



# HHS Public Access

Author manuscript

*J Agric Saf Health*. Author manuscript; available in PMC 2018 August 16.

Published in final edited form as:

*J Agric Saf Health*. 2017 April 26; 23(2): 109–123. doi:10.13031/jash.11753.

## The Impact of Work Demand and Gender on Occupational and Psychosocial Stress in Hispanic Farmworkers

**M. TePoel [Research Associate],**

Occupational and Environmental Health, University of Iowa, Iowa City, Iowa

**D. Rohlman [Associate Professor], and**

Occupational and Environmental Health, University of Iowa, Iowa City, Iowa

**M. Shaw [Research Assistant]**

Child and Family Center, University of Oregon, Eugene, Oregon.

### Abstract

Hispanic farmworkers experience hazardous work conditions, language barriers, poverty, and limited healthcare access that increase their risk for health problems. We sought to characterize occupational and lifestyle stressors in farmworker couples and to examine the impact of seasonal work demand and gender on health outcomes. We administered surveys to 31 couples ( $N = 62$ ) in May (low work demand) and September (high work demand) of 2012. Measures included acculturation, perceived stress, depressive symptoms, quality of life, decision latitude, support (supervisor, co-worker), and workfamily conflict. This population did not report significant differences in stress in low and high work demand times. Women reported more work-family conflict ( $F = 19.06$ ,  $p < 0.0001$ ;  $F = 11.28$ ,  $p = 0.0015$ ) and less supervisor support ( $F = 6.56$ ,  $p = 0.0135$ ). Women experienced more conflict between work and family and less support at work. This group reported low depressive symptomology and moderate levels of stress; a subset reported elevated levels.

### Keywords

Agricultural workers; Hispanic; Stress

---

Agriculture is considered one of the most hazardous occupations, and agricultural workers are at increased risk of both fatal and non-fatal injuries compared to the general workforce (Davis and Kotowski, 2007; Hansen and Donohoe, 2003). Although recent reports indicate that farm-related injuries and fatalities are declining, there has been an increase in stress-related behavioral health problems, including suicide, depression, and substance abuse (Rosmann, 2010). Furthermore, there is evidence that immigrant farmworkers, a large part of the U.S. agricultural labor force, are bearing an undue share of these problems (Grzywacz et al., 2010b; Kim-Godwin and Bechtel, 2004). In 2004, 30% of all agricultural workers in the U.S. were Mexican immigrants, although this number is significantly higher in some states

(Villarejo et al., 2010). In order to protect the health of these workers, it is important to understand the impact of both traditional workplace hazards and non-occupational or lifestyle factors on health outcomes (Schill and Chosewood, 2013). The NIOSH Total Worker Health initiative has identified immigrant and low-wage workers as being at greater risk for workplace injuries and adverse health outcomes (Baron et al., 2014; Loeppke et al., 2013), yet there is limited research characterizing these risk factors and their impacts.

Immigrant farmworkers experience language barriers, discrimination, lack of education, separation from immediate and/or extended family members, inadequate housing, limited transportation, and fears and uncertainties surrounding their legal status (Magaña and Hovey, 2003; Quandt et al., 2015). These challenges are compounded for immigrant farmworkers with children, who may have difficulties securing and/or paying for childcare and worry about their children's education and health (Early et al., 2006; Magaña and Hovey, 2003). Seventy percent of immigrant farmworkers report having no health insurance, and Hispanic children have limited access to healthcare, underutilize services, and have suboptimal health status (Flores and Tomany-Korman, 2008; Villarejo et al., 2010); often, this is related to lack of transportation, unfamiliarity with the healthcare system and the services available, and language barriers (Arcury et al., 2007). While the Affordable Care Act aimed to alleviate some of these disparities, access to healthcare is still problematic: small employers (<50 FTE) or those employing seasonal workers are excluded from the health insurance mandate; if the employer does offer an insurance plan, the cost of the plan may still be out of reach for a typical farmworker family, whose average income is \$17,500 to \$19,999 per year (Carroll et al., 2005). Furthermore, undocumented workers or those with H-2A visas often do not meet the requirements for health insurance or are afraid to ask for help (Ortega et al., 2015).

Although agricultural activities occur throughout the year, certain times have higher levels of activity and work demands than other times. Employment records in Oregon demonstrate this seasonal employment for orchard workers: the first two quarters of the year (January through June) have the lowest number of workers, followed by a 42% increase during the third quarter (July through September), which corresponds with harvest. Seasonal variation in work availability creates a set of additional stressors unique to this occupation, such as months with low or no wages, and childcare needs that change with work demands.

There are gender differences in work frequency as well. Hispanic women work significantly fewer days than Hispanic men (McCurdy et al., 2003, 2013); moreover, women are more likely to be employed in seasonal work (e.g., packinghouses or harvest) that requires limited training, while men are more likely to be employed year round and perform tasks requiring higher levels of training and/or physical strength (McCurdy et al., 2014). Despite this, few studies have sought to examine the experiences of immigrant Latino women in the workplace.

The job demands-control model (Karasek, 1979) and the job demands-control-support model (Van der Doef and Maes, 1999) are widely used in occupational health research to evaluate job strain and have been used in studies of Hispanic occupational groups, including agricultural farmworkers (Alterman et al., 2014; Arcury et al., 2014; Grzywacz et al., 2007, 2008, 2010c, 2012, 2014). The models posit that stress or mental strain results from the

interaction of job demands (e.g., heavy workload or insufficient supervisor instruction), decision latitude (the amount of control that workers have over their decision-making), and social support (support from family, peers, or supervisors). High job demands and low decision latitude have been associated with depression, job dissatisfaction, and self-reports of poor physical and mental health (Grzywacz et al., 2014; Karasek, 1979). Increased job control (e.g., schedule flexibility) and supervisor support may help mitigate stress and have been associated with self-reports of better physical health (Arcury et al., 2014; Grzywacz et al., 2008).

## Aim

Hispanic seasonal farmworkers experience both occupational and non-occupational factors, such as hazardous work conditions, language barriers, poverty, and limited healthcare access, that increase their risk for injuries and adverse health outcomes. Moreover, the seasonal nature of agriculture may place additional strain on workers, particularly those with children. Furthermore, little is known about the work experiences of women. With all that in mind, the aim of this study is to characterize occupational and lifestyle stressors in farmworker couples and to examine the impact of seasonal work demand and gender on health outcomes.

