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Associations of eldercare and competing demands with health and work outcomes among manufacturing workers

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ABSTRACT

Employees juggling eldercare and work report work–family conflicts and poor health-related outcomes, but little is known about eldercare demands (ECDs) in the context of competing demands in the manufacturing workforce. This study determines how ECDs vary by age, gender, income, and job category, and how ECDs and competing demands are associated with health-related and work-related outcomes, among manufacturing workers. Employees from six manufacturing companies completed questionnaires. ECDs were defined as providing assistance to an adult aged 65 and older due to disability or chronic illness; those with ECDs were asked how many care-hours per week and whether assistance included personal care. Workers over age 45 were more likely than younger workers to report ECDs. After adjusting for competing demands and socio-demographic characteristics, ECDs were associated with greater depressive symptoms and family-to-work conflict (FWC), providing 5 or more hours of eldercare weekly was associated with greater depressive symptoms, and providing personal care was associated with greater FWC.

RESUMEN

Los empleados quienes tratan de mantener un equilibrio entre el cuidado de personas de edad avanzada y el trabajo reportaron conflictos entre el trabajo y vida familiar y también reportaron problemas relacionadas con la salud. Sin embargo poco se conoce acerca de las demandas relacionadas con el cuidado de personas de edad avanzada (DCAs) en el contexto de exigencias contrapuestas en la fuerza laboral de empresas manufactureras. Este estudio determina como las demandas relacionadas con el cuidado de personas de edad avanzada (DCAs) varía de acuerdo a edad, género, ingreso (sueldo), tipo de trabajo. Así como también, las demandas relacionadas con el cuidado de personas de edad avanzada (DCAs) y las exigencias contrapuestas están asociadas con problemas relacionados con la salud y el trabajo entre los empleados de manufacturas. Los empleados de seis diferentes empresas manufactureras completaron cuestionarios. Las demandas relacionadas con el cuidado de personas de edad avanzada (DCAs) fueron definidas como tales; proveyendoasistencia a un adulto mayor de 65 años y más deberse

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a eseabilidad o enfermedad crónica; los empleados con demandas relacionadas con el cuidado de personas de edad avanzada (DCAs) respondieron preguntas respecto a cuantas horas de cuidado dedicaron por semana y si la asistencia incluía cuidado personal. Comparado con los empleados jóvenes, los empleados de más de 45 años eran más propensos de reportar demandas relacionadas con el cuidado de personas de edad avanzada (DCAs). Después de controlar por exigencias contrapuestas y características socio-demográficas, las demandas relacionadas con el cuidado de personas de edad avanzada fueron asociadas con alto índice de síntomas depresivos y conflictos de trabajo-vida familiar (CTF). Los empleados proveyendo 5 o más horas de cuidado al adulto mayor semanalmente fueron asociados con alto índice de síntomas depresivos. Por lo siguiente, los empleados proveyendo cuidado personal fueron asociados con alto reportaje de conflictos de trabajo-vida familiar (CTF).

Over 40 million Americans are aged 65 and older today (13% of population), and by 2030 this will increase to nearly 73 million (20% of population; U.S. Census Bureau, 2014). The accumulation of chronic and disabling health conditions often leads older adults to require help in activities of daily living. Two-thirds of older adults who receive care at home receive all care from family members, mostly wives and adult daughters (Feinberg, 2014). The majority of family caregivers are employed; 57% of family caregivers in a national U.S survey reported that they were currently employed, either full-time (46%) or part-time (11%) (National Alliance for Caregiving and AARP, 2009). This situation is by no means restricted to the US; employers in England are increasingly under pressure to develop policies to support family caregivers in the workplace (Bernard & Phillips, 2007).

Eldercare demands (ECDs) on employed individuals are associated with increased absenteeism, employee turnover, work interruptions, requests for unpaid leave, and status change from full- to part-time work (National Alliance for Caregiving and AARP, 2004). Employees caring for an older family member with disabilities are 29% more likely than non-caregivers to experience wage or income loss (Earle & Heymann, 2012). Estimated personal health care costs for employees with ECDs amount to an excess of $13.4 billion per year for all US employers (MetLife Mature Market Institute, 2010). Yet most employers have no supportive policies in place for employees with ECDs, and many employers not favor introducing such policies (Katz, Lowenstein, Prilutzky, & Halperin, 2011; Wagner & Neal, 1994). The prevalence and consequences of ECDs in the workforce, therefore, appear to be highly relevant to employers concerned with maximizing productivity and minimizing health care costs of their employees.

