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NURSES' PERCEPTIONS BASED ON THE HEALTH BELIEF MODEL OF STANDARD PRECAUTIONS IN HOSPITAL

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ABSTRACT

Background: The implementation of standard precautions is essential in preventing infection transmission in hospitals. Nurses, as healthcare workers who have direct contact with patients, are at high risk of exposure to blood and body fluids; therefore, their perceptions play an important role in infection prevention practices. The Health Belief Model (HBM) can be used to explain health-related behaviors based on perceived threats, benefits, and barriers. This study aimed to describe nurses' perceptions of standard precautions at Hospital X based on the Health Belief Model.
Methods: A descriptive quantitative design with a cross-sectional approach was used, involving 317 nurses selected through total sampling. Data were collected using the Indonesian version of the Basic Principles of Standard Precautions questionnaire, which measures perceived threat, perceived benefits, and perceived barriers.
Results: The results showed that most nurses had good perceptions, including perceived threat (71.3%), perceived benefits (66.6%), and perceived barriers (64.0%). Most respondents had experienced occupational exposure to blood or body fluids (70.3%) and needle stick injuries (39.7%). The highest incidence of exposure to blood or body fluids was found in the surgical ward (IBS), with 21 respondents (9.4%), and similarly, the highest incidence of needle stick injuries or injuries from infectious sharp objects was also found in the surgical ward, with 21 respondents (16.7%).
Conclusion: Nurses' perceptions of standard precautions were generally good; however, some nurses still had poor perceptions, particularly regarding barriers. These findings highlight the need to strengthen training and improve occupational safety culture to support consistent implementation of standard precautions.

Keywords: health belief model; infection prevention; nurse perception; occupational exposure; standard precautions

INTRODUCTION

Occupational health and safety is a critical component in the delivery of healthcare services. Efforts to prevent the transmission of occupational diseases in healthcare settings require comprehensive strategies, one of which is the implementation of standard precautions. Standard precautions are fundamental preventive measures that must be applied across all healthcare units to reduce the risk of infection transmission (Lubis et al., 2021). Conceptually, standard precautions encompass a series of infection control practices designed to prevent disease transmission through exposure to blood, body fluids, non-intact skin, and mucous membranes (Dewi et al., 2022; Aryanto et al., 2023).

Each hospital unit has different levels of risk and work characteristics, ranging from emergency departments with intensive patient contact to inpatient and intensive care units that are relatively more controlled. These differences influence nurses' experiences and perspectives regarding the implementation of standard precautions. Some nurses are able to implement them effectively due to a strong understanding of self-protection, while others face challenges in daily practice, such as limited facilities, high workload, and lack of workplace support. Previous studies have reported that nurses' compliance with standard precautions in Indonesia varies considerably, ranging from 50.3% to 78.2%, depending on the type of procedures and environmental support (Aryanto et al., 2023; Jati, 2023). These variations indicate that the implementation of standard precautions is not solely influenced by knowledge and hospital policies, but also by individual beliefs and attitudes in assessing the importance of infection prevention practices (Aryanto et al., 2023).

Differences in individual perceptions and risk assessments can be explained through health behavior theories. One widely used framework to understand such variations is the Health Belief Model (HBM), a psychological model that explains and predicts health behaviors based on individuals' beliefs and attitudes. Compared to other health behavior theories, the Health Belief Model (HBM) offers a comprehensive explanation of health-related decision-making by emphasizing the role of perception in shaping behavior. The HBM has also been shown to significantly influence nurses' compliance with standard precautions and infection prevention practices (Alinejad et al., 2023). In addition, HBM is considered more focused than the Transtheoretical Model, as it emphasizes cognitive and perceptual factors influencing preventive actions rather than stages of behavioral change (Glanz et al., 2015).

Initially, the HBM consisted of four main components: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. However, in subsequent developments, perceived susceptibility and severity were combined into a single construct known as perceived threat (Rosenstock et al., 1994). This study focuses on three main HBM constructs—perceived threat, perceived benefits, and perceived barriers—to assess nurses' perceptions of infection risks and preventive behaviors. Recent studies have shown that the constructs of the Health Belief Model, including perceived susceptibility, severity, benefits, and barriers, are significantly associated with nurses' compliance with standard precautions and efforts to prevent occupational exposure in healthcare settings (Alinejad et al., 2023; Amini et al., 2021). These findings support the use of HBM as a framework to understand how individual beliefs influence infection prevention practices.

