

# Effect of Occupational Safety and Health Promotion Using TikTok Media on Safe Behavior from Cognitive and Affective Aspects of Street Sweepers in Medan City

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## ABSTRACT

The purpose of this research is to analyze effect of occupational safety and health promotion using TikTok media on safe behavior from cognitive and affective aspects of street sweepers in Medan City. This study used a quantitative study with a quasi-experimental time series design, involving only the experimental group. The study population was all street sweepers (Melati) in all sub-districts in Medan City. The sampling technique used was simple random sampling. The sample size was 75 street sweepers. The results of the data analysis obtained from the normality test were used to test the research hypothesis. To test the research hypothesis with normally distributed data, a dependent t test. The results of the research show that there was a significant difference in mean cognitive aspect scores ( $p < 0.001$ ) after occupational safety and health promotion using TikTok media on safe behavior of street sweepers in Medan City. Furthermore, there was a significant increase in mean affective aspect scores ( $p < 0.001$ ) after occupational safety and health promotion using TikTok media on safe behavior of street sweepers in Medan City.

**Keywords:** Occupational Safety and Health, Promotion, TikTok, Cognitive, Affective

## INTRODUCTION

Occupational safety and health are key pillars in creating a safe, productive, and dignified work environment. As work complexity increases, the potential risk of workplace accidents also increases. Therefore, a thorough understanding of the human factors that contribute to the implementation of occupational safety and health is necessary. Human factors encompass various aspects, from skills, awareness, attitudes, to the safety culture implemented in the workplace (Yani, 2025). The implementation of occupational safety and health is a necessity, not only in large industrial sectors but also for informal sector workers. The number of informal workers in Indonesia reaches 60% of the total national workforce.

Occupational safety and health are crucial aspects in protecting workers and supporting sustainable development. This issue is increasingly important given the increasing risks faced by those in the informal and vulnerable sectors, such as street sweepers. The International Labour Organization reports that approximately 2.78 million people die annually from workplace accidents and work-related

diseases. These figures indicate that many workers worldwide still lack adequate protection from workplace hazards, especially those in sectors that receive less attention in terms of occupational safety and health protection.

Workplace accidents are generally caused by two main factors: workers' non-compliance with safety standards or unsafe behavior, and hazardous work environments or unsafe behavior. These unsafe behaviors can be influenced by inherent factors such as risky attitudes and actions, inadequate knowledge and skills, underlying physical conditions, and fatigue. A worker's ability, intelligence, and awareness can influence how they identify and respond to potential hazards. A worker's experience and training also determine the extent to which they can apply relevant safety knowledge in work situations (Larasatie et al., 2022).

Factors causing workers to engage in unsafe behavior include lack of knowledge and skills, fatigue and boredom, unsafe attitudes and behaviors, lack of mastery/skills with new equipment or machinery, decreased concentration at work, apathy among workers, lack of work motivation, lack of job satisfaction, a tendency to self-harm, and lack of supervision from management (Tarwaka, 2017).

A person's behavior plays a crucial role in workplace accidents, and behavior is also the single biggest contributor to workplace accidents, specifically unsafe behavior. Therefore, to reduce the number of workplace accidents, many industries and companies are implementing behavioral science to transform unsafe behaviors into safe ones (Anizar, 2012).

Companies play a role in promoting occupational safety and health among workers, employers, and the public. Specifically, occupational safety and health promotion involves engaging with people, specifically workers, to improve safe behaviors at work and ensure a better understanding of the safety and health aspects being taught (Andriyadi et al., 2021). Implementing occupational safety

and health promotion in the workplace can be done through various efforts to effectively communicate laws and regulations regarding occupational safety and health, thereby increasing employee awareness of the importance of occupational safety and health for themselves, their employees, the company, and the surrounding community. Occupational safety and health promotion in companies includes posters, safety signs, banners, safety talks, safety inductions, toolbox meetings, safety permits, occupational safety and health training, disciplinary raids, and other forms of communication (Tarwaka, 2017).

