Evaluation of Home Health Care Nurses' Practice and Their Employers' Policies Related to Bloodborne Pathogens

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RESEARCH ABSTRACT

The purpose of this descriptive study was to assess home health care nurses' exposure to bloodborne pathogens, evaluate Medicare Certified Home Healthcare Agency (MCHHA) and hospice organization practices related to the Occupational Safety and Health Administration's (OSHA) Bloodborne Pathogens Standard and the Needlestick Safety and Prevention Act, and link the two to recommend safety improvements. This study evaluated the experiences of 355 home health care nurses and 30 MCHHA and hospice employers in one mid-Atlantic state regarding bloodborne pathogen programs and practices and blood and sharps contact. An index was developed to evaluate employer compliance with OSHA's Bloodborne Pathogens Standard. Employer policies and nurse practice related to the OSHA Bloodborne Pathogens Standard did not meet all requirements despite identified risk. Thirty-eight home health care nurses from 12 of the 30 employers reported needlestick injuries within the past year, yet employers reported only 18 nurse needlestick injuries within the same year. Using the bloodborne pathogen compliance index, employers can review and revise their exposure control plans to ensure compliance. This intervention should benefit both employer policies and nurse practice to improve safety and decrease the risks from bloodborne pathogens in the home health care setting.

Across the United States, approximately 17,700 home health care agencies employ 867,100 home health care workers serving 7.6 million individuals annually. Expenditures for home health care were estimated to exceed $53.4 billion in 2005 (National Association for Home Care and Hospice, 2007). Home health care workers are exposed to a variety of occupational health hazards, including job stress, violence, musculoskeletal injuries, motor vehicle accidents, and needlestick injuries, but needlestick injuries are among the most poorly understood (Chalupka, Markkanen, Galligan, & Quinn, 2008; Cheung, 2000; Fazzone, Barloon, McConnell, & Chitty, 2000; Gershon et al., 2008a; Sherman et al., 2008; Trinkoff, Le, Geiger-Brown, & Lipscomb, 2007). In general, among health care workers exposed to bloodborne pathogens via contaminated sharps, it is estimated that 0.25% to 0.4% will develop HIV, 6% to 30% will develop Hepatitis B, and 0.4% to 1.8% will develop Hepatitis C (Centers for Disease Control and Prevention, 2003).

Federal legislation was enacted to protect health care workers from occupational exposure to bloodborne pathogens. In 1991, the Occupational Safety and Health Administration (OSHA) promulgated the Bloodborne Pathogens Standard, requiring employers of health care workers to maintain a written exposure control plan. Several compliance directives were later incorporated

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Applying Research to Practice

Using survey findings, a compliance index for the Occupational Safety and Health Administration's Bloodborne Pathogens Standard was developed. Home health care employers may use this index to identify opportunities to improve safety for home health care nurses. These opportunities include ensuring thoroughness of the exposure control plan, improving processes for reporting needlestick injuries, implementing a sharps log to track needlestick injuries, and involving direct care nurses in the reassessment and provision of personal protective equipment.

into the final rule, which was revised as the Needlestick Safety and Prevention Act of 2001. This act strengthened the original Bloodborne Pathogens Standard by requiring employers to use sharps protection devices and needleless systems, annually review exposure control plans, include frontline workers in evaluation and selection of engineering and work practice controls, and maintain a sharps injury log (29 CRF 1910.1030) (Lee, Botteman, Xanthakos, & Nicklasson, 2005; OSHA, 1991, 2001). Safe occupational practice in health care settings includes reduction of blood contact, safe use of sharps, and prevention of needlestick injuries.