## Methods

### Participants

Farmworker couples from an agricultural community in Oregon were invited to participate in the study by a bilingual community member. A convenience sample was initially selected from a previous study that examined pesticide exposure in children (Butler-Dawson et al., 2016). Snowball recruitment was then used to recruit additional farmworkers into the study. Couples were eligible to participate if both partners were 18 years old, the male partner was currently working in agriculture, and there was at least one child 12 years old in the home. After initiating contact with the family, research assistants explained the study and screened potential participants per the eligibility criteria. A total of 32 couples agreed to participate. One couple did not complete all the data collection instruments and was excluded from the analysis.

### Data Collection

Each partner signed a written informed consent form. Upon enrollment, an appointment was scheduled for baseline (low work demand time) and follow-up (high work demand time) data collection. Data were collected using an interviewer-administered survey questionnaire. Interviews were conducted either in participants' homes or in a private room at the local fire station. Interviews were conducted in Spanish and lasted 1.5 hours (low work demand) and 45 minutes (high work demand). Partners were interviewed separately. Each partner received \$20 and \$30 for completing the interviews at low work demand time and high work demand time, respectively. Interviews were conducted in May 2012 (low work demand time) and September 2012 (high work demand time) by Spanish-speaking interviewers who completed

training in human subjects research. All study activities were approved by the Institutional Review Board at Oregon Health and Science University.

## Measures

### Development of Agricultural Worker Stress Questionnaire

Hispanic agricultural workers ( $N = 17$ ) participated in structured interviews to identify psychosocial and occupational stressors unique to their lifestyle (unpublished study). Findings from these interviews and a literature review examining psychosocial and workplace stressors in agricultural workers were used to develop a questionnaire to assess stressors in agricultural workers. The following items were included to identify and characterize workrelated stressors: work history, job strain (Karasek et al., 1998), work-family stress (Netemeyer et al., 1996), supervisor support (Hammer et al., 2009), and safety outcomes (Griffin and Neal, 2000; Hemingway and Smith, 1999). In addition, items addressing lifestyle factors associated with stress were evaluated, including sleep (Buysse et al., 1989), diet and nutrition (Thompson et al., 2002), acculturation (Hovey and Magaña, 2000), and psychological factors (Boiko et al., 2005; Kessler et al., 2002; Mroczek and Kolarz, 1998). Several of these questionnaires have been adapted for use with Spanish-speaking agricultural workers; other standardized questionnaires were reviewed and pilot-tested during the interviews to determine the appropriateness for this population. An important theme that emerged throughout the interviews was the additional stressors faced by couples in which both parents worked.

### Demographic and Household Characteristics

Participants were asked their age (“What is your age?”), English language skills (“Can you read in this language (English)?”), years worked in agriculture (“How many years have you done farm work in the U.S.”), and if their employer paid for injuries sustained at work (“If you are injured at work or get sick as a result of your work, does your employer provide health insurance or pay for your care?”).

Standardized measures were used in the study. Acculturation was assessed using the Short Acculturation Scale for Hispanics (SASH) (5 items, Cronbach’s  $\alpha = 0.85$ ) (Marin et al., 1987). Participants rated statements regarding their language use on a five-point Likert scale. All items were summed, yielding a total score range of 0 to 20, with higher scores signifying greater acculturation. The Financial Stress Questionnaire (7 items, Cronbach’s  $\alpha = 0.82$ ) was used to assess couples’ household spending and adequacy of funds (Conduct Problems Prevention Research Group, 1994). Participants rated statements such as “My family has enough money to afford the kind of medical care we should have” on a fivepoint Likert scale. Scores were calculated as the sum of the seven spending source items. The range of possible scores was from 5 to 35, and lower scores indicate higher levels of economic strain. This scale was translated from English to Spanish for this study.

### Health Characteristics

Weight was measured using a Tanita scale, and height was determined by a tape measure on the wall. Body mass index (BMI) was calculated as weight divided by height and rounded to

the nearest tenth. BMI classifications are: underweight (<18.5), normal (18.5 to 24.9), overweight (25.0 to 29.9), and obese (≥30.0) (Ogden et al., 2014). Blood pressure classifications are: normal (SBP < 120 or DBP < 80), pre-hypertensive (SBP 120 to 139 or DBP 80 to 89), and hypertensive (SBP ≥ 140 or DBP ≥ 90) (Chobanian et al., 2003).

The Short-Form Health Survey (SF-12), a self-report instrument used to measure health-related quality of life (12 items, Cronbach's  $\alpha = 0.62$  to  $0.73$ ) (Ware et al., 1996), was administered to assess subjects' assessments of their physical and mental health. Sleep quality was measured using the Sleep Scale from the Medical Outcomes Study (12 items, Cronbach's  $\alpha = 0.64$  to  $0.78$ ) (Spritzer and Hays, 2003). Participants were asked questions such as "How often during the past four weeks did you get enough sleep to feel rested upon waking in the morning?" on a six-point Likert scale. Numeric values were recoded following scoring rules outlined by the authors and converted to a possible 0 to 100 range. Fat and sugar intake was measured using the Buxton Fat and Sugar Questionnaire (4 items) (Buxton et al., 2009). Participants rated the frequency with which they ate foods (e.g., drinks with added sugar, fast food) over a four-week period.

### Psychosocial Characteristics

Depressive symptomology was measured with the Center for Epidemiologic Studies Depression Scale (CESD-10) (10 items, Cronbach's  $\alpha = 0.80$ ) (Kohout et al., 1993). The range is 0 to 30; higher scores suggest higher depressive symptomology. The Perceived Stress Scale (PSS) (10 items, Cronbach's  $\alpha = 0.76$ ) was used to measure the degree to which situations in participants' lives were appraised as stressful (Cohen et al., 1983). Participants rated statements such as "In the past month, how often have you been upset because of something that happened unexpectedly?" on a five-point Likert scale. The range is 0 to 40; higher scores indicate higher levels of perceived stress. The Mexican Farmworker Stress Scale (MFSS) (23 items, Cronbach's  $\alpha = 0.90$ ) was used to assess stress inherent in the Mexican immigrant farmworker lifestyle (Snipes et al., 2007). Participants rated statements such as "In the past month, have you felt stressed because of injustice at work?" on a five-point Likert scale. Scores range from 23 to 115. All three of these measures have been used in prior studies with Mexican immigrant farmworkers (Crain et al., 2012; Grzywacz et al., 2010a, 2010b, 2011; Letiecq et al., 2014; Marin et al., 2009; Mora et al., 2014; Nguyen et al., 2012). The Migrant Farmworker Stress Index (MFWSI) (39 items, Cronbach's  $\alpha = 0.93$ ) was used to measure the stress related to the migrant farmworker lifestyle (Magaña and Hovey, 2003). Scores above 80 indicate high levels of migrant farmworker stress and an increased risk for anxiety, depression, and suicidal behavior.