TikTok has hundreds of thousands of users worldwide. TikTok is now one of the most popular social media platforms in Indonesia. The number of TikTok users in Indonesia has surpassed 125 million, with significant growth particularly among digitally active working-age individuals. TikTok is expected to benefit manufacturers by leveraging social media as a promotional tool, including promoting Occupational safety and health. This model emphasizes the importance of eliminating working conditions that cause or contribute to employee illness and injury, or negatively impact well-being, and redefining the work environment to improve employee safety, health, and well-being. This also raises employee awareness of health and safety, and promotes personal change to improve the health and well-being of workers.

Street sweepers are part of a team formed by the Medan City Sanitation and Parks Agency to maintain environmental cleanliness, health, and beauty. This is in accordance with Medan Mayoral Regulation Number 14 of 2014 concerning the establishment of technical and operational units for cleaning services and waste bank units. Currently, the Sanitation and Parks Agency collaborate with all sub-districts in Medan City through an inter-agency network development program. This collaboration is based on Medan Mayoral Regulation Number 18 of 2021 concerning

the delegation of partial waste management authority to sub-district heads. Through this regulation, waste management is divided between sub-districts and agencies.

The purpose of this research is to analyze effect of occupational safety and health promotion using TikTok media on safe behavior from cognitive and affective aspects of street sweepers in Medan City.

## RESEARCH METHODS

This study used a quantitative study with a quasi-experimental time series design, involving only the experimental group, which was given a pretest and posttest. Before receiving the intervention, respondents were given a pretest to determine the stability and clarity of the group's condition before the intervention (Sugiyono, 2022). This study did not use a control group because it focused solely on safe behavior, not on comparisons between groups.

The study population was all street sweepers (Melati) in all sub-districts in Medan City. The researchers used a cluster random sampling method due to the large population coverage. According to Creswell (2013), a 30% sampling rate is considered sufficient to represent the entire sub-district population in Medan City. Therefore, from 21 sub-districts, the researchers selected 7 sub-districts as samples for this study. The sampling technique used was simple random sampling. The researchers used the Slovin formula to determine the sample with a 10% confidence level. The sample size was 75 street sweepers.

The results of the data analysis obtained from the normality test were used to test the research hypothesis. To test the research hypothesis with normally distributed data, a dependent t test with a significance level of 0.05 was used, comparing the data before and after the intervention, and obtaining the mean difference between the pretest and posttest. The significance level was 95% ( $\alpha=0.05$ ). The guideline for accepting the hypothesis is that if the probability value (p) is 0.05,  $H_0$  is rejected. If the normality test

results indicate that the distribution of the data is not normal, the Wilcoxon test is used. To draw conclusions, see the p-value (sig.) from the Wilcoxon test results. Compare the p-value with the significance level ( $\alpha=0.05$ ).

## RESULT AND DISCUSSION

### General Overview

Medan City is an administrative area located in North Sumatra Province and serves as the capital of North Sumatra Province. Medan City was established on July 1, 1950. It covers an area of 265.1 km<sup>2</sup> and consists of 21 sub-districts. Medan City is one of the economic centers of the province. It is a province in northern Sumatra and one of the largest cities in Indonesia. Medan City directly borders Deli Serdang Regency on its northern, southern, western, and eastern borders.

Medan City is located between 3°27'–3°47' North Latitude and 98°35'–98°44' East Longitude, with an altitude of 2.5–37.5 meters above sea level. Medan City is one of 33 Level II Regions in North Sumatra. Most of Medan City is lowland and is also the confluence of two important rivers, namely Babura and Deli. Medan City has a tropical climate with a minimum temperature that occurred until 2020, namely 21° C and a maximum temperature of 36° C. Air humidity in Medan City averages 82% and an average wind speed of 1.16m/second, while the average total evaporation rate is 117.5 mm. Medan City consists of 21 districts and 151 villages. As a center of economic and trade activities, Medan City has a high level of population and vehicle mobility, so that the cleanliness of the highways is a challenge for the local government.