Unlike childcare responsibilities, ECDs often arise unexpectedly and become increasingly laborious over time (Azarnoff & Scharlach, 1988). ECDs can require considerable time and effort (Gordon, Pruchno, Wilson-Genderson, Murphy, & Rose, 2012). Informal caregivers have been termed the 'shadow workforce', because ECDs are often equivalent in intensity to a paid job (Bookman & Harrington, 2007). In addition to one's job, ECDs must be juggled with other outside-work responsibilities such as childcare (Solberg, Solberg, & Peterson, 2014). However, few studies have focused on the association between caregiving hours and health-related or work-related outcomes (Gordon & Rouse, 2013; Gordon

et al., 2012) and there is little research differentiating types of eldercare provided by employed individuals (e.g. personal care such as feeding, toileting vs. non-personal care such as transportation, financial assistance; Rosenthal, Martin-Matthews, & Keefe, 2007).

This paper analyzes data from the manufacturing sector (see Methods) and thus addresses ECD issues that are particularly salient in this sector. Manufacturing-sector employees may find ECDs physically and psychologically challenging, given their labor-intensive jobs (e.g. physical exertion, repetitive motion, and lifting requirements), long and/or variable work hours (due to overtime and changing shifts), and limited schedule control (Gerr et al., 2014; NORA Manufacturing Sector Council, 2010). Workers also face a more intense workload as lean production methods have become the norm in recent years, with more output being produced by fewer workers. This may be especially challenging as the manufacturing sector has an aging workforce (Manufacturing Institute, 2013). Workers in this sector also tend to be middle-class, and may not be able to afford independent living or residential care services for their elders, compared to employees of higher socioeconomic status (Bookman & Kimbrel, 2011). A deeper understanding of ECDs in the manufacturing sector is important because, despite recent losses since the 1990s, 12 million Americans (9% of the workforce) are still employed in manufacturing and the sector is expanding once again: in 2014, employment in the US manufacturing sector grew by 1.6% (U.S. Bureau of Labor Statistics, 2015).

In this paper, we use conservation of resources (COR) theory (Hobfoll, 1989) to advance our understanding of the impact of ECDs on health-related and work-related outcomes in a cohort of manufacturing-sector employees. COR theory is an excellent framework for explaining how the combination of ECDs and paid work is problematic for employees, due to the distress of not having enough personal resources (time and energy) to fulfill all of their life demands (Gordon et al., 2012; Zacher, Jimmieson, & Winter, 2012). Specifically, job demands can drain the same physical and psychological resources that are drained by ECDs. Thus, when the cumulative and competing demands of work and eldercare tax peoples' available resources, they may experience distress and adverse health-related and work-related outcomes.

ECDs and health-related outcomes

Given the difficulties associated with ECDs for working adults, the link between caring for an older disabled or chronically ill adult and poor caregiver well-being has been described as ranging from fatigue to pain symptoms and depression (Duxbury, Higgins, & Smart, 2011; Pinquart & Sörensen, 2003). In a study at a large US-based multi-national manufacturing company, numerous health-related differences were found between employees with and without ECDs; those with ECDs showed a higher prevalence of depression, diabetes, hypertension, and pulmonary disease, regardless of age or sex. They were also more likely to report fair/poor health or having deferred getting preventive medical care. Female employees with ECDs, as compared to without ECDs, reported more home stress (MetLife Mature Market Institute, 2010).

ECDs and work-related outcomes

Although the relationship between ECDs and caregiver health is well-established, there is a smaller body of research linking eldercare with work-related consequences, and less consensus among researchers about these outcomes (Calvano, 2013). Employees' ECDs have been self-reported as negatively associated with work performance, mainly due to psychological stress and strain (Kim, Ingersoll-Dayton, & Kwak, 2013). Caregiving can also compromise workers' functioning through absence, interruptions, tardiness, and leaving work early to fulfill caregiving obligations (Katz et al., 2011; Kim et al., 2013). However, some research shows that the negative relationship between eldercare and productivity is not universal across situations, because it may be buffered by contextual factors such as organizational support and eldercare task satisfaction (Zacher et al., 2012; Zacher & Winter, 2011).

One important work-related outcome associated with ECDs is interference between family and work. Relationships between the work and family spheres have been studied from the perspective of work demands conflicting with family functioning (work-to-family conflict, WFC) and family demands conflicting with work functioning (family-to-work conflict, FWC; Frone, Russell, & Cooper, 1992). ECDs are linked to FWC (Lee, Foos, & Clow, 2010) and caregiving interference with work (Gordon et al., 2012).

Organizational support for work–family balance has been positively associated with job satisfaction and negatively associated with WFC in male hourly manufacturing workers; it ameliorated the effects of working long hours, regardless of the number of a worker's caregiving roles (Grandey, Cordeiro, & Michael, 2007). One recent study found that family caregivers of older adults were more likely to report reduced levels of stress when their employers offered a greater degree of workplace flexibility and when they took advantage of these flexibility policies (Brown & Pitt-Catsouphes, 2015). Gaps in the work–family literature suggest a need for more detailed research focusing specifically on eldercare as it relates to work and family conflict, and on manufacturing-sector workers.

