Paradigm Academic Press
Journal of Innovations in Medical Research
ISSN 2788-7022
JUN. 2025 VOL.4, NO.3

Compliance with Hygiene Protocols Related to the Dress Code of Nursing Students

Harrathi Amina[1], Thabet Maissa[2], Naceur Feriel[2], Ben Mansour Amira[1] & Bergaoui Ines[1]

[1] The Private Higher Institute of Nursing Science Studies (ISEPSI), Star Training Group, University of Sousse, Sousse, Tunisia

[2] Internal Medicine Department, Farhat Hached University Hospital, Faculty of Medicine of Sousse, University of Sousse, Sousse, Tunisia

Correspondence: Thabet Maissa, Internal Medicine Department, Farhat Hached University Hospital, Faculty of Medicine of Sousse, University of Sousse, Sousse, Tunisia.

doi:10.63593/JIMR.2788-7022.2025.06.006

Abstract

Background: Healthcare-associated infections (HAIs) affect up to 20% of hospitalized patients in developing countries. Hygiene dress code protocols play a vital role in infection prevention, particularly among nursing students, whose attire and behavior in clinical settings can significantly impact cross-contamination risks. ***Objective:*** This study aimed to evaluate the knowledge, attitudes, and practices of nursing students regarding compliance with hygiene-related dress code protocols, with a focus on uniform use, changing habits, and adherence outside healthcare settings. ***Methods:*** A descriptive, quantitative, and observational study was conducted from January to March 2024 at the Institut Supérieur Privé des Études en Sciences Infirmières (ISEPSI). A total of 200 randomly selected second- and third-year nursing students completed a structured, anonymous questionnaire. Data were analyzed using SPSS software. ***Results:*** The majority of participants were female (80.5%) with a mean age of 23.1 years. Most recognized key elements of appropriate clinical attire, including clean uniforms (93%) and no jewelry (87.5%). While 82% were aware of official dress protocols, only 56% systematically changed attire when entering and leaving clinical facilities. Notably, 49% admitted wearing uniforms outside the healthcare environment. Key barriers to adherence included lack of time (82.05%), inadequate changing facilities (69.23%), lack of spare uniforms (61.53%), and work pressure (51.28%). Only 46% ensured they avoided touching non-sterile areas of their attire after hand hygiene. Students strongly supported increased awareness efforts, practical training, access to extra uniforms, and improved changing infrastructure. ***Conclusion:*** Despite good awareness of hygiene protocols, nursing students face several obstacles in implementation, primarily due to systemic and logistical challenges. Reinforcing hands-on training, improving facilities, and enhancing supervisory support are essential to promote compliance, reduce infection risks, and strengthen professional conduct in clinical environments.

Keywords: nursing students, hygiene dress code, infection prevention, uniform protocol, healthcare-associated infections, clinical practice compliance

1. Introduction

Healthcare-associated infections (HAIs) affect 5–10% of hospitalized patients in developed countries and up to 20% in developing regions, representing a major global health concern (Allegranzi, B., et al., 2011). Hospital hygiene protocols play a central role in preventing these infections, and the attire of healthcare workers, including nursing students, is a critical component of infection control (Otter, J.A., et al., 2013; Spruce, L., 2017). Official guidelines recommend clean uniforms, closed shoes, tied hair, no jewelry, and visible ID badges (Loveday, H.P., et al., 2014), along with changing attire when entering or leaving healthcare facilities to reduce

pathogen transmission (Gillespie, B.M., et al., 2015). However, studies report gaps between these recommendations and the practices of nursing students, often due to insufficient training or awareness (Wilson, J.A., et al., 2007). Wearing uniforms outside clinical settings, especially on public transport, increases contamination risks (Mitchell, A., et al., 2015). Infrequent changing or improper laundering of uniforms can further lead to pathogen buildup (Edmonds, S.L., et al., 2013), underscoring the need to reinforce compliance with hygiene dress protocols. The objective of this study is to assess the knowledge, attitudes, and practices of nursing students regarding compliance with hygiene-related dress code protocols. More specifically, this study aims to analyze the conditions under which students change their uniforms, as well as their behaviors concerning wearing the uniform outside healthcare facilities and in public transportation.

2. Methodology

A quantitative, descriptive, and observational study was conducted between January and March 2024 at the Institut Supérieur Privé des Études en Sciences Infirmières (ISEPSI). A random sample of 200 second- and third-year nursing students was surveyed using a structured and anonymous questionnaire consisting of 30 questions divided into five sections: sociodemographic data, knowledge, practices, attitudes, and suggestions regarding hygiene dress protocols. Data were analyzed using SPSS software with descriptive and comparative statistical methods.