### Occupational Characteristics

Conflicts between work and family activities were evaluated using The Work and Family Conflict Scale (WAFCS) (10 items, Cronbach's  $\alpha = 0.73$  to  $0.89$ ) (Netemeyer et al., 1996). Participants rated statements such as "My work prevents me from spending sufficient quality time with my family." Previous research has suggested that Hispanic populations do not respond well to affective response options (i.e., strongly disagree to strongly agree) and that frequency-based responses (i.e., never to always) are a more effective method for assessing subjects' range of feelings (Grzywacz et al., 2008). Subsequently, the response set was

altered from a seven-point affective-based scale to a five-point frequencybased scale. The range of possible scores is 10 to 50; work-to-family and family-to-work subscales each have ranges of 5 to 25. Higher scores indicate more conflict. Scales from the Job Content Questionnaire (JCQ) (36 items, Cronbach's  $\alpha = 0.43$  to  $0.82$ ) (Karasek, 1985) were used to assess sources of occupational stress, including job decision latitude (control over decision-making at work), psychological job demands, co-worker support, and supervisor support. All items were scored on a five-point Likert scale. Decision latitude and psychological job demands were constructed to have a range of 12 to 48; the social support scales have a range of 4 to 20. This scale has been used in previous research with Mexican immigrant farmworkers (Alterman et al., 2014; Grzywacz et al., 2008, 2010c, 2014). Psychosocial occupational stress was estimated as described by Landsbergis et al. (1994). We constructed a continuous job strain variable by dividing the response to the decision latitude subscale by the response to the psychological job demands subscale. The range of possible scores is 0 to 1; higher scores indicate greater job strain.

All measures were administered at both time points with the exception of acculturation (Short Acculturation Scale for Hispanics) and financial stress (Financial Stress Questionnaire), as these scales measure structural stressors that are not likely to change across the study time period. All items were administered in Spanish.

### Statistical Analysis

Descriptive statistics were calculated for all measures in order to characterize occupational and lifestyle stressors in farmworkers. Paired t-tests were used to examine the relationships between composite scores at low and high work demand. Linear mixed effects models were used to assess differences by work demand (low versus high), gender (men versus women), and age (continuous) for each outcome measure. A couple-specific random effects term was included in the model to account for correlation between couples. All data analyses were performed using SAS 9.2 (SAS Institute, Inc., Cary, NC).

## Results

### Demographic and Household Characteristics

Thirty-one couples participated in the study (table 1). All men and 77% ( $n = 24$ ) of women report working in agriculture during the past year, although men reported working significantly longer than women (20.4 years vs. 8.9 years). Additionally, men worked more months in the past year than women (11.0 months vs. 5.6 months, respectively). Men were primarily employed as orchard workers ( $n = 26$ ; 84%), although a small number worked in the packinghouse ( $n = 2$ ; 7%) and in both the orchard and packinghouse ( $n = 3$ ; 10%). Ninety-four percent ( $n = 29$ ) of the women were employed. Women tended to work seasonally in agriculture as field workers ( $n = 17$ , 57%) and/or in the packinghouse ( $n = 9$ , 31%). Thirty-one percent ( $n = 9$ ) were employed outside of agriculture (percentages do not equal 100 as some women reported more than one job in the previous 12 months). Fortysix percent of families had 2 people in the home working in agriculture. Sixty percent of families received free housing from their employer, while 40% rented from a non-employer. Men and women were, on average, 40 and 37 years of age, respectively. All but one

participant were immigrants from Mexico and had been living in the U.S. for 19 years, on average. Although both men and women reported that they could read English “very well” (81% vs. 74%), acculturation scores were low.

### **Personal Health Characteristics in Low and High Work Demand Times**

Over 75% of all participants had BMI scores that fell into the overweight or obese categories (table 2). The BMI for both genders decreased significantly from low to high work demand time ( $F = 7.81, p < 0.01$ ). Additionally, over 50% of the men had pre-hypertension or hypertension, compared to 28% of the women. However, self-reported physical and mental health mean scores were near the normalized mean scores in a representative sample of the U.S. population. Men reported significantly higher (better) scores than women on both scales (physical:  $F = 6.68, p = 0.01$ ; mental:  $F = 6.08, p = 0.02$ ). These scores did not change from low to high work demand times. Sleep problems (e.g., snoring, drowsiness, trouble falling asleep) were reported by approximately one-third of the participants. Sleep disturbance significantly decreased during high work demand time ( $F = 5.27, p = 0.02$ ).

High work demand time leads to an increase in consumption of sugary drinks and fast food for both men and women; however, more men consumed fast food at low work demand time than women (74% vs. 45%). During high work demand time, over 75% of all participants consumed fast food, and 84% percent of men and 94% of women consumed at least one sugary drink per day or more.

### **Psychosocial and Occupational Characteristics in Low and High Work Demand Times**

Three measures of psychosocial stress were administered. There were no significant differences by gender or work demand for these measures. Mean financial stress scores for both men and women were in the lower half of the range, indicating greater financial stress. The MFWSI, which characterized specific stressors faced by immigrant farmworkers, identified the top three concerns for men and women as: “Migrating to this country was difficult,” “I worry about my children’s education,” and “It is difficult to be away from family members.” Scores ranged from 19 to 127 on a scale of 0 to 156, with a mean of 63.3. Twenty-four percent of the sample scored above the threshold of 80, indicating that they are experiencing relatively high levels of migrant farmworker stress and are at greater risk for anxiety, depression, and suicidal behavior.

Women ( $F = 19.06, p < 0.0001$ ) reported significantly higher work-family and familywork conflict compared to men ( $F = 11.28, p = 0.001$ ) (table 3). There were no significant differences in childcare use by work demand. While one or both parents worked, mothers reported that the children were most frequently watched in the previous month by a family member (low vs. high work demand time; differences not significant), including a parent (42% vs. 52%), sibling (35% vs. 48%), and other relative (23% vs. 26%).