Socio-demographic factors and competing demands

Age and gender are important socio-demographic variables that have been associated with increased ECDs. Older caregivers report poorer health and greater physical strain than younger caregivers (National Alliance for Caregiving and AARP, 2009), and often report dissatisfaction with work–life balance due in part to having ECDs (Uriarte-Landa & Hébert, 2009). Although men are increasingly taking on ECDs (Barrah, Baltes, Shultz, & Stolz, 2004), two-thirds of caregivers are female (National Alliance for Caregiving and AARP, 2009). Female caregivers provide more hours of care, have more burdensome caregiving situations, and provide more labor-intensive tasks (dressing and bathing) than do their male counterparts. Women caregivers also report higher stress, declining health, and resulting losses to their work and financial situations (reduced work hours, change to less demanding jobs, workforce departure, and lost benefits).This difference is mainly attributed to the way gender is socially constructed in the family domain; women are still pressured to perform the traditional role of caregiver to dependent family members in spite of their changed role and more equitable status with men in the work domain (Dugan, 2010; Dugan & Magley, 2010). Moreover, women provide more intense physical and emotional

forms of caregiving than men, regardless of their income, employment status, and family structure (Duxbury et al., 2011).

Matters of social equity should also be considered when attempting to understand the relationship between eldercare and work. For example, socioeconomic status can influence who provides eldercare. Families with greater financial resources can afford paid formal eldercare services, while middle-class working families often resort to informal solutions for eldercare (Bookman & Kimbrel, 2011). As household income rises, use of paid services to meet ECDs increases (National Alliance for Caregiving and AARP, 2009). There also may be differences among workers with production jobs on the shop floor ('blue collar' jobs) and those in administrative office jobs ('white collar' jobs of managers, sales, and administrative staff). Within the same manufacturing companies, these job categories differ in terms of social status, work schedules, levels of autonomy, and biomechanical and psychosocial demands, and are likely to impact health-related and work-related outcomes differently.

Finally, it is important to recognize that physical and psychological demands in the workplace place additional drains on the same finite resources that ECDs draw from, as well as simultaneous child care demands that often compete for the same time and physical/psychological energy resources (DeRigne & Ferrante, 2012; Solberg et al., 2014). Thus it important to account for the impact of physical and psychological job demands and child care on outcomes, as distinct from that of ECDs.

Paper purpose and hypotheses

Knowledge gaps remain about employed caregivers (Lero & Lewis, 2008), especially regarding ECDs as a source of WFC and stress, because the voluminous research on work–family interface is heavily dominated by a focus on childcare (Gordon, Whelan-Berry, & Hamilton, 2007; Kim et al., 2013; Lee et al., 2010). This paper expands the eldercare research by exploring how two situational factors impact caregiver outcomes: caregiving hours, and care type. Given the theoretical underpinnings of our study, we consider the cumulative effect of life demands on health-related and work-related outcomes, assessing the unique impact of ECDs in light of competing demands (physical/psychological job demands and childcare demands).

Moreover, because workers in the manufacturing sector are an understudied population in the eldercare and work–family literatures, our study objectives were to: (1) determine how ECDs vary by age, gender, income level, and job category among manufacturing-sector employees, and (2) understand the influences of ECDs and competing demands on health-related and work-related outcomes among manufacturing-sector employees. The following study hypotheses were tested adjusting for socio-demographic factors and competing demands.

Hypothesis 1a: Employees with ECDs will report poorer health-related outcomes (self-reported health status and depressive symptoms) than employees with no ECDs.

Hypothesis 1b: Employees providing the greatest number of hours per week of eldercare will report the poorest health-related outcomes.

Hypothesis 1c: Employees providing personal care assistance to elders will report the poorest health-related outcomes.

Hypothesis 2a: Employees with ECDs will report poorer work-related outcomes (FWC and work stress) than employees with no ECDs.

Hypothesis 2b: Employees providing the greatest number of hours per week of elder-care will report the poorest work-related outcomes.

Hypothesis 2c: Employees providing personal care assistance to elders will report the poorest work-related outcomes.

These study hypotheses are grounded in COR theory, which, as noted above, posits that overloaded demands due to multiple responsibilities in life can drain one's personal resources, leading to adverse outcomes (Gordon et al., 2012; Zacher et al., 2012).

Method

Study setting and sample

This study is part of a longitudinal study, conducted in six medium-sized (ranging from 175 to 525 employees) Connecticut skilled light manufacturing companies. The parent study was designed to measure changes over time in musculoskeletal, psychosocial, and work-related variables related to aging in the manufacturing sector. The full study protocol was approved by the Institutional Review Board at the University of Connecticut Health Center. Details of company identification and study procedures within each company are published elsewhere (Cherniack, Dussetschleger, Farr, & Dugan, 2015). Briefly, eligibility criteria for site selection included medium company size, a broad age distribution centered on the late fifth and sixth decades, and a work-force engaged in skilled light manufacturing with high degrees of repetition. Companies were excluded for having age-based or other policies forcing retirement or with a history of poor employee retention, based on documentation of employee turnover for the previous five years. Four of the six participating companies were unionized. See Cherniack et al. (2015) for company differences in overtime, work hours, work organization, and benefits.

