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## Occupational factors related to slips, trips and falls among home healthcare workers

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### ABSTRACT

**Objectives:** Slip, trip and fall (STFs) injuries are a significant problem in all industries, yet there are no significant prior reports assessing the relationship between occupational factors and STFs among home healthcare workers (HHCWs) who represent an ever increasing number of workers in the healthcare sector. The unpredictable nature of the work environment specific to HHCWs may lead to an increase in injuries from STFs. The purpose of this study was to quantify associations between occupational factors and STFs among HHCWs.

**Methods:** This cross-sectional study of 870 HHCWs assessed relationships between 12-month period prevalence of falls and occupational factors. Crude and adjusted odds ratios (OR) and 95% confidence intervals were calculated.

**Results:** Nearly 18% (N = 152) of HHCWs reported at least one fall in 12 months. Nurses were significantly more likely to have had a fall (OR = 3.33). Years worked in HHC, and near miss accidents were also related to falls. Patient care factors related to falls included feeling rushed or hurried, increasing number of patients, patient's weight bearing status, combative patients, and issues of patient's homes (e.g. dangerous animals, problems with access to beds or toilets).

**Conclusions:** Numerous work organizational and patient care factors are associated with increased risk of falls among HHCWs. Many of these are readily modifiable and should be a focus for intervention.

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### 1. Introduction

Home health care (HHC) is one of the fastest-growing segments of the US healthcare sector, comprising approximately 914,000 employees, with a projected growth in excess of 22% between 2014 and 2024 (Bureau of Labor Statistics, 2015a). Home healthcare workers (HHCWs) include nurses, aides, physical therapists, occupational therapists, social workers, managers and office workers who assist patients who are disabled, chronically ill, undergoing prolonged illness/surgical recovery, cognitively impaired and/or older adults who live in their own homes or a residential facility. The unpredictable nature of environmental conditions of these occupations appears to put workers at high risk for work-related injuries or illness.

In 2013, the Bureau of Labor Statistics reported 30,400 total recordable nonfatal occupational injuries among HHCWs, with 11,300 of those resulting in days away from work (Bureau of Labor Statistics, 2015b). Washington State workers' compensation claims data for HHCWs from 1998 to 2007 indicate the average claims proportion for HHCWs was 59.5% higher than for all other industries (Howard and Adams, 2010). In another study, data from a state compensation database indicated that injuries to HHCWs resulted in greater lost time from work and accompanying costs, suggesting greater severity of injury compared to nursing home counterparts (Meyer and Muntaner, 1999). There also appears to be greater cognitive loads on HHCWs resulting in reports of increased depression and reduced well-being among these workers (Bartoldus et al., 1989; Dellve et al., 2003; Denton et al., 2002). Overexertion injuries and the need for improved ergonomics among HHCWs has also been described as being greater than in other, more controlled environments (Galinsky et al., 2001; Howard and Adams, 2010; Markkanen et al., 2007). It is still unclear if HHCWs are also at high risk of STFs.

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STFs are the second most common cause of occupational fatalities in all industries. Falls also account for more than 17% of all disabling occupational injuries. Recently, the Occupational Safety and Health Administration (OSHA) highlighted STFs as the second most common reason for OSHA-recordable injuries with an incidence rate of 9.6 per 10,000 worker-months for nurses employed by inpatient facilities (Bureau of Labor Statistics, 2015b). Comparable incidence data for HHCWs are unavailable. Yet, given the nature of this work that involves performing job duties in often uncontrolled environments, it seems likely that HHCW incidence rates of STFs are at least as high as those among nurses in inpatient facilities.

There are no significant prior reports assessing relationships between occupational factors and falls in HHCWs. The majority of studies related to this topic have focused on patient falls (Roehr, 2011; Withey and Breault, 2013). Of the few prior studies investigating occupational STFs in the healthcare industry as a whole, job title, location, and surface type are previously implicated risk factors (Brogmus et al., 2007; Drebit et al., 2010). Additional data from HHCW focus groups identified hazards of snowy/slippery walkways, clutter, unsafe stairs, inadequate lighting and entering an unknown place, but did not specifically assess STFs (Markkanen et al., 2007). In long-term care facilities, water on the floor and loose electrical cords were contributing factors to falls (Bell et al., 2013). Other factors may be analogous to occupations with some similarities to HHCWs, such as mail delivery, where workers are traveling to multiple destinations under time pressures, and dealing with potentially hostile animals and persons. One study among mail delivery workers in Great Britain found relationships between falls and ascending or descending stairs, time of year, gender and unsafe work practices such as taking shortcuts (Bentley, 1998). With a better understanding of the factors associated with STFs among HHCWs, effective preventive strategies could be developed. Therefore, the objective of this paper is to quantify potential associations between occupational factors and STFs among HHCWs.

