

Assessment of Hand Hygiene amongst Health Care Professionals at Jimma University Medical Center

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INTRODUCTION

- Healthcare associated infections (HAIs) contribute to increased patient mortality, length of hospital stays, and health care costs.¹
- Lack of hand hygiene (HH) practices amongst health care workers (HCWs) has been recognized as a leading cause of HAIs and the spread of multidrug-resistant organisms.²
- The WHO 5 moments of HH implementation methods (Figure 1) have been shown to modestly improve HH compliance among HCWs at teaching hospitals in Ethiopia.^{3, 4, 5}
- The Infection Prevention and Control (IPC) team at Jimma University Medical Center (JUMC) has recognized the need for improved HH compliance.
- We sought to apply the System Engineering Initiative for Patient Safety (SEIPS) model (Figure 2) to increase effectiveness and sustainability of WHO HH guidelines.^{5,6}

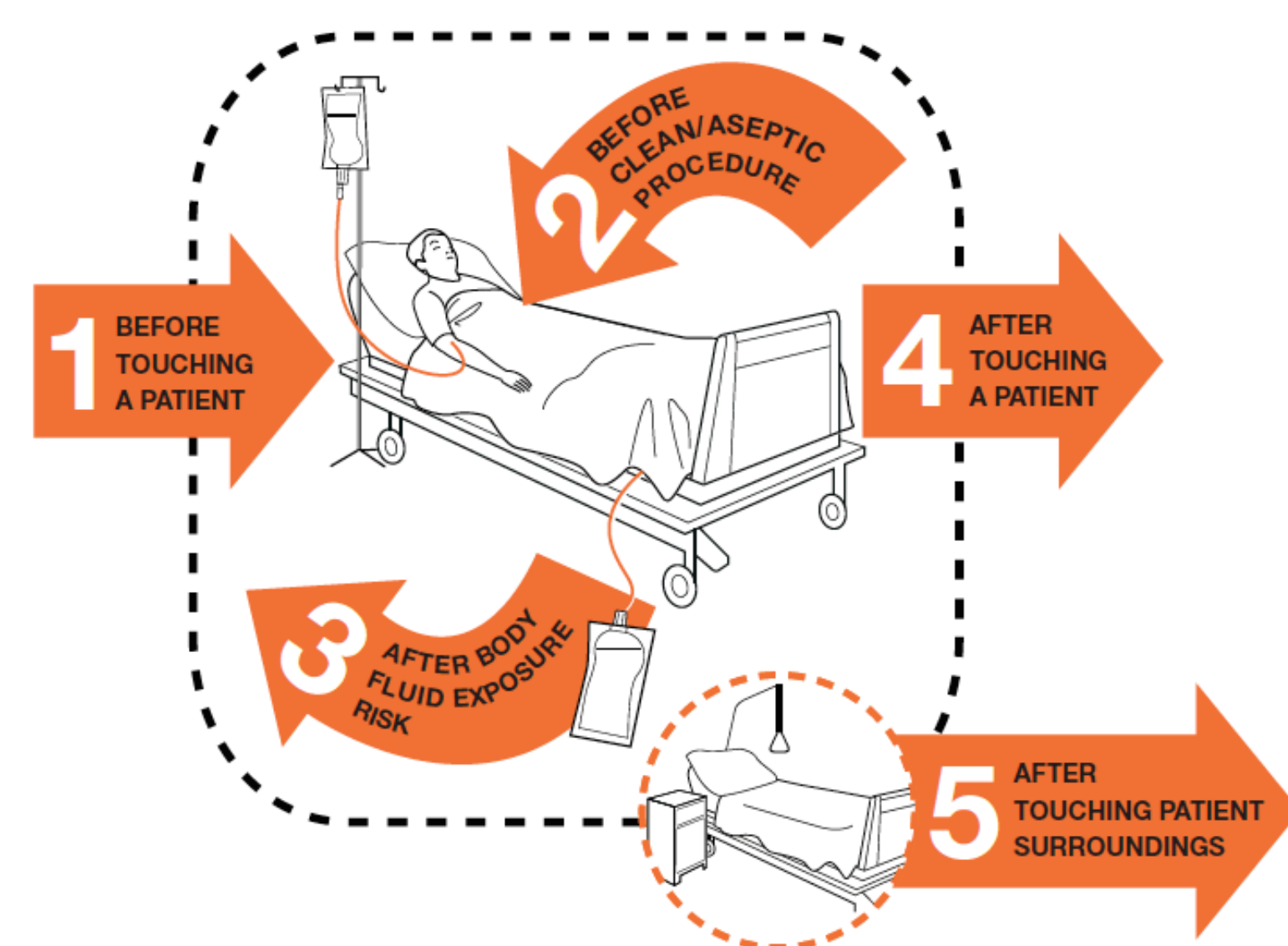


Figure 1. The WHO 5 moments of hand hygiene⁵

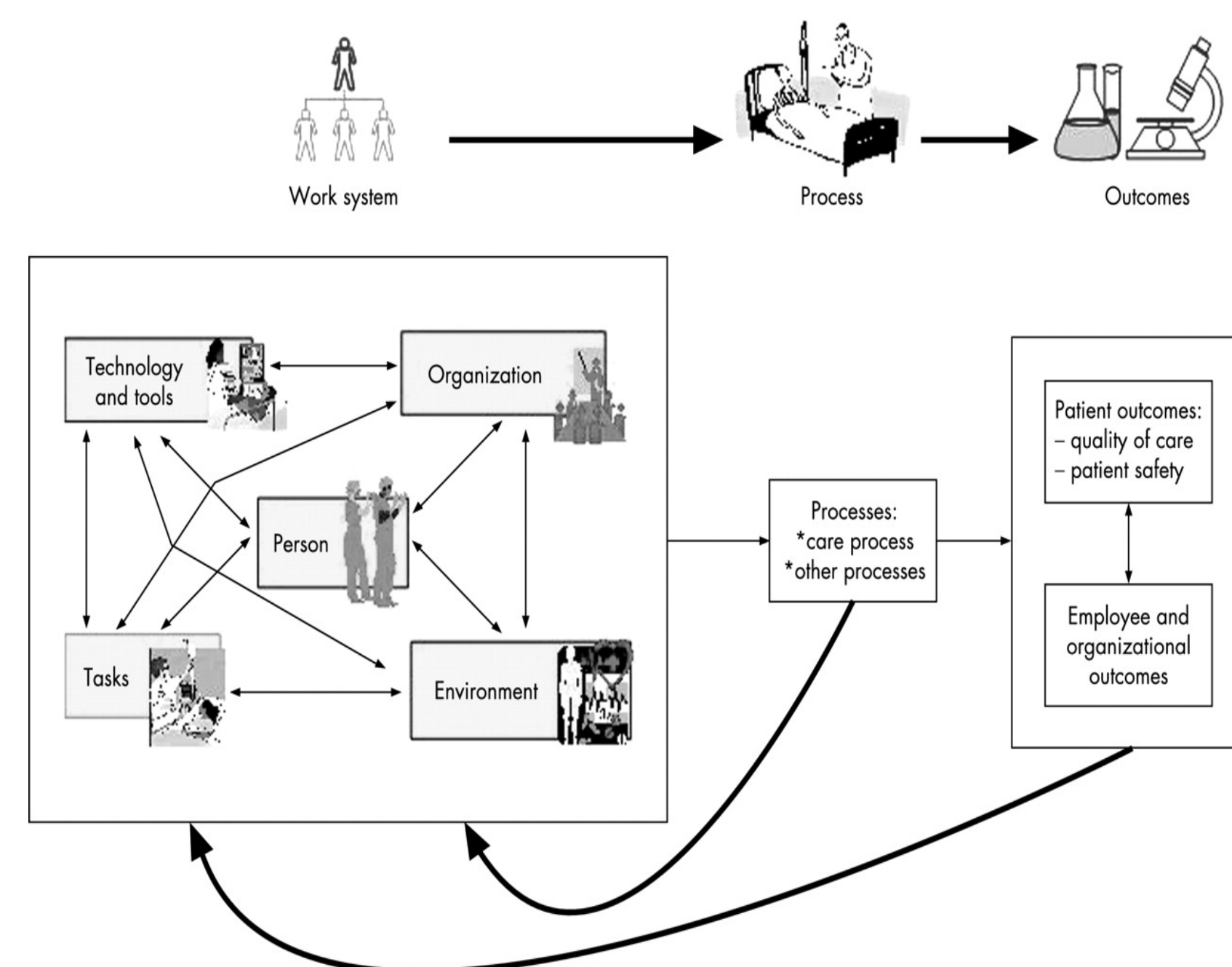


Figure 2. The SEIPS model of work systems and patient outcomes⁶

METHODS

Baseline Assessment: Nov 2018-Jul 2019

- HH Observations: nonidentified, trained observers recorded HH compliance at the 5 moments of HH.⁵
- Questionnaires: HCWs completed a questionnaire adapted from WHO HH tools to assess HH knowledge and attitudes.⁵
- Qualitative Interviews: semi-structured interviews conducted using an interview guide based on the SEIPS model.⁶

