

THE LEVEL OF KNOWLEDGE AND NURSE ATTITUDE IN THE APPLICATION OF FIVE MOMENTS HAND HYGIENE IN A PRIVATE HOSPITAL IN THE WESTERN PART OF INDONESIA

Cornelia Ayu Kristina Larosa¹, Criesty Fransiska Junita Panjaitan², Belet Lydia Ingrit³,
Tirolyn Panjaitan⁴

¹Nurse, Siloam Hospital Purwakarta, Purwakarta

²Nurse, Siloam Hospital Lippo Village, Tangerang

^{3,4}Faculty of Nursing, Universitas Pelita Harapan, Tangerang
Email: belet.ingrit@uph.edu

ABSTRACT

Hand hygiene is very important for health workers to reduce infection rates in health services area. Five Moments Hand Hygiene is one of strategy for health workers to stay safe from infections. Nurses' knowledge and attitudes about hand hygiene can influence their behavior and patients' health to reduce the spread of infection. The study to describe the level of knowledge and attitudes of nurses in applying the Five Moments Hand Hygiene in a Private Hospital in Western Indonesia. This study used descriptive quantitative, and the population were all nurses in a private hospital in Western Indonesia. The sample in this study was 46 nurses, chosen with total sampling technique. To collect the data, a questionnaire examining nurses' attitudes and level of knowledge was used. The data were then analyzed using univariate analysis aiming to explain or describe research variables, by looking at the percentage of data and then presented in tabular form. This study used ethical principles and had received ethical approval from The Research Committee Ethic Faculty of Nursing. The results showed that nurses had a good (80,43%) knowledge of Five Moments Hand Hygiene but had a sufficient (54,35%) attitude in applying the Five Moments Hand Hygiene. Most nurses had good knowledge and sufficient attitudes in applying Five Moments Hand Hygiene. For further researchers, it is suggested to find the relationship between knowledge and attitudes of nurses in applying the Five Moments Hand Hygiene.

Keywords: *Five Moments Hand Hygiene, Level of knowledge, Nurse Attitudes*

INTRODUCTION

Hand hygiene is a way of cleaning one's hands that substantially reduces potential pathogens (harmful microorganism) on the hands (Center for Disease Control and Prevention, 2016). Hand hygiene is also an action to clean hands to reduce the number of microorganisms by using soap, running water or antiseptics. One of the global patient safety challenges is related to safe care initiated by WHO in 2009. It made for health workers as a strategy in implementing hand wash using five moments hand hygiene. There are washing

before touching a patient, before performing clean and sterile procedures, after contact with a patient's body fluids, after touching a patient and after contact with the patient's surroundings. According to Centers for Disease Control and Prevention (2016), one way of preventing infection transmission is by doing hand hygiene. Disease transmission can occur when an infected person does not perform hand hygiene properly and then touches or processes food that is directly consumed by others.

Knowledge is the result of human senses or the results of someone knowing about objects through their senses. Knowledge is hence strongly influenced by the intensity of attention and perception of the object. On the other hand, attitude is a reaction or response that is still closed to stimulus or factor that will influence someone to do something. According to Rahmawati & Susanti (2014), one of the factors that can influence attitudes is culture which can have an influence on a problem. The knowledge possessed by nurses can influence the behavior of nurses in carrying out every action to improve health. The attitude of the nurse also has an impact on improving the patient's health.

Healthcare Associated Infections (HAIs) in hospitals are infections that occur in health care settings. These infections can occur during hospital treatment and other health care facilities where there is no infection at the time of admission and in the incubation period. HAIs can occur as a risk to the work of hospital staff and health workers. This is to say that HAIs are related to the health service process in health facilities. (Sundoro, 2020). Health care-associated infections are also common in patients admitted to the ICU, have poor clinical

outcomes and more severe illness (Nuvials, 2015).

The WHO reports that HAIs usually become public attention only when there are in epidemics (WHO, 2018). HAIs prevalence is different from one country to another, depending on the possibilities of infection prevention and control (European Centre for Disease Prevention and Control, 2019). It is estimated that 12%–32% of infections associated with blood lead to death in Europe and North America (Voidazan, 2020). Estimated prevalence of HAIs in Indonesia which only 0-1% indicates that not yet the presence of HAIs reporting data in hospitals (Rosa, 2017). Another article said that the prevalence of HAIs infection in patients in develop countries varied between 3.5% and 12% while in developing countries including Indonesia, the prevalence of HAIs infection was 9.1% with a variation of 6.1-16% (Rahmawati & Dhamanti, 2021).

