Impact of Patient Safety Culture on Hand Hygiene Compliance Among Healthcare Providers in Dakahlia Governorate Hospitals

YASSER W.Y. EL SAYED, M.Sc.*; TAREK E.I. OMAR, Ph.D.** and TAMER S.M. SALEM, Ph.D.***

Arab Academy for Science, Technology & Maritime Transport (AASTMT), Productivity and Quality Institute, Alexandria* Department of Pediatrics and Consultant in Child Neurology, Faculty of Medicine, Alexandria University**, Egypt The Productivity and Quality Institute for Student Affairs (AASTMT), Productivity and Quality Institute, Alexandria***

Abstract

Background: Healthcare-associated infections (HAIs) significantly threaten patient safety globally, especially in resource-constrained settings. Hand hygiene (HH) is a critical infection control measure; however, suboptimal compliance persists, contributing to increased healthcare costs and patient morbidity. This study investigated the relationship between patient safety culture and HH compliance in Dakahlia Governorate Hospitals in Egypt.

Material and Methods: A mixed-methods approach was used. Quantitative data (n=1474) were collected using the Safety Attitudes Questionnaire (SAQ) to assess patient safety culture across six dimensions (teamwork, safety climate, job satisfaction, stress recognition, perceptions of management, and working conditions). The Arabic SAQ underwent rigorous translation and cultural adaptation. HH compliance (6300 observed opportunities) was concurrently measured via direct observation using the WHO Hand Hygiene observation tool. Qualitative data were gathered from 50 participants through structured interviews, exploring perceptions and experiences related to HH practices, focusing on management's influence, job satisfaction, workplace challenges, and opportunities for enhancing safety culture.

Results: The overall HH compliance rate was 41.43%, varying significantly across hospitals, job roles, and shifts. Quantitative analysis revealed significant positive correlations between HH compliance and Teamwork Climate (r=0.567, p=0.001), Perceptions of Management (r=0.449, p=0.015), Job Satisfaction (r=0.425, p=0.021) and Working Conditions (r=0.472, p=0.01). Nurses exhibited the highest compliance rate, 75%, while other roles, especially support staff, showed lower rates. Qualitative thematic analysis identified key themes: Inconsistent management support and feedback on HH practices; the significant negative impact of high workloads

E-Mail: yasserwageh2020@gmail.com

and understaffing on compliance; role-specific challenges and differences in accountability for HH across different job categories; challenges in working conditions and opportunities to improve safety culture.

Conclusion: A positive safety culture, particularly strong teamwork, is crucial for HH compliance. However, compliance is multifaceted, influenced by job satisfaction, management support, resource availability, and effective workplace design. Variability across roles necessitates targeted interventions.

Recommendations: Enhancing HH compliance requires a multi-pronged approach: Targeted training, improved resource management, enhanced communication and feedback, team-building initiatives, optimized work environments, and formal recognition programs.

Key Words: Hand hygiene – Patient safety culture – HAIs – Teamwork – Mixed methods – Egypt – Dakahlia Governorate.

Introduction

HEALTHCARE-ASSOCIATED infections pose a significant global threat to patient safety and public health [1,2,3], imposing substantial burdens on healthcare systems and resulting in considerable patient morbidity and mortality [1,2,4]. The WHO consistently highlights HAIs as a major concern [5], emphasizing their contribution to increased healthcare costs, prolonged hospital stays, and preventable deaths [1,2,4]. This burden is particularly acute in resource-limited settings where robust infection control measures may be less readily implemented [3], a situation prevalent in many developing nations where infection rates can significantly exceed those in higher-resource settings [3]. The economic consequences of HAIs are substantial, encompassing direct treatment costs and indirect losses due to reduced productivity [4].

Correspondence to: Dr. Yasser W.Y. El Sayed,

Egypt's healthcare system faces numerous challenges, including infrastructure limitations, resource allocation difficulties, and staff training deficiencies [6]. This study focuses on Dakahlia Governorate, which reflects these broader national healthcare challenges. While precise HAIs prevalence data specific to Dakahlia Governorate are limited, available information suggests a substantial threat to regional hospitals, placing increased strain on already scarce resources [6].

Hand hygiene (HH) is a fundamental and cost-effective infection control strategy [1,5,7], essential for reducing the transmission of HAIs [1,5,7] (The WHO's "Five Moments for Hand Hygiene" framework [5] clearly identifies key opportunities for HH implementation. However, global, and especially low-resource setting, compliance frequently falls short of recommended levels [1,8,9], contributing directly to the persistence and spread of HAIs and exacerbating existing challenges.

