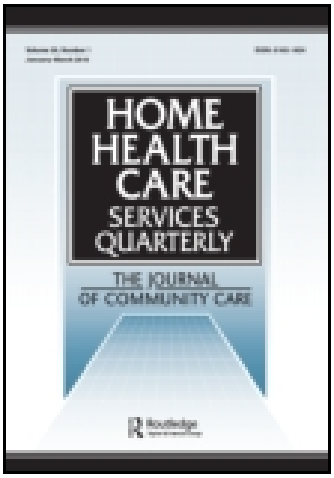

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Reducing Occupational Risk for Blood and Body Fluid Exposure Among Home Care Aides: An Intervention Effectiveness Study

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Reducing Occupational Risk for Blood and Body Fluid Exposure Among Home Care Aides: An Intervention Effectiveness Study

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The purpose of this quasi-experimental pretest/posttest research study was to examine the effectiveness of an intervention designed through a participatory process to reduce blood and body fluid exposure among home care aides. Employer A, the intervention site, was a large agency with approximately 1,200 unionized home care aides. Employer B, the comparison group, was a medium-sized agency with approximately 200 home care aides. The intervention was developed in partnership with labor and management and included a 1-day educational session utilizing peer educators and active learning methods to increase awareness about the risks for occupational exposure to blood and body fluids among home care aides and a follow-up session introducing materials to

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facilitate communication with clients about safe sharps disposal. Self-administered preintervention and postintervention questionnaires identifying knowledge about and self-reported practices to reduce bloodborne pathogen exposure were completed in person during mandatory training sessions 18 months apart. Home care aides in the intervention group for whom the preintervention and postintervention questionnaires could be directly matched reported an increase in their clients' use of proper sharps containers (31.9% pre to 52.2% post; $p = .033$*). At follow-up, the intervention group as a whole also reported increased use of sharps containers among their clients when compared to controls (*$p = .041$*).*

KEYWORDS community and home care, occupational health and safety, participatory research, worker safety

INTRODUCTION

According to the U. S. Bureau of Labor Statistics (USBLS), as of 2010 there are approximately 1.07 million home care aides employed by 20,000 home care agencies providing care to 7.6 million individuals in the United States (USBLS 2013). However, these figures may underestimate the total number of home care aides because many aides are hired privately and may not be included in official federal statistics (Stone 2004). Importantly, USBLS projections indicate that by 2020 as many as 1.7 million home care aides will be needed. Home care aides, also known as personal care attendants and home makers, assist the sick, frail elderly, and disabled with personal care services, allowing them to remain at home rather than moving into a long-term care facility (USBLS 2013). Reducing the potential for illness and injury among these workers promotes continuity of care for their clients (Baron, McPhaul, Phillips, Gershon, & Lipscomb, 2009).

Home care aides often work in uncontrolled and isolated environments while assisting with daily activities such as walking, bathing, dressing, toileting, grooming, and preparing meals; as well as helping with house cleaning and laundry, trash handling and disposal (Zanoni et al., 2007; Markkanen et al., 2007). Some aides assist clients with health-related services such as observing vital signs, assisting with bowel care, and changing soiled wound dressings. They face challenges from a number of areas—including work-site isolation; hazards such as neighborhood violence, cluttered or unstable walking surfaces; and a relative absence of assistive devices for lifting or for sharps disposal (Markkanen et al., 2007; Amuwo, Sokas, & Lipscomb, 2011). As previously reported, home care aides may be exposed to blood and body fluids that pose a risks of exposure to bloodborne infectious diseases including HIV, Hepatitis B, and Hepatitis C, particularly from unsafe sharps disposal (Markkanen et al., 2007; Amuwo, Sokas, & Lipscomb, 2011; Lipscomb et al.,