Healthcare workers, particularly nurses, are among the groups at highest risk of exposure to infectious diseases. Such exposure commonly occurs through contact with blood and body fluids of infected patients, potentially leading to serious conditions such as needle stick injuries and infections with Hepatitis B, Hepatitis C, and HIV (Ismara, 2020). Globally, occupational exposure among healthcare workers remains a major concern. A systematic review and meta-analysis by Abdelmalik et al. (2023) reported that the prevalence of needle stick injuries among nurses reached 40.97% out of 47,090 respondents worldwide, with the highest prevalence in Southeast Asia at 49.9%. This indicates that a substantial proportion of nurses globally have experienced injuries from sharp objects with potential infection risks.

The Centers for Disease Control and Prevention (CDC) reports that approximately 385,000 healthcare workers in the United States experience needle stick or sharp object injuries annually. The World Health Organization (WHO) estimates that each year there are approximately two million exposures to Hepatitis B virus (HBV), 900,000 to Hepatitis C virus (HCV), and 170,000 to HIV among healthcare workers. The risk of transmission from contaminated needle stick injuries ranges from 6–30% for HBV, 1.8% for HCV, and 0.3% for HIV (Alfulayw et al., 2021). In Indonesia, similar patterns have been observed. Nurmalia et al. (2022) reported that most occupational accidents among healthcare workers are caused by exposure to blood, body fluids, and sharp objects, often associated with high workload and limited time to properly implement standard precautions. These conditions highlight that occupational hazards in hospitals remain a significant issue, particularly for nurses who have direct and frequent patient contact.

Previous data from Hospital X in Tarakan, North Kalimantan, recorded 5 cases of needle stick injuries in 2019, 4 cases in 2020, and 5 cases in 2021 (Nurlela, 2022). These findings indicate that the risk of occupational injury due to sharp objects persists even in major referral hospitals. Based on the above considerations, it is important to further explore nurses' perceptions of standard precautions to gain a deeper understanding of how they perceive risks, benefits, and barriers in implementing infection prevention practices. However, limited studies have specifically examined nurses' perceptions using

the Health Belief Model framework, particularly in Hospital X. Therefore, this study aims to describe nurses' perceptions of standard precautions based on the Health Belief Model, with the expectation that the findings can inform policy development, training programs, and interventions to improve occupational safety among nurses in hospital settings.

METHODS

This study employed a quantitative method with a descriptive design and a cross-sectional approach to describe nurses' perceptions of the implementation of standard precautions at Hospital X. The study was conducted from 19 to 29 January, 2026. The population consisted of all actively working nurses at the hospital, totaling 561 individuals. The sample included staff nurses and team leaders who had direct interaction with patients and met the inclusion criteria. The sampling technique used in this study was total sampling. Using a total sampling technique, a total of 317 nurses who were willing to participate and met the study criteria were included as respondents.

Data were collected using the Indonesian version of the Basic Principles of Standard Precautions questionnaire, which measures three main constructs of the Health Belief Model: perceived threat, perceived benefits, and perceived barriers. The variables examined in this study were nurses' perceptions regarding the implementation of standard precautions based on these HBM constructs. Data coding and entry were performed using Microsoft Excel. Data analysis in this study was conducted using descriptive statistical methods with the assistance of SPSS software. Data were analyzed using descriptive statistics and presented in the form of frequencies and percentages. This study received ethical approval from the Health Research Ethics Committee with approval number 106/KEPK-RSUD dr. H. JUSUF SK/XII/2025, and research permission was obtained from Hospital X as the study site.

RESULTS

The following section presents the results of the study, including respondent characteristics, nurses' perceptions of standard precautions based on the Health Belief Model, and the distribution of occupational exposure among nurses.

