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SOCIAL AND ECONOMIC DIMENSIONS OF AN AGING POPULATION

**Visiting and Office Home Care Workers' Occupational Health:
An Analysis of Workplace Flexibility and Worker Insecurity
Measures Associated with Emotional and Physical Health**

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SEDAP Research Paper No. 234

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**Visiting and Office Home Care Workers' Occupational Health:
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Associated with Emotional and Physical Health**

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Visiting and Office Home Care Workers' Occupational Health: An Analysis of Workplace Flexibility and Worker Insecurity Measures Associated with Emotional and Physical Health

Abstract

The home health care sector in Canada experienced major restructuring in the mid-1990s creating a variety of flexibilities for organizations and insecurities for workers. This paper examines the emotional and physical health consequences of employer flexibilities and worker insecurities on home health care workers. For emotional health the focus is on stress and for physical health the focus is on self-reported musculoskeletal disorders. Data come from our survey of home health care workers in a mid-sized city in Ontario, Canada. Data are analyzed separately for 990 visiting and 300 office workers.

For visiting workers, results showed that none of the 'objective' flexibility/insecurity measures are associated with stress or musculoskeletal disorders controlling for other factors. However, 'subjective' flexibility/insecurity factors, i.e. feelings of job insecurity and labour market insecurity, are significantly and positively associated with stress. When stress is included in the analysis, for visiting workers stress mediates the effects of 'subjective' flexibility/insecurity with musculoskeletal disorders. For office workers, none of the objective flexibility/insecurity factors are associated with stress but subjective flexibility/insecurity factor of feelings of job insecurity is positively and significantly associated with stress. For office home care workers, work on call is negatively and significantly associated with musculoskeletal disorders. Feeling job insecurity is mediated through stress in affecting musculoskeletal disorders. Feeling labour market insecurity is significantly and positively associated with musculoskeletal disorders for office home care workers. Decision-makers in home care field are recommended to pay attention to insecurities felt by workers to reduce occupational health problems of stress and musculoskeletal disorders.

JEL Classification: I11, J28

Keywords: home health care workers, stress, worker insecurity

Résumé

Les soins de santé à domicile au Canada ont subi une restructuration majeure au milieu des années 90. Cette dernière a entraîné plus de flexibilité pour les organismes de santé et d'insécurité pour leurs travailleurs. Cet essai examine les conséquences sur la santé physique et émotionnelle résultant de la flexibilité accrue des employeurs et de l'insécurité ressentie par les travailleurs de soins de santé à domicile. Pour ce qui est de la stabilité émotionnelle, notre attention se portera sur le stress alors que pour la santé physique, notre attention se portera sur les troubles musculosquelettiques. Les données ont été recueillies à partir d'un sondage des travailleurs de soins de santé à domicile dans une ville de taille moyenne de l'Ontario au Canada. Les données ont été analysées séparément pour 990 travailleurs à domicile et 300 employés de bureau.

Parmi les travailleurs de terrain, les résultats démontrent qu'aucunes des mesures de flexibilité et d'insécurité objectives ne sont associées au stress ou aux troubles musculosquelettiques, contrôlant pour les effets liés aux autres facteurs. Cependant, les facteurs de flexibilité et d'insécurité subjectives, c'est-à-dire le sentiment d'insécurité lié au marché du travail, sont positivement et significativement associés au stress.

Parmi les travailleurs de terrain, lorsque le stress est inclus dans l'analyse, ce dernier catalyse les effets de la flexibilité et d'insécurité subjectives avec les troubles musculosquelettiques. Parmi les travailleurs de bureau, aucun des facteurs de flexibilité et d'insécurité objectives n'est associé au stress, en revanche, ce dernier est associé de manière positive et significative au sentiment d'insécurité lié au travail dû à des facteurs de flexibilité et d'insécurité subjectives. Parmi les travailleurs de soins de santé à domicile, les gardes sont associées négativement et de manière significatives aux troubles musculosquelettiques. Le sentiment d'insécurité lié à l'emploi engendre le stress et se traduit par des troubles musculosquelettiques. Le sentiment d'insécurité envers le marché du travail est positivement et significativement associé avec les troubles musculosquelettiques chez les travailleurs de bureau dans le secteur des services de soins de santé à domicile. Dès lors, les décideurs politiques dans le secteur des soins à domicile devraient prêter davantage attention au sentiment d'insécurité ressentie par les travailleurs afin de réduire les problèmes de santé au travail liés au stress et aux troubles musculosquelettiques.

Visiting and Office Home Care Workers' Occupational Health: An Analysis of Workplace Flexibility and Worker Insecurity Measures Associated with Emotional and Physical Health

Work arrangements have changed over the past three decades and labour market flexibilities eroding workers' securities have become common experiences for most workers. These changes have altered employment relations and resulted in widespread organizational downsizing and the growth of flexible and insecure forms of employment. The health care sector, including the home health care sector, has also experienced major restructuring, budgetary restrictions, and downsizing over the past few decades (CHSRF 2000, Wetzel 2005). In the restructured work environments, high levels of stress and physical health problems, including musculoskeletal disorders, have been reported among various members of the workforce, in the health care sector more generally (Koehoorn et al. 2002, Woodward et al. 1999, Shannon et al. 2001), and in home care sector more specifically (Caplan 2005, Denton et al. 2003, 2006, Zeytinoglu et al. 2000).

The purpose of this paper is to examine a variety of workplace flexibility and worker insecurity measures in home care sector and the consequences of these measures on workers' emotional and physical health. For emotional health we focus on workers' symptoms of stress and for physical health the focus is on self-reported musculoskeletal disorders. This paper includes data from 990 visiting and 300 office home care workers employed in the home health care sector in 2002 in a mid-sized city in Ontario. The term 'visiting home care worker' refers to nurses, therapists, and home support workers, and 'office home care worker' refers to managers, supervisors, coordinators, cases managers, and office support staff. Since these workers face different work environments that can affect the type of flexibility strategy used and insecurity

experienced, we analyze them separately. The respondents represent approximately 70% of the local home health care workforce in the study location at the time of the study.

The topic of this paper and its focus is important and timely. First, changes in work environments are taking place at a very fast pace both globally and in home care sector more specifically, and concerns are being raised about the effects of these flexible, insecure jobs on workers' health (see, for example, Cooper et al. 2001, McDonough 2000, Quinlan et al. 2001b, Virtanen et al. 2005, Wetzel 2005). Recent federal level consultations (Dault et al. 2004), policy reports (Koehoorn et al. 2002), national-level roundtable discussions (CHSRF 2006) and policy meetings (Health Council of Canada 2005) are all reporting concerns about unhealthy work environments in health care and the resultant stress of health care workers. Second, not much is known about the occupational health of home health care workers in Canada, although some research on this topic is emerging (see, for example, Aronson et al. 2004 and Denton et al. 2006 and 2007 studies on restructuring in home health care work environment, Denton et al. 2002 study on workers' stress, and Zeytinoglu et al. 2000 and 2002 studies on musculoskeletal disorders). This paper builds on these recent studies by focusing on the same location and similar workers. Third, most research on flexibility/insecurity measures in the workplace focuses on a single type of workplace flexibility or worker insecurity (de Ruyter & Burgess 2003). There are, however, a variety of employer flexibility strategies and resultant worker insecurities (Standing 1997, Zeytinoglu 1999). The complexity of this phenomena has made empirical testing difficult, thus the associations between employer flexibility and worker insecurity measures on workers' health as an outcome have not yet been tested (Burchell 2002). By focusing on a variety of flexibility/ insecurity measures, and examining objective measures and

subjective outcomes, i.e. workers' feelings about those measures, this study contributes knowledge to an important and under-researched area.