The results of the observations found that the nurses on duty rarely performed Five Moments Hand Hygiene actions during the treatment, especially before having contact with patients and performing aseptic technique. Based on the hospital database in 2018, there are only 58% achievement for five moments hand hygiene. Refreshment

training for all nurses is regularly conducted twice a year in Private Hospital in Western Indonesia. Nurses' knowledge and attitudes about hand hygiene need to be improved so that nurses are more obedient in doing hand hygiene and they can reduce the incidence of nosocomial infections such as phlebitis. A qualitative study in Iran found out that positive attitude, subjective norms and perceptions control is highly related to hand hygiene (Ghaffari, Rakhshanderou, Moradabadi & Barkati, 2020). Given this background, the researcher attempted to explore more the level of knowledge and attitudes of nurses in applying Five Moments Hand Hygiene in a private hospital in Western Indonesia.

METHOD

This study used a quantitative research design with descriptive methods. In this study, the researcher applied several principles of ethical considerations. There are informed consent, autonomy, justice, non-maleficence, veracity, confidentiality and value. The researchers also have ethical approval from Research Community and Training Center no. 012/RCTC-EC/R/SHPLBANGKA/VI/2019.

The population in this study were all nurses in a private hospital in Western Indonesia

with a total of 51 nurses. To be more specific, they were 5 nurses from Labor Delivery Room, 6 nurses from Emergency Department, 9 nurses from Outpatient Department, 6 nurses from Operating Theatre, 3 nurses from hemodialysis, 9 nurses from Intensive Care Unit, 3 Nurses from Head Nurse and Clinical Instructor Department, and 19 nurses from Inpatient Department. The sampling technique used in this study was total sampling. Inclusion criteria in this study were nurses in a private hospital in Western Indonesia who were willing to be respondents and the exclusion criteria were nurses who refused to participate in the study. The total number of respondents was 51 nurses, but the respondents in this study were only 46 nurses because five other nurses were refused to become respondents.

The researchers used questionnaire as the instrument of this study with 18 questions about knowledge and 21 questions about nurses' attitude. The researcher used modified instrument, where the Cronbach alpha value of the knowledge questionnaire was 0.707 and the Cronbach alpha value of the attitude questionnaire was 0.941, so it can be concluded that the instrument used in this study is reliable. The researchers used Rahfita Ferdinah's questionnaire as a

reference and modified it according to the objectives of this research. Validity and Reliability Test were also conducted on 30 people nurses outside from respondents.

Data collection was carried out in several stages. First, researchers proposed ethical and hospital approval from faculty to be able to conduct the research. Second, the researchers approached respondents through informed consent to ask their willingness to be involved in this study. Univariate analysis was then carried out after the data were complete. Univariate analysis technique aims to explain or describe research variables, by looking at the percentage of data. The results were presented in tabular form (Notoadmojo, 2018).

RESULTS

Characteristics of respondents in this study consisted of gender, age, working experience and education. The results were shown in a table below:

Based on table 1, most of the respondents in this study were female (82.60%), aged 26-30 years (47.83%), with 2-3 years of working experiences (56.52%) and Diploma holders (76.09%).

Table 1. Frequency Distribution of Respondents' Characteristics in One Private Hospital in Western Indonesia (n=46)

Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	8	17.40
Female	38	82.60
Age		
21-25 Years	17	36.96
26-30 Years	22	47.83
31-35 Years	4	8.70
36-40 Years	2	4.34
>40 Years	1	2.17
Work experience		
1 Year	10	21.74
2-3 Years	26	56.52
4-5 Years	3	6.52
>5 Years	7	15.22
Education		
Diploma	35	76.09
Bachelor's degree	1146	23.9

Table 2. Frequency Distribution of Nurses Knowledge Level in Applying Five Moments Hand Hygiene in One Private Hospital in Western Indonesia (n=46)

Level of Knowledge	Frequency	Percentage (%)
Good	37	80.43
Sufficient	8	17.40
Poor	1	2.17
Total	46	100.00

Based on the table, it was found that the knowledge of nurses in applying Five Moments Hand Hygiene in private hospitals in western Indonesia was mostly in the good category with the percentage of 80.43%,

Table 3. Distribution of Nurses' Attitudes in Applying Five Moments Hand Hygiene in One Private Hospital in Western Indonesia (n=46)

Attitude	Frequency	Percentage (%)
Good	19	41.30
Sufficient	25	54.35
Poor	2	4.35
Total	46	100.00

Based on Table 3, it was found that the attitude of nurses in applying Five Moments Hand Hygiene in private hospitals in western Indonesia was mostly in the sufficient category with the percentage of 54.35%.

