

PAIN & AGING SECTION

Original Research Article

The Relation of Pain and Caregiver Burden in Informal Older Adult Caregivers

Shannon L. Jones, MA,
Heather D. Hadjistavropoulos, PhD,
Jennifer A. Janzen, MA, and
Thomas Hadjistavropoulos, PhD

Department of Psychology, University of Regina,
Regina, Saskatchewan, Canada

Reprint requests to: Heather D. Hadjistavropoulos,
PhD, Department of Psychology, University of Regina,
Regina, SK S4S 0A2, Canada. Tel: 306-585-5133; Fax:
306-337-3227; E-mail: hadjista@uregina.ca.

Abstract

Objective. Pain in older adults is highly prevalent and although informal caregiving is commonly provided by an older cohort, the relationship between pain and caregiving has seldom been examined. Our goal was to study the associations between caregiver pain, depression, and caregiver burden in a sample of older adult caregivers.

Design. Questionnaires were completed by 116 caregivers (mean age = 73.34) to measure the caregivers' overall pain, chronic pain status, caregiver burden and its five dimensions, depression, and the care recipients' level of disability. Hierarchical linear regression analyses evaluated the extent to which care recipient and caregiver variables, including caregiver pain and depression, were related to high levels of caregiver burden.

Results. The overall level of pain reported by the caregiver was a significant predictor of overall caregiver burden and the emotional and physical dimensions of caregiver burden, whereas a number of care recipient variables (e.g., disability level) were significant predictors of the social, emotional, and time dependence dimensions of caregiver burden.

Conclusions. This is the first study to investigate the relationships among caregiver pain and caregiver burden in informal older adult caregivers. We conclude that the role of caregiver pain has been greatly underestimated in the caregiver burden literature and suggest a need for interdisciplinary col-

laboration for effective management of caregiver burden in older adults.

Key Words. Caregiver Pain; Caregiver Burden; Depression; Older Adults

Introduction

Pain in older adults is very common, with an estimated prevalence of approximately 50% among persons over 65 years of age [1]. With the aging of North America's population, older adults often assume caregiving roles for ailing spouses and other relatives. As such, it is important to examine the contribution of caregiver pain to the physical and psychological strain that is often associated with informal caregiving in the older adult population [2].

Changes to health care policy have led to a shift from inpatient to outpatient care for many serious and chronic illnesses, resulting in an increased need for family and friends to take on the informal caregiver role [3]. Informal caregiving refers to activities involved in providing assistance to relatives or friends who are unable to provide for themselves [4]. Given that today, more people are living longer with chronic and debilitating illnesses [5], it is estimated that over 2.7 million Canadians and 65.7 million Americans [6] function as informal caregivers of ill or disabled older adults [7]. As the population ages, so do many of our informal caregivers, with 20–25% of caregivers estimated to be over 65 years of age [8,9].

Caring for a sick or frail family member or loved one with dementia poses significant challenges. Caregiver burden refers to the multidimensional challenges of caregiving, for example, time demands, physical strains, emotional challenges such as having negative feelings towards the care recipient, pressure associated with role conflict (i.e., a caregiver may have to limit the time and energy invested in other relationships or work), and thoughts of being "off-course" as compared with one's peers [10]. Another well supported difficulty associated with caregiving is the increased presence of depression in caregivers [11]. Reviewing the literature on caregiver burden and depression, Clyburn, Stones, T. Hadjistavropoulos, and Tuokko (2000) [12] suggest that despite the overlap between these two constructs, caregiver burden and depression are also unique.

Degree of caregiver burden has obvious implications for the care recipient. For example, care recipients are more likely to have unmet needs if their primary caregiver is experiencing a high degree of burden [13]. Researchers have also demonstrated that caregiver burden has both psychological and physical consequences for the caregiver. Caregiver burden is predictive of elevated depression amongst many caregivers [12,14], but this link has not been consistently found [15]. In this case, females tend to present with depressive symptoms more often than their male counterparts [16] and spouse caregivers tend to exhibit more symptoms of depression as compared with other family caregivers [17]. Canadian statistics also indicate that 21% of older caregivers report experiencing a negative change in their own health as a result of caregiving [18], and that caregiver burden is associated with reduced health-related quality of life [19]. Results from a meta-analysis reveal that caregivers report more health problems, have higher stress hormone levels, and lower antibody response levels than noncaregivers [20]. Furthermore, burdened senior caregivers who reside with the care recipient have mortality risks that are 63% higher than age-matched, noncaregivers when studied in a five-year longitudinal study [21].