The Conceptual Framework of Workplace Flexibility Measures and Feelings of Worker Insecurity

The term employer or workplace flexibility is used frequently in all business circles, although it has a plethora of meanings and contexts (Zeytinoglu 1999). At the workplace level, 'flexibility' refers to numerical, functional, work environment, working time, scheduling and pay flexibility policies implemented in the internal labour markets of organizations. Companies use different forms of interrelated and sometimes overlapping flexibility strategies at the same time. These strategies are primarily demand-driven and in most cases initiated by employers. A common approach to workplace flexibility is 'numerical flexibility,' which provides employers the ability to adjust the number of workers according to changes in the product or service demanded by consumers. Numerical flexibility can be achieved through hiring workers into non-permanent contracts such as fixed-term contracts or casual contracts. 'Working time flexibility' refers to the employer flexibility in assigning hours of work to workers depending on the demand for the service or product. Hiring workers for part-time hours or casual hours, and hiring for the only available, i.e. involuntary, hours are examples of working time flexibility. 'Scheduling flexibility' is achieved by assigning workers on-call schedules where workers are expected to be available and ready to work when called but are not guaranteed a specific schedule or paid for the hours waited on-call. Another example of 'scheduling flexibility' is giving workers split shifts, such as a few hours in the morning and then later in the evening when services are required. Lastly, 'pay flexibility' involves changes in pay structure according to

economic circumstances, or paying per time worked and only when work is available. These workplace flexibilities are listed in Table 1. ‘Functional flexibility’ which allows workers to be reassigned to different tasks across job boundaries according to demand levels is not included in this study since there is no variable in our data to measure that.

Employer flexibility is insecurity for most workers (Standing 1997). On the one side, they are used by employers to achieve flexibility. On the opposite side, they are working conditions experienced by workers as condition of employment. While there are arguments that employer flexibility and worker security, i.e. flexicurity, can be achieved simultaneously (see, European Commission 2006 a&b), others argue that in most cases employer flexibility can only be achieved through worker insecurity (Standing 1997). A recent Flexicurity Conference (ILMP 2006) and report from the *Economist* (2006, 2007) showed that flexicurity is more of an employment strategy that the European Union is aspiring to than a current reality, and the flexicurity works well only if there are sufficient social supports to provide security to workers while expecting them to be flexible.

In terms of worker insecurity we use six of Standing’s (1997) seven forms of insecurities. These include employment insecurity, work insecurity, working time insecurity, income insecurity, job insecurity, and labour market insecurity. The seventh, representation insecurity, is not included in our study due to lack of a variable to measure it in our data. We focus on each type of insecurity measure separately and also create a composite variable of feelings of flexibility/insecurity (see Table 1). ‘Employment insecurity’ refers to the situation where the employer can arbitrarily dismiss or layoff workers, or where regulations on hiring and firing are relaxed, and such actions do not impose costs on employers. ‘Work insecurity’ is where the working environment is unregulated and the ability to continue to work is at risk. ‘Income

insecurity' is when earnings are unstable or when transfer payments are contingency-based and not guaranteed. 'Working time' insecurity refers to the situation when the employer can impose fragmented, shortened or irregular hours without great difficulty or costs. 'Job insecurity' refers to the employer's ability to shift workers from one job to another or alter or reduce the content of the job at will, and when barriers to skill dilution, craft boundaries, job qualifications, restrictive practices, or craft unions are removed. 'Labour market insecurities' are when there are labour surpluses and the probability of securing employment is low with workers readily available wherever jobs arise.

In addition, we bring 'objective' and 'subjective' flexibility dimension to the concept of flexibility/insecurity. We take an approach similar to De Witte and Näswall's (2003) study of 'objective' and 'subjective' job insecurity, and expand the concept. Objective flexibility/insecurity measures are characteristics of employment contracts that can be measured objectively and the measurement results do not vary whether it is the employer or the worker responding to the question. For example whether a worker is employed part-time hours or full-time hours will be the same 'objective' measure whether it is the employer or the worker responding to the question. Objective flexibility/insecurity included in our study are whether the employment contract is permanent, the worker lost their job when the employer lost a business contract, employment hours are full-time, part-time or casual, work only hours are available (i.e. involuntary hours of employment), work on call, work split shifts, paid on a salary, per visit, or on a per hours worked basis (with variable hours in the last situation).

Subjective flexibility/insecurity factor is workers' feelings and perceptions of insecurities resulting from the flexibilities the employer is creating. Although what we feel can be different from reality, feelings or perceptions are important because they affect individual behaviour

(Robbins and Langton 2003) and mental and physical health (Cooper et al. 2001). It is important to note, however, that when exposed to the same objective conditions, perceptions may vary among individuals. For example, two workers may experience same employment condition of casual hours, however, one may consider the casual hours of employment as providing an opportunity to pursue other goals in his/her life, while another worker might consider this as insecurity in their lives. Nevertheless, research shows sufficient reliability to consider perception-based measures to be accurate (Spector *et al.* 2000).

The subjective flexibility/insecurity measures in this study include workers' feelings of job insecurities measured as not being safe from dismissal, feeling that they will likely be laid off, worried about their future in employing organization, feeling uneasy about security in their present job, worried about their job security, concerned about losing their job due to overall changes in the long-term care sector, and due to potential of their employer losing their business contract. The subjective flexibility/insecurity measure in this study also includes workers seeing themselves as easily replaceable. There are no clear definitions and measures of job insecurity (Saloniemi and Virtanen 2006), and as Burchell (2002) discusses most workers refer to wider concerns when they say they are feeling insecurity rather than identifying each insecurity separately. Thus, we use a composite 'feelings of job flexibility/insecurity' measure along with a 'feelings of labour market flexibility/insecurity' measure. Table 1 lists the subjective flexibility/insecurity measures.

The contextual background of workplace flexibility, worker insecurity and their associations with stress and musculoskeletal disorders

In Canada, increasing flexibility in the labour market and job insecurity became apparent in the 1980s and 1990s. Forms of flexible and insecure employment, such as casual jobs, fixed-term contracts, and dependent self-employment, have grown over the past two decades to replace the declining opportunities for permanent full-time employment (Cranford et al. 2003). The majority of the new jobs created in the 1980s and 1990s were on a part-time or temporary basis (Tabi & Langlois 2003, Vosko et al. 2003), and temporary employment accounted for almost one-fifth of overall growth in paid employment between 1997 and 2003 (Galarneau 2005). Estimates of the full Canadian work force suggest that the share, in 2002, of part-time and non-permanent workers was 19% and 13%, respectively (Tabi & Langlois 2003), and an analysis based on the Labour Force Survey shows that in 1999, 11% of the total work force was in RPT jobs, 6% in TFT, and 4% in TPT jobs (Vosko et al. 2003). Using Workplace and Employee Survey, another study reported the large majority of workers, at 83%, are in regular full-time employment, and the proportions for regular part-time, temporary full-time and temporary part-time are about 12%, 2%, and 3%, respectively (Zeytinoglu & Cooke 2005).

Non-permanent employment is characteristic of the home care sector (Koehoorn et al. 2002). Canadian Home Care Human Resources Study (2003) reports that among home support workers responding to their survey 52% work part-time, 11% casual, and only 37% work in full-time jobs. For home care nurses, 41% are in part-time jobs, 21% in casual, and 38% are in full-time jobs. Therapists have lower percentage of non-permanent workers: 37% work part-time, 6% in casual jobs, and 57% have full-time jobs.