2009; Quinn et al., 2009; Vos, Götz, & Richardus, 2006). A cross-sectional study of 971 home care aides examining self-reported occupational exposure to blood and body fluids found that 6.3% ($N = 62$) reported instances of blood and body fluid exposure either via sharps or mucous membrane contact (Amuwo, Sokas, & Lipscomb, 2011; Lipscomb et al., 2009). The level of assistance needed by their clients in tasks such as feeding, laundry, and transportation; and the performance of health care-related tasks (outside of their purported scope of practice) such as colostomy care, caring for a urinary catheter, and bowel stimulation were found to be significantly associated with blood and body fluid exposure among home care aides ($p \leq .01$; Zanoni et al., 2007; Amuwo, Sokas, & Lipscomb, 2011). In a survey of home health aides in Massachusetts, 1.0 per 100 full-time equivalent (FTE) workers reported a sharps injury in the year surveyed, and 6.4% reported ever experiencing a sharps injury (Quinn et al., 2009).

This article will examine the effectiveness of a series of participatory training and communication interventions developed and implemented over an 18-month period aimed to increase the use of appropriate sharps disposal containers among the clients of home care aides. The study design included baseline and follow-up self-administered questionnaires.

SETTING

The study population included home care aides employed by two not-for-profit home care agencies in Chicago, Illinois. Employer A (intervention group) is a large national home care agency headquartered in the Chicago Area employing English and Russian-speaking home care aides; Employer B (comparison group) is a medium-sized home care agency with English speaking home care aides. All research materials and intervention activities were available and conducted in both English and Russian. Process evaluation of the participatory intervention which involved the adaptation of a training program designed for small- to large-group auditorium-style settings has previously been reported (Amuwo, Sokas, & Lipscomb, 2011; Amuwo, Sokas, Nickels, Zanoni, & Lipscomb, 2011).

The following research hypotheses guided the development of the study and manuscript:

- Participatory interventions will result in increased sharps container usage.
- Participatory interventions will affect the number of blood and body fluid exposures reported.

METHODS

A quasi-experimental pretest/posttest research design was used to evaluate these hypotheses. All of the data and trainings that were part of the study

were conducted during the employer-required training sessions for each of the two participating agencies. Training sessions are mandated by state regulation and typically cover information about caring for frail elderly clients. Because the state does not provide funding for the training program itself, most agencies meet training requirements by providing large-group presentations often by product vendors or other groups who offer lectures free of charge. As part of the research initiative, the training program for home care aides was provided by funded university partners, using participatory peer education techniques involving both labor and management and focused on bloodborne pathogen prevention in the intervention group. The comparison group received presentation on other topics of interest delivered by university partners.

The intervention training program involved the use of adapted small-group interactive trainings in large-group settings (Amuwo, Sokas, Nickels et al., 2011). It consisted of three, 90-minute exercises, designed to educate home care aides about the risks for exposure to blood and body fluids and other occupational hazards in the workplace. Peer educators including frontline workers, union representatives, and frontline managers engaged the participants in active learning techniques such as hazard mapping and role play. Groups of 20 were formed within a large lecture hall by re-arranging tables. Each peer educator worked with one to two groups.

Following the initial survey and training, members of labor, management, and academia met to better understand the sources of exposures and the barriers to prevention, and developed and piloted two communication tools. First, a magnet was developed for clients that described the hazards of improperly disposed sharps and providing information about obtaining proper sharps containers. The second tool was a wallet card for employees to carry with information to follow in the event of an exposure (including the supervisor's telephone number and a back-up number if needed). These communication tools were incorporated into a refresher educational session provided to the home care aides in the intervention group, at which time role-play exercises allowed workers to practice offering their clients the magnets containing safe sharps disposal information. This information included approaches to obtaining and disposing of low-cost sharps containers.