3. Results

The population study was predominantly female (80.5%; sex ratio 0.24), with a mean age of 23.1 years and 93% over 20 years old. Academically, 19% were in first year, 43.5% in second year, and 37.5% in third year. According to the respondents, the essential elements of appropriate clinical attire include a clean uniform (93%), absence of jewelry (87.5%), tied hair (77.5%), clean surgical scrubs (65%), and a visible identification badge (55.5%) (Table 1**)**.

The majority of students (82%) reported being aware of official recommendations or institution-specific protocols regarding clinical attire. Figure 1 and nearly three-quarters (74%) reported being aware of the sanctions or reminders applied in cases of non-compliance with dress protocols. Approximately 49% of students reported leaving the healthcare facility in their clinical attire to return home. About three-quarters of nursing students (72%) identified hands-on training during clinical placements as essential for better adherence to dress protocols, while over half (58%) suggested the use of explanatory videos. The main difficulties encountered in complying with these protocols are, according to the majority of the surveyed students, the lack of time (82.05%), inadequate facilities for changing clothes (69.23%), the lack of equipment or spare uniforms (61.53%), and work pressure (51.28%). According to the results obtained, it is observed that nearly three-quarters of the students surveyed, or 74%, stated that there are appropriate facilities for changing their clothing in the institution where they carry out their internships. More than half of the students surveyed, or 56%, reported that they always systematically change their clothing when entering and leaving the healthcare facility. Half of the students surveyed, or 50%, reported that they change their work attire once per day during a working day. This figure clearly shows that nearly half of the nursing students, or 46%, stated that after washing or disinfecting their hands, they sometimes make sure not to touch non-sterile areas of their clothing.

Table 1. Distribution of Respondents by Essential Clothing Elements in Healthcare Settings (Hospitals or Others)

Clothing Element	Frequency	Percentage (%)
Clean lab coat	186	93
Clean surgical scrubs	130	65
Hair tied back	155	77.5
No jewelry	175	87.5
Closed shoes	96	48
Visible identification badge	111	55.5
Clean gloves	2	1
Clean trousers	1	0.5
Discreet makeup	1	0.5
No nail polish	1	0.5
Bib apron	2	1

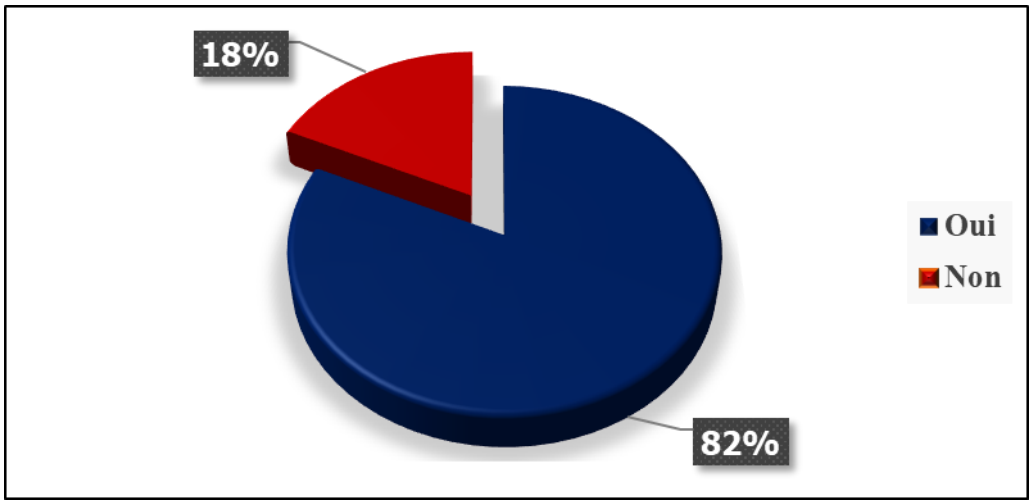

Figure 1. Distribution of respondents according to their knowledge of official recommendations or institution-specific protocols regarding dress code

