

Enterobacteriaceae. However, little has been published about the handwashing sink activities in Singapore hospitals. We explored the handwashing sink activities in a tertiary-care hospital in Singapore. **Methods:** Five trained shadow observers conducted this observational study between December 18 and 21, 2018 (6 hours per day: 07:00–09:00, 09:30–11:30, and 12:30–14:30) in acute-care general wards. We divided the handwashing sink activities by healthcare workers (HCWs) and non-HCWs (ie, visitors, caregivers, and relatives) and by HH- and non-HH-related activities. We used Stata version 15 software for the analysis. The study was approved by the Institutional Review Board of the National Healthcare Group, Singapore (DSRB no. 2020/01257). **Results:** In total, 657 handwashing sink activities were recorded [HCWs, 475 (72.3%) and non-HCWs, 182 (27.7%)]. Of the 475 HCW handwashing sink activities, 451 (94.9%) were HH-related, 10 (2.1%) were for patient nutrition, 7 (1.5%) were for environmental care, 6 (1.3%) were for medical equipment cleaning, and 1 (0.2%) was patient personal-item cleaning. Of the 182 handwashing sink activities by non-HCWs, 117 (64.3%) were HH related, 30 (16.5%) were for patient nutrition, 21 (11.5%) were for personal hygiene, 14 (7.7%) were patient personal-item cleaning. The distribution of handwashing sink activities differed significantly ($P < .01$) between HCWs and non-HCWs. The odds of non-HH-related handwashing sink activities among non-HCWs was 10× higher than among HCWs (OR, 10.44; 95% CI, 5.98–18.23; $P < .01$). **Conclusions:** Handwashing sinks use for non-HH-related activities is higher among non-HCWs than HCWs. Further studies are needed to understand the impact of non-HH handwashing sink activities on nosocomial infections and ways to reduce them.

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Hand hygiene challenges among the ancillary team during the COVID-19 pandemic

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Objectives: Ancillary staff members perform operational support functions and play an active role in enhancing the patient care experience. Infection prevention practices among ancillary staff play a critical role in preventing transmission of microorganisms, which ensures the safety of patients. Low hand hygiene compliance was found among porters in a cross-institutional hand hygiene audit in 2021. A quality improvement team was formed to improve hand hygiene compliance, especially during the COVID-19 pandemic. **Methods:** A focus-group discussion and survey were conducted to understand hand hygiene knowledge and challenges among porters. Using the findings, the team initiated Glo-germ education tools, pocket alcohol hand-rub agents, pocket moisturizer, poster display, and a toolbox messaging system via conversion of group roll call to satellite-area roll call. Respective satellite teams were sent hand hygiene reminders, and prompt corrective action was taken following noncompliance events. Analytic comparisons of pre- and postsurvey data were performed using the χ^2 test, and $P < .05$ was regarded as statistically significant. **Results:** In total, 572 ancillary staff participated in the survey. Knowledge of hand hygiene practices improved significantly following the interventions, as shown in the comparison of pre- and postintervention results: knowledge of the hand hygiene steps ($P < .001$), knowledge of the duration of hand rub ($P < .001$), and knowledge of duration of handwashing ($P < .001$). Also, 295 staff members (97.68%) stated that implementation measures increased their awareness of the importance of hand hygiene. Moreover, the hand hygiene compliance rate improved from

77.8% to 100%. There were no significant differences related to sex ($P = .089$), age group ($P = .355$), years of working ($P = .359$), education level ($P = .268$), or difficulty in reading English ($P = .906$). **Conclusions:** Evaluating staff hand hygiene knowledge and understanding the challenges faced among porters helped toward the development of appropriate interventions and assurance of success in project.

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Personal care formulations prove effective against evolving variants of SARS-CoV-2: Implications for public health and hygiene

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Objectives: Early in the COVID-19 pandemic, global health authorities identified and emphasized the importance of practicing proper hand hygiene to reduce the transmission of SARS-CoV-2 and to diminish the chances of becoming infected. It is well established in the scientific literature that surfactants and alcohols are capable of inactivating enveloped viruses such as SARS-CoV-2. However, given the novel nature of the virus, Unilever adopted an evidence-based approach to demonstrate virucidal efficacy of marketed bar soaps, liquid handwashes, and alcohol-based hand sanitizers against the original and selected variants of SARS-CoV-2. **Methods:** High titers of clinically isolated and laboratory-propagated SARS-CoV-2 strains were subjected to a range of selected proprietary formulations from Unilever at end-user-relevant dilutions, temperature, and contact duration, and were tested according to the internationally recognized ASTM E-1052 test protocol. **Results:** All tested personal-care formulations were effective against the parental SARS-CoV-2 strain as well as the β (beta) and δ (delta) variants of concern. More specifically, bar soaps with a varying concentration of total fatty matter content and liquid handwashes with varying levels of total surfactants reduced the viral titer by >99.9% within 20 seconds. Alcohol-based hand sanitizers demonstrated >99.99% reduction of input viral load within 15 seconds of contact with the viral inoculum. **Conclusions:** In conclusion, we have provided empirical proof that well-designed personal-care formulations that act through generic physicochemical mechanism against the basic structure of the virus particle have high virucidal efficacy against the original and evolved SARS-CoV-2 variants. Furthermore, we argue that due to the broad-spectrum mode of action of these tested formulations, the continued practice of good hand hygiene practices with everyday products holds significant promise as an easily accessible, economic, and effective nontherapeutic public health intervention toward reducing the transmission of present and future variants of SARS-CoV-2 across communities and populations.

