Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

The Relationship between Education Level and Age with Compliance in Reporting Needlestick Injuries Among Healthcare Workers at Hospital X

Amilah Eka Putri[1], Nadia Muthia Hanifah Amrin[2], Ummu Kamilah[1], Rendhar Putri Hilintang[1], A Ferina Herbourina Bonita[1]

[1]Department of Public Health, Tadulako University, [2]Department of Occupational Health and Safety, Famika University

Article Info

Keywords:
Needlestick Injuries,
Reporting compliance,
Education level,
age,
Health Workers

ABSTRACT

Needlestick injuries are one of the most common occupational accidents among healthcare workers and carry the risk of transmitting bloodborne diseases such as HIV, HBV, and HCV. The reporting rate of these incidents remains low, influenced by various factors including individual characteristics such as education level and age. To determine the relationship between education level and age with compliance in reporting needlestick injury incidents among healthcare workers at Hospital X. This study used an observational analytic design with a cross-sectional approach. The sample consisted of 70 healthcare workers who had experienced or were at risk of experiencing needlestick injuries, selected based on inclusion criteria. Data were collected using a structured questionnaire that had been tested for validity and reliability, then analyzed univariately and bivariately using the Chi-Square test with a significance level of $p < 0.05$. The majority of respondents held a bachelor's degree (57.1%) and were aged 20–29 years (61.4%). The highest reporting compliance was found in the bachelor's degree group (90%) and the 20–29 age group (81.4%). Chi-Square test results showed a significant relationship between education level and reporting compliance ($p = 0.042$) and between age and reporting compliance ($p = 0.031$). The main reason for not reporting was the perception of low infection risk (55.7%). Education level and age are significantly related to compliance in reporting needlestick injuries. Interventions to improve compliance should focus on continuous education, ease of reporting procedures, and strengthening the culture of occupational safety.

Corresponding Author:
Amilah Eka Putri
Universitas Tadulako
Jl. Soekarno Hatta, Kota Palu
amilahputri@untad.ac.id

INTRODUCTION

Occupational accidents remain a serious threat in developing countries such as Indonesia. According to the 1988 report by the National Safety Council, the number of occupational accidents in hospitals was recorded to be 41% higher compared to workers in other industrial sectors (Ahsan, Dima, & Widyahastuti, 2019). Several studies in various countries have also confirmed that hospitals are high-risk work environments, where nurses are among the

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

healthcare workers most vulnerable to occupational safety and health problems (Ramdan & Rahman, 2017). Data show that the incidence of acute cases is significantly higher among hospital workers compared to all other categories of workers (by gender, race, age, or employment status). The risk of HIV transmission through contaminated needlestick injuries reaches 4:1000, while the risk of HBV transmission is 27–37:100 and HCV is 3–10:100 (Kepmenkes, 2010).

The implementation of hospital occupational health and safety (K3RS) is crucial in every hospital, considering the many potential hazards faced by medical personnel and the existence of regulations in Indonesia that mandate the application of K3RS (Sapta Sarana Sejahtera, 2022). The presence of occupational safety and health hazards in hospitals requires proper risk assessment so that management can be carried out optimally and workers are protected from workplace risks (Putri, 2018).

Needlestick injuries and other sharp object-related injuries may be caused by the use of unsafe equipment, negligence of healthcare workers in adhering to standard operating procedures (SOP), or weak hospital supervision systems (Puspitasari, 2018). The increase in needlestick injury cases is also related to the still low reporting of occupational accidents. Many healthcare workers consider needlestick injuries as commonplace, thus preferring to handle them independently by cleaning the wound area with alcohol without reporting it as a workplace incident (Fitria A, 2020).

Nurses are the largest group of healthcare workers and play an important role in healthcare services. There are around twenty nursing procedures, both delegative and mandatory, that have the potential to cause biological, mechanical, ergonomic, and physical hazards. These risks are even greater in procedures such as lifting patients, administering injections, suturing wounds, inserting IV lines, drawing blood, and inserting catheters (Rizkita, Fathimah, & Asnifatima, 2020). Given the high incidence of NSIs and the persistently low reporting rates, it is essential to understand the factors influencing reporting behavior.

This study was conducted at Hospital X, a regional public hospital with a high patient load and diverse healthcare workforce. The location was selected due to its strategic role in provincial healthcare delivery and the absence of prior formal studies assessing NSI reporting behavior in this setting. Although anecdotal evidence suggests underreporting of NSIs, no systematic evaluation has been conducted to identify the extent of the issue or the contributing factors.