In other countries flexible employment contracts and the resultant job insecurity have become common characteristics of the work experiences of many workers (Auer & Cazes 2003, Dickens 2003, Gonäs 2003, de Ruyter and Burgess 2003, Saloniemi & Zeytinoglu 2007).

Although there is a general paucity of literature on the occupational health consequences of flexible, insecure forms of employment (Cooper et al. 2001, Mellie & Paoli 2001), the research that has started to emerge over the past decade suggests that the impact of flexibility and job insecurity on the health of workers is mostly deleterious. For example, the review of the literature by Quinlan, Mayhew & Bohle (2001b) shows casual employment to be associated with deterioration in occupational health and safety in terms of injury rates, and disease risk or hazard exposures, although for part-time workers, the associations are not entirely clear. A follow-up literature review (Virtanen et al. 2005) showed an association between temporary employment and increased psychological morbidity and occupational injuries. Authors suggested that the relationship between temporary employment and increased psychological morbidity may reflect the adverse effect of job insecurity. Mellie and Paoli (2001) have demonstrated that workers in insecure jobs show various physical health problems. Others, studying the retail sector (Zeytinoglu et al. 2004 & 2005) and the service sector broadly (Lewchuk et al. 2003), found strong associations between the precariousness of part-time and casual jobs and feelings of job insecurity to be associated with stress and physical health problems. Figure 1, the model of our study, shows the association between flexibilities/insecurities and stress and physical health that are discussed in the literature.

Research shows that fear of job insecurity creates occupational health problems for workers who have experienced some form of restructuring, downsizing or other forms of loss of jobs at the workplace, including those employed on a full-time basis as well (Quinlan et al 2001b). For example, downsizing and restructuring at a large teaching hospital resulted in mental health problems among health care workers (Woodward et al. 1999) and time off with MSDs (Shannon et al. 2001).

The stress literature suggests that job insecurity is a stress agent (Chirumbolo & Hellgren 2003, Probst 2005) and the anticipation of losing one's job is a more intense source of anxiety than the event itself (Lazarus and Folkman 1984). Psychosocial stress induced by job insecurity has consequences for health and health related-behaviour (Domenighetti et al., 2000), and work-related flexibility created through flexibilized employment produces chronic stress (Scott 2004). Probst's (2005) integrated model of economic stressors shows organizational change along with employment characteristics as factors affecting stress. Job insecurity is studied as one of the economic stressors in Probst's model. In particular, relevant for our study, her review of the literature shows that organizational change in the form of upcoming mergers and acquisition, organizational restructuring, and/or downsizing are all factors associated with workers' job insecurity. Employment contract characteristics of whether the contract is permanent versus temporary, full-time or part-time, are also associated with feelings of job insecurity, and higher perceptions of job insecurity are found to be stressors for workers. As Gallagher (2004) discusses, for contingent workers the insecurity of employment can contribute to their stress and well-being, though for part-time workers, if there is some continuity in employment relationship, there might not be job insecurity and stress association.

MSDs are now one of the common illnesses and becoming a major occupational health problem. In Ontario, MSDs are the number one lost-time claims reported to Workplace Safety and Insurance Board, accounting for 42% of all lost-time claims and 50% of lost-days (IWH 2007). These injuries develop over time and their origin and factors affecting them can be ergonomic as well as psychosocial. A recent analysis of Statistics Canada's 2000/01 Canadian Community Health Survey show that 10 percent of Canadians aged 20 or older report a repetitive strain injury serious enough to limit their usual activities at some point in the previous 12 months

(Tjepkema 2003). About half of all reported injuries were work-related, and injury to the upper body (neck/shoulder and wrist/hand) was more common than to the lower body. Zeytinoglu et al. (2000) study of home care workers found that visiting home care workers report pain in the back, and office workers tend to report pain in the neck and shoulder.

Using this literature as the contextual background for our analysis, we focus on flexibilities/insecurities and their association with stress and musculoskeletal disorders (Figure 1). Based on the literature discussed above, we expect to find objective flexibilities/insecurities to be associated with increased symptoms of stress and musculoskeletal disorders. We also expect that subjective flexibilities/insecurities, that is how workers feel about the employer flexibilities, will be associated with their reporting of symptoms of stress and musculoskeletal disorders. The higher the feelings of insecurity, the higher stress and musculoskeletal disorders will be reported by home health care workers. As suggested by the literature, we would expect stress to mediate the relationship between flexibilities/insecurities and musculoskeletal disorders. There is some indication in the literature that office and visiting home health care workers may experience different work conditions. Thus, we examine these issues separately for each occupational group.

Methodology

This paper is based on data collected in a larger project on the topic of the impact of health care restructuring and other organizational changes on the mental and physical health of homecare workers. The larger project uses a mixed research methodology design combining both qualitative and quantitative methods. The qualitative data collection, analysis and results are

presented in an earlier SEDAP Research Paper (Denton et al. 2003). This paper focuses on the quantitative, i.e. survey, results of the project.

Sample and Data Collection Process. The sample of this study consists of all home care workers (N = 2,355) in 11 home health care organizations in a mid-sized city in Ontario. The sample is exhaustive, in that all organizations from both non-profit and for-profit agencies in the city that received contracts to perform home health care services were included in the study. Data were collected using a self-administered questionnaire mailed out to all workers between January and April 2002. Those who had not returned their questionnaires by a selected date were mailed first a reminder card and later a second letter and copy of the questionnaire. A total of 1,311 home health care workers responded to the survey. Thus, excluding those who cannot be reached, the response rate was 70%. The sample for this paper is 990 visiting staff and 300 office workers. Visiting workers include nurses, therapists and home support workers (visiting homemakers). Office staff includes managers (except CEOs), supervisors, coordinators, other support staff, and case managers.

Instrument and measures. A self-completion questionnaire on health and work life of home care workers was developed for this study based on the literature and key informant interviews and focus groups with home care workers which comprised the qualitative portion of this project. The sections of the questionnaire on health, work life, and background characteristics are used in this paper.

The *dependent variable* is *self-reported musculoskeletal disorders*. A musculoskeletal disorder scale adapted from Kuorinka et al. (1987) is used to measure how often respondents experienced seven musculoskeletal symptoms. A sample question is, 'please indicate how often

you had this in the past few months: pain or discomfort in your neck or shoulder'. The responses are coded on a five point Likert scale from "1=none of the time" to "5=all of the time" and the scale is developed by summing the scores of seven items. Possible musculoskeletal disorders scores range from 7 to 35, with higher scores representing more extensive musculoskeletal disorders. The descriptive statistics of the musculoskeletal disorders scale, including the Cronbach's alpha (α) to determine the reliability of the scale items, are provided in Table 2. The scale indicates high internal reliability.

The *independent variable* is *workplace flexibility and worker insecurity factors*. The workplace flexibility concept refers to numerical, functional, work environment, working time, scheduling and pay flexibility measures initiated by employers. These employer flexibilities create insecurities for most workers. The *objective measures* are numerical flexibility (whether the employment contract is permanent = 1 or not = 0), work environment flexibility (lost job when employer lost contract (Yes = 1, No = 0)), working-time flexibility (work is full-time hours, part-time hours or casual hours (each coded as 1 = Yes, 0 = Otherwise)) and work only available hours (1 = involuntary hours of work, 0 = prefer to work these hours), scheduling flexibility (works on call and works split shifts (referring to work schedules where there are gaps in the day) and coded as '1 = None of the time' to '5 = All of the time'), and lastly, pay flexibility (salaried, i.e. paid the same amount each week, biweekly or monthly, paid per visit, or paid per hour worked and hours vary, with each coded as 1 = yes, 0 = Otherwise). These variables are listed in Table 1, and their descriptive statistics are provided in Table 2.