This research addresses a critical knowledge gap: the limited research exploring the interplay between patient safety culture and HH compliance in Dakahlia Governorate hospitals. Much of the existing literature, primarily from higher-resource settings [10,11,12], may not fully capture the unique cultural, social, economic, and infrastructural factors influencing HH practices within this specific region [6]. The limited exploration of qualitative dimensions of patient safety culture, including healthcare providers' attitudes, beliefs, and perceptions essential for designing effective interventions [13] and inconsistencies in assessment tools across studies [14] represent further significant limitations. Addressing these methodological and contextual limitations is crucial for developing effective, locally relevant interventions.

Aim of the work:

This research investigated the relationship between patient safety culture and hand hygiene compliance among healthcare providers in Dakahlia Governorate hospitals. It sought to identify and analyze the key factors influencing this relationship to achieve a comprehensive understanding of the dynamics affecting HH practices in this specific healthcare context. The findings would then inform the development of targeted interventions to improve HH compliance and strengthen patient safety culture.

Literature Review:

Hand Hygiene: HH is a cornerstone of infection prevention and control, widely recognized as crucial for patient safety [1,5,7]. The WHO's "Five Moments for Hand Hygiene" [5] and CDC guidelines (CDC, 2002) provide comprehensive frameworks. Despite evidence of its efficacy in reducing HAIs [1,5,7], global compliance rates remain suboptimal [1,8,9], especially in resource-constrained settings [3]. Factors influencing compliance are multifaceted, encompassing individual (knowledge, attitudes, perceived risk) [15,16,17], institutional (resource availability, organizational policies) [1], and systemic (workload, staffing, organizational culture) [18,19,20] levels.

Patient Safety Culture: Patient safety culture encompasses shared values, beliefs, attitudes, and behaviours within a healthcare organization that shape its approach to patient safety [21,22]. It is a multifaceted construct with key dimensions, frequently including teamwork climate, safety climate, job satisfaction, perceptions of management, stress recognition, and working conditions [22,23]. Assessment tools like the Safety Attitudes Questionnaire (SAQ) [23] and the Hospital Survey on Patient Safety Culture (HSOPSC) [24] are widely used. A positive safety culture, characterized by open communication, teamwork, and leadership support, is strongly associated with better safety outcomes and compliance with infection control practices [1,23,25]. However, research directly correlating patient safety culture and hand hygiene (HH) compliance, particularly in resource-constrained settings, remains limited [19].

Contextual Factors in Dakahlia Governorate: Interpreting HH compliance data in Dakahlia Governorate requires considering the unique cultural, social, and economic context [6]. Cultural norms and attitudes towards healthcare professionals influence HH expectations and perceptions [26]. Social factors, such as communication styles and teamwork, significantly affect adherence [27]. Economic constraints, including resource limitations and staffing levels, also play a substantial role [6]. Variability in infrastructure and resource availability across hospitals further complicates consistent HH practices.

Material and Methods

This study employed an explanatory sequential mixed-methods design [28] to investigate the relationship between patient safety culture and hand hygiene (HH) compliance among healthcare providers in Dakahlia Governorate Hospitals.

• *Participants:* The study population comprised all healthcare professionals (physicians, nurses, pharmacists, laboratory technicians, radiology technicians) employed in the 30 Ministry of Health (MOH) Hospitals within Dakahlia Governorate. Convenience sampling [28] was used for the quantitative phase, while purposive sampling [29,30] was used for the qualitative phase. Inclusion criteria included employment in a selected MOH hospital, active involvement in patient care during data collection, and informed consent. Exclusion criteria were not explicitly defined. Participation was entirely voluntary. The quantitative phase aimed to measure

the patient safety attitude & HH compliance among the healthcare providers. For measuring the patient safety attitude, A minimum of 40 participants per hospital was targeted to ensure sufficient statistical power, accounting for a design effect (3.95%) to address potential response clustering within hospitals due to shared organizational culture and practices [31]. This resulted in a sample size of 1474 for the SAQ survey (87.37% response rate from 1687 distributed questionnaires). For measuring hand hygiene compliance, 6300 observed opportunities, 210 per hospital (using the WHO HH observation tool), were collected from 1200 participants The qualitative phase involved 50 participants with at least five years of experience, stratified across five job roles to ensure a diverse representation of perspectives [32].

• *Data Collection:* Quantitative data were collected using: (1) The validated Safety Attitudes Questionnaire (SAQ) [23] (Arabic version, rigorously translated and validated); and (2) Direct observation using the WHO hand hygiene observation tool [5]. Three trained observers conducted observations across various shifts and hospital units [33]. Inter-rater reliability was assessed. Qualitative data were gathered via structured interviews (n=50) [34,35], audio-recorded and transcribed verbatim.

• *Data analysis:* Quantitative data were analyzed using descriptive statistics, correlation analysis (Pearson's *r*), independent samples *t*-tests, and oneway ANOVA (where appropriate). Qualitative data were analyzed using thematic analysis [36].

Results

This study employed a sequential mixed-methods design, comprising a quantitative phase followed by a qualitative phase.