Previous studies have explored NSI prevalence and general awareness in various hospital settings, but most have focused on clinical risk factors or knowledge levels. Few have examined the combined influence of demographic variables—such as age and education level—and non-demographic barriers like perceived risk, lack of procedural knowledge, workload, and fear of stigma. For example, Joukar et al. (2018) and Balgahoom et al. (2024) identified psychological and systemic barriers to reporting, but did not analyze how these interact with demographic characteristics in specific hospital contexts. Similarly, studies by Fitria et al. (2020) and Meilawati et al. (2019) highlighted associations between education and NSI risk, but lacked detailed analysis of reporting compliance and its behavioral drivers.

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

This research addresses these gaps by investigating both demographic and non-demographic factors influencing NSI reporting compliance among healthcare workers at Hospital X. It provides a contextualized understanding of reporting behavior in a regional hospital setting, offering insights that are directly applicable to similar institutions. The findings are expected to inform targeted interventions—such as training, system redesign, and cultural change—to improve occupational safety and reporting practices.

METHODS

This study employed an observational analytic design with a cross-sectional approach, in which the independent and dependent variables were measured simultaneously at a single point in time. The research was conducted at Hospital X in June 2025. The study involved 70 respondents who met the inclusion criteria, namely healthcare workers who had experienced or were at risk of experiencing needlestick injuries and were willing to participate.

The independent variables in this study were education level and age, while the dependent variable was compliance in reporting needlestick injury incidents. Reporting compliance was defined as the respondent's action in reporting a needlestick injury, categorized as reporting to a supervisor, reporting to a colleague, or not reporting at all. In addition, the study also collected supplementary data on the causes of needlestick injuries and the reasons respondents did not report such incidents.

The research instrument used was a structured questionnaire developed by the researchers based on literature related to hospital occupational safety and the reporting of needlestick injury incidents. The questionnaire had been tested for validity and reliability prior to use. Data were collected through interviews using the questionnaire with respondents who had provided consent to participate.

Data analysis was carried out in two stages. First, univariate analysis was performed to describe the frequency distribution of each variable. Second, bivariate analysis was conducted using the Chi-Square test to determine the relationship between education level and reporting compliance, as well as between age and reporting compliance for needlestick injury incidents. The results were considered statistically significant if the p-value was less than 0.05.

RESULTS AND DISCUSSION

Respondent Characteristics

The respondents in this study consisted of 70 healthcare workers at Hospital X. The distribution based on education level, age, and compliance in reporting needlestick injury incidents is presented in Table 1.

Table 1. Distribution of Respondent Characteristics (n=70)

Variable	Frequency (n)	Percentage (%)
Education		
D3	30	42.9
S1	40	57.1

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Age		
20-30 years	43	61.4
>35 years old	27	38.6
Reporting compliance		
Report to superiors	48	68.6
Report to a friend	17	24.3
Not reporting	5	7.1

Source : Primary Data

The majority of respondents held a bachelor's degree (57.1%) and were aged 20–29 years (61.4%). Most reported needlestick injury (NSI) incidents to their supervisors (68.6%), while 24.3% reported only to colleagues, and 7.1% did not report at all. Although the overall reporting rate is relatively high, the presence of informal and non-reporting behaviors suggests that institutional reporting systems may not be fully effective.

Causes of Needlestick Injuries

The causes of needlestick injury incidents experienced by respondents varied. Table 2 presents the distribution of contributing factors.

Table 2. Distribution of Causes of Needlestick Injuries (n=70)

Causes	Frequency (n)	Persentage (%)
Intravenous (IV) insertion	6	8.6
Specimen handling	5	7.1
Breaking/removing needle from syringe	12	17.1
Recapping syringe needle	4	5.7
Injection procedure	5	7.1
Improper disposal	2	2.9
Medicine ampoule	2	2.9
Lack of attentiveness	7	10
Others (combination of risky activities)	27	38.7

Source : Primary Data

The leading cause of NSIs was a combination of risky activities (38.7%), followed by breaking or removing needles from syringes (17.1%) and lack of attentiveness (10%). Routine procedures such as IV insertion (8.6%) and injections (7.1%) also contributed significantly.

Reasons for Not Reporting Incidents

Respondents who did not report needlestick injury incidents stated various reasons, as shown in Table 3.