Table 1. Respondent Characteristics

Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	105	33.1
Female	212	66.9
Age		
Adult	268	84.5
Pre-elderly	49	15.5
Education Level		
Diploma in Nursing (D3)	103	32.5
Bachelor of Nursing (S1)	62	19.6
Professional Nurse (Ners)	148	46.7
Others	4	1.3
Length of Work Experience		
< 5 Years	40	12.6
5 – 10 Years	134	42.3
> 10 Years	143	45.1
Unit		
IGD	20	6.3
ICU	12	3.8
ICVCU	16	5.0
PICU	9	2.8
NICU	8	2.5

Characteristics	Frequency (n)	Percentage (%)
HCU	17	5.4
IBS	27	8.5
OK CITO	17	5.4
Outpatient Clinic	25	7.9
Hemodialysis	24	7.6
Teratai Ward (Psychiatric Inpatient Unit)	14	4.4
Dahlia A Ward (Adult Inpatient Ward, Class II-III)	22	6.9
Dahlia B Ward (Adult Inpatient Ward, Class II-III)	19	6.0
Anggrek A Ward (Adult Inpatient Ward, Class II)	16	5.0
Anggrek B Ward (Pediatric Inpatient Ward)	17	5.4
Asoka Ward (Class I Inpatient Ward)	19	6.0
Nusa Indah Ward (VVIP Inpatient Ward)	11	3.5
Kenanga Ward (Post-Stroke Inpatient Ward)	11	3.5
Aster Ward (Perinatology Unit)	13	4.1

Source: Primary Data, 2026

Based on Table 1, the majority of respondents were female 212 respondents (66.9%), classified as adults 268 respondents (84.5%), had a professional nursing degree (Ners) 148 respondents (46.7%), had more than 10 years of work experience 143 respondents (45.1%), and were mostly assigned to the surgical ward (IBS), with 27 respondents (8.5%).

Table. 2 Distribution of Nurses' Perceptions of Standard Precautions Components

Perception	Good n (%)	Poor n (%)	Total n (%)
Perception Of Infection Threat	226 (71.3)	91 (28.7)	317 (100.0)
Perceived Benefits	211 (66.6)	106 (33.2)	317 (100.0)
Perceived Barriers	203 (64.0)	114 (36.0)	317 (100.0)

Source: Primary Data, 2026

Based on Table 2, the majority of nurses had a good perception of infection threat, with 226 respondents (71.3%). Similarly, 211 respondents (66.6%) demonstrated a good perception of the benefits of standard precautions. In addition, 203 respondents (64.0%) had a good perception of barriers related to the implementation of standard precautions.

Table 3. Occupational Exposure Among Nurses

Unit	Exposure to Blood or Body Fluids (%)	Needle Stick Injury (%)
IGD	16 (7.2)	10 (7.9)
ICU	10 (4.5)	6 (4.8)
ICVCU	11 (4.9)	5 (4.0)
PICU	7 (3.1)	4 (3.2)
NICU	8 (3.6)	7 (5.6)
HCU	13 (5.8)	2 (1.6)
IBS	21 (9.4)	21 (16.7)
OK CITO	16 (7.2)	10 (7.9)
Outpatient Clinic	11 (4.9)	7 (5.6)
Hemodialysis	18 (8.1)	9 (7.1)
Teratai Ward (Psychiatric Inpatient Unit)	9 (4.0)	3 (2.4)
Dahlia A Ward (Adult Inpatient Ward, Class II-III)	7 (3.1)	3 (2.4)
Dahlia B Ward (Adult Inpatient Ward, Class II-III)	9 (4.0)	5 (4.0)
Anggrek A Ward (Adult Inpatient Ward, Class II)	11 (4.9)	4 (3.2)
Anggrek B Ward (Pediatric Inpatient Ward)	13 (5.8)	7 (5.6)
Asoka Ward (Class I Inpatient Ward)	14 (6.3)	8 (6.3)
Nusa Indah Ward (VVIP Inpatient Ward)	9 (4.0)	5 (4.0)
Kenanga Ward (Post-Stroke Inpatient Ward)	9 (4.0)	4 (3.2)
Aster Ward (Perinatology Unit)	11 (4.9)	6 (4.8)

Source: Primary Data, 2026

Based on Table 3, most respondents had experienced occupational exposure to blood or body fluids, with 223 respondents (70.3%), while 126 respondents (39.7%) had experienced needle stick injuries or injuries from infectious sharp objects. The highest incidence of exposure to blood or body fluids was found in the surgical ward (IBS), with 21 respondents (9.4%). Similarly, the highest incidence of needle stick injuries was also found in the surgical ward, with 21 respondents (16.7%).