Preintervention and postintervention data were collected using an eight-page questionnaire, developed by the research team and based on a series of focus groups conducted with this population for this purpose (Zanoni et al., 2007; Amuwo, Sokas, & Lipscomb, 2011; Lipscomb et al., 2009). Pilot versions of the questionnaire were tested among a small group of home care aides. Survey distribution, informed consent, and self-completion of the questionnaire took approximately 1.5 hours; participation in this research was voluntary and all surveys were collected without personally identifiable information. All home care aides, including those who did not take part in the questionnaire, were paid their hourly wage by their employer as this

research occurred during their required training sessions. Human subject IRB protection approval was secured from the University of Illinois at Chicago and from the University of Maryland, Baltimore.

Immediately following the baseline data collection, home care aides at Employer A participated in the training program on blood and body fluids exposure. Approximately one year later, these workers received the two intervention tools in the context of a review session on health and safety in the home. Home care aides in Employer B did not participate in the intervention and therefore they did not participate in this training program or receive any of the tools after the baseline questionnaire. Instead, the university partners provided training on other topics of interest to them. Eighteen months following the baseline questionnaire and 6 months after the communication tools were distributed to home cares aides in Employer A, a postintervention questionnaire was administered to both groups. The postintervention questionnaire was very similar to the preintervention questionnaire but with additional follow-up questions. In addition, the postintervention questionnaire was modified and condensed to reflect information learned from the first questionnaire. Pilot testing was conducted to improve clarity. Home care aides from the two participating agencies completed the postintervention questionnaires during their employer-required training sessions (see Figure 1).

Questionnaire completion by all home care aides was voluntary and was collected without personally identifiable information. A self-created ID code was used in order to match and analyze the individual responses of home care aides between the preintervention and postintervention questionnaires for both Employer A and B. We refer to these observations as "matched data." The preintervention and postintervention questionnaire responses of home care aides who could not be individually matched using the self-created ID code but who indicated that they had completed the first survey were analyzed separately. We refer to these analyses as "grouped data."

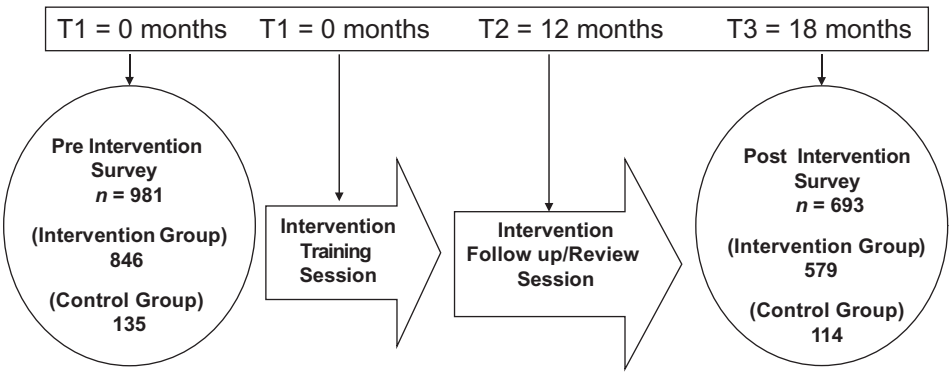

FIGURE 1 Overall Study Design.

MEASURES/VARIABLES

The preintervention and postintervention questionnaires included: demographics, job task description, workplace exposures, home care environment, and worker satisfaction.

Self-Created ID Code

A self-created ID code was developed in order to enable the tracking of home care aide responses between the preintervention and postintervention questionnaires for both Employer A and B that were otherwise anonymous. In developing this ID code, the requirements for creating the ID were that it could be easily recalled, would not change, could not be traced, and was exclusive to individual questionnaire participants. The characteristics selected for the eight-digit code were: (a) the first three letters of their mother's first name, (b) the two-digit number of the month their mother was born, and (c) the first three letters of their mother's maiden name. If the individuals did not know this information, they were asked to replace their mother's information with that of a child, spouse, or someone else they would remember.