Table 3. Reasons for Not Reporting Needlestick Injury Incidents (n=70)

Reason	Jumlah (n)	Persentase (%)
Perceived low of risk of infection	39	55.7
Lack of knowledge on how to report	10	14.3
Heavy workload	5	7.1
Needle had not been used on a patient	3	4.3
Fear of discrimination	3	4.3
Able to manage the incident independently	7	10

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Reason	Jumlah (n)	Persentase (%)
Other	3	4.3

Source : Primary Data

The most common reason for not reporting was the perceived low risk of infection (55.7%), followed by lack of knowledge on how to report (14.3%) and heavy workload (7.1%). Some respondents felt capable of managing the incident independently (10%) or feared discrimination (4.3%).

Relationship Between Education Level and Reporting Compliance

Bivariate analysis using the Chi-Square test showed a relationship between education level and compliance in reporting needlestick injury incidents ($p < 0.05$).

Table 4. Relationship Between Education Level and Compliance in Reporting Needlestick Injuries

Education	Compliant (Reporting)	Non-compliant (Non-reporting)	Total	p-value
D3	24	6	30	
S1	36	4	40	0.042
Total	60	10	70	

Source : Primary Data

There was a statistically significant relationship between education level and reporting compliance ($p = 0.042$). Healthcare workers with a bachelor's degree (S1) showed higher compliance (90%) compared to those with a diploma (D3) (80%).

Relationship Between Age and Compliance in Reporting

Bivariate analysis showed a significant relationship between age and compliance in re porting needlestick injury incidents ($p < 0.05$).

Table 5. Relationship Between Age and Compliance in Reporting Needlestick Injuries

Age	Compliant (Reporting)	Non-compliant (Non-reporting)	Total	p-value
20-29 years old	35	8	43	
>35 years old	25	2	27	0.031
Total	60	10	70	

Source : Primary Data

Age was also significantly associated with reporting compliance ($p = 0.031$). Respondents aged 20–29 years had a compliance rate of (81.4%), while those over 35 years showed a slightly higher rate of (92.6%). The variation suggests that both younger and older healthcare workers have strengths in reporting behavior—youth may bring updated knowledge, while age contributes experience. Therefore, interventions should be tailored to support both groups effectively.

The main reason healthcare workers did not report needlestick injury incidents was the perception of a low risk of infection (55.7%). This finding is consistent with the study by Joukar et al. (2018), which found that perceiving the injury as minor and the risk of infection as low were common reasons for healthcare workers not to report such incidents (Joukar, et al. 2018).

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Other reasons, such as not knowing how to report (14.3%), were also identified in previous studies, for example by Alfulayw et al. (2021), who stated that a lack of knowledge about the benefits of reporting and the reporting procedures constitutes a major barrier (Alfulayw, et al., 2021).

Heavy workload (7.1%) as a barrier to reporting was also identified in international studies, such as the study by Joukar et al. (2018), which noted that workload and work pressure can hinder the reporting of needlestick injury incidents because reporting is perceived as requiring additional time and effort (Joukar, et al. 2018).

The phenomenon of managing the injury independently without reporting is also similar to the findings of Alsabaani et al. (2022), in which most respondents perceived the incident as minor or believed they already knew what to do, and therefore did not feel the need to formally report it (Alsabaani, et al., 2022).

The results of this study also indicate a significant relationship between education level and age with compliance in reporting needlestick injury incidents among healthcare workers at Hospital X. Respondents with a bachelor's degree and aged 20–29 years had a higher proportion of reporting compliance compared to those with a diploma (D3) and aged over 35 years.

Based on the findings, 90% (36 individuals) of respondents with a bachelor's degree reported needlestick injury incidents. The Chi-Square test showed that education level was significantly associated with reporting compliance (p-value = 0.042). This suggests that education level is a contributing factor to reporting behavior in needlestick injury cases.

Healthcare workers with a bachelor's degree tended to be more compliant in reporting compared to those with a diploma. This finding is consistent with several local studies that have identified a relationship between education/knowledge and the occurrence of NSIs or preventive behaviors related to NSIs among healthcare workers. Literature reviews and hospital-based studies in Indonesia have shown that knowledge and training—often closely linked to education level—play an important role in improving safety practices and incident reporting (Balgahoom, et al. 2024).

Furthermore, these results are consistent with Balgahoom et al. (2024) in the *Indonesian Journal of Public Health*, who reported that education level influences awareness and compliance with safety procedures, including the reporting of needlestick injury (NSI) incidents. Healthcare workers with higher education levels tend to have a better understanding of the risks of bloodborne disease transmission and the importance of reporting for prevention (Balgahoom, et al. 2024).