The measure of job flexibility/insecurity is developed based on the job insecurity scale of Cameron et al. (1994) and items included in our qualitative study. The measure is a summative

variable consisting of seven-items: 'I am presently safe from dismissal at this agency' (reversed in coding), 'I feel I am likely to be laid off at this agency', 'I am worried about my future with this agency', 'I feel uneasy about the security in my present job', 'I am worried about my job security', 'I am concerned about losing my job due to overall changes in the long-term care sector', 'I am concerned about losing my job due to the potential of this agency losing their contract or not being successful with the next contract'. The last item is not applicable to the majority of office workers since they work in the agency that issues contracts and thus, it is excluded from the measure. Responses were coded as 1 = strongly disagree to 5 = strongly agree. Responses are coded as 1 = strongly disagree to 5 = strongly agree. We used exploratory factor analysis (principal components factor analysis) with "varimax" rotation method to identify items composing the scale. There were a few other items from Cameron *et al.* scale (worded positively or negatively) but they are not included since they did not contribute to the scale or, in our view, not related to workers' feelings of insecurities. Items composing the job insecurities scale are summed and Chronbach's alpha is calculated for the scale as a measure of reliability with higher values showing feelings of job insecurity. Descriptive statistics of the scale are included in Table 2.

The feeling of labour market insecurity is the second subjective measure of workers' insecurities and it refers to workers' feelings of being surplus or easily replaceable labour. This is a single item measure worded as 'if I lose my job here I will likely find another job in my profession' (coded on a scale of 1 = strongly disagree to 5 = strongly agree, and reverse coded). Descriptive statistics of the variable are provided in Table 2.

Stress is the *mediating variable* and it is measured using Denton *et al.*'s (2002) symptoms of stress scale. A sample scale item is: 'not able to sleep through the night' coded on a Likert

scale from “1 = none of the time” to “5 = all of the time”. The stress scale is developed by summing the scores of each stress item. Confirmatory factor analysis is conducted on scale items. Table 2 shows the descriptive statistics of the scale along with reliabilities with higher scores suggesting higher levels of stress.

Control variables are from Denton *et al.* (2002) and Zeytinoglu *et al.* (2000) studies on home care workers. These papers refer to a study conducted about six-years prior to our study but workers are from the same area and in similar working conditions. The *physical work environment factors* are job requires physical effort (a single item measured on a 5 point Likert-scale with 1 = strongly disagree to 5 = strongly agree) and hazards in clients’ homes is a scale measured on a 5 point Likert-scale with 1 = strongly disagree to 5 = strongly agree. A sample scale item for hazards in clients’ homes scale is ‘you are exposed to poor physical conditions in clients’ homes (i.e., cleanliness, upkeep, cockroaches). Control variables that are both *physical and psychosocial work environment factors* are heavy workload scale and job is repetitious (measured on a 5 point Likert-scale with 1 = strongly disagree to 5 = strongly agree). A sample scale item for the heavy workload scale is ‘you have too much to do on the job’. The *psychosocial work environment factors* are organizational support and peer support coded on Likert scale (with 1 = strongly disagree to 5 = strongly agree). A sample scale item for the organizational support scale is ‘your organization supports you in times of personal crisis, illness or needing time,’ and a peer support scale sample item is ‘the people you work with are helpful in getting the job done’. *Individual factors* include work injuries in the past year measured by asking respondents if they had any work injuries in the past 12 months (coded as 1 = yes, 0 = no), injured moving clients (coded as 1 = yes, 0 = no), and age (measured by years of age). Descriptive statistics of these control variables with scale reliabilities are provided in Table 2.

Analysis. Descriptive statistics, bivariate regression and hierarchical Ordinary Least Square (OLS) regression are conducted. Flexibility/insecurity measures that are not significant in the bivariate analysis are not included in the multivariate regression analysis. The equal interval assumption is used for Likert scale measurement of the dependent variable. To reduce missing data in the analyses, missing variables were coded to the mean for variables which are on a scale and are coded to the value of “0” for dichotomous variables coded 0 and 1. In most cases, missing values comprised less than 5% of the responses.

In the hierarchical regression, first the control variables are entered (Model 1 in each table), followed by the flexibility or insecurity measures that were found to be significant in the bivariate analysis (Model 2 in each table). In the MSD analysis, stress is included as the mediating variable (Model 3). Testing for mediation effects follows Baron and Kenny’s (1986) mediation test approach and their later interpretation (1998). For full mediation effect we will expect employer flexibility or worker insecurity measures to be significantly associated with stress, and stress to be significantly associated with MSDs with the significance of the flexibility and insecurity measures absent. We provide Adjusted R^2 to show the variance explained by factors included in each model, and provide Change in Adjusted R^2 to show the additional variance explained by including new variables.

We conducted a separate analysis excluding those with diagnosed musculoskeletal disorders. These workers may have received some accommodation for their illness. Workers who were considered to have diagnosed MSDs were those who responded “yes” to questions asking them if they suffered from diagnosed back problems (excluding arthritis), carpal tunnel syndrome, and any other work-related musculoskeletal disorders. The results of this sample were substantially similar to the full sample that included diagnosed visiting home health care

workers except injured moving clients and work injuries variables (where their effect were either not significant or weakly significant). Since these variables were not core factors in our study, we do not report the tables excluding those diagnosed with musculoskeletal disorders. These tables are available from the authors.

Demographic Characteristics of the Respondents. The majority of home health care workers in this study are female (94 percent), which is also a characteristic of the industry. Workers age range from 20 to 72 years and for visiting workers the average age is 44 years, and for office workers the average age is 43 years. Visiting home health care workers in our sample have a large percentage of immigrants which is well above Canadian averages though it is representative of this workforce. Of visiting workers 43% are immigrants, i.e. born outside of Canada, and the rest are born in Canada. In contrast, only 19% of office workers are immigrants, and the vast majority are Canadian-born. Most respondents are married or living with a partner (61% visiting, and 77% of office workers), and the rest are widowed, divorced, separated or never married. A large proportion of the sample had a relatively high level of education. Among visiting workers 20% had post-graduate or bachelors' degree, 57% had college diploma or certificate, and only 19% had some college courses, or high school diploma or lower. For office workers, 44% had post-graduate or bachelors' degree, 43% had some university courses, or college degree or diploma, and the rest (10%) had some college courses, high school diploma or lower. In terms of occupational distribution, of visiting home health care workers 71% are home support workers, 20% are nurses, and 9% are therapists; and among office staff 40% are managers, supervisors, or coordinators, 37% are support staff, and 24% are case managers (who work both in the office and do client visits in the home).

Results

Descriptive Results. Starting with the musculoskeletal disorders (MSDs), there is a moderate level of MSDs among visiting workers ($M = 11.30$, $S.D. = 3.73$) and office workers ($M = 12.97$, $S.D. = 4.50$) (See Table 2). Stress symptoms are common everyday experiences of home health care workers. Taking into consideration that these are working staff, not clinically sick, they report moderately high levels of stress. The most frequently reported symptoms of stress for visiting and office workers were: being exhausted at the end of the day, not feeling energized on the job, and being unable to sleep through the night. The stress scale for visiting and office workers are provided in Table 2.

