

assays, and 12HSA provides long-lasting germ protection in vivo through a handwash formulation. **Methods:** In vitro assays were performed by treating skin cells, maintained in cell-culture media, with 12HSA. After treatment, AMP gene-expression was measured in cells by RT-qPCR, and secreted AMPs in spent cell culture media were analyzed by ELISA. Skin explants were treated with 12HSA, and 3D-living skin equivalent (LSE) models were treated with 12HSA-containing handwash formulations. AMP levels were measured by immunohistochemical staining or RT-qPCR after treatment. In clinical studies, volunteer forearms were washed multiple times with 12HSA-containing handwash in an ethics-approved study in which participants provided informed consent. The washed forearms were challenged with *E. coli* at different time points after washing. The 12HSA deposition from the formulation was measured using tape strips. **Results:** Skin cells treated with 12HSA showed increased expression of several AMP genes in vitro, and higher psoriasis AMP secretion was measured in cell-culture media. An enhanced level of LL37 AMP was obtained from the skin epidermis of 12HSA-treated explant skin. AMP genes were also upregulated in the 3D-LSE model treated with a 12HSA-containing handwash formulation. A measurable level of 12HSA was deposited from handwash formulation in the in vivo clinical sample. *E. coli* recovery from challenged skin was significantly lower at 6 and 10 hours after washing compared to unwashed skin. **Conclusions:** These data demonstrate that 12HSA boosts skin-AMPs and that a handwash containing 12HSA provides long-lasting germ protection under in vivo test conditions by potentially enhancing skin's natural immunity. With an emerging understanding of skin's innate immunity and AMPs, designing cleansing products that strengthen these natural defenses will offer novel approaches to extend hygiene benefits beyond immediate in-wash protection.

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**Subject Category:** Hand Hygiene

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**Hand hygiene knowledge: Its effect on hand hygiene adherence rate during the COVID-19 pandemic in the primary care setting**

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**Objectives:** Good hand hygiene knowledge among healthcare workers (HCWs) is important in the fight against COVID-19. The coronavirus disease is primarily spread through droplet and contact routes, so hand hygiene and PPE are key infection control measures to protect patients and HCWs. We sought to determine whether hand hygiene knowledge scores had an impact on the hand hygiene adherence rate during a pandemic. **Methods:** Hand hygiene audit observations that were conducted covertly on a monthly basis and are presented as percentages of adherent reactions to moments to wash or sanitize hands. These data were examined in relation to HCW knowledge scores on hand hygiene. The knowledge scores on hand hygiene were analyzed based on 15 questions derived from WHO tools. Scores were determined using a quiz administered in a hand hygiene promotion event. **Results:** In total, 195 HCWs participated and scores on hand hygiene knowledge were ranked into 3 categories: 2% scored  $\geq 90\%$  (high), 60% scored 70%–89% (medium), and 38% scored  $\leq 70\%$  (low). Knowledge scores at the medium level and above were considered satisfactory. Even though 38% of the participants scored  $\leq 70\%$ , there was no direct impact on monthly hand hygiene audit observation rates in the 6 healthcare clinics. Hand hygiene observation rates ranged from 90% to 97%, with an overall mean of 92% for 2021. **Conclusions:** Contrary to studies that have shown the significant impact of knowledge on the hand hygiene adherence rate, our data suggest that a high hand-hygiene adherence rate is achievable and sustainable among HCWs. Adherence could be driven by attention to the importance of hand hygiene associated with the pandemic and potential exposure to COVID-19. High hand-hygiene compliance attains a place of importance in the minds of HCWs during a pandemic crisis.

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**Subject Category:** Healthcare-Associated Infection (HAI) Surveillance

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**Implementation of infection prevention and control in Indonesian hospitals: Identification of strengths, gaps, and challenges in current practices**

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**Objectives:** Infection prevention and control (IPC) in hospitals is key to safe patient care. Currently, no data are available regarding the implementation of IPC in hospitals in Indonesia. We assessed the existing IPC practices in a nationwide survey using the World Health Organization (WHO) IPC assessment framework tool (IPCAF) to identify strengths, weaknesses, and challenges. **Methods:** A cross-sectional study was conducted from July to November 2021. Of all general hospitals in Indonesia, 475 (20%) were selected using stratified random sampling based on class (ie, A, B, C, and D; A being the larger hospitals with  $\geq 250$  beds) and region. IPCAF was translated into Indonesian and was tested in 4 hospitals. Questions were added regarding challenges in the implementation of IPC. Introduction meetings were held online with all selected hospitals, after which the IPCAF was sent as an online questionnaire. **Results:** In total, 355 hospitals (74.7%) participated in this study. The overall median score of IPCAF was 632.5. The level of implementation of IPC was mostly advanced (56.9%), followed by intermediate (35.8%), basic (7.0%), and inadequate (0.3%). The core component with the highest scores was IPC guidelines; almost all hospitals had guidelines on the most important topics, including hand hygiene. Core components with the lowest scores were surveillance of healthcare-associated infections (HAIs), education and training, and multimodal strategies. Although  $>90\%$  of hospitals indicated that surveillance of HAIs was performed, 57.2% reported no availability of adequate microbiology laboratory capacity to support HAI surveillance. The most reported challenges in the implementation of IPC were behavior change and lack of availability of antibiograms. **Conclusions:** The implementation of the IPC core components in most Indonesian hospitals was “advanced.” For surveillance of HAIs, the need for the availability and capability of the microbiology laboratory was revealed.

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