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Healthcare Workers' Attitudes and Compliance With Universal Precautions: Gender, Occupation, and Specialty Differences

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ABSTRACT

We describe variations in healthcare workers' attitudes toward double gloving and reporting needlesticks, and in their readiness to comply with double gloving and hepatitis B vaccine. Differences related to occupation, specialty, and gender have implications for the need to tailor interventions for specific groups of healthcare workers to improve compliance with Universal Precautions (*Infect Control Hosp Epidemiol* 1997;18:710-712).

Healthcare workers are at risk of infection from occupational exposure to bloodborne pathogens. Risk increases with percutaneous exposures involving deeper penetration, larger volumes of blood, high viral titers, and repeated or prolonged exposures,[1] facts that place certain groups, eg, surgeons and trauma teams, at relatively greater risk. Compliance with Universal Precautions to reduce risk is suboptimal, and studies have shown that compliance varies according to gender, occupation,[2] and level of training and experience in using Universal Precautions.[3] However, to our knowledge, healthcare workers' readiness to comply with Universal Precautions has not been described previously. We sought to characterize healthcare workers' attitudes toward, and readiness to comply with, Universal Precautions in order to design interventions to improve compliance.

METHODS

A convenience sample of 84 nurses and 26 physicians (71 women, 37 men) from five St Louis-area hospitals completed a pilot survey in the initial phases of a 3-year cooperative agreement with the National Institute for Occupational Safety and Health of the Centers for Disease Control and Prevention. The anonymous survey included information about gender, age, occupation, and specialty (categorized as surgical or nonsurgical) in addition to items about their attitudes and readiness to comply with Universal Precautions. We assessed attitudes toward (1) using double gloves, (2) using protective eyewear, (3) safe sharps disposal, (4) reporting *only* high-risk injuries, and (5) the hepatitis B vaccine. Responses were "agree," "disagree," and "neither agree nor disagree."

We also asked respondents to indicate their readiness to comply with five specific precautions, including (1) using "double gloves where I might be exposed to body fluids"; (2) wearing "protective goggles or glasses where I might be splashed with blood and body fluids"; (3) depositing "all used sharp instruments and contaminated supplies into an appropriate safety container"; (4) reporting "all needlesticks and sharps injuries to the Employee Health Department"; and (5) being "fully vaccinated against hepatitis B." Possible response categories were defined according to the transtheoretical model of behavior change,[4] representing respondents' stages of readiness to change their behaviors. Stages included having "no plans" (precontemplation), "might in 3-6 months" (contemplation), "might in 1 month" (preparation), "currently do" (action), and "have for at least 6 months" (maintenance).

Respondents' attitudes and readiness to comply were analyzed by gender, occupation, and specialty using chi-squared tests; cases with missing data were excluded. In addition, because respondents in surgical specialties are believed to be at higher risk, we analyzed occupation and gender differences within the surgical specialty group alone, comparing surgeons with operating room (OR) nurses. SPSS 6.1 (SPSS Inc, Chicago, IL) statistical software was used for these analyses.

RESULTS

Mean age of respondents was 39 years (range, 21-64). Men and women were distributed similarly across surgical (n=50) and nonsurgical (n=54) specialties, and similar numbers of doctors and nurses were present in these two specialty groups. However, only 5 of 26 doctors were women, 1 of 12 surgeons was a woman, and 23 of 30 surgical nurses were women.

Respondents were divided in their attitudes toward double gloving; 36% disagreed, 47% agreed, and 17% neither agreed nor disagreed with the need to "wear two sets of gloves every time I perform an invasive procedure with sharp instruments." Responses to all other attitude items tended to be skewed toward agreement or disagreement. A majority of respondents disagreed that "prescription eyeglasses without side shields are a sufficient barrier to prevent exposure to a patient's blood and body fluid" (84% disagreed) and that they report "needlesticks and other accidental injuries involving my being exposed to a patient's blood only if I know for sure that the patient was human immunodeficiency virus (HIV)-positive or had acquired immunodeficiency syndrome (AIDS), hepatitis B, or hepatitis C" (79% disagreed). Most agreed, on the other hand, that it was "OK to deposit sharps without covering them if you drop them in the safety container" (89%