Of significance is that caregiver burden is not a universal experience. Some individuals are resilient and are able to adapt more easily to the responsibility and demands of caregiving whereas others report significant strain and distress [22]. Because of variable responses to caregiving, researchers have sought to establish factors that may predict caregiver burden [12]. Such information is helpful to health professionals in identifying those most at risk for high levels of caregiver burden.

Past research has explored both care recipient factors and caregiver variables that may predict caregiver burden. Examples of care recipient variables that predict higher caregiver burden include caring for community-dwelling patients [12] and care recipients who have high emotional lability [23] or who exhibit behavioural problems [24]. In terms of caregiver variables, sex differences have emerged with findings showing that female caregivers tend to report more burden than males [25]. This may be due in part to females conducting more caregiving tasks and receiving less informal support from others [16]. Unexpectedly, a shorter duration of caregiving is also associated with increased caregiver burden [26], suggesting that new caregivers may need time to adapt to the stress of assuming additional responsibility. Receiving support from one's social network and having time to socially interact may protect caregivers from experiencing burden [27], whereas a lack of support is associated with more strain [28]. Likewise, those caregivers who describe their relationship with the care recipient prior to taking on the caregiving role as distant and unaffectionate report increased burden and distress [29].

The current study aimed to add to this line of research by examining the contribution of caregiver pain to the level of caregiver burden experienced. Pain is a multidimensional

construct that represents both a sensory and emotional experience; some, but not all individuals with pain will have alterations in affect, physical functioning, and quality of life [30]. Caregiver pain has not yet been studied in relationship to caregiver burden despite pain being a highly prevalent [31] and often undertreated condition among older adults [32]. That is, studies have not examined the extent to which caregivers' own pain may be impacting the degree of caregiver burden reported. Only one known population-based study has sought to examine the role of pain in older caregivers' well-being [33]. Within a sample of over 9,000 older adults, Blyth and colleagues (2008) [33] observed that older caregivers with chronic pain reported greater psychological distress and poorer self-rated health as compared to older caregivers without pain. This research, however, did not consider the contribution of caregiver pain to degree of caregiver burden.

A positive relationship between caregiver pain and caregiver burden seems probable in light of past research on pain and depression. It has been demonstrated that depression symptoms are a common feature of chronic pain and can affect pain threshold and tolerance [34]. Moreover, the relationships among pain, depression, and caregiving are particularly important as caregivers with pain tend to overestimate their care recipients' pain when serving as a proxy, and depression in the caregiver can cause the caregiver to underestimate the pain experienced by the care recipient [35].

Study Purpose

The purpose of our study was to further our understanding of caregiver burden by examining the impact of caregiver pain on caregiver burden while also controlling for depression, a variable inextricably linked to caregiver burden. Furthermore, the relative importance of caregiver pain in predicting caregiver burden in comparison to other care recipient (e.g., living arrangement) and caregiver (e.g., sex) variables known to be associated with caregiver burden was investigated. It was hypothesized that pain would be associated with caregiver burden even when considered in the context of other variables known to be related to caregiver burden.

Methods

Participants and Procedure

Following receipt of ethics approval from the Research Ethics Board of our institution, 123 older adult caregivers from across Canada were recruited to participate in the study through poster and media advertisements, and by contacting caregiver organizations such as the Alzheimer Society of Canada and several of its provincial and regional offices, caregiver support programs, seniors' centres, care homes, and seniors' day programs. Prior to enrollment in the study, prospective participants were informed by a researcher that they would be eligible to participate if they were aged 60 years and older, and were caring for an individual who was physically frail or disabled,

or if the care recipient had received a formal diagnosis of Alzheimer's disease or dementia. Questionnaire packages (described below) were mailed to prospective participants and took approximately 45–60 minutes to complete. After participants' responses were returned to the researchers in pre-addressed, pre-stamped envelopes, each caregiver received a \$10.00 honorarium for their participation.

Measures

Demographics questions asked for participants' age, sex, ethnicity, province, and city of residence, educational level, relationship status, and health conditions. Participants rated their relationship status as single, dating, common law/cohabiting, married, separated, divorced, or widowed. For health conditions, participants were provided a list of common health problems and asked to indicate which conditions they have experienced. These were heart problems (e.g., coronary artery disease), respiratory problems (e.g., emphysema), diabetes, arthritis related diseases, neurological disorders, digestive problems (e.g., gallbladder disease), liver problems, kidney disease, stroke, HIV illness or AIDS, cancer, and other. For data analysis, this variable was coded as number of health conditions reported. Background questions included caregiver information, such as length of time spent in the caregiver role (in months), whether the care recipient resided in the same home as the caregiver (coded as yes or no), relationship of care recipient to caregiver (spouse or not), and whether the care recipient had received a formal diagnosis of dementia or Alzheimer's disease.