Preintervention/Postintervention Grouped Data

As part of the postquestionnaire, participants were asked if they had participated in the prior preintervention questionnaire. This was done in order to identify all individuals who took part in the preintervention and postintervention questionnaires including both those whose information could and could not be matched using the self-created code. By doing so, grouped data analysis of the home care aide responses could be conducted. For the postintervention survey, home care aides working for Employer A were included in the grouped data analysis if the self-created ID codes matched the preintervention survey code or if they responded yes to the question asking if they participated in the previous training conducted where the preintervention questionnaire was distributed. The postintervention survey of home care aides working for Employer B were included in the grouped data if the self-created ID codes matched between the preintervention and postintervention survey or if the home care aides responded yes, they had worked for their current employer for longer than the one year, the time of the previous survey.

Blood and Body Fluid Exposure

Instances of blood and body fluid exposure were defined as an affirmative response to either of the following two series of questions. The first series of questions asked if the home care aides ever had a sharps or needlestick injury

involving a device or object which had been used previously. A follow-up question was then asked about the number of times an injury occurred in the past year. The second series of questions asked home care aides if they had ever come in contact with a clients' open wound, genital secretions, or body fluids containing visible blood via their mucous membranes, or skin with an open wound; and, if so, when this exposure had occurred. Respondents were then asked a follow-up question to ascertain how many times this contact had occurred.

Sharps Container Usage

In order to determine the need for sharps containers among the home care aide population, the preintervention questionnaire asked first, if every home that needed a sharps container had one or secondly, did they ever dispose of sharps for their client. During the postintervention questionnaire, home care aides were asked if they cared for a client who used needles or other sharps in the past year. If the aides responded saying "yes" to these questions then they were classified as having clients needing sharps containers. The home care aides in both the preintervention and postintervention questionnaires were then asked what types of sharps containers were used. If they reported that their clients used professional sharps containers or heavy duty plastic bottles to dispose of their sharps, they were coded as using a valid sharps container. Home care aides were asked if they had ever spoken with their clients about safe disposal was asked, as part of the postintervention survey.

Demographic Information

Gender, race/ethnicity, and highest level of education completed were collected in the form of categorical data in both the preintervention and postintervention questionnaires. Information on the age, number of years worked in home care, number of years worked with their current employer, and number of clients seen per day and week was collected as a continuous variable. Additional information was collected about whether or not the home care aides held certifications as a Certified or Geriatric Nursing Assistant or any other form of certification.

Work Environment

In order to gain a better understanding of the characteristics of the work environment, home care aides were asked if they cared for family members, friends, or both; and if they worked in urban, suburban, or rural locations. Information on number of years worked in home care, number of years worked with their current employer, number of clients seen per day and week, how many hours per week they spent on work for which they were

not paid, and number of hours per week they spent working at another job was collected as continuous information. Home care aides were also asked if they made themselves available to their clients during time off as a yes/no question, and, what is the longest they have cared for their current clients as an ordinal question with times ranging from less than a month to more than five years.

Statistical Methods

Statistical analysis was conducted using SPSS for Windows (SPSS, Inc., Chicago, IL, USA). For Employer A and Employer B, where the prequestionnaire and postquestionnaire data can be matched using the self-created ID, McNemar testing and generalized linear modeling (generalized estimating equation; GEE) was used in order to evaluate the effectiveness of the intervention. McNemar testing was used to compare prequestionnaire versus postquestionnaire data within each employer group. GEE modeling was then used to compare the questionnaire data between each of the two employer groups over time. To compare all of the prequestionnaire and postquestionnaire data, including information which could not be matched between using the self-created ID, grouped analysis examining odds ratios (ORs) for both Employer A and Employer B was conducted in order to show trends in the interventions effectiveness.