During high work demand time, supervisor support scores on the Job Content Questionnaire differed significantly by gender, with women reporting decreased supervisor support compared to men ( $F = 6.56, p = 0.02$ ). None of the other psychosocial and occupational characteristics measured showed significant differences by gender, age, or work demand. Men were also significantly more likely than women to have (or be aware of)

employer-provided workers' compensation (80% vs. 41%;  $p = 0.01$ ). Psychosocial occupational stress was estimated as described by Landsbergis et al. (1994). We constructed a continuous job strain variable by dividing the response to the decision latitude subscale by the response to the psychological job demands subscale. There was no difference in psychosocial occupational stress by work demand time.

## Discussion

Over 75% of our sample was overweight or obese, and over 50% of men and 25% of women were pre-hypertensive or hypertensive, similar to the national averages for Hispanic Americans (Flegal et al., 2012; Wang and Wang, 2004). Men and women both reported an increased intake of sugary drinks and fast foods during high work demand time. This finding may reflect the need for convenience during high work demand time and has negative implications for long-term health effects. Despite a high prevalence of overweight and obesity, high blood pressure, and consumption of fatty foods, this population did not view themselves as unhealthy. Their self-reported physical and mental health scores were comparable to national averages, and sleep and BMI significantly improved from low to high work demand time. This could reflect the additional physical activity provided by an increased workload. However, information on physical activity (work-related or otherwise) was not collected.

Contrary to previous research (Finch et al., 2004; Grzywacz et al., 2010a, 2010b; Hovey and Magaña, 2000), this population did not report a high prevalence of depressive symptoms. This finding may be partly attributable to the population studied. While previous research has focused on migrant farmworkers, this is a settled population that lives with their immediate families and does not "follow the crop," unlike some migrant workers who leave their families behind. Two studies have reported significant associations between elevated levels of depressive symptoms and anxiety (Finch et al., 2004; Hovey and Magaña, 2000). However, we could not test this association, as an anxiety measure was not included in the questionnaire.

Stressors related to the farmworker lifestyle, as measured by the Mexican Farmworker Stress Scale, suggested that the farmworkers consistently experienced moderate stress across low and high work demand periods. This scale includes items that assess structural stressors unlikely to change over time, such as discrimination, language barriers, and distance from family members. The Migrant Farmworker Stress Index indicated that 24% of the sample scored at or above 80 and were at risk for anxiety or depression. This subset of participants reported significantly greater perceived stress, Mexican farmworker stress, and family to work conflict.

## Gender Differences

While one in five farmworkers are women or partnered with farmworkers (59% of farmworkers are married or cohabitating) (Carroll et al., 2011), much of the literature does not explore how relationships between exposure and outcomes are shaped by gender (Habib et al., 2014). Our findings suggest that women, who are often primary caregivers in addition to their part-time or full-time work, may face additional challenges. They worked



significantly fewer months than men, a finding reported in other studies (McCurdy et al., 2003, 2013). They reported more work and family conflict and significantly lower (worse) physical and mental health than men. A recent analysis of Latinas in farmworker families found that family conflict, perceived discrimination, and economic insecurity were associated with more depressive symptoms (Zapata Roblyer et al., 2016). In addition, Hispanic farmworker women's experiences with sexual harassment and/or assault by their supervisors or co-workers have been examined in two studies, which found that low social status, economic insecurity, and isolation increase women's risk of abuse (Murphy et al., 2015; Waugh, 2010). Social support has long been recognized as a buffer between stressors and strains (Field and Schuldberg, 2011; Van der Doef and Maes, 1999). As individuals receive more social support, their emotional and psychological resources for dealing with stressors increase, and their appraisals of stressors become less negative (Jex, 1998). A study of male farmworkers in Norway found that increased decision latitude and number of friends buffered the effects of high job demands (Logstein, 2016). In addition, support from one's supervisor has demonstrated a positive effect on a variety of outcomes, including reduced work-family conflict, work distress, absenteeism, intention to quit, and most recently, blood pressure (Hammer et al., 2009). In our study, women reported significantly less supervisor support than men. Together, these studies highlight the unique challenges that Hispanic women in farmworker families face at work and home and the need for additional research on their experiences and needs.

### **Strengths and Limitations**

It is important to interpret the results of this study in light of its limitations. The scope was limited by its small, regional sample size. Time constraints and inclusion criteria (both partners had to agree to participate in order to be included in the study) limited recruitment. However, for the families recruited, retention was good: all but one family returned to complete the questionnaire during high work demand time. This questionnaire was interviewer-administered and requested that participants disclose culturally sensitive information regarding their mental health and behaviors, so there may be systematic underreporting of undesirable behaviors. Unlike previous studies, which have reported high symptoms of depression and greater levels of perceived stress associated with immigrant status, our study found moderate reports of stress. This could be because our study population is settled and has lived in the same community for many years. There is a need to evaluate these measures in additional populations.

### **New Contribution to the Literature**

Despite these limitations, this study makes several contributions to our understanding of occupational and psychosocial stress and health in Mexican immigrant farmworkers. It is one of the few studies to examine stressors and health across the agricultural season at low and high work demand times, and the first study to focus specifically on farmworker couples with children. This settled, non-migratory population reported low depressive symptomology and moderate levels of stress, although a small subset reported high levels of stress. This population did not report significant differences in occupational and psychosocial stress during low and high work demand times. Women experienced greater conflict between work and family, reported less supervisor support, and engaged in

unhealthier behaviors. The NIOSH Total Worker Health initiative has identified immigrant and low-wage workers as being at greater risk for workplace injuries and adverse health outcomes (Baron et al., 2014; Loeppke et al., 2013). Aspects of the workplace (e.g., physically demanding work, long hours, seasonal variations, economic instability) not only increase the risk of injury and illness but also impact health behaviors (e.g., physical activity, diet, substance use) and health outcomes (e.g., mental health, obesity). In turn, ill health and chronic conditions impact performance at work, increasing the risk for serious injury. There is a need for interventions that address both occupational and non-occupational factors, particularly in this vulnerable population (Anger et al., 2015).

