Provision and use of safety-engineered medical devices among home care and hospice nurses in North Carolina

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Background: Nurses who provide care in the home are at risk of blood exposure from needlesticks. Using safety-engineered medical devices reduces the risk of needlestick. The objectives of this study were to assess provision of safety devices by home care and hospice agencies as well as the use of these devices by home care and hospice nurses in North Carolina, and to examine the association between provision and use.

Methods: A mail survey was conducted among North Carolina home care and hospice nurses in 2006.

Results: The adjusted response rate was 69% (n = 833). The percentage of nurses who were always provided with safety devices ranged from 51% (blood tube holders) to 83% (winged steel needles). Ninety-five percent of nurses who were always provided with safety devices, but only 15%-50% of nurses who were not always provided with safety devices, used a safety device the last time they used that general type of device. Among nurses who did not use a safety device on that occasion, 60%-80% did not use it because it was not provided by the agency.

Conclusion: This study suggests that limited access is the primary reason for home care/hospice nurses' failure to use safety devices. The policy goal of providing safety devices to health care workers in all situations in which such devices could reduce their risk of needlestick is not being achieved for home care nurses in North Carolina.

Key Words: Blood exposure; epidemiology; home nursing; needlestick; occupational exposure; survey.

Nurses who provide care in the home are at risk for blood exposure from needlesticks[1-3] and possible subsequent infection with human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV).[4-6] Using safety-engineered medical devices[7] has been shown to reduce the risk of needlestick in health care workers.[8-10] The objectives of this study were to determine the frequency of provision of safety devices by home care and hospice agencies in North Carolina, the frequency of use of safety devices among nurses employed by these agencies, and the effect of device provision by agencies on device use by nurses. For brevity, the term ''home care'' is used in the rest of this report to represent home care and hospice.

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METHODS

The North Carolina Study of Home Care and Hospice Nurses was a mail survey of registered nurses listed in the licensing database of the North Carolina Board of Nursing as working in home care or hospice in nonadministrative positions. A pilot study was conducted to test the survey process. All nurses who had not been selected for the pilot study were included in the sample for the main survey. Further eligibility criteria included on the questionnaire were current employment in home care or hospice in North Carolina and making 6 or more home visits in a typical week. Data collection was conducted during October and November 2006. Data analysis was performed using SAS 9.1 (SAS Institute, Cary, NC). The confidence intervals in this report incorporate a finite population correction factor. The questionnaire can be viewed at http://www.sra.com/nchhnquestionnaire/. Additional details of the study design have been published previously.[1] This study was approved by the Institutional Review Board of Weber State University.

Provision of safety devices was measured by the question: ''How often does your agency provide you with the following safety devices?'' Response options were ''never,'' ''sometimes,'' ''usually,'' ''always,'' and ''don't know.'' The specific types of safety devices listed were

shielded winged steel needle; retracting or shielded lancet/lancet holder; syringe with sliding shield, hinged cap, or retracting needle; intravenous (IV) catheter with shielded or blunted stylet; hinged cap or shielded straight needle; hinged cap blood tube holder; and puncture-resistant sharps container (technically not a safety device).

In order to relate the findings to current occupational safety regulations (which require employers to always provide safety devices for relevant work situations[11,12]), for each device, nurses were divided into 2 groups. One group consisted of nurses who responded that their agency ''always'' provided the safety device, and the other group consisted of nurses who responded other than ''always.''

The use of safety devices was measured by 6 questions that referred to the last time the nurse used a particular type of device and asked whether the device had the appropriate safety feature; for example: ''The last time you used an IV catheter, did it have a shielded or a blunted stylet?'' The 6 types of devices asked about were winged steel needle (was it shielded?), lancet (retracting/shielded?), syringe (sliding shield, hinged cap, or retracting needle?), IV catheter, straight needle (hinged cap/shield?), and blood tube holder (hinged cap?). Response options were ''yes'' and ''no,'' along with the following 4 reasons for not using the safety device: (1) not a risky procedure, (2) don't like this equipment, (3) equipment not provided by agency, and (4) didn't have equipment at visit. Nurses could write in other reasons as well.

RESULTS

Questionnaires were received from 833 eligible nurses; 640 nurses either did not return the questionnaire or refused to participate in the study. Based on the assumption that the proportion of eligible nurses from among those who did not return the questionnaire or could not be contacted was similar to the proportion among those who did return the questionnaire, the adjusted response rate was 69%.

Participants were primarily white (91%), female (96%), and age 36-55 years (63%). More than 96% of the nurses reported always being provided with puncture-resistant sharps containers. The percentage of nurses who were always provided with safety-engineered medical devices ranged from 51% for blood tube holders to 83% for winged steel needles (Table 1).

For all 6 types of devices, referring to the last time the nurse used that general type of device, the percentage of nurses who used a safety device was slightly greater than the percentage who were always provided with that type of safety device (Table 1). This finding indicates that some nurses, although not always provided with the safety device, did have a safety device available and did use it on the specified occasion (ie, the last time they used that general type of device).

