronger organisational support.

Theme 1: Daily Exposure to Multiple Occupational Hazards

Informants described their work as physically demanding and involving continuous exposure to biological, physical, mechanical, ergonomic, and environmental hazards. Sharp objects, broken glass, used needles, dust, decomposed waste, unpleasant odours, heavy loads, moving vehicles, and extreme weather were frequently encountered. Several informants reported experiencing cuts, puncture wounds, skin irritation, back pain, coughing, and fatigue.

"We often find broken glass mixed with food waste. Sometimes we do not see it until it cuts our hands." (Informant 3)

"The most common problem is back pain because we repeatedly lift heavy waste containers into the truck." (Informant 8)

The absence of waste separation at the household level increased workers' risks because hazardous and non-hazardous materials were often placed in the same container.

Theme 2: Inconsistent Use of Personal Protective Equipment

Informants recognised that gloves, masks, safety footwear, protective clothing, and reflective vests were important for reducing occupational risks. However, the consistent use of personal protective equipment remained limited. Some informants used only gloves and boots, while others occasionally worked without masks or protective clothing.

The main barriers included discomfort, hot weather, limited availability, unsuitable sizes, damaged equipment, and the perception that personal protective equipment restricted movement.

"I know that wearing gloves and boots is important, but sometimes the gloves are already torn and replacements are not immediately available." (Informant 5)

"Wearing a thick mask makes breathing difficult, especially when we work under the sun." (Informant 11)

These findings indicated a gap between safety knowledge and its consistent application during waste collection activities.

Theme 3: Experience-Based Safety Practices and Peer Support

Most informants developed informal safety strategies based on their previous experiences and interactions with colleagues. These practices included checking waste containers before lifting them, avoiding direct contact with suspicious materials, using proper lifting techniques, maintaining balance on collection vehicles, and warning colleagues about sharp or hazardous objects.

"Before lifting a bag, I usually touch it carefully or look at the bottom because there may be broken glass inside." (Informant 7)

"We remind each other when someone stands in an unsafe position on the truck." (Informant 13)

Experienced workers played an important role in teaching new workers how to recognise hazards and perform tasks safely. However, these practices were generally communicated informally and were not supported by structured training or written safety procedures.

Theme 4: Need for Stronger Organisational Support

Informants expressed the need for greater management commitment to occupational safety and health. They expected regular provision of appropriate personal protective equipment, safety training, health examinations, vaccination, first-aid facilities, and effective supervision. Some informants reported that safety instructions were usually provided only after an accident or when new equipment was distributed.

"We need regular training, not only warnings after an accident has occurred." (Informant 2)

"Protective equipment should be replaced regularly because boots and gloves are easily damaged during work." (Informant 15)

Informants also emphasised the importance of public participation in separating household waste and safely packaging broken glass, needles, and other hazardous materials. They believed that collaboration among workers, management, health services, and communities was necessary to create safer working conditions.

Overall, the findings showed that waste collection workers understood the importance of occupational safety and developed practical strategies to protect themselves. Nevertheless, the implementation of a strong safety culture was constrained by inadequate protective equipment, limited structured training, hazardous working environments, and insufficient organisational support. These findings demonstrate that workplace safety should be strengthened through worker-centred policies, continuous education, adequate resources, and active community participation.

DISCUSSION

This study explored the experiences of waste collection workers in implementing an occupational safety and health culture. Four major themes were identified: daily exposure to multiple occupational hazards, inconsistent use of personal protective equipment, experience-based safety practices and peer support, and the need for stronger organisational support. These findings indicate that waste collection workers possess practical awareness of workplace safety; however, safe working behaviour is influenced by the availability of protective equipment, working conditions, individual habits, peer relationships, and management commitment.

The first theme revealed that waste collection workers were routinely exposed to biological, physical, mechanical, ergonomic, and environmental hazards. Contact with decomposed waste, dust, sharp objects, broken glass, used needles, heavy loads, traffic, and extreme weather placed them at risk of injuries and occupational illnesses. Cuts, puncture wounds, skin irritation, respiratory complaints, fatigue, and musculoskeletal pain were commonly experienced. These conditions arise because waste collection activities require repetitive lifting, pushing, pulling, bending, and carrying heavy loads, often without appropriate mechanical assistance. The findings confirm that waste collection is a high-risk occupation, particularly when household waste is not separated according to its type and level of hazard (López et al., 2023).

The mixing of sharp, infectious, chemical, and domestic waste in the same container increased workers' vulnerability. Waste collectors were frequently unable to identify hazardous materials before touching or lifting waste bags. This suggests that occupational safety is not solely the responsibility of workers and waste-management organisations. Community behaviour also contributes to workplace risks. Household members should separate waste, place sharp objects in puncture-resistant containers, and provide warning labels for potentially hazardous materials. Community education regarding safe waste disposal is therefore an important component of occupational injury prevention among waste collection workers (Zeng et al., 2023).