### Individual Characteristics

The study results show that the age distribution of street sweepers in Medan City is predominantly 40 (53.3%) aged  $\leq 35$  years, and the remaining 35 (46.7%) aged  $\geq 35$  years. This distribution indicates that street sweepers are of productive age. This

is important because productive age is related to the level of physical readiness and the ability to receive new education, including digital media-based occupational safety and health promotion such as TikTok. Research by Yuliani et al. (2021) shows that younger workers have a higher rate of digital technology adoption and prefer short video-based media as a means of education, including education on occupational safety. This finding supports the hypothesis that respondents aged  $\leq 35$  in this study may be more effective in absorbing occupational safety and health messages on TikTok, such as short videos on safe work techniques or ergonomic risk prevention, which can significantly improve safe behavior.

The study's distribution of street sweepers, based on their length of service, showed that 51 (68.0%) had less than five years of service experience, while 24 (32.0%) had more than five years of service experience. This percentage illustrates that most respondents fall into the low to moderate work experience category. Workers with limited experience, when given structured message-based interventions, showed higher levels of acceptance and adoption behavior compared to workers with established work habits. Workers who received consistent BBS training showed significant behavioral changes, especially new workers who had not yet developed ingrained work habits. The study recommends that organizations provide ongoing training, particularly for new workers. This is relevant to the research context because the majority of street sweepers are in the  $\leq 5$ -year tenure group, making the use of TikTok as a medium for promoting occupational safety and health an appropriate approach. This situation has important implications for the effectiveness of occupational safety and health promotion, as workers with shorter tenure tend to be more flexible in accepting new information and more adaptable to digital media.

Regarding education, the majority of the highest education was elementary school 28

people (37.3%), junior high school 25 people (33.3%), and high school 22 people (29.3%). This distribution indicates that the majority of street sweepers have elementary and junior high school education levels. Education level is a crucial determinant of information acceptance, understanding of occupational safety and health messages, and developing safe behaviors, especially when interventions use visual and audiovisual media like TikTok. Low education is a major obstacle to the effective implementation of occupational safety and health in the informal sector. This is in line with Haryani et al. (2016) findings that cleaning workers with low education tend to require more visual educational methods. TikTok has characteristics that are very suitable for workers with low education, namely messages are delivered visually, simply, and concisely. In the context of promoting occupational safety and health using TikTok, low education levels actually make this medium very effective because the content is easy to understand, audiovisual, and does not require high literacy skills. Therefore, the educational characteristics of the respondents in this study contributed to significant improvements in cognitive, affective, and conative aspects after the intervention was given.

### **Effect of Occupational Safety and Health Promotion Using TikTok Media on Safe Behavior from Cognitive and Affective Aspects of Street Sweepers in Medan City**

The dependent t test was used to analyze the effect of occupational safety and health promotion from cognitive and affective aspects using TikTok media on the safe behavior of street sweepers in Medan City if the scores in both groups were normally distributed. However, if they were not normally distributed, the Wilcoxon test was used.

**Table 1. Differences in Cognitive and Affective Aspects of Street Sweepers Before and After Occupational Safety and Health Promotion Using TikTok Media in Medan City**

Safe Behavior	Occupational Safety and Health Promotion Using TikTok Media			
	Mean Score		Delta	P
	Before	After		
Cognitive	6,20	8,95	2,75	<.001
Affective	30,24	45,92	15,68	.005