Phase one: Quantitative Results.

Response rate:

A total of 1687 SAQ questionnaires were distributed across 30 hospitals in Dakahlia Governorate, yielding an 87.37% response rate (n=1474). However, response rates varied across hospitals, ranging from a low of 52.5% to a high of 100%, suggesting potential differences in staff engagement and participation across facilities. (Table 1).

Descriptive statistics:

The 1474 respondents constituted a diverse group of healthcare professionals. A majority (74.8%) were female, reflecting the gender distribution within the Egyptian healthcare workforce. The age distribution was relatively young, with 47.3% of respondents aged 30–39 years. Nurses formed the largest professional group (46.9%), followed by physicians (30.5%). (Fig. 1).

Table (1): Response rates and hygiene compliance rate by hospital.

Place	Numb Questior	er of maires	Return Rate	Hand Hygiene Compliance
	Distributed	Returned	%	%
M.E. Hospital	60	55	91.6	64
AG. Hospital	77	76	98.7	60.4
TA. Hospital	93	80	86	56.1
DA. Hospital	42	28	66.6	51.9
M.G Hospital	70	63	90	49
M.S Hospital	41	32	78	47.1
M.C Hospital	42	40	95.2	47.1
SH. Hospital	95	88	92.6	46.1
E.MO Hospital	41	38	92.6	45.2
N. Hospital	57	56	98.2	45.2
F.D. Hospital	40	40	100	43.8
B. Hospital	50	39	78	43.3
E.M Hospital	61	43	70.4	42.8
AT. Hospital	41	38	92.6	42.3
SH.H Hospital	40	39	97.5	40.9
OPH.Hospital	42	33	78.5	40.4
M.F Hospital	40	37	92.5	40.4
DK. Hospital	94	93	98.9	39.5
N.M. Hospital	110	71	64.5	39
SH.S Hospital	40	39	97.5	38
MT. Hospital	46	45	97.8	37.6
M.G.N.U Hospital	40	21	52.5	36.6
GA. Hospital	41	36	87.8	35.7
TA. Hospital	41	34	82.9	34.7
G. Hospital	40	39	97.5	33.3
B.C. Hospital	41	25	60.9	32.3
O M G Hospital	86	75	87.2	31.4
DE. Hospital	41	40	97.5	30.4
E.S. Hospital	96	93	96.8	30
K. Hospital	41	37	90.2	17
Total	1687	1474	87.37	41.43



Fig. (1): Age, Gender, and job role distributions.

Safety Attitudes Questionnaire (SAQ) Scores:

Analysis of the SAQ revealed variability in agreement across the six dimensions of patient safety culture. Teamwork Climate scored 15.62 (out of 27) on average, indicating a moderate level of team cohesion. Safety Climate scored higher, averaging 18.32 (out of 32), suggesting a relatively positive perception of safety. Job Satisfaction averaged 12.52 (out of 25), while Stress Recognition averaged 9.85 (out of 20), highlighting potential areas for improvement in staff well-being and stress management. Perceptions of Management averaged 15.87 (out of 30), and Working Conditions scored 8.08 (out of 15). The overall Frontline Perspectives score was 93.30 (out of 157). (Table 2).

Table (2): Frontline	e perspectives	score in the	studied group.
----------------------	----------------	--------------	----------------

Frontline Perchactives	Study group (n=1474)			
Tionume Terspectives	Mean \pm SD	Min-Max		
Teamwork Climate	15.62±5.04	6.00-30		
Safety Climate	18.32 ± 5.94	7.00-35		
Job Satisfaction	12.52 ± 5.34	5.00-25		
Stress Recognition	9.85 ± 4.01	4.00-20		
Perceptions of Management	15.87±6.67	6.00-30		
Working Conditions	8.08±3.49	3.00-15		
Total	80.26±30.49	31.00-155		

Hand hygiene compliance rates:

Direct observation, using the WHO hand hygiene observation tool, assessed HH compliance among 1200 healthcare providers. The overall HH compliance rate was 41.43%. Compliance varied significantly across hospitals (Table 1), shifts, and job roles (Table 3). Nurses exhibited the highest compliance rate (75%), while radiology technicians showed the lowest (18.2%).

Table (3): Hand Hygiene Compliance Rate By Shift & Jobs.

Items	% Hand Hygiene Compliance
Compliance by shift:	
Morning	55%
Afternoon	35%
Night	30.43%
Compliance by job:	
Nurses	75%
Physicians	43.8%
Pharmacists	30.3%
Laboratory Technicians	25%
Radiology Technicians	18.2%

Correlation analysis:

Correlation analysis examined the relationships between the SAQ dimensions of patient safety culture and HH compliance rates (Table 4). Significant positive correlations emerged between HH compliance and Teamwork Climate (r=0.567, p<0.001), Working Conditions (r=0.472, p<0.015), and Job Satisfaction (r=0.425, p<0.021). Safety Climate showed a weak correlation (r=0.239, p=0.213), and Stress Recognition showed no significant correlation (r=0.048, p=0.806) (Table 4) & (Fig. 2).