## References

- Alterman T , Gabbard S , Grzywacz JG , Shen R , Li J , Nakamoto J , ... Muntaner C (2015). Evaluating job demands and control measures for use in farm worker health surveillance. *J. Immigr. Minor. Health*, 17(5), 1364–1373. 10.1007/s10903-014-0090-z [PubMed: 25138138]
- Anger WK , Elliot DL , Bodner T , Olson R , Rohlman DS , Truxillo DM , ... Montgomery D (2015). Effectiveness of total worker health interventions. *J. Occup. Health Psych*, 20(2), 226–247. 10.1037/a0038340
- Arcury TA , Feldman SR , Schulz MR , Vallejos Q , Verma A , Fleischer AB , ... Quandt SA (2007). Diagnosed skin diseases among migrant farmworkers in North Carolina: Prevalence and risk factors. *J. Agric. Saf Health*, 13(4), 407–418. 10.13031/2013.23926 [PubMed: 18075016]
- Arcury TA , Grzywacz JG , Chen H , Mora DC , & Quandt SA (2014). Work organization and health among immigrant women: Latina manual workers in North Carolina. *American J. Public Health*, 104(12), 2445–2452. 10.2105/AJPH.2013.301587
- Baron SL , Beard S , Davis LK , Delp L , Forst L , Kidd-Taylor A , ... Welch LS (2014). Promoting integrated approaches to reducing health inequities among low-income workers: Applying a social ecological framework. *American J. Ind. Med*, 57(5), 539–556. 10.1002/ajim.22174
- Boiko P , Katon W , Guerra JC , & Mazzoni S (2005). An audiotaped mental health evaluation tool for Hispanic immigrants with a range of literacy levels. *J. Immigr. Health*, 7(1), 33–36. 10.1007/s10903-005-1388-7 [PubMed: 15744475]
- Butler-Dawson J , Galvin K , Thorne PS , & Rohlman DS (2016). Organophosphorus pesticide exposure and neurobehavioral performance in Latino children living in an orchard community. *Neurotoxicol.*, 53, 165–172. 10.1016/j.neuro.2016.01.009
- Buxton OM , Quintiliani LM , Yang MH , Ebbeling CB , Stoddard AM , Pereira LK , & Sorensen G (2009). Association of sleep adequacy with more healthful food choices and positive workplace experiences among motor freight workers. *American J. Public Health*, 99(S3), S636–S643. 10.2105/AJPH.2008.158501
- Buysse DJ , Reynolds CF , Monk TH , Berman SR , & Kupfer DJ (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Res*, 28(2), 193–213. 10.1016/0165-1781(89)90047-4 [PubMed: 2748771]
- Carroll D , Georges A , & Saltz R (2011). Changing characteristics of U.S. farm workers: 21 years of findings from the National Agricultural Workers Survey. Presented at the 2011 Immigration Reform and Agriculture Conference: Implications for Farmers, Farm Workers, and Communities.
- Carroll D , Samardick RM , Bernard S , Gabbard S , & Hernandez T (2005). Findings from the National Agricultural Workers Survey (NAWS) 2001–2002: A demographic and employment profile of United States farm workers. Washington, DC: U.S. Department of Labor.
- Chobanian AV , Bakris GL , Black HR , Cushman WC , Green LA , Izzo JL , ... Wright JT (2003). Seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure. *Hypertension*, 42(6), 1206–1252. 10.1161/01.HYP.0000107251.49515.c2 [PubMed: 14656957]
- Cohen S , Kamarck T , & Mermelstein R (1983). A global measure of perceived stress. *J. Health Soc. Behav*, 24(4), 385–396. 10.2307/2136404 [PubMed: 6668417]

- Conduct Problems Prevention Research Group (1994). Fast track project financial stress questionnaire. Retrieved from <http://www.fasttrackproject.org/technical-reports.php>
- Crain R , Grzywacz JG , Schwantes M , Isom S , Quandt SA , & Arcury TA (2012). Correlates of mental health among Latino farmworkers in North Carolina. *J. Rural Health*, 28(3), 277–285. 10.1111/j.1748-0361.2011.00401.x [PubMed: 22757952]
- Davis KG , & Kotowski SE (2007). Understanding the ergonomic risk for musculoskeletal disorders in the United States agricultural sector. *American J. Ind. Med*, 50(7), 501–511. 10.1002/ajim.20479
- DHHS. (2004). The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure. Bethesda, MD: U.S Department of Health and Human Services, National High Blood Pressure Education Program. Retrieved from <http://www.nhlbi.nih.gov/files/docs/guidelines/jnc7fuU.pdf>
- Early J , Davis SW , Quandt SA , Rao P , Snively BM , & Arcury TA (2006). Housing characteristics of farmworker families in North Carolina. *J. Immigr. Minor. Health*, 8(2), 173–184. 10.1007/s10903-006-8525-1 [PubMed: 16649132]
- Field RJ , & Schulberg D (2011). Social-support moderated stress: A nonlinear dynamical model and the stress buffering hypothesis. *Nonlin. Dynam. Psych. Life Sci*, 15(1), 53–85.
- Finch BK , Frank R , & Vega WA (2004). Acculturation and acculturation stress: A social-epidemiological approach to Mexican migrant farmworkers' health. *Intl. Migration Rev*, 88(1), 236–262. 10.1111/j.1747-7379.2004.tb00195.x
- Flegal KM , Carroll MD , Kit BK , & Ogden CL (2012). Prevalence of obesity and trends in the distribution of body mass index among U.S. adults, 1999–2010. *JAMA*, 307 (5), 491–497. 10.1001/jama.2012.39 [PubMed: 22253363]
- Flores G , & Tomany-Korman SC (2008). Racial and ethnic disparities in medical and dental health, access to care, and use of services in U.S. children. *Pediatrics*, 121(2), e286–e298. 10.1542/peds.2007-1243 [PubMed: 18195000]
- Griffin MA , & Neal A (2000). Perceptions of safety at work: A framework for linking safety climate to safety performance, knowledge, and motivation. *J. Occup. Health Psych*, 5(3), 347–358.
- Grzywacz JG , Alterman T , Gabbard S , Shen R , Nakamoto J , Carroll DJ , & Muntaner C (2014). Job control, psychological demand, and farm-worker health: Evidence from the National Agricultural Workers Survey. *J. Occup. Environ. Med*, 56(1), 66–71. 10.1097/JOM.000000000000025 [PubMed: 24351891]
- Grzywacz JG , Alterman T , Muntaner C , Shen R , Li J , Gabbard S , ... Carroll DJ (2010a). Mental health research with Latino farmworkers: A systematic evaluation of the short CES-D. *J. Immigr. Minor. Health*, 12(5), 652–658. 10.1007/s10903-009-9311-2 [PubMed: 20024622]
- Grzywacz JG , Arcury TA , Marin A , Carrillo L , Coates ML , Burke B , & Quandt SA (2007). The organization of work: Implications for injury and illness among immigrant Latino poultry-processing workers. *Arch. Environ. Occup. Health*, 62(1), 19–26. 10.3200/AEOH.62.L19-26 [PubMed: 18171643]
- Grzywacz JG , Arcury TA , Mora DC , Anderson AM , Chen H , Rosenbaum DA , ... Quandt SA (2012). Work organization and musculoskeletal health: Clinical findings from immigrant Latino poultry processing and other manual workers. *J. Occup. Environ. Med*, 54 (8), 995–1001. 10.1097/JOM.0b013e318254640d [PubMed: 22821071]
- Grzywacz JG , Chatterjee AB , Quandt SA , Talton JW , Chen H , Weir M , & Arcury TA (2011). Depressive symptoms and sleepiness among Latino farmworkers in eastern North Carolina. *J. Agromed*, 16(4), 251–260. 10.1080/1059924X.2011.605722
- Grzywacz JG , Quandt SA , & Arcury TA (2008). Immigrant farmworkers' health-related quality of life: An application of the job demands-control model. *J. Agric. Saf. Health*, 14(1), 79–92. 10.13031/2013.24125 [PubMed: 18376537]
- Grzywacz JG , Quandt SA , Chen H , Isom S , Kiang L , Vallejos Q , & Arcury TA (2010b). Depressive symptoms among Latino farmworkers across the agricultural season: Structural and situational influences. *Cult. Divers. Ethnic Minor. Psych*, 16(3), 335–343. 10.1037/a0019722
- Grzywacz JG , Quandt SA , Vallejos QM , Whalley LE , Chen H , Isom S , ... Arcury TA (2010c). Job demands and pesticide exposure among immigrant Latino farmworkers. *J. Occup. Health Psych*, 15(3), 252–266. 10.1037/a0019303