The Townsend Disability Scale (TDS) [26] is a 9-item measure of activities that assesses physical ability of the care recipient. Items are rated on a 3-point scale with scores ranging from 0 to 2. Scores ≥ 7 are used to identify care recipients with appreciable incapacity. Supporting the validity of the scale, lower scores are predictive of lower depression in healthy older adults [36] whereas higher scores are associated with greater disability and increased age [37]. Internal consistency of the scale in this study was $\alpha = 0.87$.

An overall pain score was obtained from the Geriatric Pain Measure (GPM) [30]. The instrument contains 24 items scored dichotomously and two items scored on a 0 to 10 scale, with total scores ranging from 0 (*no pain*) to 42 (*the worst pain*). The final score is adjusted to a 0–100 scale by multiplying the total score by 2.38. The measure demonstrated strong internal consistency ($\alpha = 0.94$) and test-retest reliability ($r = 0.90$) in a sample of ambulatory geriatric patients [30]. Supporting the validity of the scale, the measure shows high correlations with other measures of pain as well as depression and disease burden [30]. Internal consistency of the dichotomous items on the scale in our study was excellent ($\alpha = 0.93$).

Chronic pain status of the participants was assessed by asking the following question also used by Blyth et al. (2008) [33]: "Think back over the last six months. Has there been a period during the six month period when you

experienced pain on all of the days for a three month period?" with a *yes* or *no* response. If participants responded *yes*, they were categorized as having chronic pain.

The Caregiver Burden Inventory (CBI) [38] was completed by participants and is comprised of 24-items that measure five dimensions of burden related to the caregiving role. These are: 1) time-dependence, or the perception that caregiving restricts the time of the caregiver; 2) developmental burden, or the perception that the caregiver is missing out on life or has diverted from their expected life course as compared to their peers; 3) physical burden, or the impact of caregiving on the caregiver's feelings of chronic fatigue and physical health; 4) social burden, or feelings of role conflict with other relationships or in their jobs; and 5) emotional burden, or the caregiver's negative feelings towards the care recipient and the resulting guilt. Participants were asked how often each statement described their feelings on a scale ranging from 0 (*never*) to 4 (*nearly always*). Alpha coefficients for each subscale in this study were satisfactory and ranged from 0.74 to 0.88, with the overall internal consistency found to be $\alpha = 0.91$.

The Geriatric Depression Scale (GDS) [39] was designed to distinguish depressive symptoms from age-related cognitive decline or somatic concerns. It contains 30 dichotomous items on which participants respond *yes* or *no* in reference to how they felt over the past week. Research suggests a score of 11 or higher to be a possible indicator of depression [40]. This binary cut-off score was used to describe our sample; however, the continuous total GDS score was used for multivariate data analyses. Concurrent validity has been demonstrated by strong correlations between the GDS and other commonly used measures of depression [39]. The internal consistency of the measure in the present study was $\alpha = 0.91$.

Analysis

The data were screened to ensure completion of questionnaires and accuracy of participant responses, and to facilitate the removal of outliers. In cases where participants had less than 10% of missing data on any given scale or subscale, mean substitution was used to replace the missing data points with participants' mean scores on that scale or subscale. Mean substitution was used to replace missing data on the GPM (13 cases), the CBI (12 cases), and the GDS (13 cases). Next, outliers were examined by running descriptive statistics to determine the standardized value for each scale's total and subscale scores. If the *z*-score of a data point equalled ± 3.29 ($P < 0.001$, 2-tailed), the outlying score was changed to one unit larger than the next most extreme non-outlying score in the distribution as recommended by Tabachnick and Fidell (2001) [41]. In total, there were four outlying scores on length of time spent caregiving that were changed in this way.