RESULTS

At baseline, the intervention group had a questionnaire completion rate of 70% ($n = 707$) for the English speakers and 79% ($n = 130$) for the Russian speakers and follow-up postintervention survey completion rates of 731 (72%) for the English speakers and 173 (94%) for the Russian speakers (Amuwo, Sokas, & Lipscomb, 2011; Amuwo, Sokas, Nickels et al., 2011). Among the comparison population at baseline, the completion rate was 88% or 134 home care aides; and at follow-up, the completion rate was 125 (87%; Amuwo, Sokas, & Lipscomb, 2011; Amuwo, Sokas, Nickels et al., 2011). Of the 1,030 home care aides who completed the postintervention survey, 693 (67%) could be matched with the preintervention survey and are therefore part of this analysis. For the intervention group, there were 451 valid postintervention responses for English speakers and 128 for Russian speakers; for the comparison group, there were 114 valid responses (Table 1). In the intervention group, 132 (29.3%) of the English speakers and 15 (11.7%) of the Russian speakers that were valid could be directly matched between the preintervention and postintervention questionnaires using the self-created ID code; in the control group 20 (17.5%) could be matched (Table 2). Thirty-seven (6.4%) of the home care aides working for the intervention employer and (10.5%) of the aides from the comparison group reported blood and body fluid exposure either via sharps or nonsharps

TABLE 1 Demographics on the Preintervention and Postintervention Matched Home Care Aide Population

	Intervention group English speaking	Intervention group Russian speaking	Control group	Total
Valid total population	451 (65.1%)	128 (18.5%)	114 (16.5%)	693
Gender				
Male	30	27	2	59
Female	406	99	99	604

Race

	American Indian/ Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Black or African American	White	Two or more races	Other (Specify)	Total
Intervention group	3	2	1	391	142	5	7	551
Control group	2	0	0	96	0	0	1	99

Hispanic

	Yes	No	Total
Intervention group	16	473	489
Control group	0	78	78

Education

	8th grade or less	Some high school	High school diploma	Some college	Associate's degree	Bachelor's degree	More than a bachelor's	Total
Intervention group	8	107	145	117	61	65	19	552
Control group	1	22	51	25	1	0	0	100

	Intervention group	Control group	Total
Number of clients (Mean and 95% CI)	2.73 [2.5, 3.0]	3.03 [2.8, 3.3]	2.8
Years in home care (Mean and 95% CI)	7.91 [7.3, 8.5]	8.18 [6.9, 9.5]	8.0
Years with current employer (Mean and 95% CI)	6.28 [5.7, 6.8]	7.46 [5.4, 9.5]	6.4

Note. CI = confidence interval.

TABLE 2 Sharps Container and Blood and Body Fluid Exposure Statistics Preintervention and Postintervention

Home Care Aides Matched by Self-Created ID

Preintervention				Postintervention			
Home care aides reporting case of blood and body fluid exposure							
	BBFE	No BBFE	Total		BBFE	No BBFE	Total
Intervention group	8 (5.5%)	138 (94.5%)	146	Intervention group	15 (10.3%)	131 (89.7%)	146
Control group	2 (10%)	18 (90%)	20	Control group	1 (5%)	19 (95%)	20
Total	10	156	166	Total	16	150	166
Number of home care aides with clients in need of sharps containers							
	Yes	No	Total		Yes	No	Total
Intervention group	64 (43.8%)	82 (56.2%)	146	Intervention group	73 (50%)	73 (50%)	146
Control group	5 (25%)	15 (75%)	20	Control group	10 (50%)	10 (50%)	20
Total	69	97	166	Total	83	83	166
Number of home care aides using proper sharps containers among those who need them							
	Yes	No	Total		Yes	No	Total
Intervention group	22 (34.4%)	42 (65.6%)	64	Intervention group	36 (49.3%)	37 (50.7%)	73
Control group	2 (40%)	3 (60%)	5	Control group	4 (40%)	6 (60%)	10
Total	24	45	69	Total	40	43	83