Consenting employees at sites completed self-administered paper-and-pencil questionnaires at three time points (T1 through T3, 12–18 months apart). Questionnaires were administered by research staff on-site during work hours, and participants received a small financial incentive for completion. There were no exclusion criteria for individual participants. All employees at selected sites were eligible to participate in the study. Response rates ranged from 29% to 52%; despite assurances by research staff about confidentiality, many employees who did not participate cited concern about their employers having access to their personal information. Employees of all job classifications were invited to participate, including office managers, production, sales, and administrative staff. The cross-sectional data used in this paper were collected at T3, because eldercare questions were only included in T2 and T3 surveys, and at Time 3 we had the most complete set of data. This is due to the open enrollment and replacement design of the study, which allowed new participants to join the study at each interval of data collection. T3 corresponds to the time period July 2012 through August 2013.

A total of 857 employees completed T3 questionnaires. Table 1 summarizes sample characteristics. The population was predominately male (73%), white (80%), and married/partnered (70%). Mean age was 48.4 years old (SD = 11.1). About a third of the

Table 1. Sample characteristics ($n = 857$).

	Percentage or mean (SD)
Age group	
<45 years old	34.2
45–54 years old	32.6
≥55 years old	33.3
Gender (% Male)	72.8
Annual family income	
<$75,000	36.3
$75,000–99,999	25.0
≥$100,000 and over	38.7
Job category (% Administrative)	40.1
Childcare demands (% Yes)	38.2
Psychological job demands[a]	2.5 (0.5)
Physical job demands[b]	2.0 (0.7)
Eldercare demands (% Yes)	12.8
Hours of eldercare provided	
1–4 hours	6.4
≥5 hours	6.4
Type of eldercare provided	
Non-personal care	10.0
Personal care	2.5
Self-rated health	3.0 (0.8)
Depressive symptoms[c]	4.0 (4.1)
Family–work conflict[d]	1.5 (0.5)
Work stress	2.0 (1.0)

Notes: Percentages, means, and standard deviations listed were calculated by excluding missing cases.
[a]Scale $\alpha = .71$.
[b]Scale $\alpha = .90$.
[c]Scale $\alpha = .80$.
[d]Scale $\alpha = .69$.

sample fell into each of the age groups and each of the income level categories. Sixty percent worked in production jobs. Thirty-eight percent had childcare demands and 13% had ECDs. Among those with ECDs, one-half provided 1–4 hours of care weekly and the other half provided ≥5 hours of care weekly; most provided non-personal care. Respondents had moderate psychological job demands and moderate-to-low physical job demands. Respondents reported good health, few depressive symptoms, low FWC, and moderate work stress. Coefficient alphas for all measures showed acceptable internal consistency (ranging from .69 to .92).

Measures

All variables for this study were constructed from survey responses.

Socio-demographic variables included age group (<45, 45–54, and ≥55 years), gender, family income level (< $75,000, $75,000–99,999, ≥$100,000), and job category (production and administrative). Age groups were chosen to distinguish older workers (55 and older) from younger workers, and younger workers were further subdivided so that roughly equal numbers were in each age group. The cut point of age 55 to define older workers is common but not universal (Hwalek, Straub, & Kosniewski, 2008). Family income categories were grouped so that roughly one-third of the sample was in each category.

ECDs were measured in three distinct ways. First, having ECDs was determined from the question: 'How many adults age 65 and older depend on you in any way to help

them due to disability or chronic illness?' Respondents checking≥1 were defined as having ECDs. This operational definition was intentionally meant to be as inclusive as possible of ECDs, while inquiring about help provided to older adults with disability or chronic illness. Our eldercare question was more explicit than that used in a MetLife (2010) survey: 'Are you responsible for taking care of an elderly relative or friend?', in that we defined 'elderly' as age ≤ 65. Second, respondents with ECDs were asked the number of hours per week they provided eldercare (Gordon et al., 2012); categories of 1–4, 5–9, 10–19, and ≥20 hours were included as response options. Third, eldercare providers were asked the types of care provided, with personal care (e.g. bathing and dressing) distinguished from non-personal care (e.g. household chores, transportation; Rosenthal et al., 2007).

Competing demands

As discussed, we included competing demands in our analyses to ascertain, above and beyond other work and home demands that drain workers' personal resources, the effect that ECDs have on health and work outcomes.

Childcare demands were measured by the question: 'How much responsibility do you personally have for any children under 18 in your household?' Respondents checking that they had primary or shared responsibility were defined as having childcare demands.

Psychological and physical job demands were assessed with subscales from the Job Content Questionnaire (Karasek, Pieper, & Schwartz, 1985). Both subscales have four items and ask respondents whether items describe their jobs using a response scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). A sample item from the Psychological Job Demands subscale is: 'My job requires working very hard.' A sample item from the Physical Job Demands subscale is: 'My work requires rapid and continuous physical activity.'