4. Discussion

Our sample was predominantly female (80.5%; sex ratio 0.24), reflecting the ongoing feminization of the nursing profession (Lelièvre B & Chaffron S., 2019). The average age was 23.1 years, consistent with trends among nursing students (Chibane F, Boulaghmen A & Harzallah D., 2020). Most participants were in their second or third year, suggesting greater exposure to hygiene protocols. However, 64.5% reported not receiving formal training on dress code hygiene, echoing previous findings on insufficient curricular emphasis (Kammoun M, Ben Rejeb M & Lajmi K., 2021). As a result, although students identified key elements such as clean coats (93%), no jewelry (87.5%), and tied hair (77.5%), other crucial aspects like closed shoes (48%) and visible badges (55.5%) were less recognized (Duguet A, Alby F & Chapuis C., 2018; Martin G, Hermans L & Delsaux N., 2019). While 71.5% acknowledged the importance of attire in infection prevention, 69.5% mistakenly believed that clean clothing alone is sufficient — overlooking essential practices such as hand hygiene, cited by only 36% (World Health Organization, 2011; Ben Ayed H, Ben Hmida M, Daoud F, Fendri J & Abdelhedi S., 2020). This partial understanding underscores the need to strengthen education on standard precautions, combining attire and hygiene behaviors. A majority (82%) were aware of institutional clothing protocols, and 74% reported knowing the associated sanctions, factors that promote better compliance according to previous studies (Kebede A, Gerensea H & Meles K., 2017). Similarly, 74% noted the availability of changing rooms, which facilitate proper practice (Al-Khawaldeh OA, Al-Hussami M & Darawad MW., 2019). However, only 56% reported systematically changing their attire at the beginning and end of shifts, and 49% admitted to wearing uniforms outside healthcare settings, which increases contamination risk (Dagne H, Andualem Z, Dagnew B, Gizaw A & Adane T., 2021; World Health Organization, 2009). Moreover, 55% wore uniforms in break areas, contravening international guidelines (Al-Khawaldeh OA et al., 2019).

Regarding uniform maintenance, half of the students (50%) changed their uniforms daily, 35% twice daily, but 13% did so infrequently — contrary to official guidelines recommending changes after each shift or when soiled (Kebede A et al., 2017; Dagne H et al., 2021). While 83% avoided accessories (Loveday HP et al., 2014; Girou E, Oppein F., 2001), only 46% refrained from touching non-sterile areas after hand hygiene, a critical yet often neglected practice. These results stress the need for practical, ongoing training starting from the first year (WHO, 2004). Though 61% found it easy to follow dress protocols during placements, key barriers included time constraints (82.05%), inadequate facilities (69.23%), and a lack of spare uniforms (61.53%). Work pressure (51.28%) and, to a lesser extent, uniform discomfort (7.69%) also impacted adherence (Le Texier R, L'Her E & Mallédant Y., 2016).

Suggestions for improvement included better changing rooms (14%) and more training (7.5%), both aligned with existing recommendations. Only 52% of students made suggestions, possibly reflecting a lack of awareness of the issue. Furthermore, 53% perceived supervisors as tolerating non-compliance, indicating a need for stronger role modeling (Lee E & Cho S., 2016). Alarmingly, 52% had witnessed or heard of infections linked to non-compliance with clothing protocols, underlining the associated risks. Finally, 86% of students favored more frequent awareness efforts, confirming previous findings on their effectiveness. The most recommended methods were interactive training (52%), educational sanctions (47%), and informative posters (33%). Around 72% of students highlighted the value of hands-on training during placements, with 58% favoring instructional videos

over less effective written manuals (23.5%) (Lee E & Cho S., 2016). A large majority (85%) supported the provision of extra uniforms, and many suggested improving changing facilities (58.5%) or upgrading existing ones (41.5%) (Tonna J & Williams E., 2015). Regular evaluations were supported by 92% of students as a way to improve adherence, in line with findings from Tonna et al. (2015). Lastly, 70.5% supported frequent reminders from supervisors, and 49.5% advocated for stricter policies with sanctions, which should be balanced by positive reinforcement strategies (Watson P, O'Neill J & Roberts J., 2020).

Adherence to dress code protocols is essential for infection prevention, patient safety, and the professional image of nurses. This study revealed gaps in practical training, inadequate facilities, and limited institutional support as major barriers among nursing students. Improved hands-on training, better infrastructure (changing rooms and spare uniforms), regular supervision, and awareness campaigns were strongly recommended. Strengthening these areas can promote long-term compliance and enhance care quality.

References

Al-Khawaldeh OA, Al-Hussami M, Darawad MW., (2019). Influence of nursing students' knowledge and attitudes regarding infection prevention on their compliance with standard precautions. *Am J Infect Control.*, *47*(5), 481-487. doi:10.1016/j.ajic.2018.10.016

Allegranzi, B., et al., (2011). Global guidelines for the prevention of surgical site infection. World Health Organization.