Grouped Home Care Aides

Preintervention				Postintervention			
Home care aides reporting case of blood and body fluid exposure							
	BBFE	No BBFE	Total		BBFE	No BBFE	Total
Intervention group	52 (6.2%)	785 (93.8%)	837	Intervention group	38 (6.6%)	541 (93.4%)	579
Control group	10 (7.5%)	124 (92.5%)	134	Control group	11 (9.6%)	103 (90.4%)	114
Total	62	909	971	Total	49	644	693
Number of home care aides with clients in need of sharps containers							
	Yes	No	Total		Yes	No	Total
Intervention group	365 (43.6%)	472 (56.4%)	837	Intervention group	292 (50.4%)	287 (49.6%)	579
Control group	55 (41%)	79 (59%)	134	Control group	78 (68.4%)	36 (31.6%)	114
Total	420	551	971	Total	370	323	693

(*Continued*)

TABLE 2 (Continued)

Number of home care aides using proper sharps containers among those who need them							
	Yes	No	Total		Yes	No	Total
Intervention group	117 (32.1%)	248 (67.9%)	365	Intervention group	116 (39.7%)	176 (60.3%)	292
Control group	22 (40%)	33 (60%)	55	Control group	27 (34.6%)	51 (65.4%)	78
Total	139	281	420	Total	143	227	370

Note. BBPE = blood and body fluid exposure.

contact in the self-completed baseline questionnaire (Table 2). Among Employer A, 26 workers reported sharps contact and 15 reported nonsharps contact; aides working with Employer B, reported 9 sharps contacts and 4 nonsharps contacts (Table 2).

At baseline, 365 (43.6%) of the home care aides in the intervention group reported having a client in need of a sharps container and 117 (32.1%) reported that their clients used valid sharps containers, such as a professional sharps container or heavy duty plastic bottle (such as a bleach bottle). At follow-up, 292 (50.4%) of the home care aides in the intervention group reported having a client in need of a sharps container while 39.7% (intervention) reported that their clients used valid sharps containers, a professional sharps container, or heavy duty plastic bottle. At baseline, 55 (41.0%) of the aides in the comparison group reported having a client in need of a sharps container while at follow-up, this number had grown to 78 (68.4%). At baseline, 22 (40.0%) of the home care aides in the control group reported that their clients used valid sharps containers, and 34.6% reported this at follow-up (Table 2).

Matched by Self-Created ID Code

Self-created IDs were successfully matched for 147 intervention home care aides and 20 comparison home care aides. The change in the number of blood and body fluid exposures reported between the preintervention and postintervention questionnaires were not significant for either the intervention group ($p = .143$) or for the control group ($p = 1$; Table 3). However, the change in the reported use of proper sharps containers by clients was significantly different for the intervention group ($p = .03$) between the preintervention and postintervention questionnaires, but not in the comparison group ($p = .63$; Table 3). When preintervention and postintervention questionnaire results were compared between the intervention and the comparison group utilizing GEE modeling, the difference was only significant for the reported usage of proper sharps containers ($p = 0.04$; Table 3).

TABLE 3 Matched Self-Created Data Analysis

Intervention group				Control group			
Home care aides reporting blood and body fluid exposure							
	Postintervention				Postintervention		
Preintervention		Yes	No	Preintervention		Yes	No
	Yes	3	5		Yes	0	2
	No	12	126		No	1	37
Changed from no preintervention to yes postintervention			8.2%	Changed from no preintervention to yes postintervention			2.5%
Changed from yes preintervention to no postintervention			3.4%	Changed from yes preintervention to no postintervention			5.0%
OR = 2.4 95% CI [.85, 6.8]				OR = .5 95% CI [.18, 22.1]			
McNemar test $p = .143$				McNemar test $p = 1$			
Intervention group				Control group			
Proper sharps container usage among clients							
	Postintervention				Postintervention		
Preintervention		Yes	No	Preintervention		Yes	No
	Yes	10	12		Yes	1	1
	No	26	21		No	3	5
Changed from no preintervention to yes postintervention			37.7%	Changed from no preintervention to yes postintervention			30.0%
Changed from yes preintervention to no postintervention			17.4%	Changed from yes preintervention to no postintervention			10.0%
OR = 2.2 95% CI [1.1, 4.3]				OR = 3 95% CI [.01, 4.2]			
McNemar test $p = .033$				McNemar test $p = .625$			

GEE	Beta	(95% Wald CI)	*p* value
Blood and body fluid exposure	.068	[−1.1, 1.3]	.913
Proper sharps container usage	.613	[.26, 1.2]	.041

Note. CI = confidence interval; OR = odds ratio; GEE = generalized estimating equation (generalized linear modeling).