The results of this study are in line with the research conducted by Fitria A. et al. (2020), entitled *The Factors of Needlestick Injury on Healthcare Workers at the Hospital of Bojonegoro*, which showed that education level had a significant relationship with the occurrence of needlestick injuries (p = 0.024). Educational background can contribute to an individual's ability to perform work activities effectively (Fitria A, 2020)

The statistical test conducted by Ifadah E. and F. Susanti (2018) obtained a p-value of 0.003. It can be concluded that there is a difference in proportions between diploma (D3) nurses and those at higher educational levels in terms of risk for needlestick injury (NSI),

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

indicating a significant relationship between education level and NSI occurrence. Education level in this context determines the clinical authority of nurses to provide nursing care in accordance with their competencies. The higher a nurse's education, the more likely they are to comply with and consciously apply standard operating procedures (SOPs), particularly those related to personal protective equipment (PPE), to minimize the occurrence of NSIs.

Based on the present study's findings, 81.4% (35 individuals) of respondents aged 20–29 years reported needlestick injury incidents. The Chi-Square test showed that the age variable (20–29 years) was significantly associated with reporting compliance (p-value = 0.031). This suggests that age is a factor related to the risk of needlestick injury (Putranto, Setyaningsih, & Kurniawan , 2019).

These findings are consistent with the study by Meilawati et al. (2019) at Bhayangkara Brimob Hospital, which found that age was associated with the occurrence of needlestick injuries, with younger healthcare workers tending to be more vigilant and more likely to follow occupational safety procedures. This can be explained by the fact that younger healthcare workers have usually only recently completed their formal education, so their knowledge of reporting and prevention procedures remains fresh and aligned with the latest standards (Meilawati, 2019).

This is because age is associated with increased vulnerability to illness and occupational accidents due to anatomical changes in body organs and a gradual decline in physical condition. Age is also a significant predictor of NSI risk, with findings showing that participants in the 26–30-year age group were significantly associated with a higher likelihood of experiencing NSIs (Abalkhail et al. 2022).

However, despite the significant associations found, there were still healthcare workers with higher education levels or younger age who did not comply with reporting procedures. According to the literature, barriers to reporting are often related to perceived low risk, lack of knowledge about reporting procedures, heavy workload, and concerns about stigma or discrimination (Balgahoom et al., 2024). In the present study, the dominant reason for not reporting was the perception of a low risk of infection, which is consistent with the literature review by Balgahoom et al. (2024), who noted that 75% of NSI cases in developing countries go unreported due to misperceptions of risk.

The implications of these findings highlight the need for regular training, dissemination of accessible reporting systems, and strengthening of a safety culture for both patients and healthcare workers. Therefore, improving reporting compliance should not rely solely on demographic factors such as education and age, but also on systemic interventions that address psychological barriers, knowledge gaps, and workplace culture.

CONCLUSION

This study found that education level was significantly associated with compliance in reporting needlestick injuries (NSIs) (p = 0.042), with healthcare workers holding a bachelor's degree demonstrating higher reporting compliance than those with a diploma (D3). Age was also significantly associated with reporting compliance (p = 0.031), where younger healthcare workers aged 20–29 years were more likely to report NSIs than those over 35 years. In

addition to demographic factors, several non-demographic influences—such as perceived low risk of infection, lack of knowledge about reporting procedures, heavy workload, and fear of discrimination—also contributed to underreporting. These findings suggest that improving reporting compliance requires a multifaceted approach: not only enhancing knowledge and awareness, but also fostering a supportive workplace culture and developing accessible, non-punitive reporting systems. To acknowledge the limitations of this study and guide future research, the following recommendations are proposed: Recognize Study Limitations This study was conducted in a single hospital and focused primarily on nurses. The findings may not fully represent other healthcare roles or institutions. Future research should expand the sample to include various types of healthcare facilities and professionals to improve generalizability. Include Qualitative Exploration Future studies should incorporate qualitative methods such as interviews or focus groups to explore deeper psychological and cultural barriers to reporting that quantitative data may overlook. Evaluate Reporting Infrastructure Research should examine the effectiveness and user-friendliness of existing reporting systems, identifying technical or procedural obstacles that may discourage compliance. By addressing these areas, future research can build on the current findings and contribute to safer, more transparent healthcare environments where occupational injuries are properly reported and managed.

REFERENCE

Abalkhail, A., Kabir, R., Elmosaad, Y. M., Alwashmi, A., Alhumaydhi, F., Alslamah, T., . . . Mahmud, I. *Needle-Stick and Sharp Injuries among Hospital Healthcare Workers in Saudi Arabia: A Cross-Sectional Survey*. 2022, International Journal of Environmental Research and Public Health(19).