About a third of visiting (34%) and 17% of office home care workers are in non-permanent contracts. A small percentage of visiting workers report that they previously lost their job when employer lost contract. For office staff the percentage is negligible because there are many in the office staff employed in the organization that renders the contract. In terms of full-time, part-time or casual hours of employment, of the visiting workers surveyed more than half are in part-time and casual jobs (see Table 2). In contrast, a substantial majority of the office workers are full-time, with just a small percentage in part-time and casual hours. Close to a third of visiting and office workers are in involuntary hours, i.e. working only hours available. In terms of working on call or working split shifts, of visiting workers more than one in ten work on call or split shifts; a smaller percentage of office staff work on call or split shifts. Employers seem to have flexibility in pay or conversely workers have little income security in visiting home health care jobs as the percentages in Table 2 indicate. Among office staff, however, a good majority are salaried. The subjective job flexibility/insecurity scale shows that there is

moderately high level of feelings of insecurities among visiting workers ($M = 21.20$, $S.D. = 5.98$) and office workers ($M = 17.88$, $S.D. = 5.76$). Labour market flexibility/insecurity is felt by 9% of visiting workers and 8% of office workers.

Bivariate Regressions. Bivariate regression coefficients presented in Table 3 shows that, except salaried, none of the objective flexibility measures are significantly associated with stress. Similarly, on Table 4, bivariate regression shows that, except permanent contract, none of the objective flexibility measures are associated with musculoskeletal disorders. In both cases the significance is at $p < .05$ level. However, as presented in both tables, workers' feelings of insecurities are significantly and positively associated with stress and musculoskeletal disorders. Both the job insecurities variable and the labour market insecurity variable are significantly and positively associated with stress and musculoskeletal disorders, showing that workers who are feeling these insecurities are also the ones reporting stress and musculoskeletal disorders.

Table 5 and 6 show bivariate regression coefficients for office home care workers. None of the objective flexibility measures are significantly associated with stress but work on call is significantly and negatively associated with musculoskeletal disorders. Job insecurities and labour market insecurity are significantly and positively associated with stress, though the latter is at $p < .05$ level. Similarly, both job insecurities and labour market insecurity are significantly and positively associated with stress, though both are at the weaker significance ($p < .05$) level.

Multivariate regression results. Table 3, Model 1 shows the associations between control variables and stress for visiting home care workers. It shows that job requiring physical effort, heavy workload, work injuries in the past year and injuries incurred while moving clients are

positively and significantly associated with stress for visiting home health care workers. Organizational support and age have negative and significant associations with stress indicating that when there is organizational support and when workers are older, reporting of stress decreases. Other control variables are not significantly associated with stress. Overall, the model with control variables explains 19% of the variance in visiting home health care workers' stress. In Model 2 we include only those employer flexibilities and workers' insecurities variables that were significant at the bivariate level of analysis. Thus, only salaried employment, job insecurities and labour market insecurity variables are included. The objective measure of salaried employment is not significant in this model. Job insecurities and labour market insecurities are both significantly and positively associated with stress though the significance of the labour market insecurity variable is at $p < .05$ level. Magnitudes of standardized coefficients (Beta) of these variables¹ show that heavy workload followed by job insecurity and lack of organizational support are significant contributors to stress. Overall, the model explains 21% of the variance in visiting home health care workers' stress, and the inclusion of subjective insecurities variables contributes 2.6% to the variance.

As for the musculoskeletal disorders Table 4, Model 1 shows the control variables. Injuries in past year, injured moving clients and heavy workload are all positively and significantly associated with musculoskeletal disorders. Magnitudes of standardized coefficients of these variables show that work-related injuries in the past year, followed by injured moving clients and heavy workload are the important factors associated with musculoskeletal disorders. Other control variables have no association with musculoskeletal disorders. The model with control variables explains 16% of the variance in visiting home health care workers' musculoskeletal disorders.

¹ Standardized coefficients are not included in tables due to space limitations. They are available from the authors.

In Model 2 of Table 4, except permanent contract none of the objective employer flexibility variables are included in the model since they were not significant in the bivariate analysis. The permanent contract, however, is not significant when included in the regression with other variables. When subjective variables of job insecurities and labour market insecurity are included in the model, they are positively associated with musculoskeletal disorders showing that those feeling insecure are also the ones reporting musculoskeletal disorders. These associations, however, are only at $p < .05$ level. With the inclusion of subjective insecurities variables, the variance improves 1% and the model explains 17% of the variance in visiting home health care workers' musculoskeletal disorders.

In the full model (Table 4, Model 3) when stress is included, it is significantly and positively associated with musculoskeletal disorders. The magnitude of the standardized coefficient shows that stress is the most important factor associated with self-reported musculoskeletal disorders. The results in Table 3, Model 2 taken together with Table 4, Model 3 show that job insecurities and labour market insecurity are fully mediated through stress in their association with musculoskeletal disorders. Stress also fully mediates the heavy workload in its association with musculoskeletal disorders. Organizational support becomes a positively but weakly associated factor, and age is positively and significantly associated with musculoskeletal disorders. The full model including stress explains 29% of the variance in visiting home health care workers' musculoskeletal disorders with 12% of that attributed to the stress factor.

Table 5, Model 1 shows the associations between control variables and stress for office home care workers. It shows that heavy workload and work injuries in past year are positively and significantly associated with stress. Organizational support and peer support have negative and significant association with stress indicating that when there is organizational and peer

support reporting of stress decreases. Other control variables are not significantly associated with stress. Overall, the model with control variables explains 26% of the variance in office home care workers' stress. In Model 2 we include only those workplace flexibility and worker insecurity variables that were significant at the bivariate level of analysis. Thus, only job insecurities and labour market insecurity variables are included. Job insecurities variable is significantly and positively associated with stress. Magnitudes of standardized coefficients (Beta) of these variables² show that heavy workload followed by lack of organizational support and job insecurity are significant contributors to stress. Overall, the model explains 28% of the variance in office home care workers' stress, and the inclusion of subjective flexibility/insecurity variables contributes 2.4% to the variance.

As for the musculoskeletal disorders analysis for office home care workers, Table 6, Model 1 shows the control variables. Injuries in past year, job is repetitious and job requires physical effort are all positively and significantly associated with musculoskeletal disorders. Other control variables have no association with musculoskeletal disorders. The model with control variables explains 12% of the variance in office home care workers' musculoskeletal disorders.

In Model 2 of Table 6, work on call is negatively and significantly associated with office home care workers musculoskeletal disorders. The subjective variables of job insecurities and labour market insecurity are also included in the model, and only the latter is positively associated with musculoskeletal disorders showing that those feeling labour market insecurity are also the ones reporting musculoskeletal disorders. With the inclusion of work on call variable and subjective insecurities variables the model explains 15% of the variance in office home care workers' musculoskeletal disorders, with these variables adding 3% to the variance.

² Standardized coefficients are not included in tables due to space limitations. They are available from the authors.

In the full model (Table 6, Model 3) when stress is included, it is significantly and positively associated with office workers' musculoskeletal disorders. The magnitude of the standardized coefficient shows that stress is the most important factor associated with self-reported musculoskeletal disorders (not shown in the table but available from the authors). The results in Table 5, Model 2 taken together with Table 6, Model 3 show that job insecurities is fully mediated through stress in its association with musculoskeletal disorders. Stress also fully mediates the heavy workload and organizational support factors in their association with musculoskeletal disorders. The full model including stress explains 29% of the variance in office home health care workers' musculoskeletal disorders with 14% of that attributed to the stress factor.