TABLE 1
NUMBER (%) OF NURSES AND PHYSICIANS REPORTING COMPLIANCE WITH UNIVERSAL PRECAUTIONS

Universal Precautions	No.	No Plans	Might in 3-6 Mo	Might in 1 Mo	Currently Practice	Practiced for ≥6 Mo
Use double gloves	101	50 (50)	3 (3)	7 (7)	22 (22)	19 (19)
Use protective eyewear	102	7 (7)	1 (1)	1 (1)	56 (55)	37 (36)
Safe sharps disposal	102	0	0	0	51 (50)	51 (50)
Report all exposures	101	2 (2)	0	2 (2)	53 (53)	44 (44)
Receive hepatitis B vaccine	101	3 (3)	6 (6)	3 (3)	3 (3)	86 (85)

agreed), and that "every hospital employee should get the hepatitis B vaccine" (84% agreed).

Subgroup differences were observed in respondents' attitudes toward double gloving and toward reporting *only* high-risk injuries. A greater percentage of surgical than nonsurgical staff reported both disagreement (43% vs 33%, respectively) and agreement (48% vs 36%) with the need to wear two sets of gloves for all invasive procedures, whereas more nonsurgical (31%) than surgical (10%) staff reported being uncertain about the need for this precaution (P=.050). Within the surgical specialty group, more surgeons (58%) than OR nurses (37%) disagreed with the need to double glove for all invasive procedures, but this difference was not statistically significant.

A greater percentage of nonsurgical compared to surgical staff (88% vs 63%; P=.019), nurses compared to physicians (80% vs 73%; P=.042), and women compared to men (84% vs 69%; P=.064) disagreed with reporting only high-risk injuries. Within the surgical specialty group, more women than men disagreed (79% vs 44%), and more men than women agreed (50% vs 21%) with this item (P=.053). Surgeons and OR nurses did not differ.

A generally high level of compliance with the five precautions was reported, but the sample was split in reporting compliance with double gloving (Table 1). Because responses to the other four items were skewed, we collapsed the five stages into three categories for subgroup analyses to indicate either "compliance" (action or maintenance stages), "contemplation or preparation" (might in either "3-6 months" or "1 month"), or "precontemplation" (no plans). Respondents reported 100% compliance with appropriate disposal of sharps, and more than 90% indicated compliance with wearing protective eyewear and reporting all sharps injuries to the Employee Health Department. Subgroup analyses were performed only on readiness to comply with double gloving and receiving hepatitis B vaccine.

More doctors (64%) than nurses (34%) reported compliance with double gloving, whereas 54% of nurses and 32% of doctors reported having no plans to double glove (P=.043). The difference between surgical (48%) and nonsurgical (33%) staff was not significant. Within the surgical subsample, however, more men than women and more surgeons than OR nurses reported compliance with double gloving (Table 2).

Interestingly, 100% of the doctors and men in this sample, in comparison to 85% of the nurses and 82% of the women, reported compliance with receiving the hepatitis B vaccine. Nine (11%) of 79 nurses and 9 (14%) of 65 women were in the contemplation or preparation stages; 3 (4%) of 79 nurses and 3 (5%) of 65 women were in the precontemplation stage. Respondents' stages of readiness to comply with receiving the hepatitis B vaccine differed significantly by gender (P=.028). Universal compliance reported by doctors may reflect the fact that most (if not all) received the vaccine while they were housestaff or in medical school and may see this practice as mandatory. Within the surgical specialty group, gender and occupational differences were not significant.