Surveillance and reporting of blood contact in health care facilities is better established than surveillance and reporting of blood contact in home health care settings (Laramie et al., 2007; Scheckler et al., 1998; Vaughn et al., 2004). Beltrami et al. (2000) examined blood contact among home health care workers performing 19,164 procedures during 33,606 home visits. They estimated from this sample, which included 53 blood contacts (5 needlestick injuries and 48 skin contacts), a percutaneous injury rate of 0.6 per 1,000 procedures involving sharps. Most important, they found that gloves were appropriately used in only 52% of the procedures involving potential blood exposure. Trinkoff et al. (2007) reported a needlestick injury rate of 8.5% in the past year among home health care nurses, about half the injury rate for nurses in hospitals, long-term care facilities, and outpatient settings. Gershon, Pogorzelska, Qureshi, and Sherman (2008b) reported an injury rate of 13% in the previous year in a pilot study of 72 home health care nurses.

Overall, underreporting of needlestick injuries is estimated to be between 39% and 56% (Perry, Parker, & Jagger, 2001), but the rate of underreporting in home health care is unknown. Brown et al. (2005) identified organizational, work group, and individual job factors associated with increased reporting, including the presence of a health and safety committee, available occupational health services, and positive supervisory support. On the other hand, safety incentive programs, a climate of blame, and job insecurity tended to decrease reporting. Markkanen et al. (2007) described reasons home health care nurses provided for not reporting needlestick injuries and divided them into three factors: the "big deal factor" (i.e., reporting takes too much time, unclear reporting procedures, and postexposure care that is too removed from where the injury occurs), the "fear factor" (i.e., worrying about developing illness and not wanting to face it, afraid one will be considered a careless clinician, and fearing the incident will adversely affect current employment), and the "health insurance factor" (i.e., fearing current insurance is inadequate and not understanding workers' compensation).

The purpose of this study was to assess home health care nurses' contact with blood, identify their safety practices, and evaluate their employers' policies and practices related to the OSHA Bloodborne Pathogens Standard and the Needlestick Safety and Prevention Act. It is important to evaluate nurse and employer adherence to the policy and to identify opportunities for improvement to ensure a safe work environment.

METHODOLOGY

To evaluate adherence to the OSHA Bloodborne Pathogens Standard in home health care, two surveys were conducted. The home health care nurse survey was mailed to nurses' homes. Medicare Certified Home Healthcare Agency (MCHHA) and hospice organization employer surveys were conducted by telephone interview of home health care administrators or their designees. For analysis, individual nurses' responses were matched to their employer's survey data.

Home Health Care Nurse Survey

Guided by community-based participatory research methodology (Minkler & Wallerstein, 2003), focus groups of home health care nurses employed by MCHHAs or hospice organizations were conducted to study bloodborne pathogen risk exposure. This information was used to construct appropriately tailored survey items for the home health care nurse and employer surveys (Zanoni et al., 2007).

The sample was drawn from 2,689 nurses identified by a mid-Atlantic state Board of Nursing as practicing in home health care. Respondents were eligible if they were currently working in home health care or had worked in home health care within the past 2 years. Of these nurses, 69 had incorrect addresses and thus the surveys were undeliverable. Of the 2,620 surveys sent, 1,698 surveys (65%) were returned. A total of 794 of these surveys (47%) met the eligibility criteria and comprised the final sample. To maximize response, the mailings included an introductory letter, three waves of survey mailings, and two reminder postcards, as needed (Dillman, 2000). Monetary incentives were included with the first ($2) and third ($5) survey mailings.

The mailed nurse survey was an 8-page questionnaire that covered job and personal characteristics, including job title, work schedule, non-sharps and sharps-related blood contacts, and demographics. The survey

was pilot tested and estimated to require 20 minutes for completion.

Home Health Care Employer Survey

MCHHA or hospice administrators or directors of patient care services or their designees, hereafter referred to as employers, were surveyed by phone. Eligible MCHHAs and hospices were identified through a list available on the state health department website. Sixty employers were contacted by telephone. Thirty surveys were completed for a response rate of 50%. Two to six contacts were made with employers to schedule an appointment and complete the survey.