Grouped Results

An analysis of all valid home care aides preintervention and postintervention questionnaire responses, regardless of whether they could be matched, yield a larger sample of intervention home care aides (837 pre and 579 post) and comparison home care aides (134 pre and 114 post; Amuwo, Sokas, & Lipscomb 2011). Preintervention results show that the odds ratio for exposure versus no exposure among the home care aides in the intervention group compared to the comparison groups was 0.82., with 6.2% of those in

TABLE 4 Grouped Analysis Results From Employer A Versus Employer B

	Odds ratio	95% CI	99% CI
Preintervention BBFE	0.82	[0.41, 1.66]	[0.33, 2.07]
Postintervention BBFE	0.66	[0.33, 1.33]	[0.26, 1.66]
Preintervention proper sharps container usage	0.70	[0.40, 1.26]	[0.33, 1.52]
Preintervention proper sharps container usage	1.24	[0.74, 2.10]	[0.63, 2.47]

Note. CI = confidence interval; BBFE = blood and body fluid exposure.

the intervention group, and 7.5% in comparison group reporting exposure (Tables 2 and 4). For the postintervention odds ratio for blood and body fluid exposure, the OR was 0.66, with 6.5% of the intervention home care aides and 9.6% in control home care aides reporting exposure (Tables 2 and 4). In examining reported proper sharps container usage among clients, the preintervention results show that the OR for using a proper sharps container among the home care aides who had clients in need of one in the intervention group as compared to control group was 0.70 (Table 4). Preintervention results show 31.9% of the intervention home care aides and 44.0% of the control home care aides reported their clients used proper sharps containers (Table 2). The postintervention OR for proper sharps container usage was 1.24, with 39.7% of the intervention home care aides and 34.6% of the control home care aides reporting proper sharps container usage (Table 4).

DISCUSSION

Home care presents well-documented work-related hazards in the context of worksite isolation and the need to maintain the autonomy of clients in their homes. As such, it presents significant challenges to providing meaningful safety and health interventions. Gershon et al. (2012) have developed a hazard screening checklist that can be implemented by home care workers. This project sought to engage the workers, with the support of their union and management, to develop and implement communication tools to facilitate preventive action among their clients and to promote communication with supervisors following an incident. Because of sample size, only the effort to increase client use of appropriate sharps containers was evaluated.

The matched analysis shows that the intervention was effective in increasing the reported usage of proper containers among home care aides' clients (31.9% pre to 52.2% post; $p = .033$; Tables 2 and 4). The GEE model showed similar results.

The matched analysis did not show any statistically significant difference in the reporting for blood and body fluid exposure between the preintervention and postintervention questionnaires. This may be due in large part to the small number of cases reported in the matched population.

As a result of this sample size limitation, unmatched group data preintervention and postintervention were used to explore the odds ratios to see if there were any trends in the reporting of blood and body fluid exposure and the usage of proper sharps containers.

The grouped analysis found that the OR for blood and body fluid exposure at baseline between the intervention and control groups was 0.82, decreasing to 0.66 postintervention (Table 4). This suggests a reported decrease in the number of blood and body fluid exposures among the intervention group. Similarly, the baseline OR of 0.70 was found in the grouped analysis comparing reported client use of proper sharps containers between intervention and control groups increased to 1.24 following intervention, again suggesting impact (Table 4).