DISCUSSION

Perceived Threat of Infection

The findings of this study indicate that the majority of respondents had a good level of perceived threat. This is reflected in the proportion of respondents who demonstrated good perceived threat in this study. This suggests that most nurses are aware of the risk of infection transmission in the workplace, particularly through exposure to body fluids, sharp objects, and direct patient contact. According to the Health Belief Model (HBM), perceived susceptibility and perceived severity are key cognitive factors that influence individuals' decisions to engage in preventive behaviors. This is supported by Mortada and Elhessewi (2022), who found that perceived susceptibility and perceived severity significantly contribute to the formation of health prevention behaviors. Perceived susceptibility refers to nurses' beliefs about their likelihood of being exposed to infection, while perceived severity relates to their beliefs regarding the serious consequences of such exposure on health and occupational safety (Rusli et al., 2020). As frontline healthcare providers, nurses are at high risk of exposure to infectious agents, making perceived threat an important determinant in the implementation of standard precautions (Arthur et al., 2024).

Perceptions of infection risk reflect how individuals assess both the likelihood and severity of a health threat, which in turn influences preventive behaviors (Novdianto, 2025). Nurses who perceive a higher level of risk, such as during the COVID-19 pandemic, tend to demonstrate better compliance with personal protective equipment (PPE) use and infection prevention procedures (Elshaer & Agag, 2022). This finding is consistent with the HBM, which suggests that individuals who feel vulnerable to a disease and understand its serious consequences are more motivated to adopt preventive measures (Tubuon et al., 2023). Therefore, a strong perception of threat plays a crucial role in shaping infection prevention behaviors, as individuals who feel at risk are more likely to remain vigilant and adhere to standard precautions.

This study also found that most respondents had experienced occupational exposure to blood or body fluids, as well as needle stick injuries or injuries from infectious sharp objects. These findings indicate that biological exposure remains common among healthcare workers in hospital settings. Previous studies have reported that exposure to blood and body fluids, as well as needle stick injuries, continue to be major occupational health issues among healthcare workers. Zarei et al. (2025) reported that the highest incidence of needle stick and sharp injuries occurred in operating rooms and dialysis units, while Chen et al. (2026) identified operating rooms and emergency departments as high-risk areas for exposure to blood and body fluids. Similarly, Zhang et al. (2022) found that 52.1% of nurses had experienced at least one exposure incident during their practice. Such exposure reinforces the perception of real infection risks, including Hepatitis B, Hepatitis C, and HIV, thereby strengthening perceived susceptibility and severity among healthcare workers.

Based on these findings, it can be interpreted that direct clinical experience, especially exposure to blood and body fluids, plays an important role in shaping nurses' perception of infection risk. Nurses who

have experienced such incidents are likely to have higher awareness and vigilance in implementing standard precautions.

However, this study also revealed that a proportion of nurses still had poor perceived threat. Within the HBM framework, low perceived threat may reduce an individual's motivation to engage in preventive behaviors (Rusli et al., 2020). This reduced motivation can negatively impact compliance with standard precautions. Previous research has shown a significant relationship between nurses' motivation and their compliance with universal precautions, where higher motivation is associated with better adherence (Susanto & Murtiyani, 2023). Therefore, efforts such as education, training, and continuous socialization regarding standard precautions are essential to enhance nurses' perception of infection risk, ultimately improving occupational safety and reducing the incidence of healthcare-associated infections.

Perceived Benefits of Standard Precautions

The results of this study show that the majority of nurses had a good perception of the benefits of standard precautions. This finding indicates that most respondents recognize the importance and effectiveness of standard precautions in preventing infection transmission. This indicates that most nurses understand that implementing standard precautions—such as hand hygiene, use of personal protective equipment, and safe exposure prevention practices—provides real protection against infection risks in the workplace. Perceived benefits are an important factor influencing nurses' behavior in applying infection prevention measures in healthcare settings. Individuals are more likely to perform a behavior when they believe that it provides tangible benefits for protecting their health and safety, as well as that of their patients (WHO, 2022).

Previous studies have demonstrated that nurses with a good perception of the benefits of standard precautions are more likely to consistently perform hand hygiene, use personal protective equipment, and adhere to aseptic practices due to their recognition of the effectiveness of these measures in reducing nosocomial infections (Aryanto et al., 2023). Similarly, other studies have shown that perceived benefits and motivation significantly influence the implementation of standard precautions, including the appropriate use of PPE, as nurses recognize that these actions protect both themselves and their patients from harmful biological exposure (Ulfa et al., 2025).