DISCUSSIONS

The results showed that most of the nurses' knowledge in applying Five Moments Hand Hygiene in July 2019 was in the good category (80.43%). Nurses with good level of knowledge can apply the five moments of hand hygiene well too. Similarly, Siswanto (2015) conducted a study entitled "The Influence of Knowledge and Attitude of Nurses About Prevention of Nosocomial Infections on Hand Washing in the Inpatient Installation of Islam Jemursari Surabaya Hospital", using an analytical design with a Cross Sectional approach. The results showed that almost all respondents had good knowledge (84%) and had a positive attitude (82%) in doing hand hygiene. Another research conducted by Syarif et al. (2016) found that most of

nurses who had good knowledge about hand hygiene can answers the questions like how hand hygiene should be done before and after entering isolation room. They also know that they have to take off their ring, wristwatch, and bracelet of their hands before starting of scrubbing for surgery. This is line with study conducted by Sharrif, et al (2016) that nurses who have good knowledge usually have a good attitude and performance of hand hygiene too. However, they still need improvement that can be gained through educational classes and courses. Hand washing is assuredly important for both nurses and community. Research conducted in India showed that people had adequate knowledge about the methods and techniques used for hand hygiene (Ananya et al, 2021).

One of the universal precautions that nurses must do is to perform Five Moments Hand Hygiene during nursing interventions. Absence of hand hygiene among healthcare workers has been identified as a main cause of hospital-acquired infections. Supporting this, a study in Vietnam found that healthcare workers mainly had good knowledge of hand hygiene guidelines, but not all healthcare workers received reminders from patients about the hand

hygiene. Barriers to compliance included limited resources, patient overcrowding, staff shortages, allergic reactions to hand sanitizer, and lack of awareness. (Le et al, 2019). Besides the hospital, effective hand hygiene is one of the most important strategies to protect nursing home residents from nosocomial infections. Hammerschmidt & Manser (2019) studies have shown that increasing knowledge, behaviour and attitudes could enhance hand hygiene compliance in nursing homes. Supporting this, previous study from Listiowati & Widyanita (2014) mentioned that the lack of knowledge will affect the obedience of nurses in carrying out hand hygiene practices.

On top of that, Goodarzi, Haghani, Rezazade Abdolalizade & Khachian (2020) said that structured, regular and continuous educational programs with various and effective methods can maintain, promote and overcome nurses' deficit of knowledge. Through the Audit Tools in Infection Control of Private Hospitals in Western Indonesia in 2018, it was found that nurses had not reached the benchmark target (85%) in applying Five Moment Hand Hygiene. This is inversely proportional to the results of the study showing that the level of knowledge of nurses was in the

good category. Another research said that good attitude will increase nurses' safety and affect nurses in giving interventions (Waryantini & Pratama, 2019). In addition to improving attitudes, it is necessary to implement hand leave procedures to reduce infection. This study also in line with the results of research conducted by Sangi (2014) in the inpatient room of the Lirung Health Center, Lirung District, Talud Regency. It showed that there was no significant relationship between knowledge and hand washing with a p-value of 0.430. Therefore, more comprehensive research in one private hospital in western Indonesian is needed to determine the cause of compliance has not been achieved optimally despite the good knowledge.

The results showed that most of the nurses' attitudes in applying Five Moments Hand Hygiene in July 2019 were in the sufficient category (54.35%). This result was in line with the research conducted by Suhartini (2017) entitled "The Relationship of Attitudes with Nurse Compliance in Five Moment Hand hygiene in the Class III Inpatient Room at Sleman Hospital". The results of the study implied that 42 nurses showed positive attitudes (70.0%) and 38 nurses showed compliance (63.3%) (Suhartini, 2017). Other similar research

was conducted by Wulandari & Sholikah (2017) in the ICU and NICU wards of RSUD Sukoharjo, in which as many as 17 respondents had implemented Five Moments Hand Hygiene with 58.6%. According to research conducted by Umboh, Dado, & Kandau in (2017), attitude was one of the factors that greatly influenced nurses to carry out hand hygiene. Notoatmodjo (2014) said that attitude is a response to a particular object. Information can be received and owned by individuals. Views or assessments of an object and a person's experience can change and influence a person's attitude.