The second theme demonstrated that although informants understood the importance of personal protective equipment, its use remained inconsistent. Gloves, masks, safety footwear, protective clothing, and reflective vests were perceived as useful, but discomfort, hot weather, restricted movement, limited supplies, inappropriate sizes, and damaged equipment reduced compliance (Newaz et al., 2024). This finding illustrates a gap between safety knowledge and actual behaviour. Knowledge alone is insufficient to establish safe work practices when protective equipment is unavailable, uncomfortable, or unsuitable for the working environment.

Management should therefore provide personal protective equipment that is appropriate to the workers' tasks, body sizes, and climatic conditions. Equipment must also be inspected and replaced regularly. Workers should be involved in selecting protective equipment because their direct experience can help determine which designs are comfortable and practical (Mulasari et al., 2024). Occupational safety interventions that focus only on instructing workers to use protective equipment may be ineffective if organisational and environmental barriers are not addressed. Compliance should be promoted through supportive supervision, access to adequate equipment, regular education, and positive reinforcement rather than punishment alone (Akuoko et al., 2023).

The third theme showed that workers developed experience-based safety practices, such as inspecting waste bags before lifting them, avoiding suspicious materials, using safer lifting techniques, maintaining balance on collection vehicles, and warning colleagues of potential hazards (Pasman et al., 2023). These practices represent valuable forms of practical knowledge constructed through daily interactions with the working environment. Experienced workers also functioned as informal mentors who introduced new workers to occupational hazards and safer ways of performing their duties (Sifullah et al., 2023).

Peer support strengthened collective awareness and encouraged workers to protect one another (Nguembi et al., 2023). Nevertheless, safety knowledge transmitted informally may vary between workers and may not always follow established occupational safety standards. Unsafe practices may also become normalised when workers repeatedly perform them without immediate consequences (Srijuntrapun et al., 2022). Practical knowledge should consequently be integrated into structured training and standard operating procedures. Training programmes can combine formal safety standards with workers' contextual experiences, making occupational safety education more relevant and acceptable.

The final theme concerned the need for stronger organisational support. Informants expected regular safety training, health examinations, vaccination, first-aid facilities, supervision, and timely replacement of damaged protective equipment. These expectations demonstrate that a safety culture cannot be established solely through individual responsibility. Organisational commitment is required to ensure that safety becomes an integral part of planning, implementation, supervision, and evaluation of waste collection services (Zhang et al., 2023).

Regular safety meetings can provide opportunities for workers to report hazards, discuss occupational incidents, and recommend improvements. Management should also establish an accessible reporting system for injuries and near-miss events without creating fear of punishment (Furxhi et al., 2024). Reporting near misses is important because it enables organisations to identify potential hazards before they cause serious injury. Periodic medical examinations and vaccination programmes should be provided according to workers' occupational exposure, accompanied by access to first aid and referral services (Foley & Ricciardelli, 2023).

Overall, the findings suggest that the occupational safety culture among waste collection workers remains developing and is shaped by interactions among individual awareness, practical experience, peer support, organisational resources, and community behaviour. The novelty of this study lies in demonstrating that waste collectors are not merely recipients of safety policies; they actively develop knowledge and strategies to protect themselves. However, these individual and collective efforts require formal organisational support to become sustainable.

A worker-centred safety programme is therefore recommended. Such a programme should include hazard identification involving workers, suitable personal protective equipment, practical and continuous training, clear standard operating procedures, supportive supervision, health monitoring, vaccination, incident reporting, and public education on waste separation. Integrating workers' experiences into occupational safety

policies may strengthen their sense of ownership and contribute to safer, more responsive, and sustainable waste-management services.

CONCLUSION

Waste collection workers face various biological, physical, mechanical, ergonomic, and environmental hazards in their daily duties. Although they understand the importance of occupational safety and have developed experience-based protective strategies, the consistent implementation of safety practices remains constrained by inadequate personal protective equipment, limited training, hazardous working conditions, and insufficient organisational support. Management should provide appropriate protective equipment, continuous safety training, periodic health examinations, vaccination, first-aid facilities, and supportive supervision. Community education on waste separation and safe disposal of hazardous materials should also be strengthened to reduce occupational risks and establish a sustainable safety culture.

ACKNOWLEDGMENTS

The authors express their sincere gratitude to all waste collection workers who voluntarily shared their experiences and valuable perspectives in this study. Appreciation is also extended to the municipal waste management authorities, field supervisors, and all individuals who supported the data collection and research process. Their cooperation and contributions were essential to the successful completion of this study.

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