192

SAO Dimensions	Hand Hygiene compliance %			
SAQ Dimensions	r	р		
Teamwork Climate	0.567	0.001*		
Safety Climate	0.239	0.213		
Job Satisfaction	0.425	0.021*		
Stress Recognition	0.048	0.806		
Perceptions of Management	0.449	0.015*		
Working Conditions	0.472	0.01*		
Total	0.530	0.003*		

 Table (4): Correlation between hand hygiene compliance % and dimensions of patient safety culture.

Phase Two: Qualitative Results (Structured Interviews).

Thematic analysis of 50 structured interviews identified five major themes: Management's in-

Table	e (5):	Summary	of then	nes, sub-	themes,	and	illustrativ	ve quotes
-------	--------	---------	---------	-----------	---------	-----	-------------	-----------



Fig. (2): A scatter plot diagram showing the correlation between the percentage of hand hygiene compliance and all variables.

fluence, job satisfaction, variability of compliance across job roles, challenges in working conditions, and opportunities for enhancing safety climate. Each theme is described below, with illustrative quotes from the interviews. (Table 5).

Theme	Sub theme	Illustrations
Management's Relation- ship With Hand Hygiene Compliance	Communication of Importance	Consistent messaging from management regarding hand hygiene significantly improved compliance; however, inconsistent emphasis and lack of regular communication hindered sustained adherence. Timely feedback was lacking.
	Active Support	Management-led initiatives (workshops, feedback sessions) increased engage- ment and compliance. However, a lack of ongoing support and resources ham- pered sustained improvements.
	Variability in Engagement	Inconsistent prioritization of hygiene compliance by different managers led to inconsistencies in compliance across the organization.
	Monitoring and Feedback	A lack of timely, constructive feedback, often focused only on negative aspects, hindered improvement and discouraged consistent compliance.
Job Satisfaction and Its Relation With Hand Hygiene Compliance	Motivation through Recognition	Recognition for good hygiene practices significantly motivated compliance. Conversely, a lack of recognition for good hygiene practices was a source of frustration.
	Impact of Workload	High workloads frequently led to hand hygiene practices being deprioritized. Staff shortages during certain shifts exacerbated this issue, leading to reduced compliance.
	Team Environment	Supportive team environments, with open communication and mutual support, significantly enhanced compliance. Conversely, a lack of teamwork and conflicts regarding responsibilities undermined compliance.
Variability of Compli- ance Across Job Roles	Role-Specific Challenges	Compliance varied across job roles due to differences in responsibilities and direct patient contact. Nurses, with frequent patient interaction, showed higher compliance than physicians and support staff.
	Differences in Accountability	Physicians and support staff often felt less accountable for hand hygiene than nurses, highlighting the need for improved role-specific accountability meas- ures.
	Need for Tailored Interventions	The need for tailored interventions to address role-specific challenges and en- hance compliance was strongly emphasized.

Table (5): Count.

Theme	Sub-theme	Illustrations
Challenges in Working Conditions	Accessibility of Resources	Inadequate resource availability (sanitizers, soap, sinks) and poor placement of hygiene stations negatively impacted compliance.
	Environmental Design	Poor workplace design, including inconvenient placement of hygiene resources and outdated infrastructure, hindered compliance.
	Culture of Safety	A positive safety culture, prioritizing safety and encouraging open communica- tion about concerns without fear of punishment, proved essential for maintain- ing consistent compliance.
Opportunities for En- hancing Safety Climate	Comprehensive Training Programs	Regular refresher training and engaging, interactive sessions were identified as crucial for maintaining high levels of compliance.
	Leadership Engagement	Active leadership participation in hygiene practices set a powerful example and reinforced its importance.
	Utilizing Technology	Participants suggested that real-time feedback systems could significantly en- hance accountability and improve compliance.

• *Management's Influence:* Management communication and support were pivotal for compliance. Consistent emphasis on HH by leaders fostered responsibility. However, inconsistent support and follow-up hampered sustained compliance. "When management regularly emphasizes hand hygiene, it makes a real difference in how we see our responsibilities" (Participant 12). "Support is lacking...ongoing support and resources aren't always there" (Participant 50).

• Job Satisfaction: High job satisfaction is strongly correlated with compliance. Recognition for good hygiene, positive team dynamics, and supportive working conditions all contributed. Conversely, high workloads and inadequate resources negatively impacted compliance. "Being recognized for good hygiene practices motivates us to keep it up" (Participant 14). "When things get really busy... hand hygiene becomes a lower priority when you're overwhelmed" (Participant 26).