TABLE 2
NUMBER (%) OF SURGICAL RESPONDENTS REPORTING STAGES OF COMPLIANCE WITH DOUBLE GLOVING

	Gender		Occupation	
	Men	Women	Surgeons	OR Nurses
Number	17	22	12	28
Compliance	13 (77)	5 (23)	9 (75)	10 (36)
Contemplation or preparation	1 (6)	3 (14)	0	4 (14)
Precontemplation	3 (18)	14 (64)	3 (25)	14 (50)
P	.004	.058		

DISCUSSION

Because double gloving is especially pertinent for surgeons,[5] the finding that surgical staff were more likely to agree with the necessity to double glove was not surprising. It is worrisome, however, that respondents in surgical specialties also were more likely to disagree with the need to double glove for invasive procedures and that a greater percentage of surgeons than surgical nurses disagreed with this item. Disagreement with the need to double glove, and possibly noncompliance with double gloving, may be related to a number of factors, including healthcare workers' belief that not all surgical procedures require the extra protection provided by wearing double gloves, that there is a low prevalence of bloodborne disease where they work,[5] or (erroneously) that double gloves do not provide added protection,[6] that it is unnec-

essary given low levels of enforcement of infection control policies,[5] or that wearing two sets of gloves reduces manual sensibility.[7]

More surgical staff (those at highest risk for exposure to bloodborne pathogens) and men agreed with the need to report needlestick injuries *only* when the patient is known to have a bloodborne infection. We might attribute this finding to schedule and time difficulties, a lack of perceived risk, not knowing the protocol for reporting injuries, fear of breaches in confidentiality or negative reprisals at work, and not wanting to take the time to report injuries.[8] The lack of concordance between respondents' agreement that they report *only* high-risk injuries and their self-reported readiness to comply with the recommendation to report all injuries may reflect the bias of self-reports and reinforces the importance of actual observations of behaviors in studies of compliance with Universal Precautions.

In addition to the biases of self-reported data, the generalizability of our findings is limited by use of a convenience sample of hospital personnel in an area with fewer cases of HIV or AIDS than many other cities nationally.[9] Our respondents may have perceived themselves to be at lower risk, with little or no urgency to comply with recommended precautions. It also is likely that greater variance in attitudes and readiness to comply would be evident in a more diverse sample of hospital workers with varying levels of experience. Nonetheless, subgroup differences reported here, although not more broadly representative of all high-risk healthcare workers, point to interesting trends in the data and underscore the importance of considering subgroup differences when designing interventions for improving compliance with Universal Precautions.

According to the theory of reasoned action,[10] it makes sense that believing "I should wear two sets of gloves every time I perform an invasive procedure with sharp instruments" would be associated with compliance (or readiness to comply) with this precaution. Beliefs about behaviors and their consequences influence attitudes, intentions, and ultimately behavior. The transtheoretical model of behavior change proposes that a person expressing an intention to do something (contemplating or preparing to act) will be more likely to do it than a person expressing no plans to act.[4] Therefore, interventions tailored for specific groups of healthcare workers and sensitive to their attitudes, beliefs, and readiness to comply may be more effective in improving compliance with Universal Precautions than interventions that do not consider these correlates of their compliance behaviors.

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Effect of a Comprehensive Program to Reduce Needlestick Injuries

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ABSTRACT

The Arlington Hospital Needlestick Injury (NSI) Prevention Program was created to protect healthcare workers from NSI and to assess the effectiveness of our interventions. Interventions included revising NSI policy and procedures. The average NSI rate dropped from 109 to 43 per year after the interventions, over a period of 4 years (*Infect Control Hosp Epidemiol* 1997;18:712-715).

Needlestick injuries (NSIs) pose a risk of bloodborne infection transmission from patients to healthcare workers (HCWs) and vice versa.[1-4] This risk is related to the prevalence of infection and the risk of exposure. The prevalence of infection cannot be controlled, but the possibility of an exposure can be reduced, eg, by eliminating unnecessary needle use. The adoption of safer devices will reduce exposures, prevent lawsuits, decrease workers' compensation claims, and lower insurance premiums and treatment cost. It will improve the HCWs' emotional and physical well-being by providing a safer workplace. Thus, the hospital actually can save money.[5]