Dependent variables

We assessed two health-related outcomes. The single-item *self-rated health status* measure was drawn from the SF-12 question: 'In general, would you say your health is … ' originally created for the Medical Outcomes Study, a longitudinal study of patients with chronic illnesses (Tarlov et al., 1989; Ware & Sherbourne, 1992). Response options ranged on a 5-point scale from 1 (*poor*) to 5 (*excellent*). Single-item measures of health such as this one have been shown in research to have strong correlations with physician-assessed health and objective outcomes (e.g. mortality and hospitalization); they are commonly used in epidemiological and other health research (Bird & Fremont, 1991; Ferraro & Kelley-Moore, 2001; Fisher, Matthews, & Gibbons, 2015; Murata, Kondo, & Tamakoshi, 2006; Verbrugge, 1989). The *depressive symptoms* measure used was an 8-item version of the CES-D scale, which has excellent internal consistency and test–retest reliability in surveys of the adult population (Radloff, 1977; $\alpha = .80$). The measure lists symptoms of depression and asks respondents to rate how often they experience each on a 4-point scale from 0 (*rarely or none of the time*) to 3 (*all of the time)*. A score was calculated by summing ratings across the items.

We also assessed two work-related outcomes. Questions on family and work conflict were based on those from the National Comorbidity Study (Kessler, 2008). *Family–work conflict* was based on two questions, 'How often do things going on at home make you feel tense and irritable on the job' and 'How often do the demands of your family interfere with your work on the job?' Response options ranged on a 4-point scale from 1 (*never*) to 4 (*always*). Frone (2000) used this measure and reported an alpha coefficient of .67. *Work stress* was measured with a single-item, modeled on a question in the NIOSH Quality of WorkLife module of the General Social Survey: 'In the past year, how would you rate the average amount of stress at work?' Response options ranged on a 5-point scale from 0 (*no stress*) to 4 (*extreme stress*).

Data analyses

Hypotheses 1a and 2a analyses were conducted using hierarchical multiple regression analysis. The dependent variables used in four separate hierarchical regression models were self-rated health, depressive symptoms, FWC, and work stress. The predictor variable was ECDs (dummy coded in two categories: yes and no [reference group]). For each equation, socio-demographic variables were entered in the first step (age group, gender, income level, and job category), competing demands were entered in the second step (childcare demands, psychological job demands, and physical job demands), and the eldercare variable was entered in the third step. We sequentially entered blocks of variables in this fashion so that we could examine the unique variance explained by ECDs after adjusting for socio-demographic variables and competing demands, per COR theory. A significant R^2 change at the third step indicated support for the hypothesis.

Analyses for Hypotheses 1b, 2b, 1c, and 2c were all tested in the same fashion. Variables entered in the first and second steps were the same, but the predictor variable entered at the third step of 1b and 2b was eldercare hours (dummy coded as three categories:≥5 hours, 1–4 hours, and no ECDs [reference group]). Hourly categories of 5–9, 10–19, and≥20 hours were combined into the single category of≥5 hours because only 20 respondents reported providing care for≥10 hours. To test Hypotheses 1c and 2c, the predictor variable entered at the third step was eldercare type (dummy coded as three categories: personal care, non-personal care, and no ECDs [reference group]).

We considered a p value of $< .05$ as statistically significant. Sample sizes in our analyses vary slightly because of missing data.

Results

We used chi square tests to evaluate differences in ECDs by sample age, gender, family income level, and job category. Table 2 shows how ECDs were distributed by age, gender, income level, and job category. ECD prevalence varied by age group ($p < .001$), although the observed difference was between employees aged under 45 (7%) and those 45 or older (16%). The percentage of participants with ECDs did not significantly differ by gender, although there was a trend toward more females reporting ECDs than males ($p = .09$). Eldercare prevalence did not vary by income level or job category.

Table 2. Eldercare demands by sample age, gender, family income level, and job category.[a]

	Eldercare demands *N* (%)	No eldercare demands *N* (%)	Totals
Age group*			
Under 45 years old	19 (7)	257 (93)	276
45–54 years old	43 (16)	222 (84)	265
Over 55 years old	42 (16)	228 (84)	270
Totals	104 (13)	707 (87)	811
Gender			
Female	34 (16)	179 (84)	213
Male	68 (11)	524 (89)	592
Totals	102 (13)	703 (87)	805
Family income level			
Under $75,000	40 (14)	244 (86)	284
$75,000–99,999	20 (10)	176 (90)	196
$100,000 and over	41 (13)	266 (87)	307
Totals	101 (13)	686 (87)	787
Job category			
Production worker	49 (11)	382 (89)	431
Administrative worker	42 (15)	246 (85)	288
Totals	91 (13)	628 (87)	719

[a]Sample sizes vary due to missing data; row percentages compared.
*$p < .001$ per chi square analysis.