• Variability of Compliance Across Job Roles: Compliance varied based on job responsibilities and accountability. Nurses, due to frequent patient contact, exhibited higher compliance. Physicians often perceived less responsibility for HH. "Nurses tend to comply more because we have direct patient contact...unlike some of the support staff" (Participant 17). "Some doctors think it's not their job to wash hands...leaving it up to others" (Participant 23).

• Challenges in Working Conditions: Inadequate resources (sanitizers, soap, sinks), poor workplace design, and supply interruptions hindered compliance. A positive safety culture was crucial for overcoming these challenges. "If hand sanitizer stations aren't close by, we tend to forget to use them" (Participant 16). "A culture that prioritizes safety encourages everyone to adhere to hygiene practices" (Participant 9). • Opportunities for Enhancing Safety Climate: Participants identified opportunities to improve the safety climate and compliance, including comprehensive training programs, increased management visibility in hygiene practices, and the use of real-time feedback systems. "Regular training refresher helps keep hand hygiene top of mind for all staff" (Participant 8). "Real-time feedback systems for compliance could really help hold everyone accountable" (Participant 7).

Discussion

This study's findings reveal a strong positive correlation between teamwork climate and hand hygiene compliance, supporting previous research emphasizing the importance of a collaborative team environment in fostering a culture of safety and promoting adherence to infection control protocols [8,18,37,38]. Qualitative data reinforced this observation, highlighting how a supportive and collaborative team environment facilitates peer support, reminders, and mutual accountability, thereby enhancing compliance.

The weaker correlation between safety climate and compliance, and the lack of a significant correlation with stress recognition, suggest that while overall safety perceptions are essential for broader patient safety, they do not directly translate into improved hand hygiene adherence. This discrepancy might be attributed to the influence of other factors, such as workload, management support, and individual perceptions of responsibility.

Positive correlations between compliance and job satisfaction, perceptions of management, and working conditions are consistent with previous studies [18,19,20]. Qualitative data show that job satisfaction, enhanced by recognition and a supportive work environment, motivates compliance. Strong management support, characterized by clear communication and consistent feedback, contributes directly to adherence [19,39]. Conversely, high workloads and inadequate resources negatively impact compliance.

The observed variability in compliance across job roles underscores the influence of responsibilities and perceived accountability [10]. Nurses, with frequent direct patient contact, reported higher compliance rates than physicians and support staff who often perceived less responsibility. This necessitates tailored interventions addressing role-specific challenges and accountability gaps.

Qualitative data consistently emphasized the importance of a positive safety culture characterized by open communication, a non-punitive environment for addressing safety concerns, and consistent managerial support [19,39]. However, inconsistent managerial engagement, a lack of ongoing support, and inadequate resources emerged as significant obstacles to consistent compliance.

Limitations:

This study's limitations include: The use of convenience sampling (which may have introduced selection bias and affected generalizability); the cross-sectional design (which prevented establishing causality and assessing temporal changes); the reliance on self-reported data in the SAQ (which may be subject to social desirability bias); and the limited number of participants in the qualitative phase (which may not fully represent the range of perspectives across all roles and departments).

Recommendations:

To improve hand hygiene compliance and patient safety culture in Dakahlia Governorate hospitals, we recommend a multi-pronged approach targeting manpower, materials, methods, measures, and the workplace.

Manpower:

Address workload pressures through optimized staffing, particularly during peak hours. Foster team-based accountability for hygiene practices, implementing role-specific training and monitoring for all staff, especially physicians and support staff. Promote leadership visibility and role modeling of hand hygiene, and cultivate a non-punitive reporting culture for safety concerns.

Materials: Ensure readily accessible, high-quality, skin-friendly hygiene products (sanitizers, soap) are consistently available in strategic locations.

Methods: Maintain consistent management communication emphasizing hand hygiene importance and supporting related initiatives. Implement regular, role-specific training programs with ongoing refresher courses. Utilize technology for real-time monitoring and feedback on compliance.

Measures: Establish a formal system for monitoring hand hygiene compliance and providing timely, constructive feedback, including positive reinforcement. Implement recognition programs to reward consistent adherence to protocols.

Workplace: Redesign facilities to improve the accessibility of hygiene stations, especially in high-traffic areas.

Additional strategies: Leverage big data and AI for predictive modelling of non-compliance patterns to inform targeted interventions. Foster a collaborative network among Dakahlia Governorate hospitals to share best practices and enhance collective learning. Implementing these recommendations comprehensively and consistently can significantly improve HH compliance, strengthen patient safety culture, and reduce the risk of HAIs. Regular evaluation and adjustments to these strategies are essential for long-term success. Collaboration between healthcare leaders, staff, and administrators is crucial for effective implementation.