According to Rahmawati & Susanti (2014), one factor that can influence attitudes is culture. Likewise, attitudes towards the implementation of hand hygiene. If hand hygiene can become a good culture or habit, then the implementation of hand hygiene can be done well too. A study on nursing staff in a rural tertiary care hospital by Deepak et al (2020) reported that awareness and education of health workers about hand hygiene will improve the practice of health workers to minimize nosocomial infections. Similar with this, study from Kingston et al (2017) explicated that positive role models, the adoption of a positive social and cultural norm within the organization, and

the provision of continuing professional development opportunities may serve as a useful strategy in harnessing good practice among graduate nurses and in preventing negative socialization from occurring. Goordazi et al. (2020) added that structured, regular, and continuous educational programs with various and effective methods should be continued more seriously.

Research from Ananya, Rani, Brundha & Arivarasu (2021) about hand washing showed that people had adequate knowledge regarding the method and techniques used for hand hygiene. Majority of the respondents in their study were aware about the techniques given by WHO and willing to apply it in their daily life. Good knowledge is believed to reduce the number of nosocomial infections in hospitals. In this case, the knowledge and attitudes of nurses in Five Moments Hand Hygiene can affect the occurrence of nosocomial infections in hospitals. This is also line with the study of Diwan et al. (2016) in rural areas of India that barriers to maintaining good hand hygiene were mainly related to high workload, scarcity of resources, lack of scientific information and belief that hand hygiene is unimportant. It can occur within individuals or institutional level.

Hand hygiene is the simplest and most effective way to reduce the incidence of Health Care-associated Infections (HCAIs). Patient can also contribute to reduce HAIs by doing hand hygiene regularly. Haverstick et al (2017) asserted that hand hygiene among patients is just as important as hospitals workers' hand hygiene. Research in East Coast Malaysia among nurses at tertiary Care showed that lack of perception and hand hygiene program intervention could lead to poor of hand hygiene (Rahim, Ibrahim, Noor & Fadzil, 2021). Prevention can be done through controlling nosocomial infections in hospitals, and it must be carried out by all hospital staff. This is an effort to reduce the risk of infection among patients, the consequences of contaminated medical equipment used and to increase a protection for the nurses themselves. Patients' hand hygiene is just as important as hospital workers' hand hygiene. Haverstick et al (2017) said in their study that hand hygiene

is the single best method to prevent the spread of infection. Furthermore, education to staff and patients is essential to engage them in doing hand hygiene.

CONCLUSIONS

To sum up, nurses in one private hospital in Western Indonesia had good knowledge of Five Moments Hand Hygiene and had a sufficient level of attitude toward it. The results of this research are expected to help increasing nurses' knowledge and attitudes regarding the Five Moments Hand Hygiene and to facilitate the implementation of hand hygiene. For further research, it is recommended to find the relationship between knowledge and attitudes of nurses in applying the Five Moments Hand Hygiene and broaden the scope to several hospitals. This research can be a guide for nurses in improving the quality of care and patients' health by implementing the Five Moments Hand Hygiene strategy in a disciplined manner.

REFERENCES

- Ananya, B., Rani, L., Brundha M. P & Arivarasu, L. (2021). Knowledge and Awareness on Methods, Duration and Frequency of Hand Wash. *Annals of the Romanian Society for Cell Biology*, 25(3), 1052–1070. <https://www.annalsofrscb.ro/index.php/journal/article/view/1564>
- Center for Disease Control and Prevention. (2016, March 01). Hand Hygiene. <https://www.cdc.gov/oralhealth/infectioncontrol/faqs/hand-hygiene.html>