Prior to multivariate analyses, we inspected bivariate relationships between each ECD variable and each outcome. Results based on Spearman's correlation coefficients, used due to the ordinal nature of eldercare variables, revealed that respondents with ECDs reported more depressive symptoms, greater FWC, and greater work stress than respondents without ECDs (coefficients ranged from 0.11 to 0.14, all $p < .01$). More hours per week providing eldercare was associated with the same outcomes in the same manner (coefficients ranged from 0.10 to 0.14, all $p < .01$). Respondents providing personal care were more likely than those providing non-personal care or no eldercare to report outcomes in the same pattern (coefficients ranged from 0.11 to 0.14, all $p < .01$).

Table 3 summarizes stepwise regression models testing Hypotheses 1a and 2a in which health-related and work-related outcomes were dependent variables and the predictor was whether or not participants had ECDs. ECDs were associated with depressive symptoms ($\beta = .11$, $p < .01$) and FWC ($\beta = .10$, $p < .01$); in both models, the eldercare variable block added a small but significant amount of variance after accounting for variance explained by socio-demographic and competing demands blocks. ECDs were not independently associated with self-rated health or work stress. In the self-rated health model, respondents with the highest family income reported better self-rated health than those with the lowest income, and those with greater physical job demands reported the worst self-rated health. In the depressive symptoms model, respondents with highest family income reported fewer depressive symptoms than those with lowest income, while those with greater psychological job demands and physical job demands reported more depressive symptoms. In the FWC model, the oldest respondents reported lower conflict than the youngest respondents, and those with greater psychological job demands reported more FWC. In the work stress model, oldest workers reported more work stress than the youngest respondents, while psychological job demands were strongly and positively associated with work stress. Because the first two blocks of predictors (see Steps 1 and 2 of Table 3) are identical in all models, the regression coefficients are

Table 3. Stepwise regression analyses evaluating eldercare demands as a predictor of health-related (H1a) and work-related (H2a) outcomes.

		Health-related outcomes				Work-related outcomes			
		Self-rated health		Depressive symptoms		Family–work conflict		Work stress	
	Predictor	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Step 1:	Socio-demographic variables		.05***		.03**		.01		.03**
	Age 45–54 years old	−.07		.00		−.05		.06	
	Age ≥55 years old Reference: <45 years old	−.06		.04		−.09*		.10**	
	Male gender Reference: female gender	−.02		−.02		.00		.00	
	Family income $75,000–$99,999	.02		−.07		.07		−.02	
	Family income ≥$100,000 Reference: Family income <$75,000	.17***		−.16**		.02		.03	
	Administrative workers Reference: Production Workers	−.07		−.01		.00		.08*	
Step 2:	Competing demands		.03***		.04***		.02*		.27***
	Childcare demands	−.03		.04		.05		.04	
	Psychological job demands	−.01		.16***		.08*		.53***	
	Physical job demands	−.18***		.11*		.06		−.02	
Step 3:	Any eldercare demands		.00		.01**		.01**		.00
	Has eldercare demands Reference: Has no eldercare demands	−.04		.11**		.10**		.04	

Note: $N = 673–689$. A significant R^2 change at this step in the regression equation indicates significant for this block of variables.
*$p < .05$.
**$p < .01$.
***$p < .001$ (two-tailed).

nearly identical in all three tables, with minor deviations due to different sample sizes. For this reason, we only present the results of Steps 1 and 2 once (in Table 3); Tables 4 and 5 only include the results of Step 3 from their respective regression models.

Table 4, testing Hypotheses 1b and 2b, shows stepwise regression results in models with the same dependent variables and the same socio-demographic and competing

Table 4. Stepwise regression analyses evaluating eldercare hours as a predictor of health-related and work-related outcomes (H1b and H2b).

		Health-related outcomes				Work-related outcomes			
		Self-rated health		Depressive symptoms		Family–work conflict		Work stress	
	Predictor	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Step 3:	Number of eldercare hours/week		.00		.01*		.01		.00
	Provides 1–4 hours of eldercare/week	.00		.03		.06		.00	
	Provides ≥5 hours of eldercare/week Reference: Has no eldercare demands	−.04		.11**		.08*		.03	

Note: $N = 703–719$. A significant R^2 change at this step in the regression equation indicates significant for this block of variables.
*$p < .05$.
**$p < .01$.

Table 5. Stepwise regression analyses evaluating eldercare type as a predictor of health-related and work-related outcomes (H1c and H2c).

		Health-related outcomes				Work-related outcomes			
		Self-rated health		Depressive symptoms		Family–work conflict		Work stress	
	Predictor	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Step 3:	Eldercare type		.00		.01*		.01*		.00
	Provides non-personal care	−.04		.07		.06		.01	
	Provides personal care	.00		.07		.10*		.05	
	Reference: Has no eldercare demands								

Note: $N = 703$ and 717. A significant R^2 change at this step in the regression equation indicates significant for this block of variables.
*$p < .05$.
**$p < .01$.
***$p < .001$ (two-tailed).

demands predictors, with the ECD predictor variable being number of hours per week providing eldercare. Respondents providing eldercare for ≥5 hours reported more depressive symptoms than respondents with no ECDs ($\beta = .11$, $p < .01$); however, providing eldercare for <5 hours did not have an independent significant influence on depressive symptoms, compared to not having ECDs. Providing ≥5 hours of eldercare was also associated with greater FWC, compared to not having ECDs ($\beta = .08$, $p < .05$). No relationships were found between number of hours providing eldercare and self-rated health or work stress.