- Habib RR , Hojeij S , & Elzein K (2014). Gender in occupational health research of farmworkers: A systematic review. *American J. Ind. Med.*, 57(12), 1344–1367. 10.1002/ajim.22375
- Hammer LB , Kossek EE , Yragui NL , Bodner TE , & Hanson GC (2009). Development and validation of a multidimensional measure of family supportive supervisor behaviors (FSSB). *J. Mgmt.*, 55(4), 837–856. 10.1177/0149206308328510
- Hansen E , & Donohoe M (2003). Health issues of migrant and seasonal farmworkers. *J. Health Care Poor Underserved*, 14 (2), 153–164. 10.1353/hpu.2010.0790 [PubMed: 12739296]
- Hemingway MA , & Smith CS (1999). Organizational climate and occupational stressors as predictors of withdrawal behaviours and injuries in nurses. *J. Occup. Org. Psych.*, 72(3), 285–299.
- Hovey JD , & Magaña C (2000). Acculturative stress, anxiety, and depression among Mexican immigrant farmworkers in the midwest United States. *J. Immigr. Health*, 2(3), 119–131. 10.1023/a:1009556802759 [PubMed: 16228745]
- Jex SM (1998). *Stress and job performance: Theory, research, and implications for managerial practice.* Thousand Oaks, CA: Sage Publications.
- Karasek R (1985). *Job content instrument: Questionnaire and user's guide (Rev. 1.1).* Los Angeles, CA: University of Southern California.
- Karasek RA (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Admin. Sci. Qtly.*, 24(2), 285–308. 10.2307/2392498
- Karasek R , Brisson C , Kawakami N , Houtman I , Bongers P , & Amick B (1998). The Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *J. Occup. Health Psych.*, 5(4), 322.
- Kessler RC , Andrews G , Colpe LJ , Hiripi E , Mroczek DK , Normand S-LT , Walters EE , & Zaslavsky AM (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psych. Med.*, 52(6), 959–976.
- Kim-Godwin YS , & Bechtel GA (2004). Stress among migrant and seasonal farmworkers in rural southeast North Carolina. *J. Rural Health*, 20(3), 271–278. 10.1111/j.1748-0361.2004.tb00039.x [PubMed: 15298103]
- Kohout FJ , Berkman LF , Evans DA , & Cornoni-Huntley J (1993). Two shorter forms of the CES-D (Center for Epidemiological Studies Depression) depression symptoms index. *J. Aging Health*, 5(2), 179–193. 10.1177/089826439300500202 [PubMed: 10125443]
- Landsbergis PA , Schnall PL , Warren K , Pickering TG , & Schwartz JE (1994). Association between ambulatory blood pressure and alternative formulations of job strain. *Scandinavian J. Work Environ. Health*, 20(5), 349–363. 10.5271/sjweh.1386
- Letiecq BL , Grzywacz JG , Gray KM , & Eudave YM (2014). Depression among Mexican men on the migration frontier: The role of family separation and other structural and situational stressors. *J. Immigr. Minor. Health*, 16(6), 1193–1200. 10.1007/s10903-013-9918-1 [PubMed: 24142396]
- Loepke RR , Schill AL , Chosewood LC , Grosch JW , Allweiss P , Burton WN , ... Larson PW (2013). Advancing workplace health protection and promotion for an aging workforce. *J. Occup. Environ. Med.*, 55(5), 500–506. 10.1097/JOM.0b013e31829613a4 [PubMed: 23657074]
- Logstein B (2016). Predictors of mental complaints among Norwegian male farmers. *Occup. Med.*, 66(4), 332–337. 10.1093/occmed/kqw019
- Magaña CG , & Hovey JD (2003). Psychosocial stressors associated with Mexican migrant farmworkers in the midwest United States. *J. Immigr. Health*, 5(2), 75–86. 10.1023/a:1022955825650 [PubMed: 14512761]
- Marin AJ , Grzywacz JG , Arcury TA , Carrillo L , Coates ML , & Quandt SA (2009). Evidence of organizational injustice in poultry processing plants: Possible effects on occupational health and safety among Latino workers in North Carolina. *American J. Ind. Med.*, 52(1), 37–48. 10.1002/ajim.20643
- Marin G , Sabogal F , Marin BV , Otero-Sabogal R , & Perez-Stable EJ (1987). Development of a short acculturation scale for Hispanics. *Hispanic J. Behav. Sci.*, 9(2), 183–205. 10.1177/07399863870092005
- McCurdy SA , Samuels SJ , Carroll DJ , Beaumont JJ , & Morrin LA (2003). Agricultural injury in California migrant Hispanic farm workers. *American J. Ind. Med.*, 44(3), 225–235. 10.1002/ajim.10272