Prior to conducting multivariate analyses, a correlation table was generated to identify relationships among the

variables of interest (i.e., caregiver burden and care recipient and caregiver variables). In total, six separate hierarchical linear regression analyses were conducted with caregiver burden (as measured by the CBI total score) and its five dimensions (as measured by the subscale scores) as the dependent variables. The following care recipient variables were entered into the regression: 1) relationship of the care recipient to the caregiver (spouse or not); 2) living arrangements of the care recipient in proximity to the caregiver (reside in same home or not); 3) diagnosis of care recipient (diagnosed with Alzheimer's disease/dementia or not); 4) length of time care recipient received care from the caregiver (in months); and 5) disability of the care recipient (TDS score). These were selected based on prior research linking these variables to caregiver burden. That is, being a spouse caregiver [17], living with the care recipient [12], caring for someone with dementia with greater disability [42], and caring for a shorter duration [26] are associated with elevated burden. Along with care recipient variables, the following caregiver variables were entered: 1) sex, 2) age, 3) number of health conditions, 4) depression (GDS score), 5) overall pain (GPM score), and 6) chronic pain status. These were chosen because being female [16], of older age [19], having more self-reported health problems [20], and depression [14] are related to elevated burden. This analysis allowed us to examine variables that contribute significant variance to caregiver burden while controlling for other key variables such as depression.

Results

Background of Sample

Several participants were excluded from the analyses because they were too young ($N = 6$) or did not have a care recipient with significant disability ($N = 1$) (i.e., TDS score was less than 7 for one care recipient) leaving 116 participants for the analyses. On average, participants were 73.34 years old ($SD = 6.81$), with ages ranging from 60 to 90 years. The sample was mostly female ($N = 84$; 72.4%), Caucasian ($N = 107$; 92.2%), married or common-law ($N = 92$; 79.3%), and residents of western Canada ($N = 105$; 90.5%). Most participants had completed a high school diploma or higher education ($N = 95$; 81.9%).

The majority of participants were caring for a spouse ($N = 75$; 64.7%), with the remaining participants caring for a parent, step-parent, or parent-in-law, a friend, another family member, or one of their children ($N = 41$; 35.3%). Nine participants reported being caregivers for multiple family members. Over half of the participants were residing in the same house as the care recipient ($N = 65$; 56%) while the other caregivers were either not living with the care recipient or only stayed in the same house as needed. Most caregivers reported that their care recipients had received a formal diagnosis of dementia or Alzheimer's disease ($N = 77$; 66.4%) while the remaining care recipients were characterized as physically frail or disabled ($N = 39$; 33.6%). According to the TDS, care recipients fell in the severe disability range ($M = 13.42$; $SD = 4.59$). Length of time spent caring for the care recipient

Table 1 Means and standard deviations for participants' scores on self-report questionnaires

Measure (Range of Scores in Sample)	M	SD	N
Townsend Disability Scale (0–18)	13.42	4.59	107
Geriatric Pain Measure (0–85.68)	31.40	23.84	114
Caregiver Burden Inventory Total Score (1–79)	38.33	15.98	112
Developmental Burden (0–20)	10.47	4.96	115
Physical Burden (0–16)	6.76	3.77	115
Social Burden (0–15)	4.79	4.16	115
Emotional Burden (0–18)	3.77	4.04	115
Time Dependence (0–20)	12.58	5.02	112
Geriatric Depression Scale (0–28)	9.15	6.96	115

ents ranged from 2 months to 56 years with a mean of 79.6 months or 6.6 years ($SD = 100.5$; median = 60.0).

Scale Descriptive Statistics

Participants' mean scores and standard deviations from the self-report measures appear in Table 1. Approximately 74% of participants reported experiencing chronic pain over the last six months. According to scoring recommendations by the authors of the GPM [30], 48.25% ($N = 55$) of participants reported only mild or no pain, 44.74% ($N = 51$) reported moderate pain, and 7.01% ($N = 8$) reported severe pain. Roughly 36% of participants ($N = 41$) reported symptoms of depression that fell in the range of being a possible indicator of clinical depression (GDS score ≥ 11 [43]).

Multivariate Analyses

To assist with interpretation of the analyses, Table 2 contains correlations among the dependent variables and the care recipient and caregiver variables and Table 3 contains the results of the regression analyses along with the beta values for the significant predictors of each regression.