Furthermore, research has indicated that perceived benefits of infection prevention measures play a significant role in shaping correct preventive behaviors, as nurses perceive a direct relationship between these actions and the reduction of healthcare-associated infections (Hessels et al., 2023). Cross-national studies also highlight that training and education that enhance understanding of the benefits of standard precautions are directly associated with improved implementation of infection prevention practices in the workplace (Da'she et al., 2023). In Indonesia, support from Infection Prevention and Control (IPC) programs—such as supervision by Infection Prevention Control Nurses (IPCN), training, availability of facilities, and continuous monitoring—has been shown to improve nurses' compliance with standard precautions and PPE use. These supports not only increase knowledge but also strengthen nurses' beliefs and motivation to consistently implement infection prevention practices (Andari et al., 2025; Syamson et al., 2021; Wijaya & Putri, 2025).

Based on these findings, it can be interpreted that nurses' belief in the benefits of standard precautions is not only influenced by knowledge, but also by their experience and the support system available in the workplace. However, not all studies demonstrate a direct relationship between knowledge and compliance. Iksan (2025) found that although most surgical nurses had good knowledge (97.1%), compliance was only 51.4%, with no significant association between knowledge and adherence. This

finding suggests that knowledge alone is not sufficient to drive preventive behavior. From the perspective of the Health Belief Model, belief in the actual benefits of an action plays a more critical role than mere theoretical understanding.

Perceived Barriers to Standard Precautions

The findings of this study indicate that most nurses had a good perception of barriers to standard precautions, suggesting that they did not perceive significant obstacles in implementing these practices in the workplace. This reflects that the existing work environment may have supported the implementation of standard precautions among nurses. This aligns with previous studies indicating that barriers to infection prevention practices can be minimized when both individual and organizational factors are supportive.

A literature review shows that compliance with PPE use is influenced by knowledge, attitudes, risk perception, and institutional support, such as the availability of facilities and a strong safety culture. When these factors are well established, perceived barriers to standard precautions tend to be lower (Ningrum et al., 2026). Other studies have also found that the availability of PPE, along with positive attitudes and adequate knowledge, is significantly associated with better compliance, indicating that continuous education and institutional support play important roles in reducing perceived barriers (Hutama et al., 2025). Additionally, inadequate supervision and negative attitudes have been linked to non-compliance in PPE use, whereas effective supervision and positive attitudes contribute to minimizing barriers (Kalsum & Lilia, 2024). Nurses who receive strong workplace support and have adequate understanding are more likely to comply with PPE use, indirectly reflecting lower perceived barriers (Mulyadi, 2024).

These findings are further supported by the characteristics of respondents in this study, which were dominated by nurses with professional (Ners) education and more than ten years of work experience. Professional education provides a more comprehensive scientific and clinical foundation in infection prevention and control, enabling nurses to develop better analytical skills and technical competence in implementing standard precautions (Kanwal et al., 2025). Previous research has shown that education level and knowledge are significantly associated with compliance with standard precautions among hospital nurses (Aryanto, 2023). In addition, longer work experience contributes to greater maturity in clinical decision-making and consistency in following safety procedures (Ibrahim & Rahmi, 2023). International studies also report that nurses with higher awareness and understanding of infection risks tend to perceive standard precaution procedures not as an additional burden but as an integral part of professional practice (Haider, 2025). Continuous training and clear organizational regulations have also been shown to reduce perceived barriers to infection prevention practices (Ismael et al., 2025). Moreover, extensive clinical experience is associated with increased self-efficacy in managing exposure risks, leading to lower perceived barriers as individuals feel more capable of handling high-risk situations (Suseno, 2025).

Based on these findings, it can be interpreted that lower perceived barriers among nurses are influenced by a combination of individual factors, such as education and experience, and organizational support, including the availability of facilities and supervision in the workplace.

CONCLUSIONS

Based on the findings of this study, it can be concluded that the majority of nurses at Hospital X had good perceptions of perceived threat, perceived benefits, and perceived barriers regarding the implementation of standard precautions based on the Health Belief Model.

However, the findings also revealed that a number of nurses had experienced exposure to blood or body fluids as well as needle stick injuries or injuries from infectious sharp objects. This indicates that the risk of biological exposure remains present among healthcare workers in hospital settings. Therefore, consistent implementation of standard precautions needs to be continuously strengthened to improve occupational safety and prevent healthcare-associated infections.

