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The role of ergonomic and psychosocial workplace factors in the reporting of back injuries among U.S. home health aides

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Abstract

Background—Due to the aging population and a shift to patient home care, Home Health Aides (HHAs) are a fast-growing occupation. Since little is known about workplace risk factors for back injuries among HHAs, we examined the role of ergonomic and psychosocial factors in injury reporting among HHAs.

Methods—We used the 2007 U.S. National Home Health Aide Survey data (weighted n=160,720) to predict the risk of back injuries by use of/need for ergonomic equipment and supervisor support with logistic regression, adjusted for socio-demographic variables.

Results—The annual prevalence of back injuries for U.S. HHAs was 5.2%. Injury risk was increased in HHAs reporting the need of additional ergonomic equipment in patient homes, and marginally associated with low reported supervisor support.

Conclusions—Improvement of workplace ergonomic and psychosocial factors could be targeted as a strategy to decrease work-related injuries in HHAs.

Keywords

Home health aides; injury; occupational health; epidemiology; social support

INTRODUCTION

In the United States, home health aides (HHAs) include a group of paraprofessionals that provide vital medical assistance to ill, elderly, convalescent, or disabled persons who live in their own homes instead of a healthcare facility [NIOSH, 2010]. Their work involves direct health care services, such as changing bandages and dressing wounds, as well as delivering medications [Bureau of Labor Statistics, 2012]. Due to an aging population and a shift in patient care to non-hospital settings, HHAs are one of the fastest-growing health occupations

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Conflict of interest

The authors wish to express that they have no financial or other relationships that might lead to a conflict of interest.

in the U.S. [deVoe, 2008] and predicted to be an increasingly needed workforce globally [WHO, 2008].

The HHAs face a range of unique job hazards, including overexertion, stress, strain and verbal abuse [NIOSH, 2010]. They often work alone with minimal help, and have less access to lifting equipment than nursing aides in hospitals and other institutional settings [Myers et al., 1993]. Likewise, their work environment is the patient's personal home that may subject them to new obstacles, unknown territory and potentially injury [Aronson & Neysmith, 1996; Delp & Muntaner, 2010]. The prevalence of work-related injuries for this occupational group is high, and perhaps not surprisingly, particularly high for back injuries [Bureau of Labor Statistics, 2000]. The back injury rate is more than twice as high for HHAs compared to private industry, and significantly higher in HHAs compared to hospital nursing aides [Myers et al., 1993], and the general population [Ono et al., 1995].

Previous studies have provided some evidence concerning risk factors for self-reported musculoskeletal disorders (MSDs) among home care workers, which have been found to involve hazards in the clients' homes, injuries occurring when moving clients, and stress [Zeytino lu, 2001]. However, risk factors for back injuries in HHAs have rarely been investigated, such as the availability and use of ergonomic equipment to assist with patient handling and lifting. In nursing staff, patient handling has long been considered one of the main risk factors for musculoskeletal injuries [Ono et al., 1995; Harber et al., 1988; Videman et al., 1989], but recent studies have demonstrated the need to go beyond physical workload and also consider the importance of psychosocial factors for musculoskeletal injuries and occupational health [Quinlan & Bohle, 2008; Pompeii et al., 2009]. Job demands reported by HHAs include ill and dying clients [Davidhizar, 1999], workload and time pressure [Jarrell, 1997], uncooperative and aggressive patients [Bureau of Labor Statistics, 2008], as well as lack of occupational health and safety training and poor implication of such policies [Bohle et al., 2009]. HHAs may also have to deal with potential stressors that healthcare workers in other settings may not have to deal with, such as generally working alone, dealing with family members within the home, no direct supervision, and traveling long distances through potentially unsafe neighborhoods [NIOSH, 2010; Quinlan & Bohle, 2008]. Despite the need for integrating psychosocial risk factors in studies of occupational health and safety among HHAs, few studies have addressed this research gap. For example, McCaughey et al. (2012) showed that poor supervisor support was related to a higher number of general workplace injury among HHAs, but did not examine back injuries separately.