Ahsan, Dima, N., & Widyahastuti, K. N. (2019). Hubungan Kepatuhan Perawat Dalam Penerapan Standar Operasional Prosedur (SOP) Teknik Menyuntik Dengan Pencegahan Kejadian Tertusuk Jarum Di Rumah Sakit. *J.K.Mesencephalon, 5*(1), 42-47.

Alfulayw, H. H., Al-Otaibi, S. T., Alqahtani, S. M., Alanazi, R. D., Alqahtani, A., & Alotaibi, A. (2021). Factors associated with needlestick injuries among healthcare workers in Dammam Medical Complex. *BMC Health Services Research, 2(1)*, 1-8.

Alsabaani, A., Alqahtani, N. S., Alqahtani, S. S., Al-Lugbi, J. H., Asiri, M. A., Salem, S. E., . . . Alalyani, M. (2022, February). Incidence, Knowledge, Attitude and Practice Toward Needle Stick Injury Among Health Care Workers in Abha City, Arab Saudi. *Frontiers in Public Health, 10*.

Balgahoom, N. T., Hanifah, N., Pou, R., & Chudri, J. (2024). Prevalensi dan Faktor Risiko Cedera Tertusuk Jarum pada Tenaga Kesehatan di Rumah Sakit: Literature Review. *Jurnal Kesehatan Masyarakat Indonesia, 19 (1)*.

Fitria A, d. (2020, December). Faktor kecelakaan tertusuk jarum pada petugas kesehatan di Rumah Sakit Bojonegoro. *The Indonesian Journal of Occupational Safety and Health, 9*(3), 349-359.

Ifadah, E., & Susanti, F. (2018, Januari). Analisis Faktor yang Berhubungan Dengan Kejadian Needle Stick Injury Di Ruang Instalasi Gawat Darurat dan Ruang Intensive Care RSUD Pasar Rebo Jakarta. Jurnal Keperawatan Respati Yogyakarta, 1(5), 315-321.

Joukar, F., Mansour-Ghanaei, F., Naghipour, M., & Asharnezhad, M. (2018). Needlestick injuries among healthcare workers: why the do not report their incidence. *Iranian: Journal of Nursing and Midwifery Research, 23 (5)*, 382-387.

Kepmenkes. (2010). *Standar Kesehatan dan Keselamatan Kerja di Rumah Sakit.* Jakarta: Kementerian Kesehatan Republik Indonesia.

Meilawati, d. (2019). Faktor-faktor Yang Berhubungan Dengan Kejadian Luka Tusuk Jarum Suntik Pada Perawat Di Rumah Sakit Bhayangkara Brimob tahun 2018. Jurnal Bidang Ilmu Kesehatan. *9*(1), 2622-948X.

Puspitasari, d. (2018). Faktor-faktor Yang Berhubungan Dengan Kecelakaan Kerja Tertusuk Jarum Suntik Atau Benda Tajam Lainnya Pada Perawat Di RSUD Leuwiliang Kabupaten Bogor. *Promotor Jurnal Mahasiswa Kesehatan Masyarakat, 2*(2).

Putranto, T. J., Setyaningsih, Y., & Kurniawan , B. (2019, Oktober). Faktor-Faktor Determinan Kejadian Needlestick Injury Pada Perawat Bagian Rawat Inap RS X, Kota Semarang. *Jurnal Kesehatan Masyarakat (e-Journal) FKM Undip, 7*(4), 279-286.

Putri, E. N. (2018, Mei 09). *Analisis Risiko Kesehatan dan Keselamatan Kerja Pada Pekerja di Puskesmas Lubuk Buaya dan Puskesmas Padang Pasir Kota Padang*. Retrieved Mei 2022, from e-Skripsi Universitas Andalas: http://scholar.unand.ac.id/id/eprint/33596

Ramdan, I. M., & Rahman, A. (2017, Desember). Analisis Risiko Kesehatan dan Keselamatan Kerja (K3) Pada Perawat. *JKP, 5*(3), 229-241.

Rizkita, A., Fathimah, A., & Asnifatima, A. (2020, Oktober). Analisis Perilaku Aman Bekerja Pada Perawat Ruang Rawat Inap Garuda Bawah di Rumah Sakit Tingkat IV Salak Bogor. *Promotor Jurnal Mahasiswa Kesehatan Masyarakat, 3*(5), 440-451.

Sapta Sarana Sejahtera. (2022, 01 24). *K3RS: Keselamatan Kesehatan Kerja Rumah Sakit*. Retrieved from Sapta Sarana Sejahtera: https://saptasarana.co.id/k3rs-keselamatan-kesehatan-kerja-rumah-sakit/