Based on these findings, it is recommended that hospitals further strengthen the implementation of standard precautions in line with Permenkes No. 27 Tahun 2017, particularly through optimizing Infection Prevention and Control (PPI) programs. Efforts such as regular training, ongoing supervision, and periodic evaluation of nurses' compliance with standard precautions are needed. In addition, strengthening patient safety and quality improvement programs, as well as Occupational Health and Safety in Hospitals (K3RS), is important, especially in reducing incidents of occupational exposure such as needle stick injuries. Hospitals also need to ensure the availability of personal protective equipment (PPE) and create a supportive work environment that promotes a safety culture among healthcare workers. These efforts can be integrated with antimicrobial resistance control programs to support more comprehensive infection prevention and improve the overall quality of healthcare services.

REFERENCES

1. Abdelmalik, M. A., Alhowaymel, F. M., Fadlalmola, H., Mohammaed, M. O., Abbakr, I., Alenezi, A., Mohammed, A. M., & Abaoud, A. F. (2023). Global prevalence of needle stick injuries among nurses: A comprehensive systematic review and meta-analysis. *Journal of Clinical Nursing*, 32(17–18), 5619–5631. https://doi.org/10.1111/jocn.16661

2. Alfulayw, K. H., Al-Otaibi, S. T., & Alqahtani, H. A. (2021). Factors associated with needlestick injuries among healthcare workers: Implications for prevention. *BMC Health Services Research*, 21, 1074. https://doi.org/10.1186/s12913-021-07110-y

3. Alinejad, N., Bijani, M., Malekhosseini, M., Nasrabadi, M., Harsini, P. A., & Jeihooni, A. K. (2023). Effect of educational intervention based on health belief model on nurses' compliance with standard precautions in preventing needle stick injuries. *BMC Nursing, 22*, 180. https://doi.org/10.1186/s12912-023-01347-0

4. Amini, R., Mohamadkhani, M., Khodaveisi, M., & Karami, M. (2021). Effect of health belief model-based education on infection control standard precautions in prehospital emergency staff: A clinical trial study. *Iranian Journal of Nursing and Midwifery Research*, *26*(6), 515-520. https://doi.org/10.4103/ijnmr.ijnmr_377_20

5. Andari, M. S., Saftarina, F., Maulana, M., & Utama, W. T. (2025). Literature review: Kepatuhan penggunaan alat pelindung diri (APD) pada perawat sebagai upaya *universal precaution*. *Jurnal Kedokteran Universitas Lampung, 9*(2). https://doi.org/10.23960/jkunila.v9i2.pp297-305

6. Arthur, A., Mutiara, R., & Andry. (2024). The compliance of hand hygiene among professional nurses influenced by knowledge of precaution standards, attitude, and motivation. *International Journal of Nursing and Health Services*, 7(4). https://doi.org/10.35654/ijnhs.v7i4.779

7. Aryanto, R., Indrawati, E., & Rosa, D. (2023). Faktor-faktor yang mempengaruhi tingkat kepatuhan perawat dalam penerapan kewaspadaan standar di RSUP Persahabatan tahun 2023. *Jurnal Masyarakat dan Rumah Sakit Indonesia (MARSI)*, 4(1), 45–53. https://ejournal.urindo.ac.id/index.php/MARSI/article/view/3567

8. Chen, L., Liu, W., Dong, C., Yang, J., Gan, Y., Zhong, Y., & Liang, D. (2026). Assessment of occupational exposure to blood and other body fluids among healthcare workers in a south-western Chinese tertiary hospital from 2018 to 2023: A descriptive cross-sectional study. *Nursing Open*, 13(1), e70432. https://doi.org/10.1002/nop2.70432

9. Da's eh, A., Al-Zaru, I. M., Hayajneh, A. A., & Obaid, O. (2023). Nurses' knowledge and compliance with standard precautions to prevent healthcare-associated infections. *The Open Nursing Journal*, 17, e187443462306231. https://doi.org/10.2174/18744346-v17-e20230711-2023-3

10. Dewi, E. R., Sari, A. N., & Rachmawati, I. (2022). Pentingnya kewaspadaan perawat terhadap universal precaution. Jurnal Profesi Keperawatan dan Kesehatan, 3(2), 85–94. https://journals.itspku.ac.id/index.php/profesi/article/download/93/50/1046

11. Elshaer, N. S. M., & Agag, M. A. (2022). Nurses' perception and compliance with personal protective equipment and hand hygiene during the third wave of COVID-19 pandemic. *Journal of the Egyptian Public Health Association, 97*(1), 1–9. https://doi.org/10.1186/s42506-022-00109-1

12. Glanz, K., Rimer, B. K., & Viswanath, K. (2015). *Health behavior: Theory, research, and practice* (5th ed.). Jossey-Bass.