- Deepak, Faujdar, S. S., Kumar, S., Mehrishi, P., Solanki, S., Sharma, A., & Verma, S. (2020). Hand hygiene knowledge, attitude, practice and hand microflora analysis of staff nurses in a rural tertiary care hospital. *Journal of family medicine and primary care*, 9(9), 4969–4973. https://doi.org/10.4103/jfmipc.jfmipc_773_20
- Diwan, V., Gustafsson, C., Klintz, S, R., Joshi SC, Joshi, S.C., Joshi, R., Sharma, M., Shah, H., Pathak, A., Tamhankar, A.J & Lundborg, C.S. (2016). Understanding Healthcare Workers Self-Reported Practices, Knowledge and Attitude about Hand Hygiene in a Medical Setting in Rural India. *PLoS ONE*, 11(10): e0163347. <https://doi.org/10.1371/journal.pone.0163347>
- European Centre for Disease Prevention and Control. (2019, January 10). *Point Prevalence Survey of Healthcare Associated Infections and Antimicrobial Use in European Acute Care Hospitals—ECDC PPS Validation Protocol Version 3.1.2*. <https://www.ecdc.europa.eu/en/publications-data/point-prevalence-surveyhealthcare-associated-infections-and-antimicrobial-use-4>
- Goodarzi, Z., Haghani, S., Rezazade, E., Abdolalizade, M & Kachian, A. (2020). Investigating the Knowledge, Attitude and Perception of Hand Hygiene of Nursing Employees Working in Intensive Care Units of Iran University of Medical Sciences, 2018-2019. *Maedica: A Journal of Clinical Medicine*, 15(2): 230-237. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7482689/>
- Hammerschmid, J & Manser, T. (2019). Nurses’ knowledge, behaviour and compliance concerning hand hygiene in nursing homes: A cross-sectional mixedmethods study. *BMC Health Services Research*, 19,1-13. <https://doi.org/10.1186/s12913-019-4347-z>
- Haverstick, S., Goodrich, C., Freeman, R., James, S., Kullar, R & Ahrens, M. (2017). Patients’s Hand Washing and Reducing Hospital_Aquired Infection. *Critical care Nurse Publishing*, 37(3), 1-18. <https://doi.org/10.4037/ccn2017694>
- Kingston, L.M., Slevin, B.L., O’Connell, N.H & Dunne, C.P. (2017). Hand hygiene: Attitudes and practices of nurses, a comparison between 2007 and 2015. *American Journal of Infection Control*, 45 (12), 1300-1307. <https://doi.org/10.1016/j.ajic.2017.08.040>
- Le CD, Lehman EB, Nguyen TH, Craig TJ. (2019). Hand Hygiene Compliance Study at a Large Central Hospital in Vietnam. *International Journal of Environment Research and Public Health*, 16(4):607. <https://doi.org/10.3390/ijerph16040607>
- Listiowati, E., & Widyanita, A. (2014). Hubungan Tingkat Pengetahuan Hand Hygiene dengan Kepatuhan Pelaksanaan Hand Hygiene pada Peserta Program Pendidikan Profesi Dokter. *Jurnal Biomedika*, 6 (1), 7-12. <https://doi.org/10.23917/biomedika.v6i1.1.281>
- Notoatmodjo, S. (2018). *Metodologi Penelitian Kesehatan*. Cetakan Ketiga. Jakarta: PT. Rhineka Cipta.