Ben Ayed H, Ben Hmida M, Daoud F, Fendri J, Abdelhedi S., (2020). L'importance de la tenue vestimentaire dans la prévention des infections nosocomiales chez les étudiants en sciences infirmières. *Tunis Med.*, *98*(3), 175-180.

Chibane F, Boulaghmen A, Harzallah D., (2020). Évaluation des connaissances des étudiants infirmiers sur la prévention des infections nosocomiales. *Santé Publique*, *32*(6), 833-840.

Dagne H, Andualem Z, Dagnew B, Gizaw A, Adane T., (2021). Infection prevention knowledge, practice, and associated factors among healthcare students in Ethiopia: a cross-sectional study. *BMJ Open.*, *11*, e049852. doi:10.1136/bmjopen-2021-049852

Duguet A, Alby F, Chapuis C., (2018). Hygiène vestimentaire et port des bijoux: perceptions et pratiques des professionnels de santé. *Rech Soins Infirm*, (132), 30-37.

Edmonds, S.L., et al., (2013). A novel decontamination process for the removal of bacterial contamination from hospital uniforms. *Journal of Hospital Infection*, *83*(1), 33-39.

Gillespie, B.M., et al., (2015). Factors that influence the use of infection prevention and control practices by nurses in acute care settings. *Journal of Clinical Nursing*, *24*(13-14), 2053-2061.

Girou, E., & Oppein, F., (2001). Handwashing compliance in a French university hospital: new perspective with the introduction of hand-rubbing with a waterless alcohol-based solution. *The Journal of hospital infection*, 48 Suppl A, S55–S57. https://doi.org/10.1016/s0195-6701(01)90015-5

Kammoun M, Ben Rejeb M, Lajmi K., (2021). Le stress perçu par les étudiants en sciences infirmières en Tunisie: étude transversale. *Educ Santé*, *39*(2), 15-21.

Kebede A, Gerensea H, Meles K., (2017). Knowledge and practice of nursing students regarding infection prevention measures: A cross-sectional study in northern Ethiopia. *Int J Africa Nurs Sci.*, *7*, 17-21. doi:10.1016/j.ijans.2017.02.002

Le Texier R, L'Her E, Mallédant Y., (2016). Conformité des étudiants en soins infirmiers aux recommandations d'hygiène hospitalière. *Rev Infirm*., (221), 30-33.

Lee E, Cho S., (2016). Effectiveness of training programs in infection control for nursing students. *J Nurs Educ.*, *55*(8), 451-456.

Lelièvre B, Chaffron S., (2019). Genre et profession infirmière: entre permanence et changement. *Rech Soins Infirm*, (138), 10-18. doi:10.3917/rsi.138.0010

Loveday, H.P., et al., (2014). epic3: National evidence-based guidelines for preventing healthcare-associated infections in NHS hospitals in England. *Journal of Hospital Infection*, *86*, S1-S70.

Martin G, Hermans L, Delsaux N., (2019). Tenue professionnelle et hygiène: enquête auprès d'étudiants en soins infirmiers en Belgique. *Rev Infirm*, *68*(247), 30-35.

Mitchell, A., et al., (2015). Healthcare-associated infections: Guidelines and quality improvement efforts. In: Handbook of Infection Control.

Otter, J.A., et al., (2013). Transmission of pathogens via hospital uniforms and clothing. *Journal of Hospital*

Infection, *84*(2), 89-98.

Spruce, L., (2017). Back to basics: Preventing surgical site infections. *AORN Journal*, *105*(2), 189-199.

Tonna J, Williams E., (2015). Infection prevention in healthcare settings: The importance of continuous assessment. *Nurs Educ Pract.*, *31*, 16-22.

Treakle, A. M., Thom, K. A., Furuno, J. P., Strauss, S. M., Harris, A. D., & Perencevich, E. N., (2009). Bacterial contamination of health care workers' white coats. *American journal of infection control*, *37*(2), 101-105. https://doi.org/10.1016/j.ajic.2008.03.009

Watson P, O'Neill J, Roberts J., (2020). Rewards and recognition in healthcare: Their role in improving compliance with hygiene protocols. *J Nurs Admin.*, *50*(2), 45-50.

WHO, (2004). Practical Guidelines for Infection Control in Health Care Facilities. World Health Organization.

Wilson, J.A., et al., (2007). Uniform: an evidence review of the microbiological significance of uniforms and uniform policy in the prevention and control of healthcare-associated infections. Report to the Department of Health (England).

World Health Organization, (2009). WHO guidelines on hand hygiene in health care. Geneva: WHO.

World Health Organization, (2011). Patient Safety Curriculum Guide: Multi-professional Edition. Geneva: WHO.