Discussion and Implications

Based on the literature review, we expected to find a positive association between objective flexibilities/insecurities and stress and musculoskeletal disorders. With the exception of the negative association of working on-call being with musculoskeletal disorders (office workers), we did not find any associations between objective flexibilities/insecurities for either visiting or office home care workers. There are several possible reasons for the lack of associations. One explanation is that employer flexibilities are so common in the home care field that workers have come to expect and/or accept these as “part of the territory” of working in home care. Workers in this field may not expect to have full-time, regular and guaranteed hours. Another explanation is that some workers may actually choose to work part-time or casual jobs to suit their lifestyles. The lack of associations between objective job flexibilities/insecurities could also mean that stress is so widespread in the home care industry, it is experienced by

everyone regardless of the types of jobs they are in. Results of this study show that indeed, stress does not vary based on the types of home care jobs that people are in. Stress and musculoskeletal disorders were not associated with whether the employment contract was permanent or not (numerical flexibility), whether they lost their job when their employer lost their contract (work environment flexibility), whether work is full-time, part-time, casual or involuntary (working-time flexibility) and whether they are salaried, paid per visit, or paid per hour worked and hours varied (pay flexibility). Our stress scale shows moderately high levels of stress for visiting and office home care workers and it appears that full-time home care workers are just as stressed as casual or part-time workers.

We can conclude from these findings that it is not really the type of job, i.e. whether the job is full-time, part-time or casual (objective flexibilities) that is an important determinant of health, but rather it is how the workers *feel* about the job that affects their health. This study found that workers in the same type of job differed in their perceptions of their working conditions. While some may not be concerned with losing their jobs, others are very concerned with their job security. This finding is important for understanding why workers in similar working conditions report different outcomes in terms of stress and physical health. Our findings confirm that it is how the workers feel about the employers' flexibilities that are associated with stress and musculoskeletal disorders. In our study, both visiting and office workers are afraid of losing their jobs and it is the fear of losing their jobs due to home care restructuring that is causing stress, which is associated with musculoskeletal disorders. The fear that they could easily be replaced by other workers in the field (labour market flexibility/insecurity) was also associated with increased musculoskeletal disorders for office workers and associated through stress for visiting home care workers. This is consistent with the

literature shows that subjective flexibilities/insecurities are associated with occupational health problems.

Job Insecurities and Home Care Restructuring

Research shows that this restructuring of the home care system has led to an increased casualization of work (i.e. more part-time and temporary jobs), increased job insecurity, decreases in pay and benefits, and an increases in stress and physical health problems including musculoskeletal disorders (Denton et al. 2006; Zeytinoglu et al. 2000; Human Resources Development Canada 2003; Aronson et al. 2004; Aronson 2006; Caplan 2005; OHSCO 2007). This study shows that for both visiting and office home care workers, the feeling that one's job is not secure is associated with increased stress and musculoskeletal disorders (mediated through stress). In order to prevent these conditions policy makers must address the issue of job security in the home care field. Home care workers fear of losing their jobs is deeply rooted in the restructuring that has taken place in the home care field around the time of our study. Prior to 1997, Home care in the city was delivered primarily by three non-profit home care agencies that provided 85 percent of the home care in the city. In 1997, the Home Care system in Ontario was restructured to a system of "managed competition" where agencies compete for contracts to deliver services through a Request for Proposal (RFP) process. This opened the "home care market" to include both non-profit and for-profit home care agencies. The number of agencies delivering home care grew from three to eleven. Each agency's contract was awarded for a short period of one to three years and thus workers' jobs could not be guaranteed any longer than the contract. Home care workers live in constant fear that they are going to lose their jobs because their agencies lose the contracts to deliver home care services (see Denton et al. 2003). Studies

are beginning to examine the impact of managed competition on clients and the quality of home care (Doran et al. 2007) but here has been little research on the impact of managed competition on workers. This study is the beginning.

We found in this study that subjective job insecurity is associated with occupational health problems for individual home care workers. Further research should examine the larger impacts of job insecurity in the home care field. For example, job insecurity associated with managed competition has been associated with increased turnover (Denton et al. 2006) and increased propensity to leave for home care workers (Denton et al. 2007b). As the baby boomers age and care is shifted from the hospital to the home setting there is some serious question as to whether the system will have a sufficient number of trained home care workers to meet the needs of the system (Armstrong and Armstrong 2003; Home Care Study Corporation 2003a,b). Changes are needed to make the system more stable and sustainable for the future. Significant increases in home care funding are needed to create a permanent and stable home care work force. More funding would allow for improvements in pay and benefits and better job security for home care workers. Rebuilding the home care system would require abandoning the current managed competition system where job insecurity is built into the RFP system of bidding for short-term contracts. In order to provide home care workers with job security, agencies need to offer guaranteed permanent employment, a situation that is impossible when jobs are based on contracts for short-term. Dramatic changes to the home care system would require significant increases in funding for home care in Ontario. With the aging of the population and the high cost of institutional long-term care, properly funding home care makes sense. And, as this study shows, reducing job insecurity for home care workers could also contribute to the reduction of costly musculoskeletal disorders and stress for workers.

Study Limitations and Future Research

It is important to note that our study has several limitations. First, our study is limited in that it is a cross-sectional study on one city in Ontario. Home care falls under provincial jurisdiction and as such, home care service delivery and organization vary from province to province (Dumanont-Lemassen et al. 1999). Even within provinces, home care service delivery can vary regionally (Wilson et al. 2007). Therefore, we cannot generalize our findings to the larger population of home care workers. Future research would benefit from comparison studies with other areas of Ontario and other Canadian provinces. Our study is also limited in that it is possible that those with higher levels of work-related health problems were more likely to respond to our survey because they were more interested in the topic. But, we argue that biases are unlikely given the 70 percent response rate. Third, including those diagnosed with musculoskeletal disorders along with those not diagnosed affected the importance of two variables in our study: work-related injuries and injuries moving clients. We conducted all the analysis excluding diagnosed workers, and the results were substantially the same except these variables where their association with musculoskeletal disorders was weaker. Fourth, our study was also limited by the self-reported nature of our measure of musculoskeletal disorders and stress. Medical reports and/or evaluations of stress and musculoskeletal disorders would be ideal and perhaps future research could include these types of measures in the study design. Our objective in this study was not to report on the level of stress and musculoskeletal disorders among home care workers but was instead to examine the factors that contribute to increased stress and musculoskeletal disorders in this population.

Conclusion

Musculoskeletal disorders and stress are costly both to individuals and society. Our study showed that it is subjective feelings of job flexibilities/insecurities are associated with increased stress and musculoskeletal disorders (mediated through stress) for visiting and office home care workers. We also found that for visiting workers, subjective feelings of labour market flexibilities/insecurities were positively associated with stress and musculoskeletal disorders (mediated through stress) and for office workers, subjective feelings of labour market flexibilities/insecurities were associated with increased musculoskeletal disorders. Despite our finding that objective employer flexibilities were not associated with increased stress or musculoskeletal disorders, we still need to consider the other consequences of these types of flexibilities/insecurities. As a society we need to ask ourselves, are these jobs the types of jobs that we want? Our study of turnover in home care workers suggests that this is not the case (Denton et al. 2006). We also need to ask, how will employer flexibilities/insecurities affect the ability of the home care system to sustain itself in the future? What are the long-term prospects for the quality of peoples' lives when they have no guaranteed employment or full-time hours of work? The mean age of the visiting and office home care workers in this study is 45 and 44, respectively. As these workers approach retirement, how will working in insecure jobs affect pensions and income security in later life? Future research should examine these consequences for both the individuals and society as a whole.