Conclusion:

This study's findings highlight the multifaceted nature of HH compliance, emphasizing the crucial interplay between individual behaviors, team dynamics, organizational culture, resource availability, and the specific context of the healthcare setting. The strong correlation between teamwork climate and compliance underscores the vital role of fostering a collaborative and supportive team environment. Addressing identified challenges through targeted interventions focusing on training, resource management, communication, and a supportive safety culture is critical for improving HH practices and building a sustainable culture of safety and hygiene within Dakahlia Governorate hospitals. These findings offer valuable insights for other healthcare systems facing similar challenges, particularly in resource-constrained settings.

References

- ALLEGRANZI B. and PITTET D.: Role of hand hygiene in healthcare-associated infection prevention. The Journal of Hospital Infection, 73 (4): 305-315, 2009.
- 2- CLASSEN D.C., RESAR R., GRIFFIN F., FEDERICO F., FRANKEL T., KIMMEL N. and JAMES B.C.: Global trigger tool shows that adverse events in hospitals may be ten times greater than previously measured. Health Affairs, 30 (4): 581-589, 2011.
- 3- MCFEE R.B.: Nosocomial or Hospital-acquired Infections: An Overview. Disease-a-Month, p. 422. doi: 10.1016/j.disamonth.2009.03.014, 2009.
- 4- REYGAERT W.: An overview of the antimicrobial resistance mechanisms of bacteria. AIMS Microbiology, p. 482, 2018. doi: 10.3934/microbiol.2018.3.482.

- 5- World Health Organization: WHO guidelines on hand hygiene in health care. World Health Organization, 2009.
- 6- EL-SAYED N., EL-GAMMAL M. and SALAMA M.: Hand hygiene practices among nursing staff in public secondary care hospitals in Cairo. Journal of the Egyptian Public Health Association, 88 (2): 68-74, 2013.
- 7- PITTET D. and BOYCE J.M.: Hand hygiene and patient care: Pursuing the Semmelweis legacy. The Lancet Infectious Diseases, 1 (1): 9-20, 2001.
- 8- ALLEGRANZI B., et al.: Successful implementation of the World Health Organization Hand Hygiene Improvement Strategy in a referral hospital in Mali, Africa. Infection Control & Hospital Epidemiology, 32 (5): 534-536, 2011.
- 9- ELLINGSON K., HAAS J.P., AIELLO A.E., KUSEK L., MARAGAKIS L.L., OLMSTED R.N. and VAN AM-RINGE M.: Strategies to prevent healthcare-associated infections through hand hygiene. Infection Control & Hospital Epidemiology, 35 (8): 937-960, 2014.
- 10- HAAS J.P. and LARSON E.L.: Measurement of compliance with hand hygiene. Journal of Hospital Infection, 66 (1): 6-14, 2007.
- 11- HARUN M.G.D., SUMON S., MOHONA T., HASSAN Z., RAHMAN A., ABDULLAH S. and STYCZYNSKI A.: Compliance and constraints of hand hygiene among healthcare workers in Bangladesh. Antimicrobial Stewardship & Healthcare Epidemiology, 2: s46-s47, 2022. doi: 10.1017/ ash.2022.145.
- 12- HUANG D.T., CLERMONT G., KONG L., WEISSFELD L.A., SEXTON J.B., ROWAN K.M. and ANGUS D.C.: Intensive care unit safety culture and outcomes: A US multicenter study. International Journal for Quality in Health Care, 22 (3): 151-161, 2019.
- 13- ALAMSIDIN A., ALYAHYA M., SULIMAN M., AL-SHEYAB N. and ALBASHTAWY M.: Perceived Patient Safety Culture among Healthcare Providers in Southern Jordanian Hospitals during COVID-19 Pandemic. Jordan Journal of Nursing Research, 2: 16-24, 2022.
- 14- TESFAYE G., DAMTEW M., GIRMA H., MALEDE A., BAYU K. and ADANE M.: Application of the gold standard direct observation tool to estimate hand hygiene compliance among healthcare providers. International Journal of Environmental Health Research, 2021. doi: 10.1080/09603123.2021.1975657.
- 15- GOULD D.J., MORALEJO D., DREY N., CHUDLEIGH J.H. and TALJAARD M.: Interventions to improve hand hygiene compliance in patient care. Cochrane Database of Systematic Reviews, (2), 2007.
- 16- WHITBY M., MCLAWS M.L. and ROSS M.W.: Why healthcare workers don't wash their hands: A behavioral explanation. Infection Control & Hospital Epidemiology, 27 (5): 484-492, 2006.
- 17- JENNER E.A., FLETCHER B.C., WATSON P., JONES F.A., MILLER L. and SCOTT G.M.: Discrepancy between self-reported and observed hand hygiene behavior in

healthcare professionals. Journal of Hospital Infection, 63 (4): 418-422, 2006.