- McCurdy SA , Stoecklin-Marois MT , Tancredi DJ , Bennett DH , & Schenker MB (2014). Region of birth, sex, and agricultural work of immigrant Latino farm workers: The MICASA study. *J. Agric. Saf Health*, 20 (2), 79–90. 10.13031/jash.20.10239 [PubMed: 24897916]
- McCurdy SA , Xiao H , Hennessy-Burt TE , Stoecklin-Marois MT , Tancredi DJ , Bennett DH , & Schenker MB (2013). Agricultural injury in California Hispanic farm workers: Micasa follow-up survey. *J. Agromed*, 18(1), 39–49. 10.1080/1059924X.2012.743380
- Mora DC , Grzywacz JG , Anderson AM , Chen H , Arcury TA , Marin AJ , & Quandt SA (2014). Social isolation among Latino workers in rural North Carolina: Exposure and health implications. *J. Immigr. Minor. Health*, 16(5), 822–830. 10.1007/s10903-013-9784-x [PubMed: 23417706]
- Mroczek DK , & Kolarz CM (1998). The effect of age on positive and negative affect: A developmental perspective on happiness. *J. Pers. Soc. Psych*, 75(5), 1333–1349.
- Murphy J , Samples J , Morales M , & Shadbeh N (2015). “They talk like that, but we keep working”: Sexual harassment and sexual assault experiences among Mexican indigenous farmworker women in Oregon. *J. Immigr. Minor. Health*, 17(6), 1834–1839. 10.1007/s10903-014-9992-z [PubMed: 24514945]
- Netemeyer RG , Boles JS , & McMurrian R (1996). Development and validation of work-family conflict and family-work conflict scales. *J. Appl. Psych*, 81(4), 400–410. 10.1037/0021-9010.81.4.400
- Nguyen HT , Quandt SA , Grzywacz JG , Chen H , Galvan L , Kitner-Triolo MH , & Arcury TA (2012). Stress and cognitive function in Latino farmworkers. *American J. Ind. Med*, 55(8), 707–713. 10.1002/ajim.22035
- Ogden CL , Carroll MD , Kit BK , & Flegal KM (2014). Prevalence of childhood and adult obesity in the United States, 2011–2012. *JAMA*, 311(8), 806–814. 10.1001/jama.2014.732 [PubMed: 24570244]
- Ortega AN , Rodriguez HP , & Bustamante AV (2015). Policy dilemmas in Latino health care and implementation of the Affordable Care Act. *Ann. Rev. Public Health*, 36(1), 525–544. 10.1146/annurev-publhealth-031914-122421 [PubMed: 25581154]
- Quandt SA , Brooke C , Fagan K , Howe A , Thornburg TK , & McCurdy SA (2015). Farmworker housing in the United States and its impact on health. *New Solutions*, 25(3), 263–286. 10.1177/1048291115601053 [PubMed: 26320122]
- Rosmann MR (2010). The agrarian imperative. *J. Agromed*, 15(2), 71–75. 10.1080/10599241003630585
- Schill AL , & Chosewood LC (2013). The NIOSH Total Worker Health Program: An overview. *J. Occup. Environ. Med*, 55(12S), S8–S11. 10.1097/jom.0000000000000037 [PubMed: 24284752]
- Snipes SA , Thompson B , O’Connor K , Godina R , & Ibarra G (2007). Anthropological and psychological merge: Design of a stress measure for Mexican farmworkers. *Cult. Med. Psychiatry*, 31(3), 359–388. 10.1007/s11013-007-9054-2 [PubMed: 17955350]
- Spritzer K , & Hays R (2003). *MOS sleep scale: A manual for use and scoring*. Ver. 1.0. Los Angeles, CA: RAND Corporation.
- Thompson FE , Subar AF , Smith AF , Midthune D , Radimer KL , Kahle LL , & Kipnis V (2002). Fruit and vegetable assessment: Performance of two new short instruments and a food frequency questionnaire. *J. American Diet. Assoc*, 102(12), 1764–1772.
- Van der Doef M , & Maes S (1999). The job demand-control (-support) model and psychological well-being: A review of 20 years of empirical research. *Work Stress*, 13(2), 87–114. 10.1080/026783799296084
- Villarejo D , McCurdy SA , Bade B , Samuels S , Lighthall D , & Williams D (2010). The health of California’s immigrant hired farmworkers. *American J. Ind. Med*, 53(4), 387–397. 10.1002/ajim.20796
- Wang Y , & Wang Q (2004). The prevalence of prehypertension and hypertension among U.S. adults according to the New Joint National Committee guidelines: New challenges of the old problem. *Arch. Intern. Med*, 164 (19), 2126–2134. 10.1001/archinte.164.19.2126 [PubMed: 15505126]
- Ware JE , Kosinski M , & Keller SD (1996). A 12-item short-form health survey: Construction of scales and preliminary tests of reliability and validity. *Med. Care*, 34(3), 220–233. 10.1097/00005650-199603000-00003 [PubMed: 8628042]

- Waugh IM (2010). Examining the sexual harassment experiences of Mexican immigrant farmworking women. *Violence Against Women*, 16(3), 237–261. 10.1177/1077801209360857 [PubMed: 20093433]
- Zapata Roblyer MI , Grzywacz JG , Suerken CK , Trejo G , Ip EH , Arcury TA , & Quandt SA (2016). Interpersonal and social correlates of depressive symptoms among Latinas in farmworker families living in North Carolina. *Women Health*, 56(2), 177–193. 10.1080/03630242.2015.1086464 [PubMed: 26327338]

**Table 1.**Demographic characteristics by gender ( $N = 62$ ).

	Men ( $N = 31$ )		Women ( $N = 31$ )	
	% ( $n$ ) <sup>[a]</sup>	Range	% ( $n$ ) <sup>[a]</sup>	Range
Age	<b>40.0 (8.5)</b>	24.0-57.0	<b>37.1 (7.0)</b>	<u>19.0-51.0</u>
40 years	51.6 (16)		67.7 (21)	
>40 years	48.4 (15)		32.3 (10)	
Reads English				
Very well	74.2 (23)		80.7 (25)	
A little	25.8 (8)		19.4 (6)	
Years working in agriculture	<b>20.4 (7.6)</b>	5.0-31.0	<b>8.9 (6.5)</b>	0.0-29.0
Employer pays for at-work injuries <sup>[b]</sup>				
Yes	80.7 (25)		41.4(12)	
No	9.7 (3)		17.2 (5)	
Don't know	9.7 (3)		41.4(12)	
Acculturation (SASH) <sup>[c]</sup>	<b>7.2 (2.2)</b>	5.0-13.0	<b>5.8 (2.3)</b>	5.0-17.0
Financial Stress Score <sup>[d]</sup>	<b>15.2 (5.8)</b>	7.0-32.0	<b>16.3 (6.0)</b>	7.0-27.0

<sup>[a]</sup>Values **in bold** are means (standard deviations shown in parentheses).