The 15-minute telephone survey covered an employer evaluation of essential elements of the OSHA Bloodborne Pathogens Standard and the Needlestick Safety and Prevention Act. Specifically, employers were asked about their understanding of employee exposure risk and compliance with components of the OSHA standard. These items included evaluation of employer compliance with the hepatitis B virus vaccination program, development and implementation of a bloodborne pathogen safety education program, degree of inclusion of staff in evaluation and selection of safety-engineered devices, adequacy of postexposure prophylaxis procedures, and the presence of an OSHA sharps log. Employers were also asked about needlestick injuries reported within the past 12 months.

Nurse Survey and Employer Survey Linkage

The home health care nurses were asked to indicate their employer from a list of MCHHAs and hospice organizations on the nurse survey. Using this information, home health care nurses' survey data were then linked to data from their designated employer. Only nurse survey respondents who reported working for an agency for which a phone survey was completed were included in the analysis. This procedure resulted in a final sample of 355 nurses who worked with the 30 employers surveyed. Data from the surveys were analyzed using SPSS software, version 14.

Compliance Index Measurement

An OSHA Bloodborne Pathogens Standard index was developed to further evaluate reported employer compliance. The nine required components of employer bloodborne pathogen safety programs were scored, including the presence of (1) an exposure control plan (8 items), (2) a training program (7 items), (3) a hepatitis B program (2 items), (4) a reporting mechanism for postexposure management (1 item), (5) an injury log (1 item), (6) prohibition of recapping needles (2 items), (7) monitoring of the exposure control plan (1 item), (8) needle disposal policies (2 items), and (9) use of personal protective equipment (4 items). For example, to receive credit for the hepatitis B program, the employer had to offer all employees at risk for occupational exposure to blood and body fluids the hepatitis B vaccination (three doses) free of charge and have a documentation procedure for those employees who refused. The final scores were based on compliance with all elements of that particular component. If any one element of the component was not present, the employer did not receive credit for that component. To further evaluate employer compliance using these data, a summed compliance index was calculated to determine the presence of each of the nine elements in each employer's blood safety program.

Table 1

All Nurses Compared to Nurses Matched to Employers

	All Nurses (N = 794)	*Nurses Matched to Employers (N = 355)*	p
Mean age (yr)	48.8 (± 9.3)	48.3 (± 9.0)	.33
Mean nursing experience (yr)	23.4 (± 10.5)	22.4 (± 9.0)	.12
Mean home health care experience (yr)	11.4 (± 6.8)	11.6 (± 6.6)	.61
Ethnicity			.15
White	78.7%	78.9%	
Black	17.1%	16.5%	
Other	4.2%	4.6%	
Education			.12
Diploma	17.3%	15.7%	
Associate degree	33.3%	36.3%	
Bachelor's degree	36.0%	35.2%	
Master's degree/other	13.4%	12.8%	

RESULTS

Sample Description

The 355 nurses included in this analysis did not differ significantly from the entire sample of 794 nurses in terms of demographics, time in nursing, or education (Table 1). The mean age of the 355 nurses was 48 years, they were predominantly White (78.9%), and they had extensive experience in nursing (M = 22 years) and home health care (M = 12 years). Slightly fewer than half (48.0%) of the 355 nurses had a bachelor's degree or higher. The majority of the nurses (82.9%) worked for a MCHHA, with 17.1% working solely for a hospice or a combined home health care and hospice organization. Roughly two thirds (64.3%) of the nurses worked in home health care agencies that were independent, and roughly one third (31.9%) worked in hospital-based agencies. A majority of the nurses (55%) worked for not-for-profit agencies. The

Table 2

Home Health Care Employers' Compliance Index for the Occupational Safety and Health Administration (OSHA) Bloodborne Pathogens Standard and the Needlestick Safety and Prevention Act (*N* = 30)