13. Haider, N., Ayoub, F. A., & Fatima, A. (2025). Awareness and practices towards standard precaution among nursing staff. *Biological and Clinical Sciences Research Journal, 6*(3), 1654. https://doi.org/10.54112/bcsrj.v6i3.1654

14. Hessels, A. J., Guo, J., Johnson, C. A., Larson, E. L. (2023). Impact of patient safety climate on infection prevention practices and healthcare worker and patient outcomes. *American Journal of Infection Control*, 51(5), 482–489. https://doi.org/10.1016/j.ajic.2023.01.021

15. Hutama, R. F., Zaman, C., & Gustina, E. (2025). Hubungan umur, jenis kelamin, pengetahuan, sikap dan ketersediaan alat pelindung diri (APD) terhadap kepatuhan pemakaian APD. *Jurnal 'Aisyiyah Medika, 10*(2), 471–480. https://doi.org/10.36729/jam.v10i2.1452

16. Ibrahim, N., & Rahmi, N. (2021). Karakteristik perawat pelaksana terhadap kewaspadaan standar di Rumah Sakit Umum Dr. Zubir Mahmud Aceh Timur. *Jurnal Kesehatan Masyarakat, 5*(2), 703–710. https://doi.org/10.31004/prepotif.v5i2.1829

17. Iksan, D. F. (2025). Hubungan Pengetahuan Dengan Kepatuhan Perawat Dalam Pencegahan Infeksi Nosokomial Di Ruang Bedah Rsmi Jayapura. *Healthy Papua-Jurnal keperawatan dan Kesehatan*, 8(2). https://jurnal.akpermarthenindey.ac.id/akper/article/view/181

18. Ismael, N. H., Qader, D. J., Faris, G. O., Abdulkarim, A. G., & Mohamad, C. T. (2025). Awareness of infection control and barriers among the healthcare workers in Sulaymaniyah City, Iraq. *UHD Journal of Science and Technology, 9*(2), 313–320. https://doi.org/10.21928/uhdjst.v9n2y2025.pp313-318

19. Ismara. (2020). *Perilaku mencegah cedera tertusuk dan tersayat (CTS)*. Yogyakarta: UNY Press.

20. Jati, W. P. (2023). Pengaruh audit kewaspadaan standar terhadap tingkat kepatuhan kebersihan tangan perawat di RSI Malang UNISMA. *Malang Health Journal of Nursing Science (MHJNS)*, 4(2), 117–125. https://mhjns.widyagamahusada.ac.id/index.php/mhjns/article/download/117/85

21. Kalsum, P. A., & Lilia, D. (2024). Analisis kepatuhan penggunaan alat pelindung diri (APD) bagi petugas kebersihan jalan di Kecamatan Muara Enim. *Media Informasi, 20*(2), 163–170. https://doi.org/10.37160/mijournal.v20i2.622

22. Kanwal, A., Latif, A., Bibi, A., Manzoor, N., Kousar, F., & Maqbool, B. (2025). Knowledge and practice of nurses regarding infection control measures in tertiary care hospital. *Biological and Clinical Sciences Research Journal, 6*(1), 134–137. https://doi.org/10.54112/bcsrj.v6i1.1536

23. Lubis, P., Harahap, J., & Theo, D. (2021). Analisis kewaspadaan standar dalam pencegahan infeksi di kamar bedah rumah sakit umum daerah Doloksanggul. *Jurnal Kesehatan*, 2(3), 150–159. https://doi.org/10.31004/jkt.v2i3.2109

24. Mulyadi. (2024). Analisis kepatuhan penggunaan alat pelindung diri pada petugas cleaning service di RSUD Palembang Bari Kota Palembang tahun 2024. *Health Care: Jurnal Kesehatan, 13*(1), 154–174. https://doi.org/10.36763/healthcare.v13i1.453

25. Ningrum, K., Griharti, R., & Iarasati, T. A. (2026). Faktor yang mempengaruhi kepatuhan penggunaan alat pelindung diri (APD) pada tenaga kesehatan: Literature review. *Medula, 16*(3), 23–30. https://doi.org/10.53089/medula.v16i3.1812

26. Nurlela. (2022). *Hubungan pengetahuan dan sikap perawat terhadap perilaku pencegahan luka tusuk jarum di RSUD dr. H. Jusuf SK Provinsi Kalimantan Utara* (Skripsi Sarjana, Universitas Borneo Tarakan). Universitas Borneo Tarakan Repository.