Based on the results of the normality test, the data were not normally distributed, so the Wilcoxon test was used. There was a significant difference in mean cognitive aspect scores ( $p < 0.001$ ) after occupational safety and health promotion using TikTok media on safe behavior of street sweepers in Medan City. The mean increase in cognitive scores after occupational safety and health promotion using TikTok was higher (mean rank=37; delta=2.75) than before the intervention. Students in the treatment group were asked to respond to 10 cognitive items and were asked to answer one of the questions. After the occupational safety and health promotion intervention through short TikTok videos, there was a substantial increase in the street sweepers' cognitive aspect scores on almost all items measured, from basic knowledge (the benefits of occupational safety and health and personal protective equipment) to procedural or practical knowledge (safe work positions, signaling, and steps taken during extreme weather). This improvement was consistent, significant, and large-scale on previously low indicators. According to Gong et al. (2023), short videos (30–60 seconds) facilitate focus, can be watched repeatedly, and provide reinforcement through repetition. Evidence reviews show that short-form content on platforms like TikTok can improve knowledge retention when well-designed. This explains the surge in correct answers to technical indicators. The presented material facilitates the transfer of learning to everyday work contexts, enabling knowledge to quickly become immediately useful. Studies of field workers confirm that contextualized education improves understanding and compliance. Thus, the TikTok intervention not only improved understanding of basic

occupational safety and health theory (benefits and definitions) but also reinforced critical procedural knowledge (safe work positions and traffic signals) through visual representations that are easy to imitate and repeat. This reinforces the notion that using short-form video social media is a highly appropriate occupational safety and health education strategy for field workers with varying literacy levels and real-world physical work.

Furthermore, there was a significant increase in mean affective aspect scores ( $p < 0.001$ ) after occupational safety and health promotion using TikTok media on safe behavior of street sweepers in Medan City. The mean increase in affective scores after occupational safety and health promotion using TikTok was higher (mean rank=38; delta=15.68) than before the intervention. Students in the treatment group were asked to respond to 10 items on affective factors, each with a range of responses: strongly agree, agree, undecided, disagree, and strongly disagree. Data analysis showed significant affective changes after the intervention. Prior to the intervention, the majority of respondents chose either undecided or agree to many affective statements; only a small number chose strongly agree. After being given Occupational Safety and Health Promotion in the form of short TikTok videos, there was a substantial increase in the category of strongly agreeing for a number of key statements such as concern for personal safety on the highway (to 80% strongly agree), the view that occupational safety is a shared responsibility (77.3% strongly agree), concerns about working without adequate protection (68% strongly agree), and the belief that maintaining safety protects families (66.7% strongly agree).

However, a small number of respondents still indicated disagreement with several statements regarding concern for coworkers, indicating residual resistance or barriers in some individuals. According to McCashin and Murphy (2022), effective TikTok content often includes emotional elements, such as short narratives about the impact of accidents on family or colleagues and calls to action. This method increases affective motivation to change. Overall, the intervention through TikTok was proven not only to improve cognitive aspects, but also significantly strengthen the affective aspects of street sweepers in terms of care, concern about danger, motivation to be safe, and the belief that safety is an important part of their work role.

## CONCLUSION AND SUGGESTION

The results of the research show that there was a significant difference in mean cognitive aspect scores ( $p < 0.001$ ) after occupational safety and health promotion using TikTok media on safe behavior of street sweepers in Medan City. Furthermore, there was a significant increase in mean affective aspect scores ( $p < 0.001$ ) after occupational safety and health promotion using TikTok media on safe behavior of street sweepers in Medan City.

Based on the research results and discussions, the following recommendations can be made:

### 1. Street Sweepers

Street sweepers are expected to improve compliance with safe work behaviors through consistent use of personal protective equipment, awareness of traffic flow, and implementation of safety procedures outlined in educational materials. The use of digital educational media, including TikTok, is also recommended as a means of independent learning to deepen understanding of occupational risks and preventative measures. Furthermore, participation in occupational safety and health training held periodically by sub-districts and related institutions is important

to strengthen safety competencies and increase worker awareness of maintaining safety while carrying out their duties in the field.

### 2. Sub-district Offices

Sub-district offices or agencies managing street sweepers are advised to integrate digital media-based occupational safety and health promotion into routine training programs, given the effectiveness of short videos in improving workers' understanding, attitudes, and intentions to behave safely. Furthermore, the provision of standard personal protective equipment needs to be ensured so workers can perform their tasks safely, along with consistent field supervision. Occupational safety training also needs to be implemented continuously, focusing not only on theory but also through hands-on simulations to reinforce safe practices in the field. Developing technology-based safety policies, such as providing access to educational content through social media or internal communication channels, can support increased safety literacy. Regular evaluation of safe behavior is important to assess the effectiveness of interventions and ensure that occupational safety and health programs are continuously refined to meet worker needs and field conditions.