The aim of the current study was, therefore, to investigate the association between ergonomic and psychosocial workplace factors with reported back injuries among a nationally representative sample of HHAs. We hypothesized that both physical work conditions, such as availability of ergonomic devices, and psychosocial work conditions, such as supervisor support, would be associated with the reporting of back injuries.

MATERIAL AND METHODS

We used the 2007 U.S. National Home Health Aide Survey, representing over 160,700 home health aides, to examine relationships between back injuries and (a) psychosocial and (b) ergonomic workplace factors using sample weighted multivariable logistic regression.

Data Source and Sample

The 2007 National Home Health Aide Survey (NHHAS) conducted by the National Center for Health Statistics is the first nationally representative sample of U.S. home health aides and includes information on job characteristics, family life, client relations, organizational

commitment and job satisfaction, workplace environment, work-related injuries, and demographics. HHAs employed by agencies that provided home health and/or hospice care were identified and selected through a complex, multistage sampling probability design. A total of 3,377 HHAs working in agencies providing home health and/or hospice care completed a computer-assisted telephone interviewing system. The unweighted response rate among persons in the sample was 79% (3,377/4,279) (for a detailed description of the survey and data collection see Bercovitz et al. [2010]).

Survey Measures

Back injury was operationalized with the question “Since you started your job with { AGENCY }, have you had any/During the last 12 months that you have been working for { AGENCY }, have you had any back injuries including pulled back muscles?” Respondents answering in the affirmative were classified as injured.

Self-reported quality of supervisor support was measured with four items about the supervisor giving clear instructions, listening to the HHA, supporting career progress, and telling the HHA if she/he did a good job (e.g., “My supervisor tells me when I am doing a good job”). The answers were given on a 4-point scale ranging from “strongly disagree” to “strongly agree” and were summed to a score ranging from 4–16 points. This score was dichotomized in “low support” (4–8 points) and “high support” (9–16 points). The items showed an acceptable internal consistency reliability with an estimate of cronbach’s alpha of =0.73.

Ergonomic workplace factors were operationalized as “Since you started your job at { AGENCY } have you ever used lifting devices when moving patients?” (Yes/No); “How often are lifts present in patients’ homes when needed?” (Never/Sometimes/Always); and “Is other equipment needed to make the job safer that is typically missing in patients’ homes?” (Yes/No).

We used the following self-reported socio-demographic variables as covariates in the multivariable analysis: race (White; Black/Other), educational attainment (12 years or less; >1 year college/trade school); family income (less than \$20,000; \$20,000–\$39,000; \$40,000 or more); and HHA training quality (“How well did your home health aide training prepare you for what it is actually like to work in a home health setting?” – “Well prepared”; “Somewhat prepared”; “Not at all prepared”). Age (years) and gender (male/female) were analyzed in the univariate analysis only.

Statistical Analysis

The frequency of back injuries, the use and need of ergonomic equipment, level of supervisor support, and demographic characteristics were calculated for the overall sample and by back injury using sample weights for the overall population of U.S. HHAs provided by the National Center for Health Statistics [Bercovitz et al., 2010]. Multivariable weighted logistic regression analysis was used to predict back injury risk by ergonomic and psychosocial workplace factors, controlling for education, income, race, and HHA training. Since age and gender did not affect injury risk significantly and due to the low count in some cells that could result in unstable parameter estimates, these variables were dropped from the final logistic regression model. Given the complex sample survey design of the NHHAS, survey weighted analyses were performed with the SPSS 19 (IBM Co, Chicago, IL) Complex Sample module to take into account sample weights and design effects. The protocol was approved by the institutional review board of the Harvard School of Public Health.

RESULTS

An estimated 8,213 (5.2%) of all U.S. HHAs reported at least one back injury in the prior 12 months from the day of survey administration. The distribution of sample characteristics and back injuries is shown in Table I. Among demographic characteristics, a slightly but not significantly higher prevalence of back injuries was reported for male HHAs, white race, HHAs aged 45–54 years, higher education, and lower income. HHAs reporting low supervisor support, the need of other equipment to increase job safety, and those who ever used lifting devices showed a slightly but not significantly increased proportion of back injuries. Overall, 51.9% of all HHAs reported not always having lifts present when needed and 14.3% reported needing other equipment to make their job safer (see Table I).

