

AUTHORS: Lisa Blackburn MS, APRN-CNS, AOCNS, Kelly Acree, MPH, BSN, RN, CIC, Judith Bartley DNP, RN, SCRN, NPD-BC, Elizabeth DiGiannantoni BSN, RN, OCN, Elizabeth Renner RN, BSN, Loraine Sinnott PhD

ABSTRACT TITLE: Microbial Growth on the Nails of Direct Patient Care Nurses Wearing Nail Polish

PURPOSE/PROBLEM STATEMENT: The purpose of this double-blind, randomized controlled trial was to compare the type and degree of bacterial load on fingernails of direct -care nurses with and without nail polish.

SIGNIFICANCE: Hospitalized oncology patients with sepsis due to hospital-acquired infection have 2.32 times greater odds of dying than non-cancer patients. Hand hygiene, a critical factor in preventing transmission of bacteria to patients, has been studied extensively. Little is known about the growth of microbes on the hands of direct care nurses outside of the operative setting, particularly with respect to wearing nail polish. Rigorous evidence about the relationship of wearing nail polish to bacterial growth on nurses' fingernails is needed in order to implement more efficacious hand hygiene to decrease the risk of transmitting pathogens to vulnerable oncology patients.

METHODS/INTERVENTION: Participants included 89 direct-care nurses from a multi-site comprehensive cancer center of a Midwestern academic healthcare organization. Participants' fingers on one hand were randomly assigned to nail polish treatments: unpolished, one-day-old, and four-day-old. Nail lacquer from identical bottles was applied using consistent technique. Participants performed usual work and hand hygiene before bacterial cultures were obtained from their fingernails after one and four days. Colony forming units (CFUs) were used as a proxy measure for patient infection outcomes.

FINDINGS: Comparison of CFUs revealed that nails with intact one-day-old polish grew fewer gram-positive microorganisms than unpolished ($p=0.04$). Nails with damaged four-day-old polish grew significantly more microorganisms than one-day-old ($p=0.03$). Gram-negative results were similar, but statistically insignificant ($p=0.30$, and $p=0.17$).

DISCUSSION/IMPLICATIONS: Consistent with the Evidence-Based Model for Hand Transmission During Patient Care (Pittit, et al., 2006), increased microbial growth due to damaged polish may increase the risk of patient infection. The evidence suggests prohibiting nail polish use may help to prevent infections in patients. Key implications included:

Hand hygiene may be less effective for direct-care nurses wearing damaged polish than those with unpolished nails.

Undamaged polish may transiently reduce microbial growth.

Polish may remain undamaged too briefly for HAI prevention.

INNOVATION: Prior studies lacked sufficient generalizability and rigor. Based on the evidence, the optimal strategy for preventing infection transmission from nurses' hands to oncology patients appears to be for nurses not to wear nail polish or other nail adornments.