

The influence of knowledge, perceptions, and beliefs, on hand hygiene practices in nursing homes

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There are few studies that have assessed factors influencing infection control practices among health care workers (HCW) in nursing homes. We conducted a cross-sectional survey of HCWs (N = 392) in 4 nursing homes to assess whether knowledge, beliefs, and perceptions influence reported hand hygiene habits. Positive perceptions and beliefs regarding effectiveness of infection control in nursing homes were associated with reported appropriate glove use and fingernail characteristics, respectively, among HCWs. Further research on hand hygiene interventions, including targeted educational in-services should be conducted in the nursing home setting.

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The potent mix of functionally dependent individuals and institutional environment of nursing homes creates a favorable setting for acquisition and transmission of infectious pathogens. Although several studies have addressed hand hygiene in hospital settings, few studies have examined hand hygiene in nursing homes.¹⁻³ The purpose of this study was to examine the influence of knowledge, beliefs, and hand hygiene perception on infection control practices, including hand hygiene habits, gloving, and fingernail characteristics, among nursing home health care workers (HCWs).

METHODS

Study design

A cross-sectional survey of nursing staff in nursing homes was utilized to assess knowledge, beliefs, perceptions and practices of hand hygiene-related infection control practices. The survey was conducted in February 2005 among 4 nursing homes in southeastern Michigan. An invitation to participate in infection control research was sent to 105 nursing homes: 22 reported interest and 13 homes agreed to participate. Nursing homes were approached based on proximity to the University of Michigan. The first 4 homes approached agreed to participate, providing sufficient sample size for the proposed analysis. The study was approved by the University of Michigan Medical Institutional Review Board.

Questionnaire

Data was collected via self-administered survey in each facility, from registered nurses (RNs), nurse practitioners (NPs), licensed practicing nurses (LPN), and certified nursing assistants (CNAs). Full-time or part-time HCWs from all shifts were invited to participate. Three hundred ninety-two HCWs were eligible to take the survey, and 330 had data available for analyses.

The survey instrument used in this study was based on earlier surveys described by Pittet et al⁴ and Kennedy et al.⁵ Questions included demographics and responses to the following content areas: hand hygiene, alcohol rub use, fingernails, glove use, and Centers for Disease Control and Prevention (CDC) hand hygiene guidelines. Summary variables were created to measure knowledge, beliefs about hand hygiene, beliefs about fingernails, perception of potential barriers to good hand hygiene, and

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Table 1. Characteristics of the 330 participants overall and by facility

Characteristic	Overall		Facility 1		Facility 2		Facility 3		Facility 4		P value*
	(536 beds)		(103 beds)		(230 beds)		(43 beds)		(160 beds)		
Total N	330		71		115		42		102		
Occupation, % (n)											.31
Nurse practitioner	1.21	(4)	0	(0)	1.71	(2)	2.38	(1)	0.98	(1)	
Registered nurse	13.0	(43)	9.86	(7)	9.57	(11)	14.3	(6)	18.6	(19)	
Licensed practicing nurse	28.8	(95)	28.2	(20)	31.3	(36)	16.7	(7)	31.4	(32)	
Certified nursing assistant	57.0	(188)	62.0	(44)	57.4	(66)	66.7	(28)	49.0	(50)	
Sex, % (n)											.45
Female	96.4	(318)	100.0	(71)	100.0	(115)	95.2	(40)	89.2	(92)	
Age, yr											.12
Mean (SD)	35.9	(11.6)	35.0	(12.1)	37.4	(12.0)	38.7	(13.3)	33.7	(9.7)	
Months in unit											.01
Mean (SD)	37.2	(45.6)	52.7	(68.5)	45.2	(51.7)	33.1	(36.3)	23.0	(17.2)	
Months at facility											<.001
Mean (SD)	56.2	(68.9)	63.5	(79.7)	77.7	(87.3)	45.7	(35.2)	30.3	(22.6)	
Knowledge											.03
Mean (SD)	4.9	(1.0)	4.9	(1.0)	4.7	(0.9)	5.1	(1.2)	5.0	(0.9)	
Range	(3-8)		(3-7)		(3-7)		(3-8)		(3-7)		
Hand infection beliefs											.49
Mean (SD)	38.6	(4.5)	38.5	(4.2)	38.3	(5.3)	38.4	(3.7)	39.2	(4.0)	
Range	(0-42)		(24-42)		(0-42)		(31-42)		(20-42)		
Fingernail beliefs											.16
Mean (SD)	13.6	(4.2)	14.12	(4.1)	13.7	(4.6)	12.3	(4.8)	13.8	(3.4)	
Range	(0-18)		(0-18)		(0-18)		(2-18)		(4-18)		
Perceptions											.78
Mean (SD)	30.8	(5.7)	31.1	(5.7)	31.1	(6.0)	30.2	(5.0)	30.6	(5.4)	
Range	(3-36)		(3-36)		(5-36)		(15-36)		(10-36)		
Good glove use, % (n) [†]	67.1	(228)	72.0	(54)	70.8	(85)	50.0	(21)	66.0	(68)	.07
Good fingernail traits, % (n) [‡]	68.7	(233)	75.7	(56)	66.9	(81)	60.5	(26)	69.3	(70)	.35
Handwashing frequency/shift hour											.52
Mean (SD)	4.67	(3.1)	4.8	(1.5)	4.4	(1.6)	5.3	(1.7)	4.6	(5.2)	

NOTE. There were 13 missing values for occupation, 104 for age, 58 for months in facility, 152 for months in unit, 26 for knowledge, 2 for fingernail beliefs, 23 for perceptions, 3 on glove use, 4 on fingernail traits, and 26 on handwashing frequency.

*P value compares characteristics across facilities using χ^2 tests for categorical characteristics and analysis of variance for continuous characteristics.

[†]Good glove use was defined as using gloves 100% of the time when anticipating contact with bodily fluids and changing gloves in all situations.

[‡]Good fingernail traits were defined as not wearing fingernails longer than the tip of the finger and not wearing artificial nails.

hand hygiene practice. Frequency of handwashing was derived from reported number of times hands were washed during the shift divided by hours on shift.

Statistical methods

Participant characteristics were compared across facilities using χ^2 tests and analysis of variance. The odds of better gloving and fingernail practices by occupational title were estimated using logistic regression with generalized estimating equations (GEE) to account for correlations among staff working in the same

facility. The relationships among knowledge, beliefs, perception measures, and hand hygiene practices were assessed using linear and logistic regression with GEE, adjusted for occupational title and patients per shift hour. All analyses were conducted using SAS (V.9; SAS Institute, Cary, NC)

RESULTS

A total of 343 of 392 questionnaires were returned, providing a response rate of 87.5%. Of the 343

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