27. Nurmalia, D., Sari, A. N., & Pratiwi, L. (2022). Occupational accidents among healthcare workers in Central Java. *Jurnal Kesehatan Masyarakat (Undip)*, 10(2), 120–128. https://doi.org/10.15294/kemas.v18i1.33053

28. Novdianto, A. (2025). Gambaran penerapan universal precaution perawat bedah kamar operasi. *Media Husada Journal of Nursing Science*, 6(1), 1–9. https://doi.org/10.33475/mhjns.v6i1.219

29. Roozbeh, J., et al. (2023). Exposure to needle stick injuries among health care workers in hemodialysis units: in the southwest of Iran: A cross-sectional study. *BMC Health Services Research*. https://doi.org/10.1186/s12913-023-09465-w

30. Rosenstock, I. M. (1974). The Health Belief Model and preventive health behavior. *Health Education Monographs*, 2(4), 354–386. https://doi.org/10.1177/109019817400200405

31. Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1994). The Health Belief Model and HIV risk behavior change. In R. J. DiClemente & J. L. Peterson (Eds.), *Preventing AIDS* (pp. 5–24). Springer. https://doi.org/10.1007/978-1-4899-1193-3_1

32. Rusli, N. T. (2021). Kajian perilaku kepatuhan perawat terhadap praktek kewaspadaan standar di RS X Palembang dengan teori Health Belief Model (Tesis, Universitas Indonesia). Fakultas Kedokteran, Program Pendidikan Dokter Spesialis Ilmu Kedokteran Okupasi.

33. Susanto, N. A., & Murtiyani, N. (2023). Hubungan motivasi perawat dengan kepatuhan penerapan universal precaution pada pemasangan infus di ruang rawat inap. *Jurnal Keperawatan dan Kebidanan*, 4(3). https://e-journal.lppmdianhusada.ac.id/index.php/jkk/article/view/292

34. Suseno, W., & Altrusia, R. O. (2025). Faktor determinan kejadian cedera tusuk jarum pada perawat di rumah sakit, 36–42. https://doi.org/10.47560/chkf9j64

35. Syamson, M. M., Murthini, Asnuddin, & Yuarniati. (2021). Infection control and practice of standard precautions among hospital staff nurses in Indonesia. *Malahayati International Journal of Nursing and Health Science, 4*(1), 28–34. https://doi.org/10.33024/minh.v4i1.4339

36. Tubuoan, Y. N., Posangi, J., & Rombot, D. V. (2023). Analisis health belief model dengan kepatuhan penggunaan alat pelindung diri pada tenaga kesehatan di Puskesmas Gogagoman Kotamobagu. *Jurnal Keperawatan dan Kebidanan*, 4(3).

37. Ulfa, M., Adi, M. S., & Suryoputro, A. (2025). Nurses' motivation, knowledge and perception on compliance with standard precautions. *Malahayati International Journal of Nursing and Health Science*, 8(3), 374–380. https://doi.org/10.33024/minh.v8i3.833

38. Wijaya, L., & Putri, S. A. (2024). Hubungan supervisi infection prevention control nurse (IPCN) dengan kepatuhan perawat dalam menerapkan standar prosedur operasional *universal precaution*. *Jurnal Kesehatan dan Pembangunan, 14*(2). https://doi.org/10.52047/jkp.v14i2.345

39. World Health Organization. (2022). *Standard precautions for the prevention and control of infections: Aide-memoire*. World Health Organization. https://apps.who.int/iris/handle/10665/330080

40. Zarei, O., et al. (2025). Prevalence and factors contributing to needle-stick and sharp injuries across hospital departments: Operating room and dialysis unit prevalence. *BMC Nursing*, 24, 389. https://doi.org/10.1186/s12912-025-02839-x

41. Zhang, L., Li, Q., Guan, L., Fan, L., Li, Y., Zhang, Z., & Yuan, S. (2022). Prevalence and influence factors of occupational exposure to blood and body fluids in registered Chinese nurses: A national cross-sectional study. *BMC Nursing*, 21(298). https://doi.org/10.1186/s12912-022-01090-y