- 18- ALLEGRANZI B., GAYET-AGERON A., DAMANI N., BENGALY L., MCLAWS M.L., MORO M.L. and PITTET D.: Global implementation of WHO's multimodal strategy for improvement of hand hygiene: A quasi-experimental study. The Lancet Infectious Diseases, 13 (10): 843-851, 2014.
- 19- ALI H., ABDUL-AZIZ A., DARWISH E., SWELEM M. and SULTAN E.: Assessment of patient safety culture among the staff of the University Hospital for Gynecology and Obstetrics in Alexandria, Egypt. The Journal of the Egyptian Public Health Association, 97: 20, 2022. doi: 10.1186/s42506-022-00110-8.
- ÇILHOROZ Y. and İLGÜN G.: Examination of Nurses' Attitudes About Patient Safety According to Sociodemographic Characteristics. Sudan Journal of Medical Sciences, 17, 2022. doi: 10.18502/sjms.v17i4.12544.
- 21- Health Foundation: Research scan: Does improving safety culture affect patient outcomes? Retrieved from, 2011.
- 22- SORRA J.S. and NIEVA V. F.: Hospital survey on patient safety culture. Agency for Healthcare Research and Quality, 2004.
- 23- SEXTON J.B., HELMREICH R.L., NEILANDS T.B., ROWAN K., VELLA K., BOYDEN J. and THOMAS E.J.: The Safety Attitudes Questionnaire: Psychometric properties, benchmarking data, and emerging research. BMC Health Services Research, 6 (1): 44, 2006.
- 24- SORRA J. and DYER N.: Multilevel psychometric properties of the AHRQ hospital survey on patient safety culture. BMC Health Services Research, 10 (1): 199, 2010.
- 25- BERRY L.L. and SELTMAN K.D.: Management lessons from Mayo Clinic: Inside one of the world's most admired service organizations. McGraw Hill Professional, 2008.
- 26- ABD-ELAZIZ K.M., EL MOWAFY M.R. and EL-ENEIN N.Y.A.: Impact of a hand hygiene initiative on hand hygiene compliance in selected hospitals in Egypt. Eastern Mediterranean Health Journal, 25 (2): 99-107, 2019.
- 27- JULIAWATI M., DARWITA R.R., ADIATMAN M. and LESTARI F.: Patient Safety Culture in Dentistry Analysis Using the Safety Attitude Questionnaire in DKI Jakarta, Indonesia. Journal of Patient Safety. doi: 10.1097/ PTS.000000000000980, 2022.
- 28- CRESWELL J.W., PLANO CLARK V.L., GUTMANN M.L. and HANSON W.E.: Advanced mixed methods research designs. In A. Tashakkori& C. Teddlie (Eds.), Handbook of mixed methods in the social and behavioral research (pp. 209-240). Thousand Oaks, CA: Sage Publications, 2003.
- 29- MORSE J.M. and NIEHAUS L.: Mixed method design: Principles and procedures. Walnut Creek, CA: Left Coast Press Inc., 2009.
- PATTON M.Q.: Qualitative research and evaluation methods (3rd ed.). Thousand Oaks, CA: Sage, 2002.

196

- 31- SEKAMATTE T., MUGAMBE R., ISUNJU J.B., WANYENZE R., NALUGYA A., ADYEDO C. and DENZ N.K.: Using the Behaviour Centered Design to understand the facilitators and deterrents to hand hygiene among healthcare providers. doi: 10.21203/rs.3.rs-1604259/v1, 2022.
- 32- DENZIN N.K.: The research act: A theoretical introduction to sociological methods (3rd ed.). Englewood Cliffs, NJ: Prentice Hall, 1989.
- 33- Royal College of Physicians of Ireland HSE Hand Hygiene Observation Audit Standard Operating Procedure, 2014.
- 34- JOHNSON R.B., ONWUEGBUZIE A.J. and TURNER L.A.: Toward a definition of mixed methods research. Journal of Mixed Methods Research, 1 (2): 112-133, 2007.
- 35- MAXWELL J.A.: Qualitative Research Design: An Interactive Approach (3rd ed.). Los Angeles: Sage, 2012.

- 36- GREEN J. and THOROGOOD N.: Qualitative methods of health research. London: Sage Publications, 2004.
- 37- HALLIGAN M. and ZECEVIC A.: Safety culture in healthcare: A review of concepts, dimensions, measures and progress. BMJ Quality & Safety, 20 (4): 338-343, 2011.
- 38- PITTET D., et al.: Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. The Lancet Infectious Diseases, 10 (12): 811-816, 2010.
- 39- ROTTA A., SOUZA L.P.D., CARVALHO M., PESTANA DA SILVA A., BANDEIRA A. and URBANETTO J.: Analysis of the convergence of the Safety Attitudes Questionnaire and the Hospital Survey on Patient Safety Culture. Revistabrasileira de enfermagem, 76. doi: 10.1590/0034-7167-2021-0379, 2022.