Figure 1: The model of workplace flexibility and worker insecurity measures and home care workers' stress and self-reported musculoskeletal disorders relationship

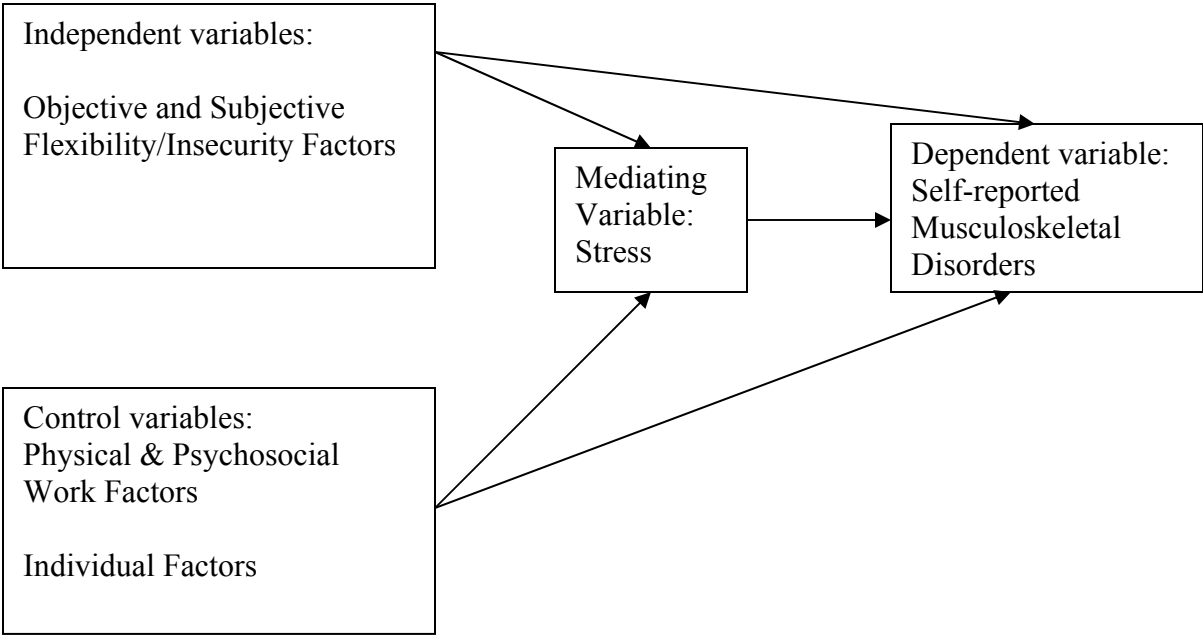


TABLE 1: A typology of objective and subjective workplace flexibility and worker insecurity measures included in our study

Objective	Workplace Flexibility	Worker Insecurity	Questionnaire variable
	Numerical flexibility	Employment insecurity	Permanent contract or not
	Work environment flexibility	Work insecurity	Lost job when employer lost contract
	Working-time flexibility	Working-time insecurity	Part-time hours, casual hours
	Working-time flexibility	Working-time insecurity	Work only hours available
	Scheduling flexibility	Working-time insecurity	Work on call
	Scheduling flexibility	Working-time insecurity	Work split shifts
	Pay flexibility	Income insecurity	Pay per visit, pay per hours worked & hrs vary
Subjective	Workplace Flexibility	Worker Insecurity	Questionnaire variable
	Workplace flexibility (Numerical, functional, and work environment flexibility)	Job insecurity scale (Employment, job, and work insecurity)	A composite variable: (Presently safe from dismissal; likely to be laid off; worried about my future with this agency; uneasy about security in my present job; worried about my job security; concerned about losing job due to overall changes in the long-term care sector; due to potential of agency losing their contract)
	Labour market flexibility: Surplus/ easily replaceable labour	Labour market insecurity: Feeling labour surpluses & easily replaceable	Labour market flexibility/insecurity: If I lose my job here I will likely find another job in my profession

Table 2: Descriptive Statistics (means, standard deviations and scale reliabilities (α))

Variable	Visiting Workers N=990 Mean (S.D.) or %	Visiting Workers Min-Max Value (Scale α)	Office Workers N=300 Mean (S.D.) or %	Office Workers Min-Max Value (Scale α)
Dependent variable: Self-reported MSDs	11.30 (3.73)	7-35 (0.82)	12.97 (4.50)	7-35 (0.78)
Independent variables: Objective flexibility/insecurity factors:				
Non-permanent contract	34%	N/A	17%	N/A
Lost job when employer lost contract	4%	N/A	0.7%	N/A
Full-time hours	45%	N/A	83%	N/A
Part-time hours	37%	N/A	13%	N/A
Casual hours	16%	N/A	4%	N/A
Work only available hours (involuntary hours)	33%	N/A	30%	N/A
Work on call	1.57 (.69)	1-5	1.25 (.56)	1-5
Work split shifts	1.47 (.73)	1-5	1.02 (.18)	1-5
Salaried	9%	N/A	68%	N/A
Paid per visit	17%	N/A	0.7%	N/A
Paid per hours worked & hours vary	73%	N/A	30%	N/A
Subjective flexibility/insecurity factors:				
Job Flexibility/Insecurity scale	21.20 (5.98)	7-35 (.85)	17.88 (5.76)	6-30 (.90)
Labour market flexibility/insecurity	2.02 (1.02)	1-5	2.20 (0.99)	1-5
Mediating variable: Stress	29.15 (6.96)	14-70 (0.82)	31.87 (7.66)	14-70 (0.86)
Control variables:				
Physical work environment:				
Job requires physical effort	3.40 (1.05)	1-5	3.17 (1.12)	1-5
Hazards in clients' homes	26.67 (5.81)	8-40 (.84)	N/A	N/A
Physical office environment	N/A	N/A	7.93 (3.05)	3-15(.71)
Physical & psychosocial work env.				
Heavy workload	21.82 (4.73)	7-53 (.84)	25.13 (5.62)	7-35 (.91)
Job is repetitious	4.10 (.68)	1-5	2.71 (1.07)	1-5
Psychosocial work environment:				
Organizational support	33.47 (6.42)	9-45 (.81)	30.65 (8.34)	9-45 (.85)
Peer support	13.98 (2.84)	4-20 (.82)	16.18 (2.73)	4-20 (.84)
Individual factors:				
Work injuries in past year	13.3%	N/A	7%	N/A
Injured moving clients	20.8%	N/A	3.3%	N/A
Age	45 (10)	N/A	44 (9)	N/A

Table 3. Factors associated with visiting home care workers' stress (Bivariate Regressions and Hierarchical OLS regressions)