Interventions: Aug 2019-Oct 2019

- Installation of 400 hand rub dispensers
- Selection and training of unit IPC Officers
- Day-long HH trainings for 184 nurses
- Placement of HH posters around hospital

Follow-up Assessment: May 2020-August 2020

- HH observations repeated using same methods described previously

RESULTS

Questionnaire Responses

Table 1. Demographics, knowledge, and attitudes between professional categories

	Total (N=250)	Nurse/ Midwife (N=155)	Physician (N=72)	Laboratory Tech (N=23)	P value
Age, mean (SD)	27.2 (5.12)	25.8 (4.5)	29.5 (5.6)	29.1 (4.7)	<0.001 ^c
Sex, n (%)					
Male	149 (59.6)	73 (47.1)	59 (81.9)	17 (73.9)	<0.001 ^a
Female	101 (40.4)	82 (52.9)	13 (18.1)	6 (26.1)	
Received HH training in last 3 years, n (%)					
Trained	34 (13.6)	26 (16.8)	8 (11.1)	0 (0)	0.06 ^b
Untrained	216 (86.4)	129 (83.2)	64 (88.9)	23 (100)	
HH practices and knowledge					
Reports performs HH routinely, n (%)	174 (69.6)	108 (69.7)	46 (64.9)	20 (87)	0.11 ^a
Knowledge Total, mean (SD)	16.6 (2.85)	16.17 (2.58)	17.58 (3.2)	16.26 (2.72)	0.002 ^c

a=chi-squared test, b=Fisher's exact test, c=ANOVA
*Statistically significant at p<0.05