As can be seen in Table 3, all regression equations were significant. There were differences, however, in the variables that uniquely predicted caregiver burden and the five caregiver burden dimensions. Depression was not surprisingly a significant covariate of caregiver burden and four of its dimensions. Specifically, depression was a significant predictor of social, physical, and emotional burden, and was the lone significant predictor of developmental burden. Nonetheless, overall pain accounted for a significant proportion of the variance in overall caregiver burden, physical burden, and emotional burden. Additionally, age of the caregiver was also related to physical burden. The relative effect sizes of the regression models predicting overall caregiver burden and physical burden demonstrate the strength of the relationships among depression, overall pain, and caregiver burden. In comparison, social

Table 2 Correlations among dependent variables and the care recipient and caregiver variables

	Care Recipient Variables					Caregiver Variables					
	Spouse	Living	Diagnosis	Care length	Disability	Sex	Age	Health	Dep.	Pain	Chronic pain
Caregiver burden	0.02	0.01	0.10	0.10	0.05	-0.04	-0.18	0.26*	0.56**	0.48**	-0.03
Developmental	0.01	-0.02	0.09	0.08	0.01	-0.10	-0.20*	0.22*	0.52**	0.39**	-0.06
Physical	-0.04	-0.04	0.03	0.10	0.09	0.06	-0.23*	0.33**	0.84**	0.60**	-0.12
Social	-0.23*	-0.22*	-0.10	0.16	0.04	-0.04	-0.31**	0.13	0.70**	0.23*	0.16
Emotional	-0.02	0.26**	0.02	0.01	-0.33**	-0.26**	-0.14	0.18	0.40**	0.36**	-0.04
Time	0.17	0.05	0.29**	0.02	0.33**	0.22*	0.11	0.18	0.13	0.25**	-0.05

* $P < 0.05$; ** $P < 0.01$.

Spouse coded as 1 = caring for spouse; 0 = caring for someone other than spouse; Living coded as 1 = care recipient lives with caregiver; 0 = care recipient not living with caregiver; Diagnosis coded 1 = care recipient has diagnosis of Alzheimer's disease/dementia; 0 = care recipient does not have diagnosis; Disability = care recipient disability as measured by TDS; Sex coded as 1 = male; 0 = female; Health = number of health conditions; Dep. = depression as measured by GDS; Pain = overall pain as measured by GPM; Chronic pain status coded as 1 = yes; 0 = no.

burden and time dependence burden were primarily predicted by care recipient variables, although the nature of the care recipient variables differed to some extent. Time dependence burden was predicted by the care recipient living with the caregiver, higher levels of disability in the care recipient, as well as the care recipient having Alzheimer's disease or dementia. Higher social burden was predicted by not living in the same home as the care recipient and lower care recipient disability. Finally, of note was that in addition to depression and pain, emotional

burden experienced by the caregiver was predicted by lower levels of disability in the care recipient.

Contrary to prior caregiver burden research, a number of variables did not emerge as significant predictors of caregiver burden or its dimensions. Specifically, the relationship of the care recipient to the caregiver, length of time spent in the caregiver role, sex of the caregiver, and number of caregiver health conditions were not related to caregiver burden in the present study.

Table 3 Significant predictors of caregiver burden

Dependent Variable	Beta	SE Beta	β	P	F	R^2
CBI Total					5.75**	0.35
Depression	0.83	0.20	0.39	0.001		
Overall pain	0.18	0.07	0.29	0.009		
CBI Developmental					4.02**	0.25
Depression	0.25	0.07	0.38	0.001		
CBI Physical					9.55**	0.49
Age	-0.13	0.06	-0.23	0.025		
Depression	0.17	0.04	0.32	0.001		
Overall pain	7.13	0.02	0.45	0.001		
CBI Social					4.79**	0.37
Living arrangement	-2.11	0.83	-0.25	0.013		
Disability level	-0.19	0.10	-0.20	0.054		
Depression	0.24	0.06	0.41	0.001		
CBI Emotional					4.56**	0.28
Disability level	-0.24	0.10	-0.25	0.017		
Depression	0.15	0.06	0.26	0.010		
Overall pain	3.90	0.02	0.22	0.047		
CBI Time Dependence					4.72**	0.30
Living arrangement	2.31	0.96	0.24	0.018		
Diagnosis	3.49	0.94	0.36	0.001		
Disability level	0.45	0.11	0.42	0.001		

* $P < 0.01$; ** $P < 0.001$.

CBI = Caregiver Burden Inventory.

Discussion

Given the proportion of informal caregivers over age 65, this study offers important information about the contribution of caregiver pain to caregiver burden in an older population of caregivers. Caregiver burden can have devastating consequences for both the caregiver [2] and the care recipient [13] and understanding its sources, including undermanaged pain, is critical in our effort to help these persons to optimize their coping resources. Adding to previous literature, this study focused on caregiver burden and depression exclusively in an older population of caregivers. Depression and pain scores in our sample were comparable with previous studies of older caregivers of patients with dementia [44] and community dwelling seniors [45]. A noteworthy finding was the higher level of caregiver burden reported in our older sample as compared to a prior large-scale study with younger caregivers of individuals with dementia [46].