Strengths of the study included the high response rates and sufficient time to administer the questionnaire, to read it aloud to the group, and to assist individuals with specific questions. The willingness of two employers to participate was extremely helpful to reach this largely isolated and difficult-to-reach population. The participatory nature of the project itself demonstrated the willingness and ability of the workers to engage both in learning and in teaching their clients.

Limitations include the fact that we were only able to match 24% of participants' (166 of 693) preintervention and postintervention questionnaires. Although instructions for the creation of the ID code were given verbally and in writing, many aides had difficulty correctly creating the code. Our ability to replicate our findings from the matched analysis with a larger sample of grouped data, should address concerns related to this limitation. Additionally, the study lacks representativeness from nonunionized home care employers and independent contractors.

CONCLUSIONS

The results from the home care aides suggest that a participatory intervention had a statistically significant impact on the use of proper sharps containers among the clients of home care aides. This finding has important implications because sharps injuries are a common source of occupational exposure to blood and body fluids, and part of the intervention implemented in this research focused specifically on addressing this issue. The results of this research show that the health and safety training of home care aides can reduce their risk of injuries from needles and other sharps used in the home by increasing the use of an accepted engineering control, namely the use of approved sharps containers.

REFERENCES

Amuwo, S., Sokas, R., & Lipscomb, J. (2011). Occupational risk factors for blood and body fluid exposure among home care aides. *Home Health Care Services Quarterly*, *30*(2), 96–114.

Amuwo, S., Sokas, R. K., Nickels, L., Zanoni, J., & Lipscomb, J. (2011). Implementation and evaluation of interventions for home care aides on blood and body fluid exposure in large-group settings. *NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy*, *21*(2), 235–250.

Baron, S., McPhaul, K., Phillips, S., Gershon, R., & Lipscomb, J. (2009). Protecting home health care workers: A challenge to pandemic influenza preparedness planning. *American Journal of Public Health*, *99*(Suppl. 2), S301–S307.

Gershon, R. R., Dailey, M., Magda, L. A., Riley, H. E., Conolly, J., & Silver, A. (2012). Safety in the home healthcare sector: Development of a new household safety checklist. *Journal of Patient Safety*, *8*(2), 51–59.

Lipscomb, J., Sokas, R., McPhaul, K., Scharf, B., Barker, P., Trinkoff, A., & Storr, C. (2009). Occupational blood exposure among unlicensed home care workers and home care registered nurses: Are they protected?. *American Journal of Industrial Medicine*, *52*(7), 563–570.

Markkanen, P., Quinn, M., Galligan, C., Chalupka, S., Davis, L., & Laramie, A. (2007). There's no place like home: A qualitative study of the working conditions of home health care providers. *Journal of Occupational and Environmental Medicine*, *49*(3), 327–337.

Quinn, M. M., Laramie, A. K., Sama, S. R., Gore, R. J., Kim, H., Chalupka, S. M., . . . Davis, L. (2009). Sharps injuries and other blood and body fluid exposures among home health care nurses and aides. *American Journal of Public Health*, *99* (Suppl. 3), S710–S717.

Stone, R. (2004). The direct care worker: A key dimension of home care policy. *Home Health Care Management & Practice*, *16*(5), 339–349.

U.S. Bureau of Labor Statistics. (2013). *Home health and personal care aides: Occupational outlook handbook*. Retrieved from http://www.bls.gov/ooh/healthcare/home-health-and-personal-care-aides.htm

Vos, D., Götz, H. M., & Richardus, J. H. (2006). Needlestick injury and accidental exposure to blood: The need for improving the Hepatitis B vaccination grade among health care workers outside the hospital. *American Journal of Infection Control*, *34*(9), 610–612.

Zanoni, J., Kauffman, K., McPhaul, K., Nickels, L., Hayden, M., Glassman, M., . . . Lipscomb J. (2007). Personal care assistants and blood exposure in the home environment: Focus group findings. *Progress in Community Health Partnerships: Research, Education, and Action, 1*(2), 121–122.