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Hand hygiene feedback card—Providing real-time feedback to improve hand hygiene compliance

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Objectives: Hand hygiene is widely recognized as the most effective practice for preventing healthcare-associated infections. Despite ongoing interventions and strategies implemented by the infection control committee, the compliance with and consistency in the hand hygiene practice remains a challenge. At times, staff are unaware when they are noncompliant with

hand hygiene; therefore, a more robust strategic approach is needed. One such strategy is customized audit with real-time feedback. A literature review highlighted the effectiveness of audit coupled with specific feedback. This approach was also supported by several guidelines and regulatory bodies that recognized the importance of audit and feedback in hand hygiene improvement efforts. For example, the World Health Organization (WHO) has emphasized 5 core components of improving hand hygiene. One of these components is evaluation and feedback. We sought to provide feedback to healthcare personnel when they do not show compliance with the Five Moments of Hand Hygiene. We aimed to achieve >95% hand hygiene compliance among healthcare staff. **Methods:** Information on the use of the hand hygiene feedback card was provided to the auditors. The hand hygiene feedback card procedure began in all the wards in May 2020. This process first started with orientation of the auditors regarding the hand hygiene feedback card, followed by auditing hand hygiene practice. Staff who did not comply with hand hygiene procedures were given real-time feedback via a card that specified the missed hand hygiene movement. **Results:** Overall hand hygiene compliance among healthcare staff increased by 6% after the hand hygiene feedback card procedure was implemented. **Conclusions:** Overall, the hand hygiene feedback card was effective in improving hand hygiene. Through this quality improvement project, significant and sustained gains in hand hygiene compliance rates of >95% can be achieved.

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A new approach of hand hygiene observation with focus on healthcare worker (HCW) category

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Objectives: The past hand hygiene (HH) compliance rate has indicated the low number of opportunities for some healthcare workers (HCWs) because the infection control liaison officer (ICLO) tended to capture opportunities from nurses who were available, despite the proportional allocation of opportunities per HCW type based on the World Health Organization (WHO) HH methodology. Therefore, HH compliance rates may not have accurately represented the specific HCW type, which may have affected the overall HH compliance rate. We sought to determine an accurate baseline of HH compliance rate with consistent number of opportunities across all HCW categories. **Methods:** HH auditors were ICLOs trained in HH observation by the infection control nurse (ICN) according to the WHO “My Five Moments of Hand Hygiene.” HH observations were conducted bimonthly with assigned areas focusing only on 1 HCW category for each session: nursing, medical, clinical support services, or environmental services. A briefing session was given on the day of observation, with the goal of collecting 20 opportunities per area with HCW focus during their peak activities. Direct feedback and positive reinforcement were given to HCWs after observations were completed. **Results:** A survey of 96 ICLOs indicated that observations based on HCW focus allowed them to capture more HH opportunities and concentrate on their observations. The new approach showed a significant increase in number of opportunities across all HCW categories that was more representative. We also successfully determined a new baseline for all HCW categories, with further breakdown of HCW type. **Conclusions:** A new methodology of HH observation with a focus on HCW category has resulted in more HH opportunities across all HCW categories and improved representation of the HH compliance rate.

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Hospital-wide study to evaluate the tolerability and acceptability of alcohol-based hand rubs according to WHO protocol, and healthcare worker hand hygiene behavior during the COVID-19 pandemic

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Objectives: To evaluate the tolerability and acceptability of 3 different alcohol-based hand rub (ABHR) products, and to determine factors influencing hand hygiene (HH) behavior among healthcare workers (HCWs) during the COVID-19 pandemic. **Methods:** A cross-sectional study was conducted in Sarawak General Hospital, a 1,034-bed tertiary-care state hospital. A self-administered 7-point Likert scale questionnaire was adapted from the WHO ‘Protocol for Evaluation of Tolerability and Acceptability of ABHR.’ The study was conducted between November 12 and 26, 2021, based on 3 types of ABHR products. Participation in answering the questionnaire was voluntary, so consent was implied. The Student *t* test was used to determine the significant differences among the ABHR product. The χ^2 distribution test was performed to evaluate the characteristics of ABHR products. **Results:** We received a response rate of 35% (1,598 of 4,628); 82% of respondents were female, and the overall cohort had a mean age of 35 years. Also, 972 (61%) of 1,598 respondents were nurses, and 1,490 (93%) of 1,598 respondents used ABHR at least 5 days every week. Of 1,598 respondents, 1,156 (72%) indicated that ABHR products were easily accessible at the point of patient care. Evaluation of ABHR products showed that respondents were receptive to all product colors ($P < .0114$) and had no color preference ($P > .05$). Comparison among ABHR products yielded no statistical difference ($P > .05$) for ‘smell,’ ‘stickiness,’ ‘irritation,’ or ‘drying speed.’ ‘Drying effect’ of all products was statistically significant ($P < .0252$). The overall satisfaction for all products was good ($P < .0022$). HCWs did not expect their HH compliance to improve even if they were provided with their preferred choice of ABHR. Of 1,598 respondents, 783 (49%) correctly used a palm-full of ABHR for HH, and 1,275 (80%) indicated that hospital management should organize more HH-related awareness and continuous medical education on HH. **Conclusions:** A comparison among different ABHR characteristics mostly showed no statistically significant difference regarding tolerability and acceptability. These findings suggest that different ABHR products will not influence HH behavior during COVID-19 pandemic.

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12-hydroxystearic acid upregulates skin antimicrobial peptides in skin models and provides long-lasting protection from bacterial challenge from a handwash formulation

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Objectives: We evaluated the role of 12-hydroxystearic acid (12HSA) in upregulating skin antimicrobial peptides (AMPs) in *in vitro* and *ex vivo*