Knowledge

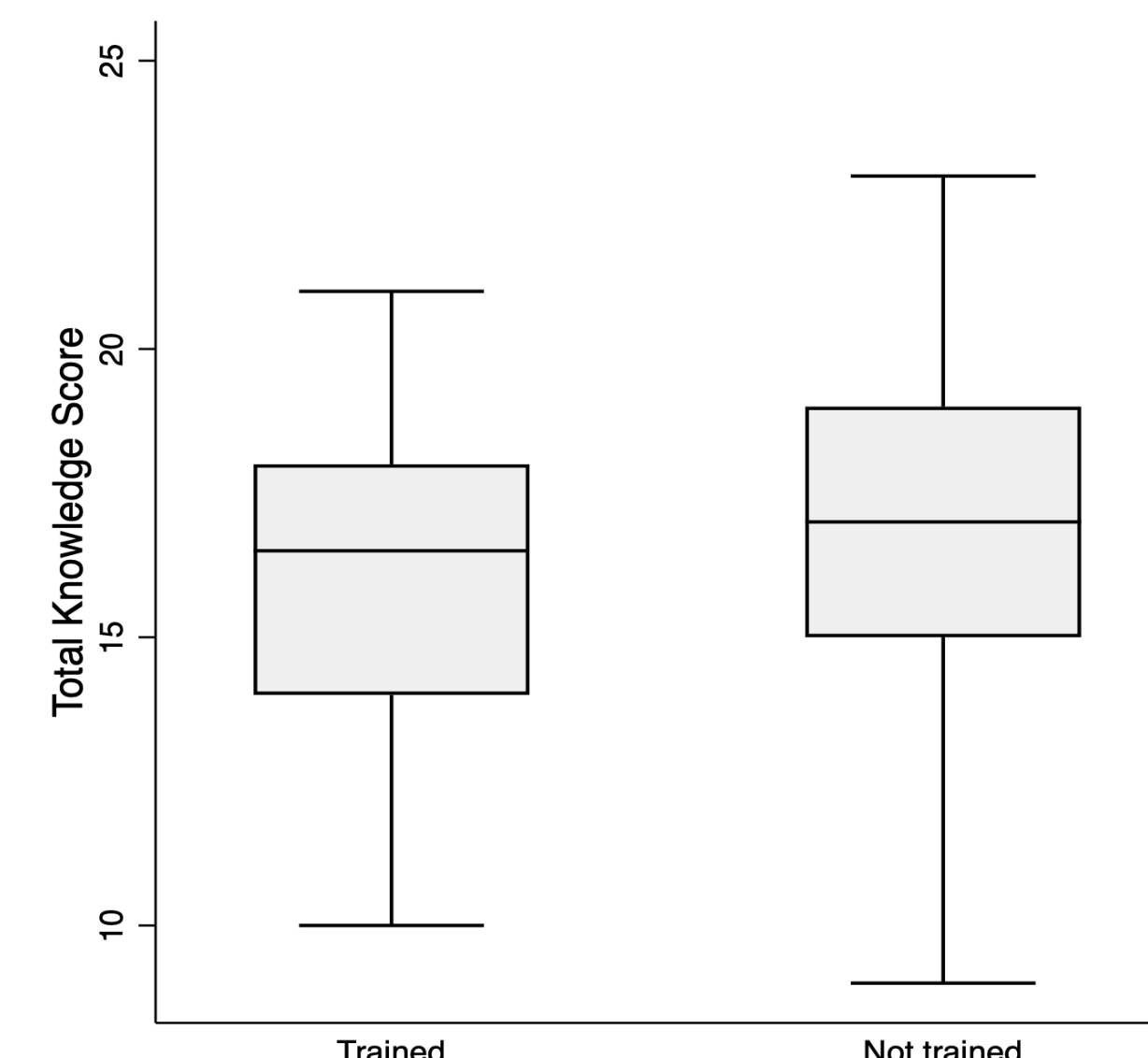


Figure 3. Box and whisker plot showing HH knowledge scores out of 27 possible points on the questionnaire for trained and untrained participants. Mean knowledge scores for trained (16.2 ± 2.5) vs untrained (16.6 ± 2.9) participants were not statistically different (p-value 0.41).

RESULTS

Attitudes and Perceptions

Table 2. Attitude scores by professional category. Participants used scale of 1-5 to indicate "1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree" for each statement. Mean attitude scores reported (SD). One-way ANOVA used to calculate P value. *Statistically significant at p<0.05.

	Nurse/ Midwife (N=155)	Physician (N=72)	Laboratory Tech (N=23)	P value
I am tasked to act as a model about hand hygiene for other healthcare personnel	3.14 (1.28)	3.61 (1.39)	2.87 (1.42)	0.02*
Execution of hand hygiene may reduce mortality of patients under the recommended conditions	3.4 (1.12)	4.15 (1.22)	3.69 (1.14)	<0.001*
Execution of hand hygiene may reduce the related medical costs to nosocomial infections under the recommended conditions	3.46 (1.28)	4.2 (1.26)	3.78 (1.17)	<0.001*
Prevention from the acquired infections is deemed as one of valuable roles for personnel of healthcare services.	3.49 (1.19)	4.2 (1.25)	3.9 (1.22)	<0.001*
The existing infectious diseases in healthcare-giving environments may threaten my life and occupation.	2.5 (1.16)	1.74 (1.16)	2.26 (1.32)	<0.001*
I think I have the potential to change poor performances regarding hand hygiene in my workplace	3.55 (1.22)	3.99 (1.33)	3.74 (1.54)	0.06
The hand hygiene is assumed as a habit in my personal life.	3.42 (1.37)	3.99 (1.22)	4.0 (1.43)	0.005*
It is more important for me to fulfill perfectly my tasks than doing hand hygiene when the ward is busy	3.1 (1.18)	3.63 (1.38)	3.6 (1.5)	0.007*
I could not always do hand hygiene under the recommended situations because of preference of my patients' requirements.	3.22 (1.27)	3.83 (1.24)	3.78 (1.47)	0.002*
I think one could follow the medical service officials in order to make decision for execution and or non- execution of hand hygiene	3.18 (1.26)	2.85 (1.52)	2.78 (1.44)	0.14

Barriers and Facilitators

Table 3. Identified barriers and facilitators to HH classified within the SEIPS model's 5 components of the work system: tools and technology, organization, person, task, and environment⁶.

SEIPS Category	Barrier	N=22	Facilitator	N=22
Tools and technology	Lack of functional water facilities and/or water supply, hand rub, and soap	22	Pocket hand rub	12
	Lack of gloves	21	Dispensers increase access to hand rub	10
Organization	Lack of HH monitoring and surveillance	22	Communication between HCWs to promote patient safety	15
	Perceived lack of IPC or organized body focusing on HH initiatives	7	Head nurse manages ward supplies well	5
	Inadequate dispensing and management of supplies	6		
	Hospital norms exclude HH	4		
Person	Lack of formal training	21	Knowledge of HH	19
	Lack of awareness	9	Informal HH education from school instructors, peers, and superiors	8
Task	High workload	14	Infectious patient	15
Environment	Too few HH posters	18	Some HH signs and posters	8
	HH materials kept outside of patient rooms	12		
	HH materials in nursing station and bathrooms locked	4		