تأثير ثقافة سلامة المرضى على إمتثال مقدمى الرعاية الصحية بنظافة الأيدى فى مستشفيات محافظة الدقهلية

الخلفية: تُشكل العدوى المرتبطة بالمنشآت الصحية (HAIs) تهديدًا كبيرًا لسلامة المرضى على الصعيد العالمى، خاصة فى الأماكن التى تفتقر للموارد. وتُعدّ نظافة الأيدى (HH) إجراءً بالغ الأهمية للسيطرة على العدوى؛ ومع ذلك، لا يزال الإمتثال بها دون المستوى الأمثل، مما يُسلهم فى زيادة التكاليف الصحية وإمراض المرضى. وقد هدفت هذه الدراسة إلى التحقيق فى العلاقة بين إمتثال مقدمى الرعاية الصحية بنظافة الأيدى فى مستشفيات محافظة الدقهلية بمصر.

المنهجية: تم استخدام منهج مختلط (كمى و نوعى). تم جمع البيانات الكمية (n=1474) باستخدام استبيان استكشاف اتجاهات سلامة المرضى (SAQ) لتقييم ثقافة سلامة المرضى عبر ستة أبعاد (روح الفريق، مناخ السلامة، الرضا الوظيفى، إدراك الضغوط، تصورات الإدارة، وظروف العمل). وقد خضع استبيان لعملية ترجمة وتكييف ثقافى دقيقين. تم قياس االإمتثال بنظافة الأيدى (٦٣٠٠ فرصة مُشاهدة) بالتزامن من خلال الملاحظة المباشرة باستخدام أداة منظمة الصحة العالمية لملاحظة النظافة اليدى (٦٣٠٠ النوعية من ٥٠ مشاررة، وطروف العمل). عن المائل المائية المائرين لعملية ترجمة وتكييف ثقافى دقيقين. تم قياس الإمتثال بنظافة الأيدى (٦٣٠٠ فرصة مُشاهدة) بالتزامن من خلال الملاحظة المباشرة باستخدام أداة منظمة الصحة العالمية لملاحظة النظافة اليدوية. وتم النوعية من ٥٠ مشاركًا من خلال مقابلات مُهيكلة، لاستكشاف تصوراتهم وخبراتهم المتعلقة بممارسات النظافة اليدوية، مع التركيز على تأثير الإدارة، والرضا الوظيفى، وتحديات مكان العمل، وفرص تعزيز ثقافة السلامة.

الذنائج: بلغ معدل الامتثال للنظافة الأيدى بشكل عام ٤٢,٤٣٪، مع اختلاف كبير بين المستشفيات، والأدوار الوظيفية، وورديات العمل. أظهر التحليل الكمى علاقات إيجابية معنوية بين الامتثال لنظافة الأيديو روح الفريق (r = ٥، ٥، ٥، ٣ = ١، ٥،)، وتصورات الإدارة (r = ٤٤٩, ٥، ٩ = ٥، ٥، ٥)، والرضا الوظيفى (r = ٢٥, ٤٠، ٩ = ٢٠, ٥)، وظروف العمل (r = ٤٧٢, ٥، ٥)، والرضيا المُرضات أعلى معدل امتثال، ٥٥٪، بينما أظهرت الأدوار الأخرى، خاصةً موظفى الدعم، معدلات أقل. حدد التحليل المواضيعى النوعى المواضيع الرئيسية التالية: عدم اتساق دعم الإدارة والمُلاحظات على ممارسات نظافة الأيددى؛ التأثير السلبى الكبير لأعباء العمل الكبيرة ونقص الكوادر على الامتثال؛ التحديات الخاصة بكل دور والاختلافات فى المساءلة عن نظافة الأيدى عبر الفئات الوظيفية الكبيرة ونقص الكوادر على الامتثال؛ التحديات الخاصة بكل دور والاختلافات فى المساءلة عن نظافة الأيدى عبر الفئات الوظيفية

الاسـتنتاج: تُعدَّ ثقافة السـلامة الإيجابية، وخاصـة روح الفريـق القويـة، أمـرًا بالـغ الأهميـة للامتثـال بنظافـة الأيـدى. ومـع ذلك، فإن الامتثـال متعدد الأبعـاد، ويتأثر بالرضـا الوظيفـى، ودعـم الإدارة، وتوافـر المـوارد، وتصميـم مـكان العمـل الفعـال. تتطلب التباينـات بـين الأدوار تدخـلات مُسـتهدفة.

التوصيات: يتطلب تعزيز الامتثال بنظافة الأيدى اتباع نهج متعدد الجوانب: التدريب المُستهدف، وتحسين إدارة الموارد، وتعزيز التواصل والمُلاحظات، ومبادرات بناء فرق العمل، وتحسين بيئات العمل، وبرامج الاعتراف الرسمية.