Table 5, testing Hypotheses 1c and 2c, summarizes how ECD type, measured as providing personal or non-personal care, compared to providing no eldercare, affects outcome variables after adjusting for socio-demographic factors and competing demands. Providing personal care was associated with greater FWC ($\beta = .10$, $p < .05$), compared to not having ECDs. Additionally, providing both personal care ($\beta = .07$, $p = .063$) and non-personal care ($\beta = .07$, $p = .054$) were marginally associated with greater depressive symptoms, compared not having ECDs. This eldercare variable block explained a small but significant amount of variance in depressive symptoms. Conversely, neither regression coefficient for the two eldercare type categories was significant in predicting self-rated health or work stress.

Discussion

This study examined effects of ECDs on health-related and work-related outcomes in a cohort of light manufacturing-sector workers employed in medium-sized companies. Guided by the COR theoretical model, we hypothesized that study participants with ECDs would report lower self-rated health, more depressive symptoms, greater FWC and greater job stress. Independent effects of ECDs were observed after accounting for variance explained by socio-demographic variables, and by variables representing competing life demands. Several findings related to hypotheses are noteworthy.

First, having ECDs, compared to not having such demands, was positively associated with depressive symptoms and FWC, but not with self-rated health or work stress (Table 3). Second, providing 5 or more hours per week of eldercare, compared to providing no eldercare, was also associated with increased depressive symptoms and FWC (Table 4). Third, providing personal care to elders, compared to providing no eldercare, was associated with greater FWC, but not with any other outcomes (Table 5).

Consistent with COR theory, these results can be interpreted to suggest that workers in the light manufacturing sector feel greater conflict between family and work responsibilities when ECDs are added to other competing demands. Demands associated with caring for elders with chronic illness and disability can overwhelm workers who are expected to retain productive work patterns on the job. However, we did not find that ECDs were associated with work stress, suggesting that the contribution of ECD to family-related conflict affected their work on the one hand, but work stress per se was not influenced by family-related demands.

Also consistent with COR theory, ECDs had a deleterious impact on workers' depressive symptoms, especially when such demands required 5 or more hours per week in addition their work hours. Further theoretical support for these findings can be found in the stress-coping model of family caregiving, which posits that inability to handle the stress of caring for older relatives leads to poor mental health outcomes such as depressive symptoms (Pearlin, Mullan, Semple, & Skaff, 1990). The combination of FWC and depressive symptoms could signal that ECDs require personal resources that are excessive and could lead to declined work performance unless support is available to such workers. The fact the ECDs were not associated with self-rated health suggests that workers might have interpreted the single-item self-rated health question as physical health only.

Our application of COR theory resulted in additional important findings, especially regarding competing work-related demands (study covariates) and their effects on outcomes. Specifically, higher physical job demands were associated with lower self-rated health and greater depressive symptoms, while greater psychological job demands were associated with greater depressive symptoms, FWC, and work stress. Socio-demographic variables showed that workers of the highest family income level had better self-rated health and fewer depressive symptoms than workers of lower family income groups, and that the 55+ age group had less FWC but more work stress than workers in the younger age groups. Our findings suggest, in keeping with COR theory, that older workers and those with heavy job demands may have poorer outcomes due to resource decrements that inhibit their ability to fulfill the cumulative and competing demands of their lives. The finding regarding income is consistent with previous research that suggests the positive association of income and well-being may be explained by people with higher incomes having less financial stress, heathier diets and lifestyles, better living environments, and access to healthcare; it has also been noted that healthy people are more likely to be financially productive than people who are less healthy (Adler et al., 1994; Currie & Madrian, 1999; Smith, 1999).

Our study findings have several implications given the lack of published studies on workers with ECDs in medium-sized manufacturing-sector companies. Employee assistance programs or human resource departments within these companies should consider polling employees regarding ECDs and assessing eldercare-related risk for adverse health-related and work-related outcomes. Follow-up assessments could inform which support and at what intensity or duration selected employees may benefit, and sharing results with employees and human resource managers might lead to promising and novel interventions. At a minimum, information and referral services to local community resources such as Area Agencies on Aging could be available in human resource offices. Recognizing probable fiscal constraints of medium-sized manufacturing companies, additional lower-cost eldercare support initiatives such as flexible scheduling, job

sharing, and support networks might also be considered. In addition, our findings regarding the effects of competing demands suggest the importance of interventions focused on work organization. Ergonomic and engineering interventions can be used to reduce physical demands, and job redesign initiatives can minimize psychosocial demands. These suggested strategies need not be restricted to medium-sized manufacturing companies if ECDs and their consequences on employees are found in other work settings than those studied here.