- Nuvials, X., Palomar, M., Alvarez-Lerma, F., Olaechea, P., Otero, S., Uriona, S., Catalán, M., Gimeno, R., Gracia, M. P., Seijas, I., & ENVIN-HELICS (2015). Health-care associated infections. Patient characteristics and influence on the clinical outcome of patients admitted to ICU. envin-helics registry data. *Intensive Care Medicine Experimental*, 3(Suppl 1), A82. <https://doi.org/10.1186/2197-425X-3-S1-A82>
- Rahim, M.H.A., Ibrahim, M.I., Noor, S.S.M, & Fadzil, N.M. (2021). Predictors of Self-Reported Hand Hygiene Performance among Nurses at Tertiary Care Hospitals in East Coast Malaysia. *International Journal of Environmental Research and Public Health*, 18 (2):409. <https://doi.org/10.3390/ijerph18020409>
- Rahmawati, S.A & Dhamanti, I. (2021). Infections Prevention and Control (IPC) Programs in Hospitals. *Journal of Health Science and Prevention*, 5(1), 23 - 32. <https://doi.org/10.29080/jhsp.v5i1.396>
- Rahmawati, R., & Susanti, M. (2014). PENGETAHUAN DAN SIKAP PERAWAT PENCEGAHAN INFEKSI NOSOKOMIAL DALAM PELAKSANAAN CUCI TANGAN. *Journals of Ners Community*, 5(2), 190–195. <https://doi.org/10.5281/j%20nerscommunity.v5i2.106>
- Rosa, E. M. (2017). Surveillance Incidences HAIs: Urinari Tract Infection (UTI), Surgical Site Infection (SSI) and Phlebitisat Hospitalin Indonesia. *International Journal of Recent Advances in Multidisciplinary Research*, 4 (1), 2147-2150. https://www.researchgate.net/publication/323538308_SURVEILLENCES_HAIs_URINARY_TRACT_INFECTION_UTI_SURGICAL_SITE_INFECTIO_N_SSI_AND_PHLEBITISAT_HOSPITALIN_INDONESIA
- Sangi, O. M. (2014). Hubungan Pengetahuan dan Sikap Perawat dengan Kepatuhan Mencuci Tangan pada Tindakan Pemasangan Infus di Ruang Rawat Inap Puskesmas Lirung. *Jurnal Online Universitas Sariputra Indonesia Tomohon*, 5 (3). <http://jurnal.unsrittomohon.ac.id/index.php?journal=jurnalprint&page=article&op=view&path%5B%5D=108>
- Sharif, A., Arbabisarjou, A., Balouchi, A., Ahmadidarrehsima, S., Kashani, H.H. (2016). Knowledge, Attitude, and Performance of Nurses toward Hand Hygiene in Hospitals. *Global Journal Health Science*, (8), 57–65. <https://doi.org/10.5539/gjhs.v8n8p57>
- Siswanto. (2015). *Pengaruh Pengetahuan dan Sikap Perawat Tentang Pencegahan Infeksi Nosokomial Terhadap Pelaksanaan Cuci Tangan di Instalasi Rawat Inap RS Islam Jemursari Surabaya.* (Undergraduate Thesis). http://digilib.unusa.ac.id/data_pustaka-11538.html
- Suhartini, E. (2017). Hubungan Sikap dengan Kepatuhan Perawat dalam Hand Hygiene Five Moment di Ruang Rawat Inap Kelas III RSUD Sleman. (Undergraduate Thesis). <http://repository.unjaya.ac.id/id/eprint/2236>

- Sundoro, T. (2020). Program Pencegahan dan pengendalian Healthcare Associated Infections (HAIs) di Rumah Sakit X Yogyakarta. *Jurnal Ilmu Kesehatan Masyarakat Berkala (JIKeMB)*, 2 (2), 23-35. <https://doi.org/10.32585/jikemb.v2i2.986>
- Umboh, Dado, & Kandau. (2017). Analisis Faktor-faktor yang Berhubungan dengan Kepatuhan Perawat Melaksanakan Hand Hygiene dalam Mencegah Infeksi Nosokomial di Ruang Rawat Inap Rumah Sakit Advent Manado. *JOM FKp*. 6 (1), 100-113. <https://jom.unri.ac.id/index.php/JOMPSIK/article/download/23913/23145>
- Voidazan, S., Albu, S., Toth, R., Grigorescu, B., Rachita, A. & Moldovan, I. (2020). Healthcare Associated Infections-A New Pathology in Medical Practice?. *International Journal of Environmental Research and Public Health*, 17, 1-13. <https://doi.org/103390/ijerph17030760>
- Waryantini & pratama, F. (2019). Hubungan Sikap Perawat Dengan Tingkat Kepatuhan Dalam Melakukan Langkah-langkah Mencuci Tangan di Unit Pelaksana Teknis Pelayanan Kesehatan. *Healthy Journal*, 8 (2), 48-56. <https://ejournal.unibba.ac.id/index.php/healthy/article/view/496/419>
- Wulandari, R., & Sholikah, S. (2017). Pengetahuan dan Penerapan Five Moments Cuci Tangan Perawat di RSUD Sukoharjo. *Gaster*, 15 (1), 18-27. <https://doi.org/10.30787/gaster.v15i1.133>
- World Health Organization. (n.d) *Health care-associated infections FACT SHEET*. https://www.who.int/gpsc/country_work/gpsc_ccisc_fact_sheet_en.pdf