OSHA Compliance Component (Number of Items)	*Number of Employers With 100% Compliance*[a]	*% of Employers With 100% Compliance*
1. Presence of reporting mechanism after exposure (1)	30/30	100
2. Recapping prohibited practices (2)	30/30	100
3. Needle disposal practices (2)	30/30	100
4. Monitoring of exposure control plan (1)	28/29	97
5. Hepatitis B program (2)	28/30	93
6. Injury log (1)	20/29	69
7. Exposure control plan (8)	11/30	37
8. Training program (7)	11/30	37
9. Personal protective equipment practices (4)	4/30	13

[a]*A denominator of 29 reflects missing data.*

Table 3

Home Health Care Employers' Summed Compliance Index for the Occupational Safety and Health Administration (OSHA) Bloodborne Pathogens Standard and the Needlestick Safety and Prevention Act (*N* = 30)

Total Compliance With 9 Essential Elements of the OSHA Standard	*Number of Employers (Compliance Score)*	*% of Employers With Compliance Score*
0 to 2 Items	0	0
3 Items	1	3
4 Items	5	17
5 Items	13	43
6 Items	8	27
7 Items	2	7
8 Items	1	3
9 Items	0	0

majority of the nurses in these agencies were permanent full-time employees (83.1%).

Blood Exposure Potential

Home health care nurses and employers both reported potential for blood exposure. Nurses reported performing phlebotomies (42%), injections (62%), and intravenous therapy (29%) more than once a day. Similarly, employers reported provision of services that involved nurse contact with blood, including phlebotomy services (100%), blood glucose monitoring (83%), insulin administration (87%), and intravenous therapy (70%).

Exposure Control Plans

All employers reported the presence of a blood safety exposure control plan, but implementation of the essential elements of the OSHA standard was inconsistent. For example, all employers reported that they implemented an exposure control plan with orientation and annual education, a reporting mechanism after sharps contact, and a procedure for postexposure prophylaxis. However, only 80% reported that the plan covered all job classifications at risk for exposure and only 53% had their plan evaluated by a safety professional, as required by the OSHA Bloodborne Pathogens Standard.

Use of Safety Devices and Education

Although employers reported that their education programs for bloodborne pathogen safety included all essential elements, only 57% reported that they included staff in the selection of safety-engineered devices as required. Although the standard requires employers to supply safety devices, nurses reported that such devices were not always available for patient care. Eighty percent of the nurses reported they had limited access to safety-lock needles, two thirds had limited access to retractable syringes, needleless medlocks, and intravenous tubing, and just more than half had limited access to blunt needles.

Compliance Index Findings

The compliance for each item ranged from 14% to 100% (Table 2). Although all employers described an exposure control plan and bloodborne pathogen safety training program, only 37% included all of the essential elements. Ninety-three percent of employers reported their hepatitis B program had the necessary components, but no employer could report the percentage of employ-

ees who actually completed the vaccination series because this was considered private health-related information. Although 100% of employers described a reporting mechanism for postexposure management, only 47% of nurses who had experienced sharps injuries reported them. Only 14% of employers met the criteria for personal protective equipment practices. Furthermore, only two employers reported an occupational health nurse evaluated employees who sustained needlestick injuries, so generally managers and directors were expected to direct employees through postexposure evaluation, prophylaxis, and counseling. Employers' scores ranged from 3 to 8 (possible range = 0 to 9). Approximately two thirds of employers reported 5 or fewer of the essential components necessary for a blood safety program as mandated by the OSHA standard (Table 3).

Needlestick Injury

Twelve employers reported a total of 18 needlestick injuries among their nurses within the past year; however, when surveyed, 38 nurses reported needlestick injuries within the past year. This reflects an underreporting rate of 53%. The use of a needle (18%) or lancet (6%), disposal procedures (7%), and recapping (4%) were the most commonly cited events associated with the most current needlestick injury. Finally, although all employers reported policies prohibiting recapping, one fourth of the nurses reported recapping needles and one fourth of the nurses who had a sharps injury reported the injury occurred when they recapped a needle.