<sup>[b]</sup> $N = 60$ ; two women did not work in the previous 12 months.

<sup>[c]</sup>Possible range is 0 to 20; higher scores indicate higher acculturation.

<sup>[d]</sup>Possible range is 5 to 35; lower scores indicate higher strain.

**Table 2.**Personal health characteristics by gender and work demand ( $N = 62$ ).

	Men ( $N = 31$ ),		Women ( $N = 31$ ),	
	% ( $n$ ) <sup>[a]</sup>		% ( $n$ ) <sup>[a]</sup>	
	Low Work Demand	High Work Demand	Low Work Demand	High Work Demand
Body mass index <sup>[b]**</sup>	<b>29.1 (4.7)</b>	<b>28.6 (4.5)</b>	<b>31.4 (6.0)</b>	<b>30.9 (6.0)</b>
Underweight	0.0 (0)	6.5 (2)	0.0 (0)	3.6 (1)
Normal	16.1 (5)	19.3 (6)	10.7 (3)	14.3 (4)
Overweight	54.8 (17)	48.4 (15)	35.7 (10)	28.6 (8)
Obese	29.0 (9)	25.8 (8)	53.6 (15)	53.6 (15)
Blood pressure <sup>[c]</sup>				
Normal	45.2 (14)	35.5 (11)	71.4 (20)	71.4 (20)
Pre-hypertension	38.7 (12)	51.6 (16)	17.9 (5)	28.6 (8)
Hypertension	16.1 (5)	12.9 (4)	10.7 (3)	0.0 (0)
Self-reported health <sup>[d]</sup>				
Physical health score *	<b>50.4 (5.4)</b>	<b>50.6 (5.9)</b>	<b>46.8 (7.0)</b>	<b>47.7 (6.7)</b>
Mental health score *	<b>47.0 (7.4)</b>	<b>47.6 (6.9)</b>	<b>44.1 (8.6)</b>	<b>42.8 (7.9)</b>
Sleep <sup>[d]</sup>				
Disturbance **	<b>29.2 (21.5)</b>	<b>25.1 (22.8)</b>	<b>38.3 (25.5)</b>	<b>31.4 (21.7)</b>
Snoring	<b>34.2 (37.7)</b>	<b>39.3 (30.9)</b>	<b>33.5 (32.4)</b>	<b>42.0 (37.6)</b>
Sleep problems index I	<b>28.6 (18.4)</b>	<b>29.3 (15.8)</b>	<b>34.0 (18.0)</b>	<b>30.8 (16.3)</b>
Sleep problems index II	<b>31.1 (17.6)</b>	<b>29.4 (15.4)</b>	<b>36.5 (19.1)</b>	<b>32.3 (16.0)</b>
Drinks with added sugar <sup>[d]</sup>				
Once a day or more	58.1 (18)	83.9 (26)	64.5 (20)	93.5 (29)
Fast food <sup>[d]</sup>				
Once a day or more	74.2 (23)	79.3 (23)	45.2 (14)	76.7 (23)

<sup>[a]</sup>Values **in bold** are means (standard deviations shown in parentheses). Asterisks indicate significant differences (<0.05): \* = significant difference by gender, and \*\* = significant difference by work demand.

<sup>[b]</sup>BMI classification: underweight = <18.5, normal = 18.5 to 24.9, overweight = 25.0 to 29.9, and obese = 30.0. Three were women excluded due to pregnancy. For low work demand: men = 31, and women = 28. For high work demand: men = 31, and women = 28.

<sup>[c]</sup>Three women were excluded due to pregnancy. Blood pressure classification based on DHHS (2004).

<sup>[d]</sup> $N = 59$  because three participants did not take the Short-Form Health Survey (SF-12), Sleep Survey, or Buxton Fat and Sugar Questionnaire during high work demand.



**Table 3.**Psychoical and occupational characteristics by gender and work demand ( $N = 62$ ).

Characteristic <sup>[a]</sup>	Men ( $N = 31$ ),		Women ( $N = 31$ )		Scale Range (not range of scores)
	Mean (SD)		Mean (SD)		
	Low Work Demand	High Work Demand	Low Work Demand	High Work Demand	
Depressive symptoms <sup>[b]</sup>	6.0 (5.7)	6.2 (5.5)	7.4 (5.7)	7.3 (4.7)	0-30
Perceived stress <sup>[b]</sup>	13.5 (5.6)	14.8 (7.4)	15.6 (5.9)	15.3 (4.4)	0-40
Mexican farmworker stress <sup>[b]</sup>	48.2 (17.5)	46.2 (14.6)	49.2 (13.0)	46.3 (10.0)	23-115
Work to family conflict <sup>[c]*</sup>	10.0 (4.5)	10.9 (4.0)	14.0 (5.4)	13.6 (4.8)	5-25
Family to work conflict <sup>[c]*</sup>	8.7 (2.9)	8.4 (2.5)	9.6 (3.4)	11.0 (3.7)	5-25
Decision latitude (control) <sup>[c]</sup>	72.1 (13.3)	74.1 (17.7)	65.9 (12.0)	63.1 (18.1)	24-96
Decision authority <sup>[c]</sup>	31.5 (9.4)	34.7 (9.4)	32.8 (6.4)	29.3 (9.3)	12-48
Landsbergis job strain	0.38 (0.15)	0.43 (0.16)	0.49 (0.17)	0.53 (0.15)	0-1
Psychological job demand <sup>[c]</sup>	26.9 (8.4)	31.0 (10.5)	31.8 (9.2)	32.3 (8.8)	12-48
Coworker support <sup>[c]</sup>	15.2 (3.3)	14.7 (3.9)	15.0 (3.5)	13.8 (3.7)	4-20
Supervisor support <sup>[c]*</sup>	17.7 (3.0)	16.2 (2.7)	14.8 (4.3)	15.4 (2.9)	4-20

<sup>[a]</sup>An asterisk (\*) indicates significant difference by gender ( $<0.05$ ).

<sup>[b]</sup> $n = 59$  during high work demand; three participants (two men and one woman) did not complete the CESD, PSS, MFSS, or injury questions.

<sup>[c]</sup> $n = 60$  during low work demand;  $n = 51$  during high work demand.