Variables	Bivariate regression coefficients	Model 1	Model 2
	B (S.E.)	B (S.E.)	B (S.E.)
Constant		25.654 (2.300)***	22.047 (2.383)***
Permanent contract	.334 (.466)		
Lost job when employer lost contract	-.803 (1.11)		
Full-time hours	-.012 (.445)		
Part-time hours	-.330 (.459)		
Casual hours	.520 (.606)		
Work only hours available	.336 (.471)		
Work on call	.245 (.193)		
Work split shifts	.094 (.174)		
Salaried	1.579 (.757)*		.883 (.719)
Paid per visit	-.071 (.594)		
Paid per hours worked and hours vary	-.673(.495)		
Job insecurities	.298 (.036)***		.167 (.036)***
Labour market insecurity	.438 (.216)*		.475 (.196)*
Job requires physical effort	.817 (.208)***	.440 (.198)*	.504 (.197)*
Hazards in clients homes	.222 (.037) ***	.047 (.039)	.003 (.039)
Heavy workload	.512 (.044) ***	.405 (.047)***	.372 (.047)***
Job requires repetitive tasks	1.160 (.323)***	-.126 (.312)	.045 (.311)
Organizational support	-.281 (.033) ***	-.186 (.035)***	-.160 (.035)***
Peer support	-.379 (.077) ***	-.066 (.079)	-.080 (.080)
Work injuries in past year	3.474 (.641)***	1.514 (.617)*	1.293 (.609)*
Injured moving clients	1.378 (.194)* **	.635 (.198)***	.614 (.195)**
Age	-.049 (.023)*	-.048 (.021)*	-.062 (.021)**
Adj.R ²		.191	.214
R ²		.198	.224
Change in R ²			.023
N	990	990	990

* $p < .05$

** $p < .01$

*** $p < .001$

**Table 4. Factors associated with visiting home care workers' MSDs
(Bivariate Regressions and Hierarchical OLS regressions)**

Variables	Bivariate regression coefficients	Model 1 (Control vars)	Model 2 (Independent variables incld.)	Model 3 (Full Model with stress incld.)
	B (S.E.)	B (S.E.)	B (S.E.)	
Constant		6.774 (1.44)***	4.195 (1.598)**	-1.310 (1.543)
Permanent contract	.642 (.305)*		.187 (.285)	.236 (.264)
Lost job when employer lost contract	.496 (.728)			
Full-time hours	.254 (.291)			
Part-time hours	-.421 (.301)			
Casual hours	.222 (.397)			
Work only hours available	-.031 (.309)			
Work on call	.147 (.128)			
Work split shifts	.155 (.114)			
Salaried	.165 (.497)			
Paid per visit	.278 (.389)			
Paid per hours worked and hours vary	-.445 (.325)			
Job insecurities	.118 (.024)***		.055 (.024)*	.011 (.023)
Labour market insecurity	.396 (.141)**		.322 (.132)*	.203 (.123)
Job requires physical effort	.523 (.137)***	.230 (.132)	.232 (.132)	.110 (.122)
Hazards in clients homes	.115 (.025)***	.020 (.026)	.004 (.026)	.002 (.024)
Heavy workload	.225 (.030)***	.136 (.031)***	.128 (.032)***	.032 (.030)
Job requires repetitive tasks	.989 (.211)***	.260 (.208)	.325 (.208)	.327 (.193)
Organizational support	-.075 (.022)**	.000(.024)	.005 (.024)	.045 (.022)*
Peer support	-.185 (.051)***	-.096 (.053)	-.099 (.053)	-.083 (.049)
Work injuries in past year	3.992 (.407)***	2.841 (.411)***	2.779 (.411)***	2.447 (.382)***
Injured moving clients	1.178 (.125)***	.709 (.132)***	.674 (.131)***	.516 (.123)***
Age	.029 (.015)	.027 (.014)	.020 (.014)	.035 (.013)**
Stress				.253 (.020)***
Adj.R ²		.162	.172	.289
R ²		.169	.182	.298
Change in .R ²			.010	.116
N	990	990	990	990

* $p < .05$

** $p < .01$

*** $p < .001$

**Table 5. Factors associated with office home care workers' stress
(Bivariate Regressions and Hierarchical OLS regressions)**

Variables	Bivariate regression coefficients	Model 1	Model 2
	B (S.E.)	B (S.E.)	B (S.E.)
Constant		35.966 (4.421)***	29.343 (4.854)***
Permanent contract	2.056 (1.183)		
Lost job when employer lost contract	2.649 (5.442)		
Full-time hours	1.601 (1.176)		
Part-time hours	-1.300 (1.315)		
Casual hours	-3.754 (2.347)		
Work only hours available	1.026 (.962)		
Work on call	-.453 (.428)		
Work split shifts	-.149 (1.096)		
Salaried	1.415 (.949)		
Paid per visit	.132 (5.444)		
Paid per hours worked and hours vary	-1.678(.959)		
Job insecurities	.373 (.074)***		.216 (.073) **
Labour market insecurity	1.014 (.445)*		.219 (.400)
Job requires physical effort	1.049 (.393)**	.329 (.379)	.270 (.374)
Physical office environment	-.817 (.138)***	-.246 (.156)	-.181 (.156)
Heavy workload	.501 (.073) ***	.371 (.075)***	.369 (.074)***
Job is repetitious	.404 (.414)	-.373(.373)	-.372 (.370)
Organizational support	-.380 (.048) ***	-.203(.058)**	-.163 (.059)**
Peer support	-.482 (.160) **	-.299(.147)*	-.309 (.145)*
Work injuries in past year	6.077 (1.663)***	3.503 (1.499)*	3.857 (1.487)**
Injured moving clients	1.597 (.484)**	.467 (.455)	.463 (.450)
Age	.010 (.048)	-.031 (.480)	-.010 (.045)
Adj.R ²		.258	.278
R ²		.281	.305
Change in .R ²			.024
N	300	300	300

* $p < .05$

** $p < .01$

*** $p < .001$

**Table 6. Factors associated with office home care workers' MSDs
(Bivariate Regressions and Hierarchical OLS regressions)**

Variables	Bivariate regression coefficients	Model 1 (Control vars)	Model 2 (Independent variables incld.)	Model 3 (Full Model with stress incld.)
	B (S.E.)	B (S.E.)	B (S.E.)	
Constant		4.991 (2.832)	2.214 (3.100)	-5.502 (3.008)
Permanent contract	-.319 (.698)			
Lost job when employer lost contract	4.053 (3.187)			
Full-time hours	.752 (.691)			
Part-time hours	-.888 (.772)			
Casual hours	-1.106 (1.382)			
Work only hours available	1.040 (.563)			
Work on call	-.584 (.249)*		-.544 (.242)*	-.466 (.222)*
Work split shifts	-.086 (.643)			
Salaried	-.251 (.559)			
Paid per visit	2.542(3.193)			
Paid per hours worked and hours vary	.113 (.566)			
Job insecurities	.093 (.045)*		.073 (.047)	.013 (.044)
Labour market insecurity	.798 (.259)*		.661 (.256)**	.599 (.234)**
Job requires physical effort	.534 (.231)*	.526 (.243)*	.503 (.239)*	.433 (.218)*
Physical office environment	-.260 (.084)**	-.024 (.100)	.031 (.100)	.074 (.092)
Heavy workload	.149 (.046)**	.090 (.048)	.089 (.047)	-.007 (.045)
Job is repetitious	.912 (.237)***	.696 (.239)**	.758 (.236)***	.852 (.216)***
Organizational support	-.085 (.031)**	-.034 (.037)	-.006 (.038)	.036 (.035)
Peer support	.092 (.095)	.170 (.094)	.155 (.093)	.237 (.085)**
Work injuries in past year	4.24 (.967)***	3.511(.960)***	3.407 (.949)***	2.412 (.877)**
Injured moving clients	.268 (.289)	-.161 (.291)	-.100 (.287)	-.224 (.263)
Age	.037 (.028)	.014 (.028)	.007 (.028)	.010 (.026)
Stress	.265 (.030)***			.261 (.034)***
Adj.R ²		.117	.148	.288
R ²		.144	.182	.319
Change in .R ²			.030	.138
N	300	300	300	300

* $p < .05$

** $p < .01$

*** $p < .001$

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