### 3. Further Research

Further research is recommended to include a control group to test the effects of the intervention more robustly and validly. Follow-up measurements are also needed to assess the sustainability of the intervention's effects over a longer period. Furthermore, the use of direct observation alongside surveys can provide a more objective picture of safe behavior. Variations in video content formats can also be explored to determine the most effective educational format. Analyzing individual characteristics, such as age, education, tenure, and digital literacy, is important to understand the factors influencing intervention success. Evaluating the effectiveness of other digital

platforms could also provide an opportunity for future research.

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#### **REFERENCES**

1. Andriyadi, Y., Setyowati, D. L., & Ifroh, R. H. (2021). Hubungan safety promotion dengan perilaku aman pada pekerja konstruksi proyek pembangunan. *Jurnal Promosi Kesehatan Indonesia*, 16(2), 56–63. <https://doi.org/10.14710/jpki.16.2.56-63>
2. Anizar. (2012). *Teknik Keselamatan dan Kesehatan Kerja di Industri*. Yogyakarta: Graha Ilmu.
3. Creswell W., John. (2013). *Research Design: Pendekatan Kualitatif, Kuantitatif, dan Mixed*. Yogyakarta: Pustaka Pelajar.
4. Gong, X., Dong, B., Li, L., Shen, D., & Rong, Z. (2023). TikTok video as a health education source of information on heart failure in China: a content analysis. *Frontiers in public health*, 11, 1315393. <https://doi.org/10.3389/fpubh.2023.1315393>
5. Haryani, S., Sahar, J., & Sukihananto, S. (2016). Penyuluhan Kesehatan Langsung dan melalui Media Massa Berpengaruh terhadap Perawatan Hipertensi pada Usia Dewasa Di Kota Depok. *Jurnal Keperawatan Indonesia*, 19(3), 161–168. <https://doi.org/10.7454/jki.v19i3.469>
6. Larasatie, A., Fauziah, M., Dihartawan, D., Herdiansyah, D., & Ernyasih, E. (2022). Faktor-Faktor yang Berhubungan dengan Tindakan Tidak Aman (Unsafe Action) pada Pekerja Produksi PT. X. *Environmental Occupational Health And Safety Journal*, 2(2), 133-146. <https://doi.org/10.24853/eohjs.2.2.133-146>.
7. McCashin, D., & Murphy, C. M. (2023). Using TikTok for public and youth mental health - A systematic review and content analysis. *Clinical child psychology and psychiatry*, 28(1), 279–306. <https://doi.org/10.1177/13591045221106608>
8. Sugiyono. (2022). *Metode Penelitian Kuantitatif*. Bandung: Alfabeta.
9. Tarwaka. (2017). *Dasar-dasar Keselamatan Kerja serta Pencegahan Kecelakaan di Tempat Kerja*. Surakarta: Harapan Press.
10. Tarwaka. (2017). *Keselamatan dan Kesehatan Kerja: Manajemen dan Implementasi K3 di Tempat Kerja*. Surakarta: Harapan Press.
11. Yani, A. (2025). Efektivitas Pelatihan Keselamatan Kerja di Konstruksi dan Peran Manajemen dalam Meningkatkan Kepatuhan K3; Literatur Review. *Jurnal Ilmiah Ekonomi Manajemen & Bisnis*, 3(1), 8–17.
12. Yuliani, M., Wahyuni, I., & Ekawati, E. (2021). Hubungan antara Pengetahuan, Penerapan Prosedur Kerja, Punishment dan Stres Kerja Terhadap Safety Behavior pada Pekerja Konstruksi di PT X. *Jurnal Kesehatan Masyarakat*, 9(1), 58–64.

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