RESULTS

HH Observations

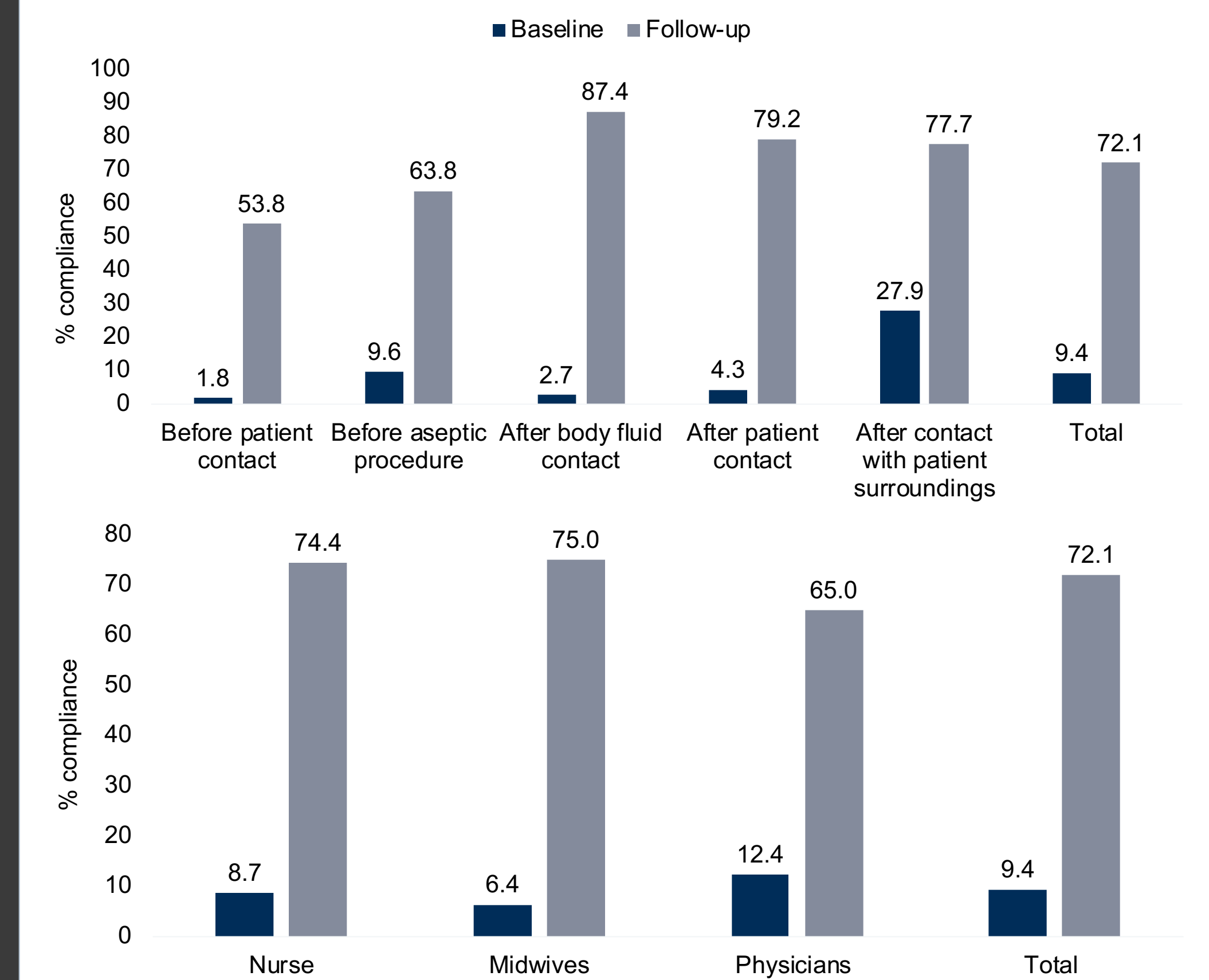


Figure 4. HH compliance (%) at the WHO's 5 moments of HH. % compliance calculated from number of recorded HH actions and opportunities based on the WHO's 5 moments. Follow-up compliance rates were higher than baseline compliance rates amongst all professional categories and within all moments for HH.

DISCUSSION

- Drastically higher HH compliance in follow-up (72.1%) compared to baseline (9.4%) assessment influenced by COVID-19 pandemic.
- Low knowledge scores (61.4%) regardless of professional category or prior training indicate the need for more rigorous education for all HCWs.
- Attitude scores show motivation to improve patient safety.
- Utilizing the SEIPS model revealed key barriers and provided actionable items beyond WHO guidelines to further improve HH at JUMC:
 - Providing a sustainable supply of alcohol hand rub
 - Increased accessibility of hand hygiene supplies
 - Enhanced IPC presence and HH monitoring
 - Informal education by IPC officers and superiors
 - Increased number of HH posters

AKNOWLEDGEMENT & REFERENCES

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