Our results support the need for interdisciplinary collaborations in the management of caregiver burden considering the contribution of both pain and psychological difficulties to caregiver burden. Consistent with our initial hypothesis that caregiver pain would predict response to caregiving, the findings indicate that pain ratings are associated with overall caregiver burden, as well as several of its dimensions, including emotional burden and physical burden. As expected, depression was a robust correlate of caregiver burden, yet this study uniquely took into account the variance that caregiver pain contributed to caregiver burden. Our findings suggest that the role of caregiver pain has been underestimated in the literature. In some ways these results are not surprising, however, since past research has demonstrated that pain is highly prevalent [31] and often undertreated among older adults [32].

A particularly significant result of this study was that overall pain was a significant covariate of caregiver burden but the chronic pain status of the caregiver was not, despite 74% of participants experiencing chronic pain. This finding may be due to our measure of chronic pain obtained from prior research [33], which may not have been an accurate assessment of chronic pain when used in a written survey. Alternatively, the high proportion of participants reporting chronic pain may have prevented detection of any significant results for this measure. Nevertheless, these preliminary results would suggest that health care providers should attend to the overall pain the caregiver reports and not necessarily whether the pain the individual experiences is classified as chronic.

As previous research has demonstrated that care recipients are more likely to have unmet needs if their primary caregiver is experiencing a high degree of burden [13], effective pain management in this population is imperative. Related to this is also the finding that caregivers with pain tend to overestimate their care recipients' pain when serving as a proxy [35]. As such, more effective pain management among caregivers could facilitate more accurate pain assessment and management in care

recipients, especially considering inherent difficulties in accurately evaluating subjective pain states in older adults with dementia and serious limitations in their ability to communicate [47].

While pain was an important predictor of overall burden, it is not surprising that some dimensions of caregiver burden were more strongly related to the care recipient than to the caregiver. Time dependence, for instance, was uniquely related to whether the care recipient had Alzheimer's disease, lived with the caregiver, and experienced significant disability. Moreover, higher social burden was observed when the care recipient did not live in the same home and had lower disability. These findings underscore the importance of assessing the multiple dimensions of caregiver burden as the predictors of the dimensions of burden vary.

Surprisingly, no significant differences were found between male and female caregivers on measures of caregiver burden or caregiver burden dimensions, despite past literature reporting that females often experience higher levels of caregiver burden than male caregivers, even in samples that were predominantly female [25]. Likewise, given that earlier research observed stronger sex differences in older caregivers as compared to younger caregivers [25], it was unexpected that no sex differences were observed in our older caregiver sample. Sex differences, however, may not have emerged because our sample was exclusively older adults and was largely female. Whereas most, if not all, caregiver burden reported by younger females may be related to being of the "sandwich" generation, a strain that is unlikely to be present in a sample that is mostly retired.

A potential limitation of this research is the use of a self-selected volunteer sample of participants. The caregivers who took the time to participate in this study may have experienced increased burden and thus wanted to share their concerns with others by contributing to this study. On the other hand, the caregivers who participated in this study may have felt less overwhelmed by their caregiver role and therefore had the time to volunteer. The latter explanation may be less likely as higher CBI scores were found in the current study as compared with other research using this measure [46]; however, as identified above, this may also reflect the increased age of the caregivers in our study. It should also be acknowledged that our sample was mostly Caucasian and well-educated. It is probable that the findings of this research are limited to older caregivers with these demographic characteristics.

A second shortcoming of the present analysis was the limited information collected regarding the caregivers' health status. Although participants were able to indicate which health conditions and problems they have experienced, it is uncertain how the range of health conditions may vary in the degree to which they impact the participants' pain, depression, and ability to function as a caregiver. These concerns may be addressed in the future by including an objective assessment of health status,

and by taking into account the relation between health conditions and pain in older adults.

There are numerous directions for future research. First, replication of the findings in another sample will be important since this was the first study to examine how pain relates to caregiver burden. Second, further examination of the causal relationship between pain and caregiver burden will be important for future researchers to assess. Finally, a key question that emerges is whether assisting caregivers with pain management would assist in reducing caregiver burden. Significant strides have been made in improving pain management among older adults using psychological [48] and pharmaceutical [49] therapies and application of this research to caregivers with pain is essential.

Acknowledgments

This research was supported, in part, through funding from the Canadian Institutes of Health Research. Thomas Hadjistavropoulos is also supported through funding from the RBC Foundation.

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