DISCUSSION

Although all employers reported the presence of some aspects of a mandated exposure control plan, some of the essential elements of the OSHA Bloodborne Pathogens Standard were missing. Findings from the index suggest that employers have opportunities to improve their understanding and implementation of safety policies required by the OSHA Bloodborne Pathogens Standard. This study demonstrated the presence of opportunities for improvement in home health care bloodborne pathogen safety programs. These opportunities include ensuring thoroughness of the exposure control plan; improving processes for reporting needlestick injuries; implementing a sharps log to assist in tracking needlestick injuries; and involving direct care nurses in the reassessment and provision of personal protective equipment, including selection of appropriate safety-engineered devices. Diligent use of red sharps containers and ensuring that nurses have access to safety equipment during all patient visits could also be improved.

Findings from this study warrant attention because of the safety hazards related to potential bloodborne pathogen exposure among nurses in the home health care setting and their employers' less than full compliance with the OSHA Bloodborne Pathogens Standard. Alerting the home health care community to these lapses in provision of a safe work environment for nurses is ethically responsible. Providing recommendations for improving protective practices will enable employers to reevaluate their compliance with the OSHA Bloodborne Pathogens Standard and provide the venue for improved practices and adherence.

IMPLICATIONS FOR PRACTICE

The OSHA Bloodborne Pathogens Standard and the Needlestick Safety and Prevention Act have been in effect for many years and many home health care employers may assume that their organizations are in full compliance with them. This study described the inconsistencies in home health care and hospice employer implementation of the standard and differences between nurse-reported practice and employer-reported policies. Home health care employers do not always have access to occupational health professionals. For example, only 37% of employers reported that their exposure control plan was evaluated annually by a safety professional and only 7% reported that the post-injury protocol for nurses who sustained needlestick injuries was evaluated by occupational health nurses.

Occupational health nurses may use this evidence to assist home health care administrators to comply with the OSHA Bloodborne Pathogens Standard and the Needlestick Safety and Prevention Act, and implement policies that support best practices in protecting nurses from blood exposures. Occupational health nurses can implement, lead, or participate on home health care safety committees. Blood exposure risk and safety should be a permanent agenda item for the safety committee, which should meet at least quarterly. All reported needlestick injuries and blood contacts with mucous membranes and broken skin should be reviewed from the mandated OSHA injury log. Recommendations may be offered to decrease the risk of blood exposure based on the incident and to improve the efficiency and effectiveness of reporting blood exposures and managing postexposure prophylaxis and counseling. Guided by the occupational health nurse, the safety committee can also ensure review of the exposure control plan by a safety professional and implement recommendations to ensure proper compliance. The occupational health nurse can then guide revisions to policies, orientation, and annual training based on review of the exposures and recommendations of the safety professional. The occupational health nurse can further enhance risk reduction and safety monitoring by assisting the safety committee to annually survey home health care nurses regarding availability and preferences of safety-engineered sharps devices and personal protective equipment, developing competencies, and reviewing supervision guidelines for safe use of sharps devices and equipment. Finally, the occupational health nurse can work with the safety committee to ensure that 100% of home health care staff with direct patient care responsibilities receive the full hepatitis B vaccine series and maintain protective titers. Using these measures, the occupational health nurse can assist home health care employers to implement policies that support best practices and protect nurses from blood exposures.

CONCLUSION

Survey methodology was used to investigate MCHHA and hospice nurses' and employers' practices regarding

bloodborne pathogen safety. An index was developed to measure reported employer compliance with the OSHA Bloodborne Pathogens Standard. The results supported the need for assisting home health care and hospice employers to comply with the OSHA Bloodborne Pathogens Standard, including staff involvement in the selection of safety-engineered sharps devices, identification of strategies to address underreporting of blood contacts, and management of sharps logs.

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CE Answers
July 2008

Family History: Value-Added Information in Assessing Cardiac Health

1. C	6. C
2. B	7. D
3. A	8. D
4. B	9. C
5. D	10. D