Results of the adjusted weighted logistic regression analysis (see Table II) showed that in terms of ergonomic factors, injury risk was increased in HHAs reporting the need for additional ergonomic equipment (Odds Ratio (OR) = 4.64; 95% Confidence Interval (CI) = 1.6–14.0; $p=0.006$), whilst low supervisor support as a psychosocial workplace factor only marginally increased injury risk (OR: 3.85; 95% CI = 0.8–18.3; $p=0.091$). As compared to the unadjusted estimates, the adjusted ORs were increased for both supervisor support and the need for additional ergonomic equipment while controlling for all other independent variables and the covariates race, education, income, and training. No additional effects were found for other ergonomic factors or demographic variables.

DISCUSSION

The findings of this study suggest that lack of ergonomic equipment and low supervisor support may be risk factors for back injuries among HHAs. The association between supervisor support as a psychosocial workplace factor and back injuries was found both in the univariate and in the adjusted analyses, while controlling for ergonomic risk factors. Prior studies support this finding indicating that home health aides with lower supervisor support are more likely to report workplace injury [McCaughey et al., 2012]. While these results were in line with the research hypotheses, other findings were unexpected, i.e., that ever having used a lifting device and the frequency of lifts being present in patient homes were not associated with back injuries in this sample. It may be possible that HHAs with existing back injuries may be more eager to use lifting devices than HHAs without injuries. HHAs in general often use forceful exertions and awkward postures during patient-care tasks, especially while lifting and moving patients in the patients' home [McCaughey et al., 2012]. Ergonomics solutions that adjust work tasks to best accommodate their natural capabilities could be a promising approach for preventing injuries, and for enhancing their own comfort and safety as well as of their patients, especially since a high number of participants reported to not always have lifts present when needed.

While low supervisor support was marginally associated with an increased injury risk, the reported level of support was very high in the population under study, leading to small cell sizes for injured HHAs with low support, and, thus, large confidence intervals. Additionally, the reported high level of support suggests the sampling of the HHAs in each agency might not have been too random, so that a selection bias towards HHAs who had a rather positive relation to their supervisors seems possible. Thus, cognitive dissonance or social desirability might have played a role in the reporting, leading to a potential overestimation of support and an underreporting of injuries compared to the overall population workforce of HHAs.

Other limitations of this study include the self-reported nature of the data, the cross-sectional design, and the less than optimal distribution of the predictor variables. Thus, the findings do not imply temporal association between objective workplace characteristics and injuries.

Additionally, potential confounders of the relation between ergonomic and psychosocial factors and back injuries could not be examined due to lack of information in the sample (e.g., actual workload, the frequency of lifting/handling patients, posture while lifting). Another limitation of the survey was that underreporting of injuries by the HHAs might have occurred [Jones & Arana, 1996; Bohle et al., 2009], but no estimates of underreporting were available. However, this should not have affected the structural associations between working conditions and back injuries reported here.

Nonetheless, the use of the first and only nationally representative sample of U.S. Home Health Aides allowed for the calculation of population estimates, leading to a high external generalizability of the study findings to the U.S. HHA workforce.

The home is the setting of choice for most Americans needing long-term care, but the future of home care depends on a healthy, sustainable workforce [Stone, 2004]. HHAs do not only have a higher rate of work-related injuries compared to other occupational groups and the general population, their injuries do also result in greater lost time from work and accompanying costs [Meyer & Muntaner, 1999; Ono et al., 1995]. Increased knowledge about factors associated with work-related injuries is therefore crucial to inform interventions aiming to reduce and prevent work-related injuries in this occupational group.

The results from the current study provide novel information about unique associations and potential risk factors for back injuries in HHAs. Although future studies are needed to test directionality of the associations, the results still indicate that workplace ergonomic and psychosocial factors could be targeted as a strategy to decrease work-related injuries in HHAs.

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Prevalence of back injury by socio-demographic, ergonomic and organizational characteristics among participants of the 2007 U.S. National Home Health Aide Survey.