When the data were stratified to compare nurses who were and were not always provided with safety devices, a striking (although not surprising) difference between the 2 groups emerged. As shown in Fig 1, 95% of nurses who were always provided with safety devices used them on the specified occasion. In contrast, only 15%-50% of nurses who were not always provided with safety devices used a safety device on the specified occasion. The proportion of nurses who used safety devices was 1.8-times (IV catheter; 97% vs 54%) to 5.2-times (blood tube holder; 94% vs. 18%) greater among nurses who were always provided with the safety device compared to nurses who were not always provided with the safety device.

Among nurses who did not use a safety device on the specified occasion, 60%-80% did not use the device because it was not provided by the agency (Table 1). The remaining 20%-40% did not use it because of the other reasons listed earlier (see Methods).

DISCUSSION

The importance of providing health care workers with safety devices was recognized in the Needlestick Safety and Prevention Act of 2000[11] and the subsequent revision of the Bloodborne Pathogens Standard.[12] Under the revised standard, employers are required to provide health care workers with safety devices and to ensure that workers use the devices in appropriate situations.[12] However, because the patient's home is not under the control of the home care agency, employers are not required to ensure use of safety devices in the home care setting.[13] Nevertheless, home care agencies are still required to provide safety devices to their nurses.[14]

There are 2 possible scenarios under which provision of safety devices by home care agencies would not result in increased use by home care nurses. In 1 scenario, nurses who are always provided with the devices use them, and nurses who are not always provided with the devices obtain them by other means and also use them. In this case, the percentage of nurses reporting use would be high in both groups. In the other scenario, both nurses who are and who are not provided with the devices do not use them. In this case, use would be low in both groups.

The results of this study suggest that home care nurses' access to safety devices may be limited. Between 15% and 50% of the nurses were not always provided with safety devices, depending on the type of device (Table 1).

This study also suggests that limited access is the primary reason for home care nurses' failure to use

Table 1. Provision and use of safety devices among North Carolina home care and hospice nurses, 2006 (n = 833)

Type of device	Safety device always provided, % (95% CI)	Used safety device last time, % (95% CI)	Did not use safety device because it was not provided, % (95% CI)*
Winged steel needle	83 (81-85)	85 (84-87)	70 (63-78)
Lancet	70 (67-72)	76 (74-78)	72 (66-78)
Syringe	75 (72-77)	82 (80-84)	70 (63-76)
IV catheter	75 (72-77)	85 (83-87)	67 (58-75)
Straight needle	64 (62-67)	70 (68-73)	63 (57-69)
Blood tube holder	51 (48-54)	57 (54-60)	82 (78-85)

CI, confidence interval.
*Nurses who did not use a safety device for this reason as a percentage of all nurses who did not use that device for all reasons combined.

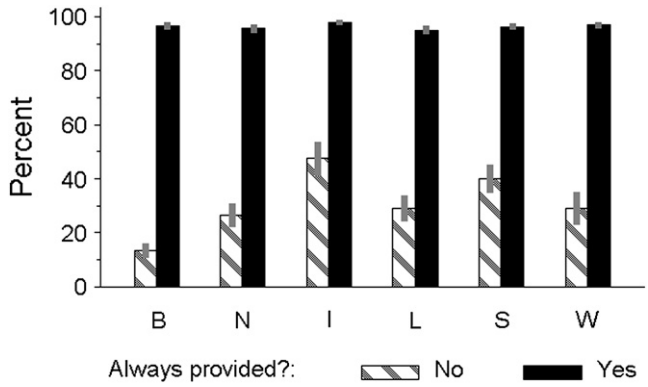

Fig 1. Use of safety devices among nurses who were and were not always provided with safety versions of 6 types of devices. The small vertical bars indicate 95% confidence intervals. B, blood tube holder; N, straight needle; I, IV catheter; L, lancet; S, syringe; W, winged steel needle.

safety devices. Between 60% and 80% of nurses who did not use a safety device did not use it because it was not provided by their agency (Table 1). Nurses who were always provided with safety devices were 2-5 times more likely to use a safety device compared to nurses who were not always provided with safety devices (Fig 1).

Some medical equipment used in home care is provided by the patient or the patient's insurance company. Neither the nurse nor the home care agency has control over whether or not these parties choose to provide safety devices. In fact, these parties often choose not to provide safety devices because they are usually more expensive than comparable non-safety devices.[15] In the present study, some respondents indicated that they used a non-safety device because it was provided by the patient, but the data are insufficient to quantify the contribution of patient-provided devices to the overall results.

In a previous analysis of this survey,[1] we found that having 5 years or less experience in home care and working on a part-time/contract basis were both associated with higher incidence rates of blood exposure. In the present analysis, these 2 factors were not associated with provision or use of safety devices. This suggests that the mechanism by which these factors are associated with a greater incidence of blood exposure is something other than less use of safety devices among nurses who have less experience or who work on a part-time/contract basis.

In summary, this study demonstrates that the policy goal of providing safety devices to health care workers in all situations in which such devices could reduce their risk of needlestick[11] is not being achieved for home care nurses in North Carolina. Future research should focus on understanding the reasons for home care nurses' lack of access to safety devices and on developing interventions to mitigate the lack of access.

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