## 2. Methods

This study is best described as descriptive/correlational research. The relationships between and among variables collected using a detailed questionnaire were analyzed for trends and associations. The systematic collection of information from a sample of HHCWs was completed and statistical analyses of data relevant to STFs were used to quantitatively describe any relationships between variables of interest.

### 2.1. Study location and population

A cross sectional study of HHCWs to assess disease/injury status of workers and associated psychosocial, non-occupational, and occupational risk factors was conducted. This study was approved by the Institutional Review Boards at the University of Utah (IRB #: 8197), University of Wisconsin-Milwaukee (Protocol #: 01-01-047), Intermountain Health Care (IRB #: 1292) and Aurora Health Care (Protocol #: S-01-123E). Data were collected at 17 different home healthcare agencies located in Utah, Wisconsin, Iowa and Canada (Saskatoon, Saskatchewan). All employees in the participating HHC agencies were encouraged to participate and volunteers were enrolled regardless of age, gender or ethnicity. A total of 883 workers were enrolled: 35 from Iowa, 237 from Wisconsin, 337 from Utah, and 274 from Saskatchewan, Canada. Participation among those who attended enrollment sessions averaged 98.5% and the overall participation rate was approximately 85%. All data were collected by paper questionnaires. A trained research assistant and/or researcher was available to answer questions. There were 13 (1.5%) participants who did not answer the question about

STFs and were excluded from these analyses, leaving a total sample size of 870.

### 2.2. Data collection

Questionnaires included items on demographics, health history, job tasks, non-musculoskeletal disorder hazards (e.g., dog bites, traffic accidents, seat belt use, needle stick/sharps injuries), utilization of patient assistive devices, de-identified patient characteristics, and structural hazards in client's homes.

Occupational factors were divided into work organizational factors and patient care factors (see Table 1). Work organizational factors included job title, years worked as a home healthcare worker, number of near miss auto accidents in the past 12 months, seatbelt use in the past 30 days, time spent in a vehicle each day, average number of miles traveled each day and if needles/sharps were used as part of their job. Patient care factors include how often the home healthcare worker feels threatened by dogs or other animals at patient homes, how often they feel threatened by people at patients' homes, how often they feel rushed or hurried, how many home care visits they had in the past week, how many patients they had in the past week, if they have any partial weight bearing patients, if they have any non-weight bearing patients, if they have any assaultive patients, if they have any combative patients, and if there are issues in homes they visited in the past week including access to bed, height of bed, access to toilet, walking obstacles, hazardous stairways, dangerous dogs/animals, uncooperative family members and potential for violence.

### 2.3. Outcome

STFs data were collected using the questionnaire. Participants answered if they had experienced at least one slip, trip or fall in the past year. One-year prevalence odds ratios (PORs) were calculated by analyzing STFs in the past year in relationship to work organizational and patient care factors. Logistic regression models were constructed to include both recognized and plausible occupational risk factors for STFs.

### 2.4. Confounding factors

Age, gender, body mass index (BMI), number of home visits and job category were considered potentially confounding factors regarding the other occupational factors. Numbers of visits and

**Table 1**

Summary of occupational factors divided into work organizational and patient care categories.

Work organizational factors	Patient care factors
<ul style="list-style-type: none"> <li>• Job Title</li> <li>• Years worked as HHCW</li> <li>• If needles/sharps were used as part of job</li> <li>• Seatbelt use in past 30 days</li> <li>• Time spent in a vehicle each day</li> <li>• Average number of miles traveled each day</li> <li>• Number of near miss auto accidents in past 12 months</li> </ul>	<ul style="list-style-type: none"> <li>• Feeling threatened by animals at patient homes</li> <li>• Feeling rushed or hurried</li> <li>• Number of home care visits in the past week</li> <li>• Work with partial weight bearing patients</li> <li>• Work with assaultive patients</li> <li>• Work with combative patients</li> <li>• Issues affecting:               <ul style="list-style-type: none"> <li>– Access to bed</li> <li>– Height of the bed</li> <li>– Access to toilet</li> <li>– Walking obstacles</li> <li>– Hazardous stairways</li> <li>– Dangerous dogs/animals</li> <li>– Uncooperative family members</li> </ul> </li> <li>• Potential for violence</li> </ul>

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