Table 1

Variable	Total			No Back Injury			Back Injury		
	n	%		n	%		n	%	
Total	160,720	100		150,300	94.8		8,213	5.2	
Gender									
Female	152,725	95.0		142,897	94.9		7,621	5.1	
Male	7,995	5.0		7,403	92.6		592	7.4	
Age									
<25 years	8,126	5.1		7,887	97.5		205	2.5	
25–34 years	27,504	17.1		25,242	93.2		1,845	6.8	
35–44 years	34,350	21.4		32,445	95.9		1,373	4.1	
45–54 years	45,846	28.5		41,509	93.0		3,138	7.0	
55 years	44,894	27.9		43,217	96.3		1,652	3.7	
Race									
White	85,657	53.3		79,197	93.1		5,902	6.9	
Black/Other	75,063	46.7		71,103	96.9		2,311	3.1	
Income									
<20,000 \$	34,543	22.7		32,770	94.9		1,773	5.1	
20–39,000 \$	73,680	48.4		69,075	93.8		4,605	6.3	
40,000 \$	44,071	28.9		42,398	96.3		1,644	3.7	
Education									
12 years	94,925	59.9		90,561	95.4		4,335	4.6	
1 year college/trade school	63,566	40.1		59,689	93.9		3,877	6.1	
Supervisor Support									

Variable	Total			No Back Injury			Back Injury		
	n	%		n	%		n	%	
High	148,026	95.5		139,060	94.9		7,459	5.1	
Low	6,930	4.5		6,224	89.8		706	10.2	
Ever used lifting devices									
No	46,526	29.3		44,953	96.7		1,544	3.3	
Yes	112,013	70.7		105,344	94.0		6,669	6.0	
Lifts present when needed									
Never	13,694	9.0		13,371	97.6		323	2.4	
Sometimes	65,056	42.9		61,726	94.9		3,330	5.1	
Always	72,861	48.1		68,688	94.3		4,144	5.7	
Other equipment needed									
No	135,412	85.7		129,839	95.9		5,544	4.1	
Yes	22,670	14.3		20,001	88.2		2,669	11.8	
HHA Training									
Well prepared	110,821	82.2		103,734	95.1		5,293	4.9	
Somewhat prepared	21,560	16.0		19,814	92.2		1,679	7.8	
Not prepared	2,437	1.8		2,321	95.2		116	4.8	

Table II

Crude and adjusted weighted logistic regression model predicting back injuries among U.S. Home Health Aides by supervisor support and ergonomic workplace factors.

Parameter	Parameter Estimate [†]	Standard Error [†]	uOR [95% CI]	aOR [95% CI]
Supervisor Support				
High	Reference			
Low	1.35	0.80	2.12 [0.60–7.43]	3.85 [0.81–18.34] *
Ever used lifting devices				
No	Reference			
Yes	0.60	0.97	1.84 [0.67–5.06]	1.82 [0.27–12.31]
Lifts present when needed				
Never	Reference			
Sometimes	1.14	0.97	2.50 [0.88–7.10]	3.14 [0.47–21.13]
Always	0.72	0.81	2.23 [0.78–6.42]	2.06 [0.42–10.17]
Other equipment needed				
No	Reference			
Yes	1.54	0.56	3.13 [1.23–7.93]	4.64 [1.55–13.95] **
Race				
White	Reference			
Black/Other	–0.53	0.49		0.59 [0.23–1.55]
Income	0.03	0.27		1.03 [0.61–1.76]
Education	–0.07	0.46		0.94 [0.38–2.31]
Home Health Aide	0.15	0.34		
Training				1.16 [0.60–2.27]

[†] Parameter estimates and standard errors calculated for the adjusted logistic regression model, controlling for other main effects (e.g., supervisor support, ever used lifting devices, lifts present when needed and other equipment needed) as well as for race, income, education, and Home Health Aide training;

**
p<0.05;

*
p<0.10;

uOR=unadjusted Odds Ratio; aOR=adjusted Odds Ratio; 95% CI=95% Confidence Interval.