Regarding work leave, it should be noted that existing policies such as the federal Family Medical Leave Act (FMLA), which provides job protection for unpaid leave used to care for ill family members, may be inadequate for many working caregivers because FMLA only applies to certain employees and family members, and is unpaid. In particular, women, Latinos, low-wage workers, and less-educated employees utilize leave policies less frequently than other groups (Chen, 2014), suggesting the need for more targeted initiatives. For employees who stand to benefit by utilizing them, existing policies should be overtly and widely publicized within the workplace, because policies and benefits (e.g. flexible arrangements and dependent-care tax credits) designed to support employed caregivers are underutilized when employees do not perceive that organizational leaders support their use (Calvano, 2013; Kim et al., 2013; Sahibzada, Hammer, Neal, & Kuang, 2005). In fact, organizational support for family-related leave policies is a contributing factor in reducing work–family conflict (Gordon et al., 2012, 2007), and mitigates the risk of pay loss due to family caregiving (Earle & Heymann, 2012).

Organizations that adopt and promote eldercare-related policies and programs can reduce employed caregivers' strain, keep them engaged in the organization, and prevent reductions in work productivity; this would also likely lead to greater perceptions of organizational support for ECDs by employees, ultimately leading to better health-related and work-related outcomes (Brown & Pitt-Catsouphes, 2015; Zacher & Schulz, 2015; Zacher & Winter, 2011). Moreover, organizations that help employees accommodate this outside-work experience are likely to benefit from their increased commitment and enhanced morale due to the positive impact of eldercare. Although examined as a demand in this study, eldercare can be a meaningful and rewarding part of family life (Louderback, 2000). Providing eldercare offers psychological benefits, including enhanced relationships and a sense of accomplishment (Brown & Pitt-Catsouphes, 2015; Dembe, Dugan, Mutschler, & Piktialis, 2008; Scharlach, 1994). Also, studies of work–family enrichment indicate that the work and family spheres can enhance one another (Carlson, Kacmar, Wayne, & Grzywacz, 2006), especially if employees have built a 'bank of trust' with managers and co-workers (Bernard & Phillips, 2007). To the extent that workers regard caregiving in a positive light, intrinsic enjoyment of care provision can spill over into work, consistent with role enrichment theory and the expansion hypothesis (Greenhaus & Powell, 2006; Trukeschitz, Schnieder, Muhlmann, & Ponocny, 2013).

Thus eldercare is not exclusively a burden to caregivers. Not only does it have beneficial effects, but the extent to which it is stressful is strongly impacted by modifiable circumstances. A Connecticut study of the effects of family caregiving found that on the whole, caregiving per se did not lead to poorer health, depressive symptoms, or social isolation. Adverse outcomes were more likely in cases in which the caregiver lived with the elder, had inadequate income, or had unmet needs for long-term care services. The study concluded that caregiver support in the form of training and education, respite, and

physical and mental health care, can serve to mitigate the negative effects of family caregiving (Robison, Fortinsky, Kleppinger, Shugrue, & Porter, 2009). These are forms of support that organizations and communities can offer to employed caregivers.

There are several limitations to this study. This was a cross-sectional analysis, so we cannot make conclusions about causal pathways between predictor and outcome variables. Also, we acknowledge that although splitting continuous variables (e.g. eldercare hours) into categorical variables is associated with a loss of information and statistical power, using a taxonomy is justified when data are highly skewed, as is the case with our ECD variables, where a large majority of participants (87.2%) reported having no ECDs (MacCallum, Zhang, Preacher, & Rucker, 2002). Although nearly identical to the prevalence found elsewhere (MetLife, 2010), eldercare prevalence was modest so that sample sizes were too small to fully evaluate eldercare hours and type as predictor variables. It is possible that a subset of caregivers in the study suffered greater severity of effects due to more intense caregiving demands (e.g. 15+ hours per week), but we were unable to assess this due to an insufficient sample size. Moreover, given how we operationalized the eldercare variable (i.e. providing care for a dependent adult aged 65 and older due to disability or chronic illness), it is possible that respondents who provided shorter term, intensive care to older adults who experienced falls and other acute events resulting in injury or illness did not reply affirmatively to the eldercare measure.

In conclusion, although the topic of eldercare among paid employees has received intermittent attention in the gerontological and work literature, there remains a gap in knowledge about how to maximize the health and work experiences of employed adults with ECDs. Such workers in the manufacturing sector remain hidden from policy and intervention initiatives, especially when their companies are of a modest size and resources to support them are limited. Nevertheless, ECDs are only expected to grow in the labor force along with the projected sharp increase over the next few decades in the older population most in need of family care. Local partnerships between manufacturing-sector companies and community organizations serving older adults and their families represent a promising way forward to minimize the adverse health-related and work-related effects of ECDs in the employed population.

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